Bromesberrow
St Mary's CofE (VA) Primary School
We're Reaching for the Stars

Respect, Motivation, Cooperation, Kindness, Pride, Perseverance

Bromesberrow St Mary's C of E Primary School Maths Curriculum Overview.

We believe that **all** children can deepen their understanding within mathematics across our school through motivated teachers, courage and perseverance. At Bromesberrow St Mary's Primary School, we are developing the mindsets of both children and staff, building resilience and a 'can do' attitude to be well rounded, motivated and successful mathematicians. With high quality first teaching and expectations, intelligent practice, collaborative learning and intervention and support, all our children will be given every opportunity to develop key concepts and explore mathematics deeply, being positively enabled to *Reach for the Stars* in their learning of mathematics.

Skill it: demonstrates fluency – being quick in solving questions (procedural knowledge).

Apply it: demonstrates verbal and written reasoning. Children are able to explain why something has happened, how it can be done (proving) and what needs to be done to correct it – declarative knowledge/conceptual knowledge. This is an area for children to show a 'can do' attitude and persevere to improve, developing resilient learners at Bromesberrow.

Deepen it: demonstrates problem solving skills, which we encourage to be open ended. Children will show a depth in understanding a specific mathematical concept in a range of different ways and in different scenarios. Transferring the skills they have learnt in that concept to wider fields (conditional knowledge).

Early Years Foundation Stage:

In Preschool and Reception note that the definition alter slightly in line with the characteristics of effective teaching within Early Years:

Skill it - through adult modelling and imitation, children will **play and explore** by giving things a go.

Apply it – children being able to say if something is right/wrong or good/bad and are **actively learning** where they are concentrating and willing to try out new things.

Deepen it- children use their learning in different circumstances and can change something using concrete materials to make it correct; demonstrating an ability in **creativity and thinking critically** to make links.

The Early Years Foundation Stage provides our children with the fundamental components to mathematics and our curriculum reflects this by ensuring the children are provided with the opportunities to develop a deep understanding within mathematics with a 'can do' attitude. Within Early Years, their mathematical development is hugely influenced by our children being able to explore, practice and enjoy Maths through concrete and pictorial representations to deepen understanding. To support this deepened understanding, the children will continuously be developing five key skills throughout all their learning objectives and continuous provision;

Subitising: instantly recognise small quantities.

Counting: regular opportunities to practise counting forward and back. This is broken into 5 principles:

- *The one-one principle: children assigning one number name to each object that is being counted. Children need to ensure they count each object only once ensuring they have counted every object.*
- *The stable-order principle: children understand when counting, the numbers have to be said in a certain order.*
- *The cardinal principle: children understand that the number name assigned to the final object in a group is the total number in that group.*
- *The abstraction principle: involves children understanding that anything can be counted including things that cannot be touched including sounds and movements e.g. jumps.*
- *The order-irrelevance principle: involves children understanding that the order we count a group of objects is irrelevant. There will still be the same number.*

Composition: recognise that all quantities are composed of smaller quantities.

Sorting and matching: notice similarities and differences as they match and sort objects in different contexts.

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Compare and order: compare and order quantities and measures by noticing more than/fewer than and equal amounts.

Pre School				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**
Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').	Point to small groups of two or three objects: "Look, there are two!" Occasionally ask children how many there are in a small set of two or three.	Able to correct someone or themselves if recognition is incorrect.	Child picks up equipment as part of their play independently and is able to subitise quickly and accurately.	Count One, two, three, four, five. More than, fewer than, circles, rectangles, triangles, cuboids, sides, corners, straight, flat, round, sharp corner, straight edge, pointy, curvy, off, on, under, on top, on, beside, next to, between, down, large, small, exactly, size, length, long, short, heavy, light, first, then, after, before, morning, afternoon, evening and night-time, earlier, later, too late, too soon, in a
Recite numbers past 5.	Regularly say the counting sequence accurately.	Able to correct someone or themselves if recognition is incorrect.	In a variety of playful contexts, inside and outdoors, forwards and backwards, sometimes going to high numbers. For example: hide and seek, rocket-launch countdowns.	
Say one number for each item in order: 1,2,3,4,5.	Count things and then repeat the last number. For example: "1, 2, 3 – 3 cars". Point out the number of things whenever possible; so, rather than just 'chairs', 'apples' or 'children', say 'two chairs', 'three apples', 'four children'.	Recognise if someone has counted correctly or incorrectly and able to verbalise if something is incorrect.	Children to use this counting within their own independent play.	
Know that the last number reached when counting a	Ask children to get you a number of things, and emphasise the total	Children able to say yes or no to the number of objects they have in relation to what they	Children independently show an adult remembering earlier conversations e.g 'I	

small set of objects tells you how many there are in total ('cardinal principle').	number in your conversation with the child.	have been asked. Some children may then self-correct/ some may need adult support e.g. you need 2 more cars. Now we have 4 cars	have 3 cars' may then go and find another set of 3 objects.	minute, yesterday, tomorrow 2
Show 'finger numbers' up to 5	When counting shows on fingers. Adult models counting up to 5 on fingers.	Able to say if the number of fingers is right or wrong	Transfer this into counting other objects.	
Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.	Use small numbers to manage the learning environment. Suggestions: have a pot labelled '5 pencils' or a crate for '3 trucks'. Draw children's attention to these throughout the session and especially at tidy-up time: "How many pencils should be in this pot?" or "How many have we got?" etc.	Able to say if the number of objects is correct or incorrect and can change where needed.	Able to transfer knowledge of amount into different scenarios.	
Experiment with their own symbols and marks as well as numerals.	Encourage children in their own ways of recording, for example how many balls they managed to throw through the hoop. Provide numerals nearby for reference.	Talk about the numerals they have written.	Use in play – independently	
Solve real world mathematical problems with numbers up to 5.	Discuss mathematical ideas throughout the day, inside and outdoors. Suggestions: - "I think Adam has got more crackers…" "I wonder how many sticks I need to make a potion"	'I have given Adam 4 crackers' – actually give child three crackers. Child should recognise if that is right or wrong.	Support children to solve problems using fingers, objects and marks: "There are four of you, but there aren't enough chairs…."	

Compare quantities using language: 'more than', 'fewer than'.	Draw children's attention to differences and changes in amounts, such as those in stories like 'The Enormous Turnip'. 'You have more than me'	Correctly say who has more or who has fewer.	Able to share objects out so one has more or one has fewer etc. can do this through visually seeing a bigger pile and then count after.	
Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'.	Encourage children to play freely with blocks, shapes, shape puzzles and shape-sorters. Encourage children to talk informally about shape properties using words like 'sharp corner', 'pointy' or 'curvy'. Talk about shapes as you play with them: "We need a piece with a straight edge."	What is the same and what is different?	When playing independently or in another environment, children to spot 2D and 3D shapes in those environments and name these without any adult intervention.	
Understand position through words alone – for example, "The bag is under the table," – with no pointing.	Discuss position in real contexts. Suggestions: how to shift the leaves off a path, or sweep water away down the drain.	Is the ball under the table? Children able to say yes/no and explain accurately where it is.	Children use in play.	
Describe a familiar route.	Use spatial words in play, including 'in', 'on', 'under', 'up', 'down', 'besides' and 'between'. Suggestion: "Let's put the troll	Is the troll under the bridge? Children able to say yes/no and explain accurately where it is.	Children using this language in play.	

	under the bridge and the billy goat beside the stream.”			
Discuss routes and locations, using words like ‘in front of’ and ‘behind’.	Take children out to shops or the park: recall the route and the order of things seen on the way. - Adult model the vocabulary as they make any route.	Did they go the right way? Yes or no. Which way should they have gone?	Set up obstacle courses, interesting pathways and hiding places for children to play with freely. When appropriate, ask children to describe their route and give directions to each other. Provide complex train tracks, with loops and bridges, or water-flowing challenges with guttering that direct the flow to a water tray, for children to play freely with. Read children stories such as Rosie’s walk.	
Make comparisons between objects relating to size, length, weight and capacity.	Provide experiences of size changes. “Can you make a puddle larger?”, “When you squeeze a sponge, does it stay small?”, “What happens when you stretch dough, or elastic?” Talk with children about their everyday ways of comparing size, length, weight and capacity. Model more specific techniques, such as lining up ends of lengths	Able to explain why something is larger or smaller in an age appropriate way.	See children using the modelled learning in their own play.	

	and straightening ribbons, discussing accuracy "is it exactly the same?"			
Select shapes appropriately	Flat surfaces for building, a triangular prism for a roof etc. Provide a variety of construction materials like blocks and interlocking bricks. Provide den-making materials. Allow children to play freely with these materials, outdoors and inside. When appropriate, talk about the shapes and how their properties suit the purpose.	Will this be good to use on the bottom? Did that work? Discussion of why not or why it did.	If something isn't working within their construction, they adapt and alter what they are doing to find success.	
Combine shapes to make new ones - an arch, a bigger triangle etc.	Provide shapes that combine to make other shapes, such as pattern blocks and interlocking shapes, for children to play freely with. When appropriate, discuss the different designs that children make. Use tidy-up time to match blocks to silhouettes or fit things in containers, describing and naming shapes. Suggestion: "Where does this *triangular one / cylinder/ cuboid* go?"	Explain what their design is and how they made it.	Able to find what they need to complete their design independently. Occasionally suggest challenges, so that children build increasingly more complex constructions.	

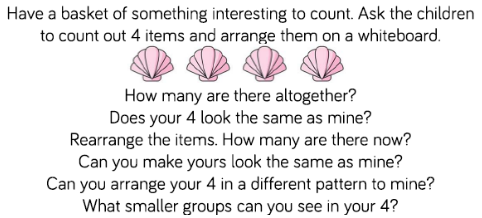
Talk about and identify the patterns around them.	For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc. Provide patterns from different cultures, such as fabrics.	Able to spot mistakes within the pattern.	Provide a range of natural and everyday objects and materials, as well as blocks and shapes, for children to play with freely and to make patterns with. When appropriate, encourage children to continue patterns.	
Extend and create ABAB patterns	Engage children in following and inventing movement and music patterns, such as clap, stamp, clap, stamp. Stick, leaf, stick, leaf.	Notice and correct an error in a repeating pattern.	Create their own pattern for someone to follow.	
Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'	Talk about patterns of events, in cooking or getting dressed. Suggestions: - 'First', 'then', 'after', 'before' - "Every day we…" - "Every evening we…" Talk about the sequence of events in stories. Count down to forthcoming events on the calendar in terms of number of days or sleeps. Refer to the days of the week, and the day before or day after, 'yesterday' and 'tomorrow	When retelling a story or sequence of events children are able to correct themselves or correct someone else by saying where something is right/wrong.	When role playing with small world/dolls, children use the language freely and correctly to describe events that are happening in a sequence.	

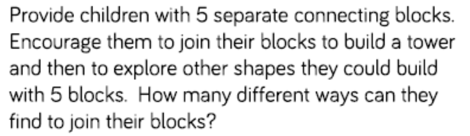
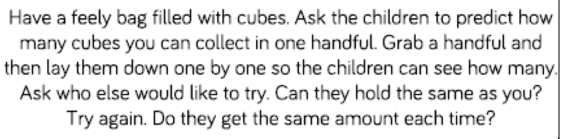
Reception

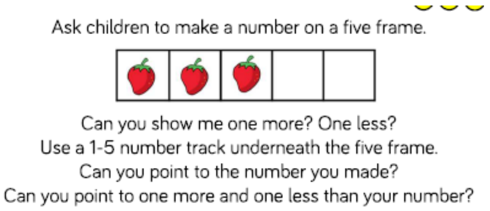
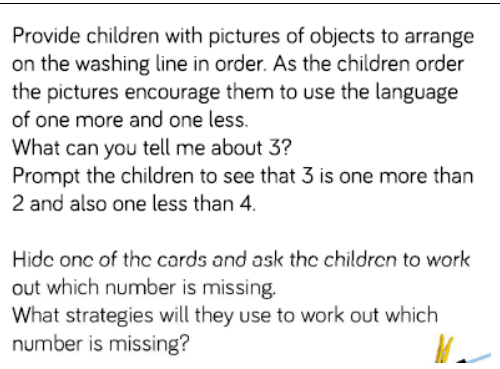
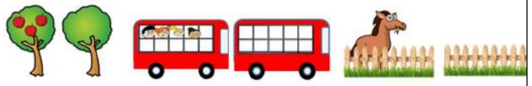
Number

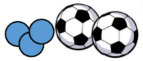
Objective	Skill it	Apply it	Deepen it	Mathematical talk
Able to make comparisons between amounts.	Children shown smaller and larger quantities to compare. Adults model this language. Show children amounts in quantity and size. E.g. more or less cake, size of each item, number of items in each group. Building blocks outside – challenge the children to make a shorter tower and a taller tower. How many crates/blocks did you use? Loose parts – one child grabs a handful as does another child. Does your friend hold more than you, fewer than you or the same amount?	Children given different groups of different sizes/quantities and they are able to explain which one is smaller or larger. Adult could make an error with the expectation of the child correcting them.	Recognise comparison in other day to day activities, such as snack time or when sharing. Children may link this to the idea of fairness.	Number, one, two, three to twenty and beyond, none, count on/up/to/from/down, before, after, more, less, many, few, fewer, fewest, smaller, smallest, equal to, the same as, odd, even, digit, numeral, compare, order, size, value, between, halfway between, number line, add, more, plus, make, sum, total, altogether, double, half, halve, equals, is the same (including equals
Count 1,2,3	- Subitise or count to find how many objects they have. - Encouraged to make their own collections.	Use cards that show the number and a picture card set that represents the numbers. Show an	Children create their own games and create a scoring system using their knowledge of representing 1, 2 and 3.	

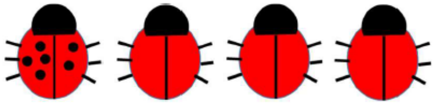
	- Match number names we say to numerals and quantities. - Use own mark making to represent 1,2,3 e.g. scoring in their own game. - Have a number hunt inside and out. - Prepare dot card for children to call out 1, 2 and 3 depending on the number of dots they see. - Hickory dickory dock nursery rhyme. - Children could count the number of beats on a drum.	example of matching card together. Is this true or false? What is wrong? How can we make this right?		sign), how many more to make…? How many more is…? How much more is…? Subtract, take away, minus, share, share equally, group in pairs, equal groups of, divide, split, whole, equal, one half, number track, tens frame, number cards, number squares, numicon, count, work out, Subitise, compare, smaller, larger, zero, number bonds, if I add one more how many will there be? If I take one out how many will there be? How do you know? How can we check?
Comparing 1,2 and 3.	Children begin to recognise that as we count, each number is one more than the number before. Similarly as we count back, each number is one less than the previous number. - Use a range of representations to support understanding and encourage children to represent one more/ one less patterns as the count. - Use stories and number songs that count one more or one less. e.g. The Three little bears	Ask children to compare how far they can travel in 3 giant steps or in 1 or 2. In 1, 2 and 3 tip toes. 'I think we got further when we made 1 step' children should recognise that this is incorrect and correct the mistake.	With the children, count how many items are in a hidden bag? Ask the children to watch as you add one more item to the hidden group. How many will there be now? What if you take one out? Drop stones on marbles into a bucket and children count how many sounds they hear. How many are there? What if we add one more? How do you know? How can we check?	

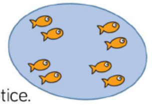
Composition of 1, 2 and 3. - Introduce that all numbers are made of smaller numbers.	Explore and notice the different compositions of 2 and 3 e.g. 1+1 = 2 1+1+1= 3 1+2=3 2+1=3. Use hands to make bunny ears – using two hands show me different ways to make 1, 2 and 3. Create the numbers using numicon. When children are playing with small world – ask the children how many animals they have in one field, how many have we got in the other?	If I have 1 and 1 there will be 3? – Children should recognise this is incorrect and say the correct answer. Encourage children to use fingers or equipment to show the correct answer.	Place 1, 2 or 3 items into a feely bag. Ask the children to feel inside the bag and try to count how many there are without looking. Count to check.	Could there be zero? What do you notice when you try to make pairs with…. Can you arrange smallest to largest? How many do you have to start? How many do you have now? Why? Can you represent what we did using counters? Read, write, listen, join in, tell me, describe, work out.
Children count on and back to four. - Count objects, actions and sounds up to four to find how many. - Subitise sets of up to 4 objects to find how many. - Match number names to numerals and quantities. - Able to say which set has	Children could make their own collections of up to 4 items.  Have a basket of something interesting to count. Ask the children to count out 4 items and arrange them on a whiteboard. How many are there altogether? Does your 4 look the same as mine? Rearrange the items. How many are there now? Can you make yours look the same as mine? Can you arrange your 4 in a different pattern to mine? What smaller groups can you see in your 4? Set up a number hunt outside. In the pictures have 4 represented in different ways.	When counting, children able to self-correct if a mistake has been made or highlight the mistake someone else has made. e.g. there are 4 items but they only count 3. Child may respond with 'there are 4! You didn't count this one.' Recount then with the child leading that.	With the children, count how many items are in a hidden bag? Ask the children to watch as you add one more item to the hidden group. How many will there be now? What if you take one out?	

more or fewer items. - Use own mark marking to represent numbers to 4. - Final number they say is the quantity. - Children able to link the number symbol (numeral) with its cardinal number value (how many of something).				
Subitise up to 5 items. - Count forwards and backwards with 5. - Represent up to 5 objects. - Children able to link the number symbol (numeral) with its cardinal	- Use 5 frames to represent number. - Link in children's birthdays when counting forward. - Counting 5 on fingers. 'Show me five'. 'let's count back from 5' - Use 5 bean bags, fly swatters, numerals 1-5 and a bucket or hat. Arrange the numerals around the edge of an area. Hide a quantity of bean bags	Children able to show more than 1 way to show 5 using their fingers.	 Provide children with 5 separate connecting blocks. Encourage them to join their blocks to build a tower and then to explore other shapes they could build with 5 blocks. How many different ways can they find to join their blocks?  Have a feely bag filled with cubes. Ask the children to predict how many cubes you can collect in one handful. Grab a handful and then lay them down one by one so the children can see how many. Ask who else would like to try. Can they hold the same as you? Try again. Do they get the same amount each time?	

number value (how many of something).	under the bucker to hat and then reveal. Children subitise how many and then run to swat the correct number.			
One more and one less. - Count, subitise and compare number.	Use five frames to represent number and predict how man there would be if you add one and subtract 1. Use songs and stories e.g. 5 current buns/five little ducks  Ask children to make a number on a five frame. Can you show me one more? One less? Use a 1-5 number track underneath the five frame. Can you point to the number you made? Can you point to one more and one less than your number?	Show/ say an incorrect way when showing one more or one less. Children should then pick up on the mistake and then correct what you have done.	 Provide children with pictures of objects to arrange on the washing line in order. As the children order the pictures encourage them to use the language of one more and one less. What can you tell me about 3? Prompt the children to see that 3 is one more than 2 and also one less than 4. Hide one of the cards and ask the children to work out which number is missing. What strategies will they use to work out which number is missing?	
Introducing Zero - Know the number name zero. - '0' in relation to 'nothing there' and 'all gone'	Popular counting back songs like 5 little monkeys jumping on the bed. – Children could predict how many monkeys would be left on the bed after one falls off.  Encourage children to represent numbers including zero.	Adult to say there are zero apples on the tree when there are more than zero. Children would then correct this mistake and could draw a tree showing zero apples.	Children independently recording zero in games they play that may involve scoring. Able to say there is zero and what zero means for that score.	

	'Show me 3 fingers, show me 5 fingers, show me 0 fingers' 'Can you park zero cars in this space?'			
Comparing numbers to five - Continue to recognise that quantities can be more than, fewer/less than or the same as.	Is it fair? Has everyone got the same? Use snack time to reinforce the language use of comparing. 'Hold up more than 3 fingers, fewer than, the same'. Provide opportunities to compare smaller quantities of large items with larger quantities of small items to help children make the distinction between size and quantity. E.g. 2 large balls take up more space than 3 small balls but there are more small balls.  Make towers using pebbles – who can make the tallest tower? How many pebbles are in each tower? Does your tower have more or less?	Hold up the incorrect number of fingers e.g. I have more than 3 fingers showing but hold up less than 3. Children should then recognise this mistake and give examples on how to make it correct.	Whilst children are in their continuous hear the language being used independently – being able to comment on if something is fair or unfair due to the quantities they have.	
Composition of 4 and 5 - Explore and notice the different compositions of 4 and 5.	Encourage children to Subitise (instantly recognise these small quantities without counting) throughout this objective. e.g 5 can be made up of 1+1+1+1+1 or 3+2	Mistake made in composition of number and would want to see the child self-correct or child is able to correct someone ese and show how to make it correct.	**Exploring Possibilities**  Show the children an empty feely bag. Together, count 4 pebbles into the bag. Take out an unseen amount in your hand. Ask the children to discuss how many could be in your hand and how many could be left in the bag.	

Represent, count and compare 6, 7 and 8 in different ways. - Continue to apply counting principles. - Count out required number of objects from a larger group. - Order and compare representation. - Continue to recognise one more/less as they count on/back to 8. - Children able to link the number symbol (numeral) with its cardinal number value (how many of something).	How many legs does a ladybird have? How many spots? Do you know any other creatures with 6 legs? Use counters to add 6 spots to the other ladybird Can you find more than one way to do it?   How many colours do you see in the rainbow? Can you paint a rainbow with 7 colours? Can you make rainbows using objects around th classroom? How many colours did you use? Encourage the children to think about where we see 6, 7, and 8 in everyday life and to make collections of 6, 7 and 8 objects in the classroom. Sort these items into 6, 7 and 8 How else could you show 6, 7, and 8?	When counting, miscount the number of objects etc – expect children to self-correct or correct others and prove how to do it correctly.	Children independently able to represent and count 6,7,8. They are confident in representing these in different ways and will do so independently in their play.	

Making pairs - Begin to understand a pair is two. - Children to arrange small quantities into pairs. - Begin to notice some quantities will have odd one.	Have a basket of unsorted socks or wellies and ask the children to help you sort them into pairs. Can they spot which pairs go together? Why do they match?   Encourage children to investigate making pairs using differen quantities of small world creatures, cubes or counters. Which quantities will make pairs and which will have one left out? D they notice a pattern? Draw children's attention to when objects are grouped into twos and calling this a pair.	Have objects paired together with an odd one – 'All my objects are in a pair'. Children should recognise that one of the objects is on its own and not in a pair.	Children independently pair items together. They could go on a pair hunt for items and are able to independently pair items together. Recognising that pair is two. Able to clearly explain their pairing rules. Provide each child with a blue 'pool' and 8 fish. Ask them to arrange their fish into pairs. Ask the children what they notice. Ask the children to arrange their fish in a different way and to discuss the different compositions of 8 that they notice.  Encourage them to explore the composition of 6 and 7 in a similar way. You can vary the contexts. For example, cars in a car park, horses in a field, ladybirds on a log.	
Combining two groups. - Combine two groups to find out how many altogether. - Children continue to practise subitising.	Tell your partner about the flowers. How many purple flowe can you see? How many blue flowers? How many flowers altogether?  Provide an assortment of 1-5 number shapes. Ask the children to choose a number shape. Next, find a friend and combine their shapes to see what numbe they can make altogether? Repeat by moving to different friends.	When combining two groups together.	Spread a set of dominoes out face down. Ask the children to pick a domino and tell their partner how many spots there are on each side. Can their partner tell them how many spots on the domino altogether? What if my domino has 6 spots? How many could be on each side? Can you draw a domino with 6 spots? Can you draw more than one? 	

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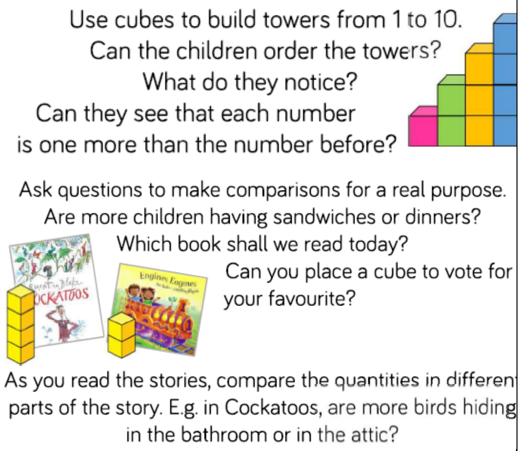
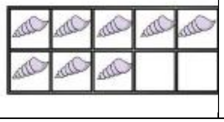
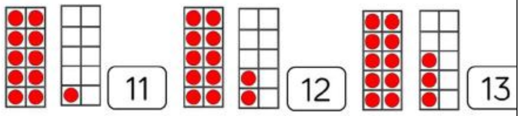
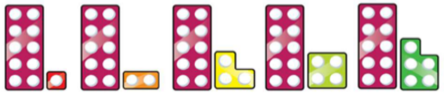
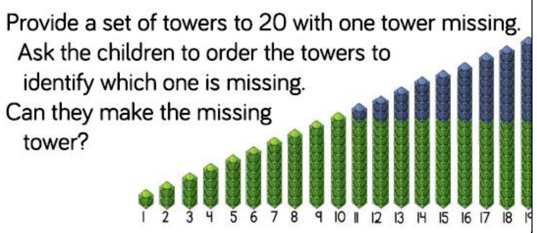
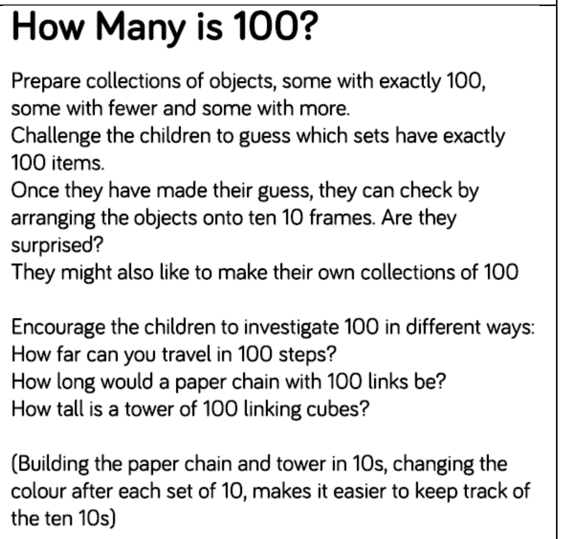
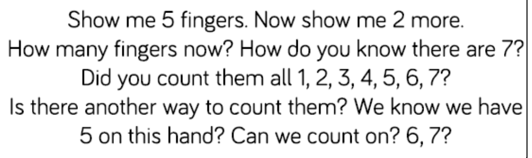
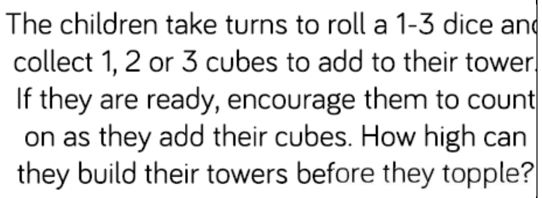
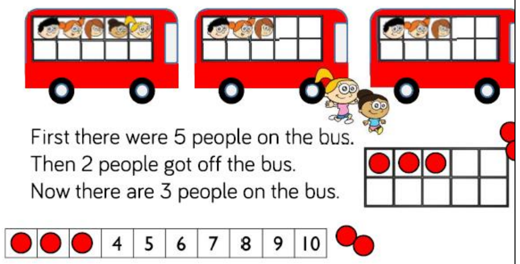
9 and 10 - Apply counting principles when counting 9 and 10 (forwards and backwards) - Represent 9 and 10 in different ways. - Arrange 9 or 10 items into small groups - Notice that a 10 frame is full when there is 10 - Subitise 9 and 10 e.g. I know it is 9 because I see 3,3 and 3/ 4 and 5. - Children able to link the number symbol (numeral) with its cardinal number value (how many of something).	Show children a number card and ask them to show you the number using their fingers or other objects. Finding 9 and 10 using numicon. Ask children to count out 9 or 10 objects. Can they find different ways to arrange their objects? Show me 10 beads on a bead string. Show me 9. **Outdoors**  Ask the children to build a wall and set up 10 green bottles. Each time a bottle 'accidently falls' ask the children how many have fallen and how many are standing. Do they always have 10 in total?	Have number cards lined up. Hide one of the cards – can the children spot which one is missing? Ask the children to help you order a set of number cards up to 10. As you do this, make deliberate mistakes. Can the children spot these and correct you?	Within children's play, they independently use their knowledge of counting forward and back with 9 and 10. They represent 9 and 10 in the games they play in writing and using objects from their environment. This is done without support.	

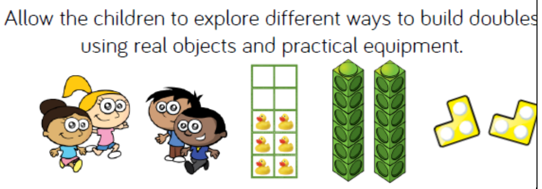
Comparing numbers to 10. - Make comparisons by lining items up with 1-1 correspondence (match number to object) to compare directly or count each set. - Begin to compare/order 3 or more quantities.	 Use cubes to build towers from 1 to 10. Can the children order the towers? What do they notice? Can they see that each number is one more than the number before? Ask questions to make comparisons for a real purpose. Are more children having sandwiches or dinners? Which book shall we read today? Can you place a cube to vote for your favourite? As you read the stories, compare the quantities in differen parts of the story. E.g. in Cockatoos, are more birds hiding in the bathroom or in the attic? Grab a handful of buttons and count them out onto a tens frame. Children then take it in turns to grab some buttons and count them onto a tens frame. Use these to compare.	Using dominos, children find the domino with 7 spots. Find 6 for fewer but place as more than. Child to spot this mistake and order correctly.	During times in the day children can be using this language independently with numbers up to 10. E.g. voting on a class book/ comparing snack or toys with their peers. 'you have more than me. You have 8 and I have 5'.	
Bonds to 10. - Explore number bonds to 10 using real objects in different contexts e.g. there are 10 apples.	Use tens frames of egg boxes. Partially filled – how many more do we need to make 10? Can also use bead strings/fingers.  	With a tens frame, have 6 spaces filled in. Say to the children you need three more objects to complete the tens frame. Expectation of children to correct and say that 4 more are needed not three.	How many ways can they find to park 10 cars in 2 car parks? Encourage independency when doing this.	

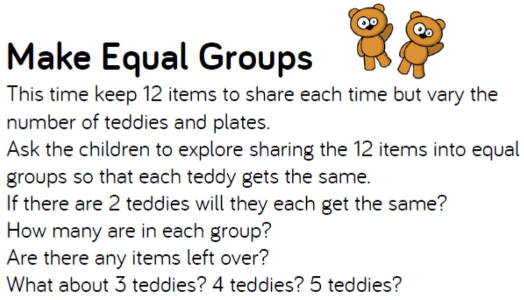
	Provide each child with a numicon piece. Ask them to find a partner who can complete the numicon piece to make 10. 10 hunt: draw a large tens frame on the ground outside. Hide 10 of the same object e.g. duck for children to find. As they children are finding them keep bringing them back to how many they already have and how many more they need to find.		**Pots to 10**  Provide pots labelled with numbers 1-10 and a selection of loose parts such as beads or cubes. Ask the children to count the correct number of beads into each pot. Can they find 2 pots which have 10 beads in total? Is there more than one way to do it? Can they find a way to make 10 by combining 3 pots? How can they check they have 10? Is there more than one possible way? Can they draw what they found?	
Building numbers beyond 10 - Build and identify numbers to 20 and beyond. - Use tens frames, bead strings, tower cubes. - Provide opportunities for children to recognise that numbers 1-9	 Show the children 11 using the number shapes or 10 frame. What do the children notice? Can they see whi number is represented? Now build 12. What's the same? What's different? Continue the pattern, ask the children to predict wha numbers come next and how they could represent each number. What happens when they get to 20 and beyond? 	Incorrectly match number to representation. Children should correct this mistake.	Provide black outlines of a cityscape for the children to fill using numicon. Independently they see which number fills each tower. They see if they can find more than one way of doing it. They could then go on to create their own cityscape for their peers to complete.	

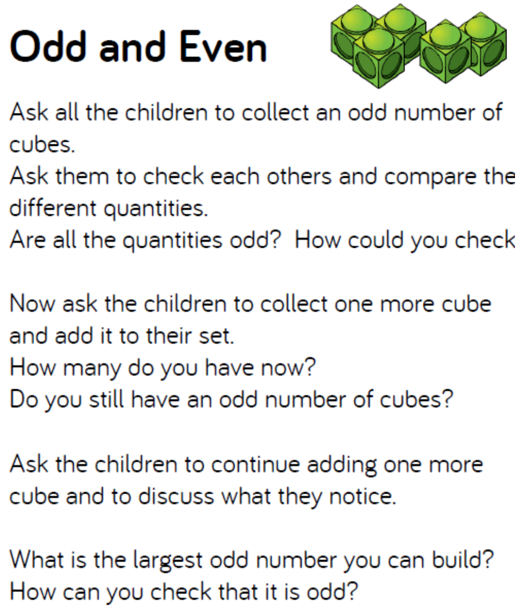
repeat after every full 10.	Prepare some number card with numbers up to 20 (and beyond when necessary) show children the number card – they say the number then represent it using numicon. Children to have number card and pictorial cards representing number – play snap.			
Counting patterns beyond 10. - Count on beyond 10 - Count back beyond 10 - Count on and back from different starting points	Provide children with representations which clearly show full 10s and part of 10 e.g. 14 one full 10 and 4. Use of a number line and 100 square to support children. Play a game 'I count, you count' – blue is what the adult says, red is what the child says 4, 5, 6 7,8,9, 10, 11, 12, 13,14,15 etc. 12, 11, 10, 9, 8, 7 etc.  Provide a set of towers to 20 with one tower missing. Ask the children to order the towers to identify which one is missing. Can they make the missing tower? 	Tell the children you are going to make the number 17 on a tens frame. Fill in the incorrect number on the tens frame. Children should recognise the mistake and correct it.	 **How Many is 100?** Prepare collections of objects, some with exactly 100, some with fewer and some with more. Challenge the children to guess which sets have exactly 100 items. Once they have made their guess, they can check by arranging the objects onto ten 10 frames. Are they surprised? They might also like to make their own collections of 100 Encourage the children to investigate 100 in different ways: How far can you travel in 100 steps? How long would a paper chain with 100 links be? How tall is a tower of 100 linking cubes? (Building the paper chain and tower in 10s, changing the colour after each set of 10, makes it easier to keep track of the ten 10s)	

	Race to 20. Provide children with a number line and counter. Children take it in turns to roll a dice and move the number of spaces. Whoever gets to 20 first wins. Board games such as snakes and ladders can also support learning.			
Adding more - Use real objects to see quantity of a group can be changed by adding more. - Can use language of first, then, now. - Children may start by recounting objects to find total. Once confident encourage children to count on. - Children able to link the number symbol (numeral) with its cardinal	Use tens frames, fingers to support children with number stories. First I had 5, then I added 2 more, now I have 7.  Show me 5 fingers. Now show me 2 more. How many fingers now? How do you know there are 7? Did you count them all 1, 2, 3, 4, 5, 6, 7? Is there another way to count them? We know we have 5 on this hand? Can we count on? 6, 7?  The children take turns to roll a 1-3 dice an collect 1, 2 or 3 cubes to add to their tower If they are ready, encourage them to count on as they add their cubes. How high can they build their towers before they topple?	When adding more make a mistake when adding on. Children to correct the mistake.	Children to create their own first, now and then stories using small world to support them. You would be expecting to see the children doing this independently.	

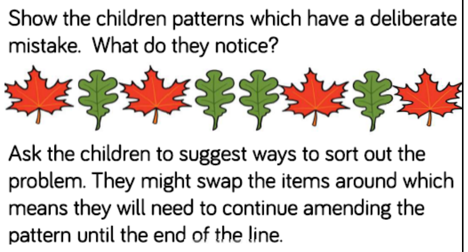
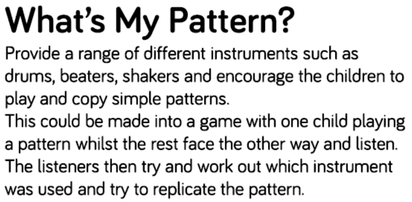
number value (how many of something).				
Taking away - Use real objects to see a quantity of a group can be change by taking items away. - Children able to count items to start and take away required amount practically. - Children able to Subitise or recount number left. - Children able to link the number symbol (numeral) with its cardinal number value (how many of something).	Use tens frames, fingers to support children with number stories. Ask the children to show you 5 fingers and then to show you 4. Prompt the children to notice that one less is the same as taking away one. Extend to taking away two fingers or 3 and noticing how many are left each time. 	When taking away make a mistake and encourage children to correct the mistake. They could prove this by showing it on a tens frame to support their explanation.	Children able to play independently: Pick a number card and count out the corresponding number using whatever they wish. One player covers their eyes whilst the second 'steals' some of the objects, hiding them in their hand. The first play has to work out how many object shave been stolen.	

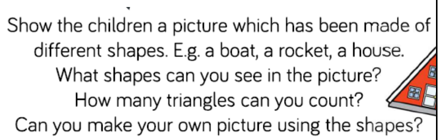
Doubling - Know double means twice as many. - Able to build doubles using mathematical equipment and real objects. - Able to build numbers using pair-wise patterns on 10s frames. - Children able to say doubles as they see them e.g. double 2 is 4. - Children able to sort and explain doubles.	Children given the opportunity to see doubles in mirrors/ in barrier games. Allow the children to explore different ways to build doubles using real objects and practical equipment.  Play match my quantity: The children sit opposite each other in pairs with a barrier between them and a collection of small items such as pebbles or cubes. One child sets out a quantity. They show their partner quickly and then hide again. Their partner matches the quantity. Then the barrier is removed. Check – is it a double? Which double have we made? Children take it in turns to roll 2 dice. The score a point each time they roll a double. The first to reach 3 points wins the game.	When playing the barrier game you could deliberately make an incorrect quantity and encourage the children to recognise the mistake and correct it.	Provide a ladybird or butterfly templates and ask the children to draw or us the tweezers to pick up objects to make doubles by adding the same number of objects (pompoms) to each side. How many different doubles can they make? Can they make one which is not a double and tell you why?	
Sharing and grouping - Able to share items equally.	Provide opportunities for the children to share items equally e.g. sharing cards	Able to recognise a mistake in sharing	When sharing equally and there are items left – children to independently	

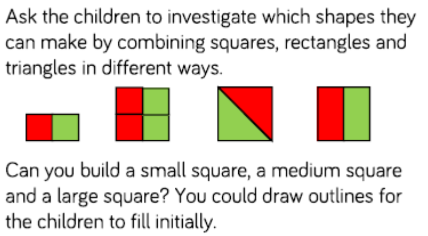
- Able to show how to share fairly. - Able to make equal groups.	before playing a game. Sharing a given number of counters. This could be achieved during snack time. Using small world – ask the children to make groups using the small world animals. Can they make groups of 2? What happens if they make groups of 3?	equally and explain why. Show the children a bowl of strawberries. Explain that you are going to share them into 2 equal groups so there will be half for you and half for your friend. Put a handful straight onto each plate without counting – make sure that one plate clearly has more strawberries than the other. Ask the children if it is fair? Prompt them to explain why this isn't fair and then ask them to show you how to share these strawberries fairly? What happens if another friend arrives? Expect children to say we need to share all the strawberries into three groups equally not 2.	share ideas on how to share or group these.  **Make Equal Groups** This time keep 12 items to share each time but vary the number of teddies and plates. Ask the children to explore sharing the 12 items into equal groups so that each teddy gets the same. If there are 2 teddies will they each get the same? How many are in each group? Are there any items left over? What about 3 teddies? 4 teddies? 5 teddies? Expect children to be doing this independently.	

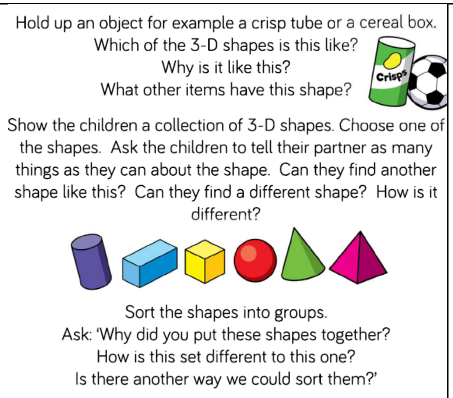
Even and odd - Children begin to understand that some quantities will be shared into 2 equal groups and some won't. - Children able to notice some quantities can be grouped into pairs and some will have one left over. - Able to build pair-wise patterns on a 10s frame.	Ask 5 children to come to the front. Can we group the children into pairs? Does anyone not have a partner? Why not? What could we do to solve this problem? Use of the language 'we have 1 left over because there are an odd number of children'  Encourage the children to investigate whether small quantities are odd or even by sharing into 2 groups and by making pairs. Prompt them to recognise that sometimes there is one left over. 	After pairing something successfully say that the quantity is odd. Children should correct this by saying 'no it is even because everyone is in an equal group.'	 Odd and Even Ask all the children to collect an odd number of cubes. Ask them to check each others and compare the different quantities. Are all the quantities odd? How could you check Now ask the children to collect one more cube and add it to their set. How many do you have now? Do you still have an odd number of cubes? Ask the children to continue adding one more cube and to discuss what they notice. What is the largest odd number you can build? How can you check that it is odd?	

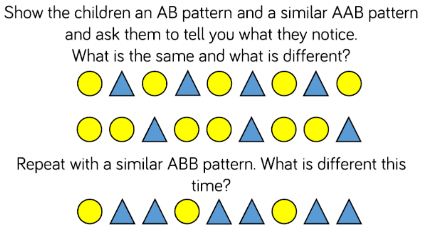
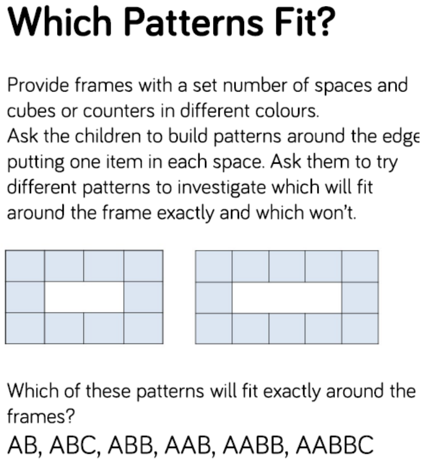
Reception				
Geometry				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**
Match and sort identical objects by recognising what is the same and different.	When given objects e.g. socks/wellies they match them together.	Able to recognise if a match or sort has been done incorrectly and are able to explain how to make it correct.	Children able to find something that matches the object given to them that is in a different environment or time.	Match, sort, same, different, group, cube, cuboid, pyramid, sphere, cone, cylinder,

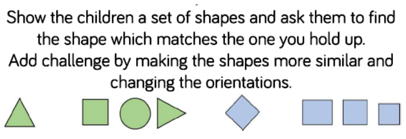
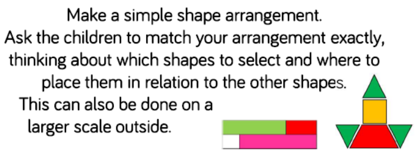
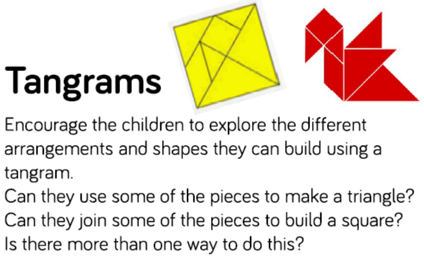
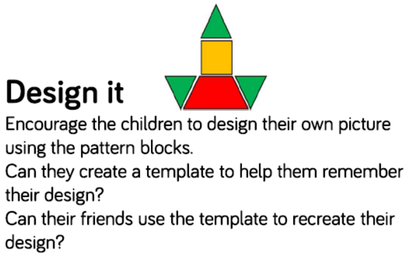
	Provide children with a selection of shapes that have been drawn around – children match to the correct outline. Children group by: colour, texture, size. Could be sorting blocks in construction or sorting beads into pots. - Read the story of Noah's Ark – talking about matching animals. - Snap card games - Button box	Can you find something that doesn't belong? Find the odd one out. - Adult join children in their play during constructions. Can we build towers that match? Do they look the same? Explain why not if needs be. Create an opportunity for the children to spot a mistake and correct it.	Provide children with objects already sorted and they have to come up with the rule on how it has been sorted. Any sensible rule is correct. - Give child one item with its pair being hidden outside for child to find.	circle, triangle, rectangle, square, shape, flat, curved, straight, round, solid, corner, face, side, make, build, draw, over, under, underneath, above, below, top, bottom, side, on, in, outside, inside, in front, behind, front, back, before, after, beside, next to, middle, up, down, forward, backwards, sideways, close, far, though, towards, away from, side, roll, turn, what is the same? What is different, is the pattern correct?, what do you notice about the pattern?, can you make the same sound pattern? Can you make a different sound pattern? Which shapes can you build? Is there more than one way to
Recognise and copy repeating patterns.	Children shown patterns that include three full units of repeat AB AB AB to copy. Red brick, blue brick, red brick, blue brick, red brick, blue brick. Shown in a range of contexts and ways e.g. sounds, actions, colours, shapes and sizes. e.g. In and out the dusty bluebells. Children say patterns and create their own patterns.	 Show the children patterns which have a deliberate mistake. What do they notice? Ask the children to suggest ways to sort out the problem. They might swap the items around which means they will need to continue amending the pattern until the end of the line.	Children create their own patterns for others to follow – sharing the rule with others independently.  **What's My Pattern?** Provide a range of different instruments such as drums, beaters, shakers and encourage the children to play and copy simple patterns. This could be made into a game with one child playing a pattern whilst the rest face the other way and listen. The listeners then try and work out which instrument was used and try to replicate the pattern.	
Triangles and circles. - Know that circles have 1 curved side.	Children can build their own circles and triangles.	Miss name a shape in their play – children should correct and encourage them to explain why.	Children to use different resources (e.g. sticks, rope) to independently create their own	

- Know that triangles have 3 straight sides	Go on a shape hunt for circles and triangles in everyday objects. Mark make their own circles and triangles. During all activities adults to highlight the feature of triangles and circles. Use 3D shapes to print triangles and circles using the flat faces.  Show the children a picture which has been made of different shapes. E.g. a boat, a rocket, a house. What shapes can you see in the picture? How many triangles can you count? Can you make your own picture using the shapes?	Shape jigsaw boards – try and match a triangle with a circle hole. Child should recognise the mistake and correct this, explaining why it won't fit.	triangles and circles in different sizes. Is it possible to make a circle out of sticks?	build the shape? What shape can you make when joining two squares? Two triangles? Can you find a shape like this? Can you build a larger/smaller triangle than this one? Is there more than one way to make this shape?
Spatial awareness - Use positional language	Language model by adults – next to, on, over, under, around, though, behind. Build life size journeys and explore these from different perspectives. Where shall we put the car? Where shall we but the horse? Use small world to create models. When doing this highlight positions of different objects.	Place something in small world incorrectly. Say clearly where you have placed the object. Child should pick up on the wrong positional language being used and either correct the language or place the object where the adult said it was in the first place.	Children create their own treasure hunts for their peers to follow. They give different clues which use prepositional language. Children should do this with increased independency.	

	Language use during tidy up time. Share the story of 'Going on a bear hunt' when reading highlight the prepositional language being used.			
Shapes with 4 sides. - Name a square/rectangle - Know squares/ rectangles have straight sides and 4 corners. - Be taught that squares are special rectangles.	- Children given the opportunity to build their own squares and rectangles. - Go on a shape hunt for squares and rectangles.	Miss say a shape and the children should correct you. Explain why a shape is a square e.g. this is a square because it has 4 straight sides and 4 corners.	 Ask the children to investigate which shapes they can make by combining squares, rectangles and triangles in different ways. Can you build a small square, a medium square and a large square? You could draw outlines for the children to fill initially. Is there more than 1 way to make this shape? Use matchsticks to build squares and rectangles. What's the smallest size you can make? How many match sticks did you use?	

3D shapes - Explore and manipulate 3D shapes through block play and modelling. - Recognise which shapes stack, roll, and why. - Provided with opportunities to build and construct their own 3D shapes in different ways. - Introduced to the names of 3D shapes. - Explore similarities and differences between 3D shapes in their play. - Compose and decompose shapes so that the children recognise a	 Hold up an object for example a crisp tube or a cereal box. Which of the 3-D shapes is this like? Why is it like this? What other items have this shape? Show the children a collection of 3-D shapes. Choose one of the shapes. Ask the children to tell their partner as many things as they can about the shape. Can they find another shape like this? Can they find a different shape? How is it different? Sort the shapes into groups. Ask: 'Why did you put these shapes together? How is this set different to this one? Is there another way we could sort them?' Go on a 3D shape hunt. Children make 3D shapes out of playdough. Conversations had whilst the children make them about the names and properties. Can this shape roll? Can we stack this shape? Could we build a staircase out of the shapes we have here? Provide children with a range of 3D shapes. Find 2D shapes within 3D shapes to support the children	Miss name a shape and encourage children to correctly tell you the name.	Hide a shape from the children. Describe some of the properties to the children for them to guess what it is. Children independently use 3D shapes to support them in constructing what they wish. They problem solve independently when something isn't working in the way they want it to and are able to find a solution. Can you build a shelter to keep everyone dry?	

shape can have other shapes *within* it.	when exploring similarities and differences.			
Pattern (needs 3 full units of repeat). - Introduce more complex patterns - Explore patterns which use items more than one in each repeat e.g. ABB/AAB/AABB - Able to describe, continue and copy patterns.	Provide opportunities for the children to describe, continue and copy patterns including movement pattern along a line or around a circle: stand, sit, stand, sit, stand, sit. Hands on heads, hands down, hands on head, hands down, hands on heads, hands down. Etc.  Show the children an AB pattern and a similar AAB pattern and ask them to tell you what they notice. What is the same and what is different? Repeat with a similar ABB pattern. What is different this time?	Introduce patterns with a deliberate error. This could include an extra item, a missing item or a muddled unit of repeat. Can the children identify the mistake and put it right?	Show the children examples of fabric showing patterns from different cultures or traditions. Encourage the children to discuss the patters and recreate them. Children then independently design their own patters in a similar style.  **Which Patterns Fit?** Provide frames with a set number of spaces and cubes or counters in different colours. Ask the children to build patterns around the edge putting one item in each space. Ask them to try different patterns to investigate which will fit around the frame exactly and which won't. Which of these patterns will fit exactly around the frames? AB, ABC, ABB, AAB, AABB, AABBC	
Spatial Reasoning - Use positional language.	Regular opportunities for children to complete jigsaws and shape puzzles. Why did you choose this shape?	Why does this shape not fit?	Investigate how many different ways a given shape can be built using smaller shapes independently.	

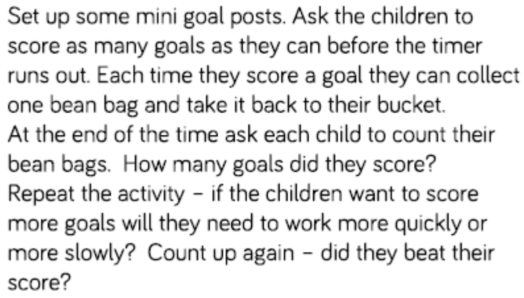
- Understand shapes can be combined and separated to make new shapes. - Combine shapes in different ways. - Fit shapes together and brake shapes apart – notice the new shapes created. - Understand places and models can be replicated. - Look at replicated places and models from different positions. - Replicate simple constructions, models, places in stories. - Make maps and plans to	 Show the children a set of shapes and ask them to find the shape which matches the one you hold up. Add challenge by making the shapes more similar and changing the orientations.  Make a simple shape arrangement. Ask the children to match your arrangement exactly, thinking about which shapes to select and where to place them in relation to the other shapes. This can also be done on a larger scale outside. Set up a small world scene and ask the children to describe where things are in relation to other things. Then ask them to move around and look at it from a different view point. Does it look the same? What do they notice? Show the children some different maps, lots of books have maps of the story setting. What can you see on the maps? Which map do they like best? Why do we need maps?	Provide some paper rectangles, squares and triangles. Encourage the children to predict which new shapes will be made if the shapes are folded or cut in different ways. Children encourage to explain their prediction and can then move on to investigating to see if they predicted correctly.	What shapes can you build? Can you make them in more than one way?  **Tangrams** Encourage the children to explore the different arrangements and shapes they can build using a tangram. Can they use some of the pieces to make a triangle? Can they join some of the pieces to build a square? Is there more than one way to do this?  **Design it** Encourage the children to design their own picture using the pattern blocks. Can they create a template to help them remember their design? Can their friends use the template to recreate their design? Provide each child with a set of items the same as yours. Provide verbal instructions as you arrange your items for the children to follow. They can't see your items but do it through	

represent places and use them.	Children draw their own map of the places in the story. Children could make a map of the classroom – what can you see on the map. Children will use positional language when drawing their map e.g. the door is next to the board. The toilet is in the make it room. Provide the children with a map of the outdoor area with an obstacle course. Children use the map to create the obstacle course to be able to use it.		the positional language given. Compare the finished arrangements to see if they look the same. Do the same activities but the children are the leader. Challenge the children to solve problems on a large scale: the playground is a crocodile-infested swamp. How could we rescue teddy without putting our feet on the ground? Children given a treasure map to follow 'X marks the spot'!	
Patterns and relationships. - Children explore and investigate relationships between numbers and shapes. - Children able to copy, continue, and create patterns and symmetrical constructions.	Show the children a set of Cuisenaire rods. How many green rods measure the same as one blue block? What other relationships can they find? Can they find a block that is double the length of another block? How could they check?	Show the children one rabbit. How many ears do you see? Add another rabbit? How many ears do you see because I see five? Children should correct you hear. Continue to add rabbits each time and encourage the children to recognise 2 ears get added each time.	Children independently using their knowledge of patterns and relationships between shapes and numbers in their play. This can come through in construction or model making.	

Reception

Measurement

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Compare and order size, mass and capacity.	What could fit in the box? Which sized item fits where? Children could create homes for different sized bears. Sort items they find into different piles – large/small etc. Provide the children with a large bucket and a small bucket. Children to fill each bucket with sand and count how many scoops it takes.	Children able to explain why an item wouldn't fit in somewhere e.g. 'it is too short/long/tall'	- Children to be using comparison vocabulary when playing with peers and able to problem solve when something doesn't fit to find an appropriate size. - Guess my rule. - Get the children to secretly create their own rule for their peers to guess. - Add a set of balance scales to the playdough area. Children can then compare mass of different sized balls. Problem solve to try and use the scales to balance equal sized dough balls. - What else can we find that weighs the same as your ball of dough? - Baking cupcakes.	Short, tall, long, night, day, morning, afternoon, before, after, today, tomorrow, heavy, heavier than, heaviest, light, lighter than, lightest, longer, shorter, taller, wider, narrower, now, soon, before, then, next, after, yesterday, full, half, empty, holds, container, weigh, weighs, balance, scales, times, days of the week: Monday, Tuesday

			Provide a range of different sized and shaped containers and some pebbles. Ask the children to half-fill their containers with water. What happens to the water if they add pebbles to their container? How many pebbles will the need to make the containers overflow?	etc., seasons: spring, summer, autumn, winter, days, wee, month, year, weekend, birthday, holiday, bedtime, what else weights the same? What do we need to do first? What do I do next/after that/ then? How many minutes did you take? Who was the fastest? Did they take more minutes or less minutes than you? Which is the heaviest/lightest? How can we balance…? Who threw the furthest? How could we check? Who is the tallest person? How do you know?
Night and day - Talk about night and day - Order key events in daily routine - Use time language events happen. - Measure time in simple ways e.g. counting number of sleeps to important events.	Use visual timetable within the classroom that is referred to throughout the day. Use pictures to order familiar activities. Use stories and non-fiction books to introduce the idea of nocturnal animals and explain that as we go to sleep some animals are waking up. Put a calendar in the home corner for the children to mark their birthdays on. How many sleeps is it until…	How could you score more goals in the time you have? How can we work out who came first? Order something incorrectly for children to self-correct. They explain why they need to do something in the order they do.	Children independently using the visual time table within the classroom.  Set up some mini goal posts. Ask the children to score as many goals as they can before the timer runs out. Each time they score a goal they can collect one bean bag and take it back to their bucket. At the end of the time ask each child to count their bean bags. How many goals did they score? Repeat the activity – if the children want to score more goals will they need to work more quickly or more slowly? Count up again – did they beat their score?	
Compare Mass - Make direct comparisons when	Bring in a heavy case or box and show the children it is hard to lift and carry because it is really heavy. Ask them if they have	Children able to discuss what could be inside a mysterious box because of its weight	Provide a selection of wrapped parcels of various shapes and sizes. Children independently compare parcels to see which are heavier and lighter than others.	

estimating which object feels heaviest. Use balance scales to check. - Recognise that the bigger item doesn't always mean the heaviest.	carried anything heavy. Discuss as a group what could be inside. Children be a human balance scale – place an item on one hand and then on the other. They tip to the side of the heavier. This could be done using buckets of water adding more in and taking some out to change the balance scales.	giving justified reasons for their choice. E.G I think it could be a rock because when I picked a rock up on the beach it was so heavy.	They could group these parcels in different ways e.g. heavier/lighter. Are larger parcels always heavier? They are able to find the lightest/heaviest independently and use this vocabulary when sharing. Show fully and empty using different material. Provide children with different sizes tall/thin/narrow/wide/shallow to investigate the weight of these items.	
Length and height - Begin to use language to describe length and height. - Make direct comparisons - Use objects, blocks or cubes to measure items. Adults are mindful not to use the language of big.	Opportunities for comparing length and height will arise naturally during play. This could be they compare the height of their towers or the length of their roads. – Who has the longest scarf? Who can thread the longest string of beads? Children could draw around their footprint and find objects around the room that are longer than or shorter than their foot. With a group of children make comparisons by ordering their footprints in size order.	Children may be building in construction – adult uses this opportunity to deepen vocabulary use by modelling the correct vocabulary being used. After this – adult could incorrectly describe two blocks e.g.' this is the longer block'. Expect children to correct this language and use the resources to correctly describe.	Using dough: children independently use mathematical language relating to length as they play. Challenge: provide children with different amounts of dough, which amount can make the longest snake? The shortest snake? Why has this happened? 'Let's find something to measure these' – children independently find something suitable to measure e.g. blocks, cubes etc. Give each child a small object such as a bean bag or welly. In small groups or pairs, challenge the children to throw the object as far as they can. Who has thrown their item the furthest? How could we check? 	

	Provide the children a mixture of measuring tools to explore e.g. tape measure, ruler, trundle wheels.		Encourage the children to discuss and try different ways to find this out. For example they could count strides or heel-to-toe footsteps or use a trundle wheel. Prompt them to use the language of further, nearer and closer. Encourage them to record their distances using their own methods. Have another throw – did they manage to throw their item further this time?	
Time - Order and sequence important times in their day. - Recognise that regular events happen on the same day each week. - Describe and talk about specific events in their lives.	Ask children to see how many tasks they can complete in one minute/ how many circles they can draw in a minute etc.	Children able to actively say the order of events with little support. They can recognise if something in their day has been done in the wrong order. Can spot a change in the visual time table and then has a discussion around this change.	In own play children use stop watches/ hour glass to time activities they do with peers.	

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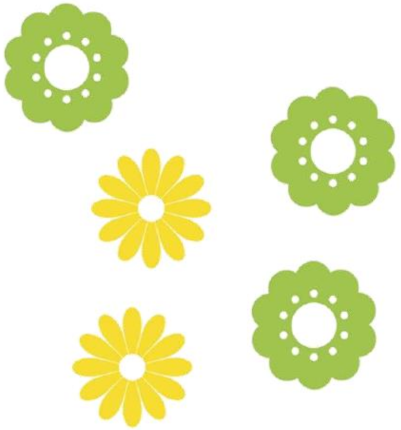
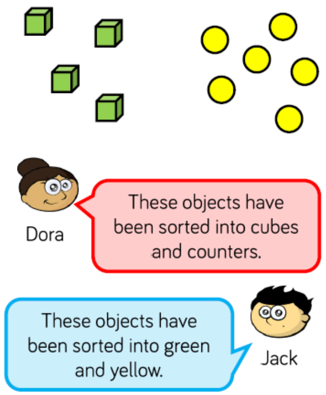
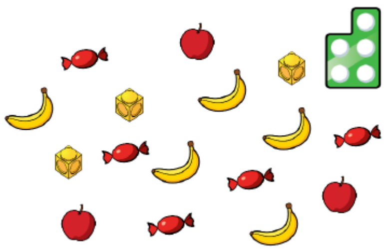
Year 1

Number: Place Value within 10

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Sort objects (by characteristics)	How can you sort the objects? How have you grouped the objects? E.G. Sort the fruit into different groups. Sort the flowers into two groups.  	Are there any different ways they could be sorted? Can there be more than 2 groups? Two children are discussing how some objects have been sorted.  Who is correct and why do you think this?	Are there any different ways they could be sorted?  Group these objects in different ways. How many different ways did you group them?	Fewer, more, equal, less than, greater than, number, pair, zero, one, two, three to twenty, and beyond, none, zero, count (on/up/to/from/down), before, after, many, few, fewer, least, fewest, lesser, smallest, greater, same as, odd, even, units, ones, tens, ten more/less, digits, numeral, figure(s), compare, (in) order/ a different order, size, value, between, halfway

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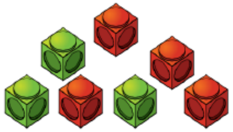
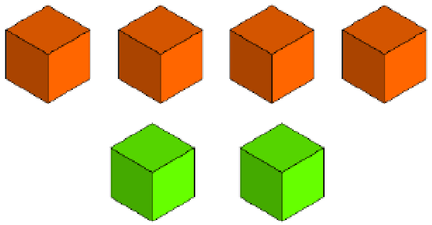
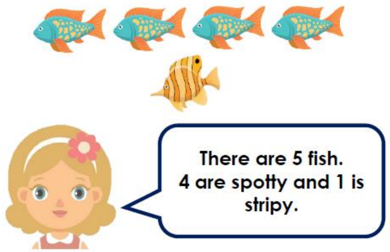
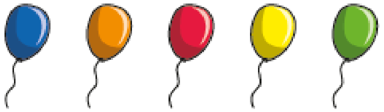
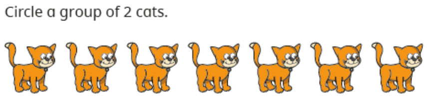
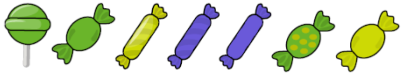
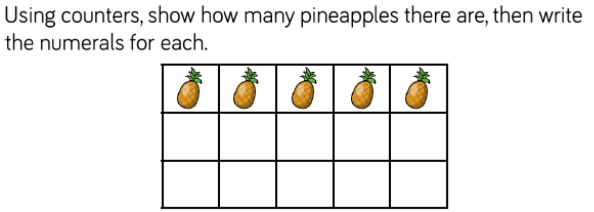
Count Objects	What does one ……… Represent? What number will we say first? How many are there in total? Can you show me a group of zero? How many red cubes and how many green cubes are there?  There are _____ red cubes. There are _____ green cubes. There are _____ cubes altogether. **Circle the number of cubes.**  5 6 7	Line up the objects – is it easier to count now? Why? When would we count zero? Sally is counting fish:  Is she correct? Explain your answer.	How many different ways can you find to group the objects and find the total? 	between, above, below, order, ordinal, what does……… represent? How many different ways can you represent…..? What is the next number? Are the numbers getting greater or smaller? How many objects are there? If I move them around, are there still the same amount? Count and check. Did you need to count them all? Numerals, words 'I know….. because….'

Count objects from a larger group (children need to be secure on cardinal counting principle)	Give children number cars from 1-10. Ask them to pick a card, then go outside and find that many number of leaves. Sticks etc. Circle 3 balloons. 	Circle a group of 2 cats. Did you need to count all the cats? Explain your answer. E.G. I know I don't need to count all the cats because I only needed to circle 2 so once I counted to 2 I could stop.	 How many different ways can you group these sweets? Share the total of each group.	
Represent Objects	Show me different ways to show the number………? Using counters, show how many pineapples there are, then write the numerals for each.	Do we always have to use counters to show an amount?	How many ways can you represent 6 apples? Can you show me fewer than 4 sweets? How many ways can you do this? How can you show me that there are more green cars than blue cars?	

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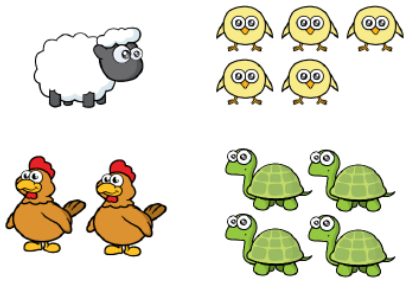
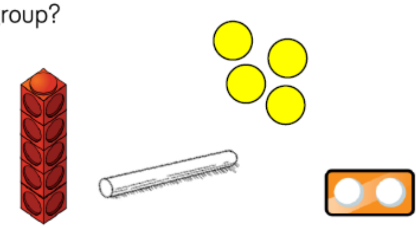
<td>
Which representation matches which group?

Explain how you know.</td>
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<td>Count forwards from any number (number line)</td>
<td>What is the next number?
Are the numbers getting greater or smaller?
Complete the number tracks.
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<table><tr><td>one</td><td></td><td>three</td><td>four</td><td>five</td><td>six</td><td></td><td>eight</td><td>nine</td><td>ten</td></tr></table></td>
<td>Whitney says,


Do you agree?
Explain why.</td>
<td>I'm thinking of a number. The number I am thinking of comes one after nine. What number am I think of?</td>
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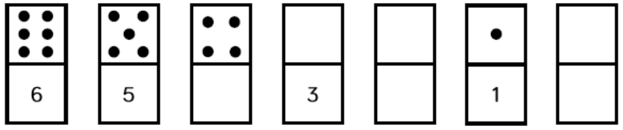
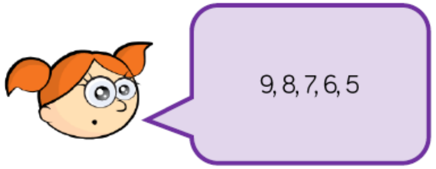
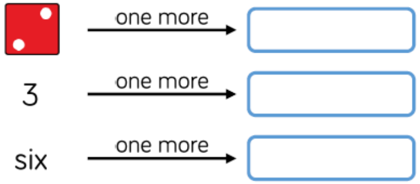
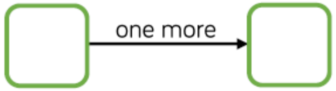
Count backwards	Are the numbers getting greater or smaller? Fill in the empty boxes.  	Do we always have to start at 10 when counting back? Alex is counting.  How do you know that Alex is counting backwards?	How many different starting points could you have if you wanted to count backwards and stop at 3?	
Count one more	How can we show one more? Complete each box using a picture, a numeral and a word.  	Teddy rolls the number that is 1 more than the dice below.  He says that he rolls 2 Explain his mistake.	Using number cards 0 to 10, how many different ways can you complete the boxes below?  Expect children to work systematically to solve this.	

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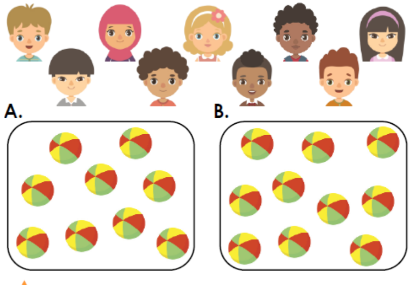
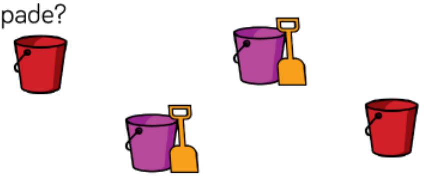
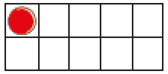
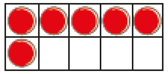
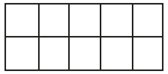
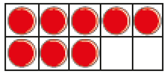
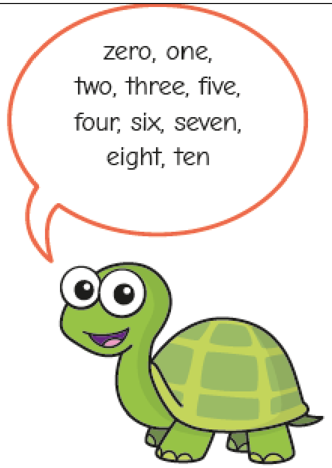
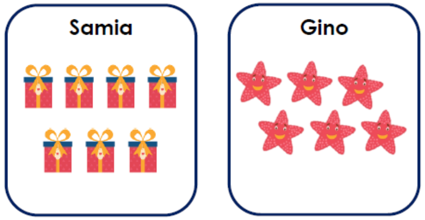
Count one less	How can we show one less? Roll a dice, represent the number using counters on a track, and find 1 less. Then complete the sentences.  1 less than ______ is ______ ______ is one less than ______	Polly thinks the number of cars is 1 less than 7.  **Is she correct? Explain why.**	Complete the sentence stems. One less than 9 is ______ One less than ______ is 7 One less than ______ is 6 What pattern do you notice with the numbers? What would the next sentence be? Children should recognise that one less than any number is the number before it when counting.	
One to one correspondence (match objects to a number)	What does match mean? Children match one object with another. Draw sweets for each child so they all get 1 each. 	Are there any objects left over? Why has that happened?	Which group of beach balls belongs to the children?  	

		There are four children going to the beach. Can every child have a bucket and spade?  If not, why not?		
Recognise numbers as words	Make a class book with a double page spread for each number zero to ten. Stick in drawings, photographs, objects the children have collected and include the numeral and word on each spread. How many counters does each ten frame show? Match the ten frames to the words.     zero eight six one	 What mistake has been made?	See children using this knowledge in other areas of the curriculum e.g. Science, English.	

Compare objects	How can you tell which one has the least/most? Circle the picture with more trees.  	Samia and Gino both think they have the fewest objects.  **Who is correct? Explain your answer.**	Whitney has this many cubes in one hand.  She has fewer cubes in the other hand. How many cubes could she have in her other hand?	

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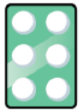
Introduce < > and =	Which symbol shows greater than, less than, equals to? Begin by showing children a visual representation of how the symbols work: For example:  Use <, > or = in each circle to make the statement correct.  ○   ○ Seven	Circle all the numbers from the track that **cannot** go in the box. Explain why. 6 < □ 1 2 3 4 5 6 7 8 9	Game • Both children make a fist. • On 3, show some fingers. • Use <, > or = to compare.  This game can be extended to develop fluency. To extend: • Can we move places to change the sign? • How can we change fingers to use the '=' sign? • Can we use two hands each?	
Compare numbers	Use <, > or = to make the statements correct. 5 ○ 6 8 ○ 1 10 ○ 0	One of these statements is incorrect. Use cubes to prove which one. 8 > 4 7 < 10 3 > 6	Using number cards 0 – 10, how many ways can you make the statement correct? _____ is more than _____	

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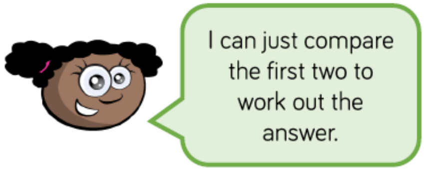
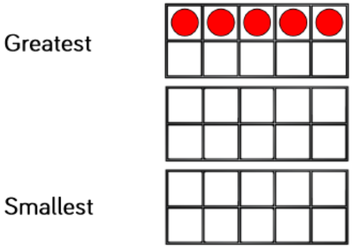
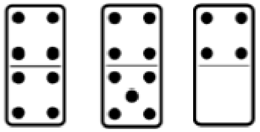
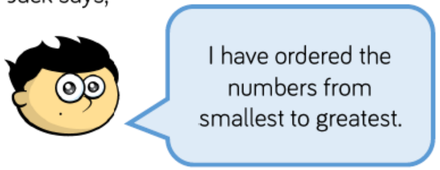
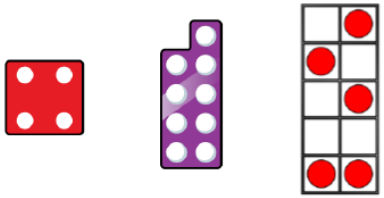
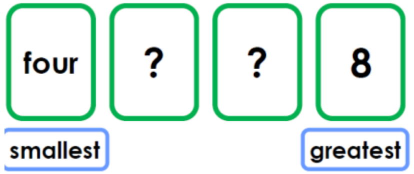
Order Objects	How do you compare the groups? Complete the statements. ____ ice creams ____ ice creams ____ ice creams The smallest amount of ice creams is ______ The greatest amount of ice creams is ______	Whitney is ordering the amount of spots on these three ladybirds, from the greatest amount of spots to the least.  She says,  Do you agree? Explain why.	Draw counters on the ten frames so that they are ordered from greatest to smallest. How many ways can you find? 	

Order Numbers	Order the dominoes from smallest to greatest.  Complete the sentences: • The greatest number is ______ • ______ is the smallest number.	Jack says,   Do you agree with Jack? Explain your reasoning.	 What could the number cards be?	

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Ordinal Numbers	What does first mean? What does last mean? What do we mean by ordinal numbers? Colour the 7th flower blue. Start counting from the left.  Colour in another flower and complete the sentence. The _____ flower is ________.	Two children have used the instructions to make a pattern. There are four shapes. The first is a circle. The last is a square. The other two shapes are a triangle and a rectangle. Here are their patterns. Amir ○ △ ▭ □ Dora ○ ▭ △ □ Who is correct?	Write the correct letters in the boxes to crack the code. p b u z c k s h n first 3rd 7th 8th ⇩ ⇩ ⇩ ⇩ ☐ ☐ ☐ ☐	

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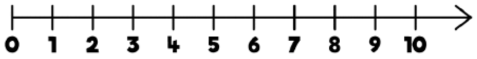
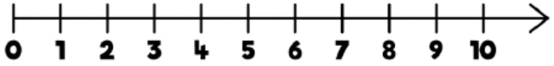
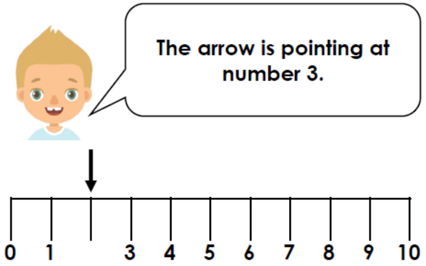
The number line	Can you label the number line? On the number line, - Circle the number 7 - Underline a number **greater** than 7 - Draw an arrow to the number that is **one less** than 5 - Put a box around the **smallest** number.  How many jumps from zero is eight?  	What does each mark on the number line represent?  **Is he correct? Explain why.**	Game  Roll a die. Place a counter on the number line covering the number shown by the die. Work out how many jumps to 0 and how many to 10 Which is closer? If you rolled a 6 and did three jumps, what numbers could you land on? Can you roll a number where there are 7 and 3 jumps to 10 or 0? Which numbers could they be?	

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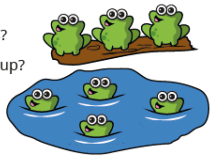
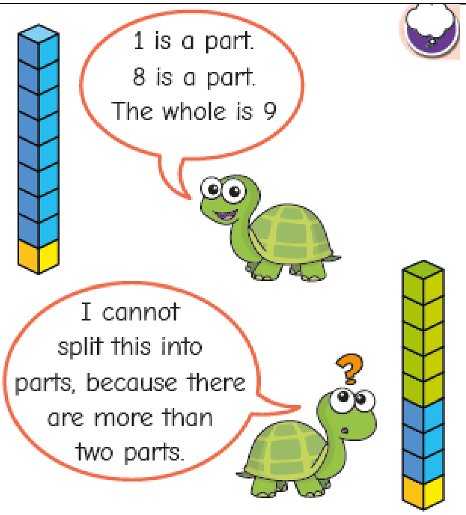
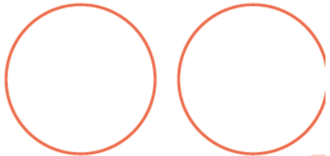
Year 1

Number: Addition and Subtraction (within 10)

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Introduce parts and wholes	Here are some frogs. - Can you see two groups of frogs? - How many frogs are in each group? - Complete the sentences. _____ is a part. _____ is a part. The whole is _____ 	 Do you agree? How could you split the tower into parts?	Here are five objects.  Put the objects into two groups. Draw the groups.  Say out loud for your groups: - _____ is a part. - _____ is a part. - The whole is _____ Is the whole always the same? Compare answers with a partner.	

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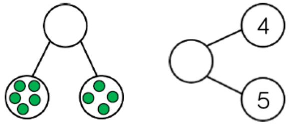
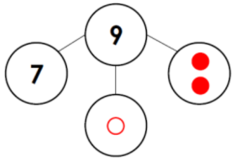
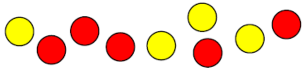
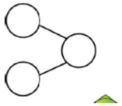
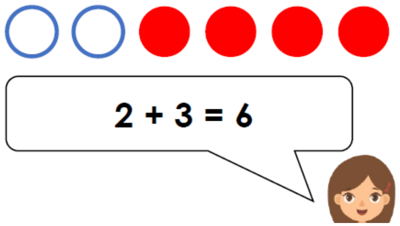
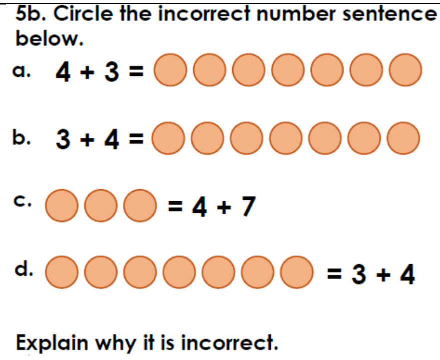
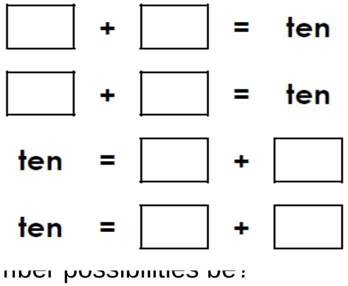
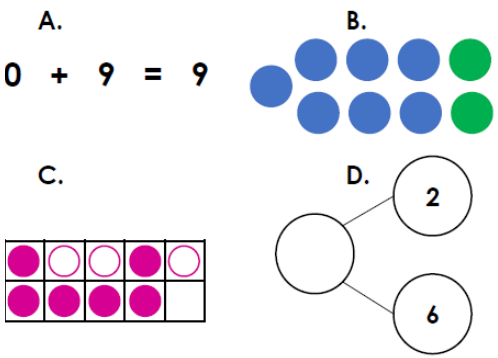
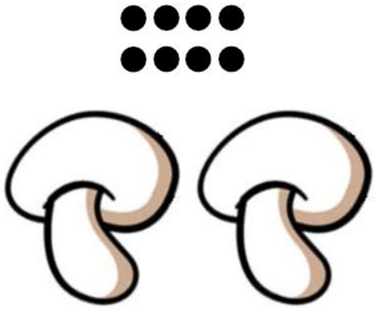
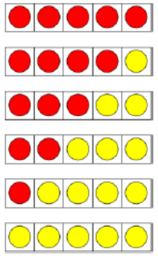
Part-whole model - Recognise number can be partitioned into two or more parts.	Complete the part-whole models by drawing counters and then writing the numerals.  Draw the part-whole model that represents the stem sentences: • A part is 4 • A part is 3 • The whole is 7	Can the parts be swapped around? Why? My part whole model is correct.  Am I right? Explain how you know.	There are 6 animals.  How many different ways can you sort the animals? Complete a part-whole model for each way. Can you partition the animals into more than 2 groups?	What does part mean? What does whole mean? How many where there at the start? Which number represents the total? Number bonds, number line, add, more, plus, make, sum, total, altogether, inverse, double, near double, half, halve, equals, is the same as (including equals sign), difference between, how many more to, how much more is…?, subtract, take away, minus, how many fewer is…
The addition symbol - Introduced to + and add this with = to make number sentences. - Write number sentences	Here are some counters.  Group the counters by colour. Fill in the gaps in the sentence and say it out loud. _____ red counters plus _____ yellow counters is equal to _____ counters. Complete the part-whole model and the number sentence. ☐ + ☐ = ☐ 	I have written a number sentence to match the image.  Am I correct? Explain how you know.	Using the numbers 0 – 9, how many ways can you fill in the boxes to make the calculation correct? You can only use each number once. ☐ + ☐ = ☐ How many different calculations are there? What do you notice?	

Fact families (addition facts) - See that the order of addition number sentences can be varied.	Complete the number sentences.  __ + __ = 7 7 = __ + __ __ + __ = 7 7 = __ + __	 **5b. Circle the incorrect number sentence below.** a. 4 + 3 = ●●●●●●● b. 3 + 4 = ●●●●●●● c. ●●● = 4 + 7 d. ●●●●●●● = 3 + 4 **Explain why it is incorrect.**	 ☐ + ☐ = ten ☐ + ☐ = ten ten = ☐ + ☐ ten = ☐ + ☐ number possibilities be?	than…? How much less is…?
Number bonds within 10	Here are 5 cubes.  Break them apart in different ways to find all the number to 5 One has been done for you.  5 = 3 + 2 If 9 is the whole what could the parts be?	**Josh is making number bonds to 9.**  Which is the odd one out and why?	All the dots have fallen off 2 toadstools.  How many different ways can you put them back on?	

		Which number bond is the odd one out? 3 + 4 5 + 2 6 + 1 3 + 5 Explain your answer.		
Systematic Number Bonds - Children to work systematically by starting with the whole.	Complete the number sentences.  5 = 5 + 0 5 = 4 + 1 _ = _ + _ _ = _ + _ _ = _ + _ _ = _ + _	**Explain the mistake in this sequence.** 1 + 7 = 8 3 + 5 = 8 2 + 6 = 8 4 + 4 = 8 5 + 3 = 8	A butterfly's spots have fallen off. How many different ways can you put the spots back on? Remember to be systematic. 	

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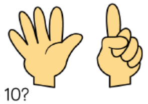
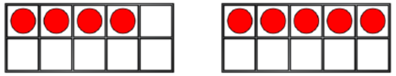
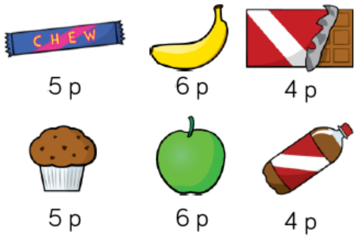
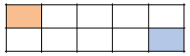
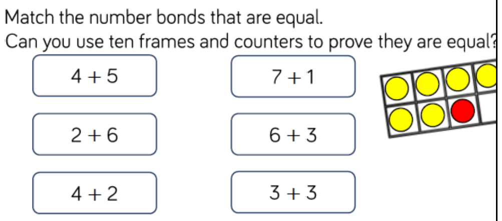
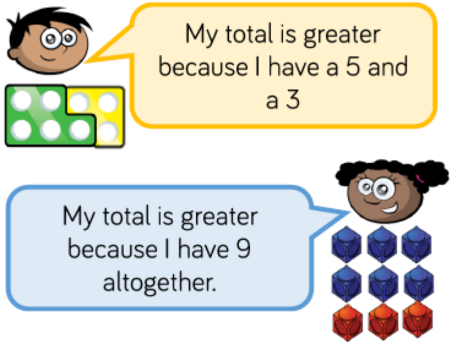
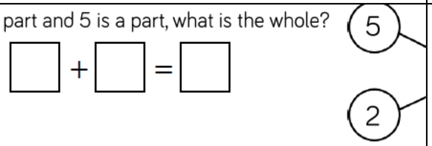
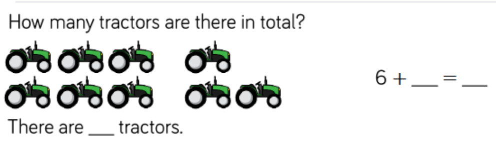
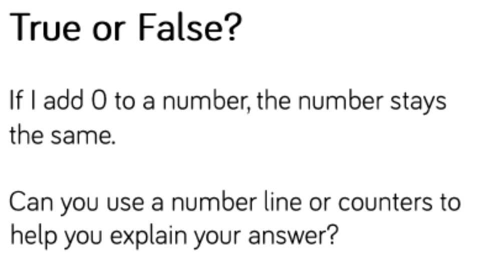
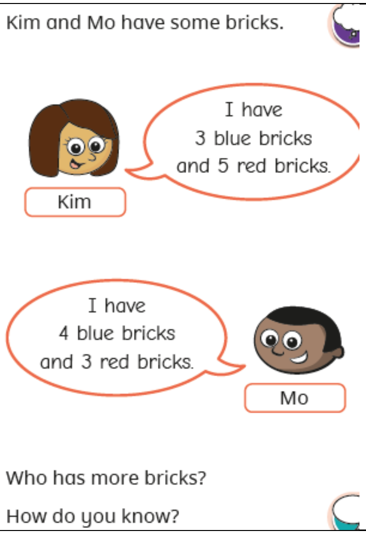
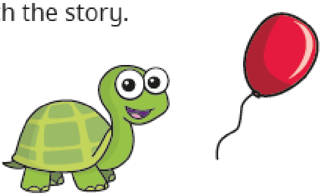
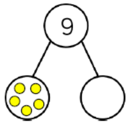
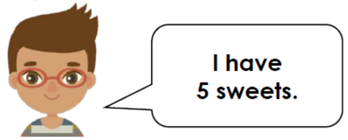
Number bonds to 10 - With a focus on the number 10 and continuing to work systematically.	10's frames, bead stings, fingers. Amir shows a number on his fingers.  How many more fingers are needed to make 10? What would this look like as a number sentence? Use the ten frames to complete the number bonds to 10  4 + ___ = 10 5 + ___ = 10	Max needs 10 books.  Is he correct? Explain your answer.	Dora has 10 p to spend.  Which two items could she buy? How many different ways can she do it? Tommy needs to colour in **all** of the boxes using two different colours. One box of each colour has been done for him.  How many different ways can he colour the boxes?	

Compare number bonds	Concrete resources used to support growing understanding of number bonds and comparison of numbers and number sentences.  Match the number bonds that are equal. Can you use ten frames and counters to prove they are equal? 4 + 5 7 + 1 2 + 6 6 + 3 4 + 2 3 + 3	Amir and Whitney have both created their own number bonds.  Who do you agree with? Explain your answer.	How many different ways can you complete the number sentence? $3 + \underline{\quad} < 3 + \underline{\quad}$	
Add together (concrete objects) - Accurately use + and = - Able to count all.	If 2 is a part and 5 is a part, what is the whole?  All these examples being shared should be paired with concrete objects.	There are 9 sweets altogether. 3 have a red wrapper and 7 have a blue wrapper. Is this correct? Explain how you know.	There are 8 cubes. Some are red and some are yellow. How many different ways can you make a total of 8?	

Add more (number line) - Able to count on.	This can be shown pictorially and then in number sentences.  How many tractors are there in total? 6 + ___ = ___ There are ___ tractors.	 True or False? If I add 0 to a number, the number stays the same. Can you use a number line or counters to help you explain your answer?	Children could be given a set of number cards and they need to get to a target number using the number cards they have been given. Change the target number. Children have 4 buckets in front of them with numbers on. They have to throw bean bags into the buckets to reach a target number that has been given to them. Then move this on to them independently working out the highest number they can make following a set of rules you provide.	

Addition problems - Support children in understanding what the question is asking them before solving - Encourage number bond use.	4 boys and 3 girls are playing at the park. ▶ How many children are there in total? ______ + ______ = ______	 Kim and Mo have some bricks. Kim: I have 3 blue bricks and 5 red bricks. Mo: I have 4 blue bricks and 3 red bricks. Who has more bricks? How do you know?	Ron tells Tiny a number story about balloons. Tiny writes a number sentence to match the story.  8 + 1 = 9 What is Ron's story?	
Finding a part - Use number bond knowledge to solve missing number problems	Complete the part-whole model and use it to fill in the number sentences.  ☐ + ☐ = ☐ ☐ = ☐ + ☐ 5 is a part, ___ is a part, 9 is the whole.	Jed and Ada have 8 sweets altogether. **Jed says,**  **I have 5 sweets.** **How many sweets does Ada have?** Prove it. Children can show this through drawing different coloured sweets or using resources.	Find all the ways to complete the number sentence below using the number cards provided. **8** **seven** **0** **2** **six** ☐ **+ 6 =** ☐	

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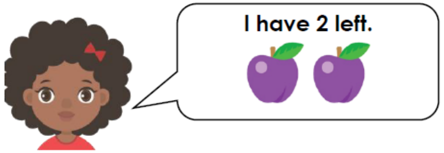
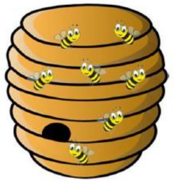
Take away - How many are left? - Introduced to language of subtraction. - Recognise that zero is important when subtracting as you take nothing away. Once confident: - Introduce the subtract symbol.	First, then, now language can be used to support the children in understanding the concept of how many left. Use everyday examples to support subtraction e.g. flying away or eating. There were 7 birds in a tree and 3 flew away. Complete the sentences.  At first there were ___ birds. Then ___ flew away. Now there are ___ birds in the tree. Tom has 9 toy cars. He gives 5 of them away. How many does he have left? ☐ – ☐ = ☐ 	Ava had less than 10 plums and ate some. **She says,**  How many plums could Ava have had to start with? Use a number line to support thinking and explanation. How many calculations can you complete?  ☐ = 7 – ☐ Why can't the digits 8 or 9 be used?	Some cakes have been eaten. There are 2 cakes left.  How many cakes could there have been, and how many could have been eaten to be left with 2? How many ways can you get an answer of 0? ☐ – ☐ = 0 What is the rule?	

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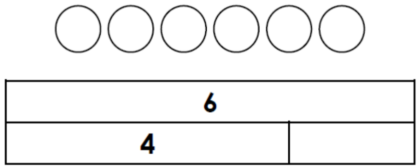
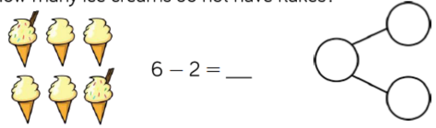
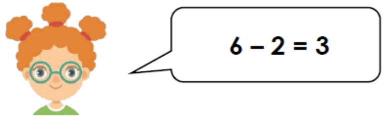
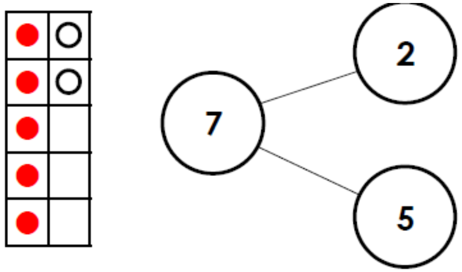
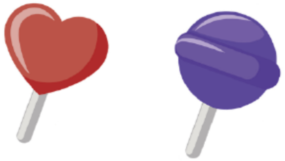
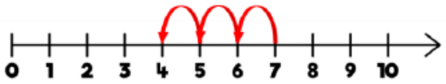
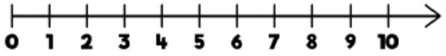
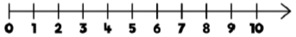
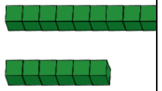
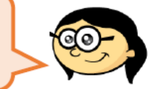
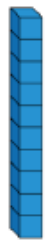
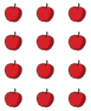
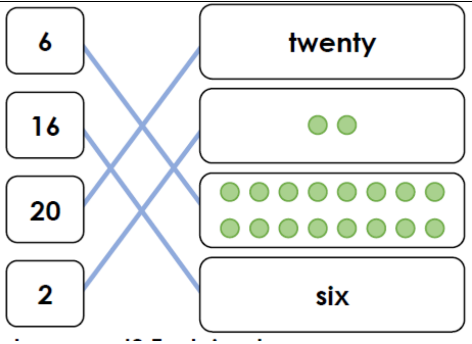
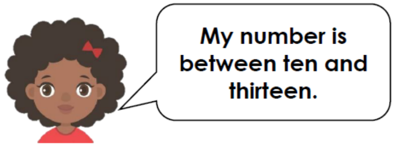
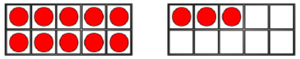
Subtraction – take away/ cross out (how many left?) - Children to use the knowledge finding a part to support this small step.	Shade in the counters below to complete the bar model.  How many ice creams do not have flakes?  6 – 2 = __ There are __ ice creams that do not have flakes.	Tammy is writing a number sentence to describe the image below.   Is she correct? Prove it.	Think of two questions to ask your friend about the image.  Represent your questions and answers in a part-whole model and as a number sentence.	
Fact families – 8 facts. - Children link addition and subtraction facts. - Children show and understand the links between numbers. - Children continue to	Write 4 number sentences about this part whole model.  Children then supported in another 4 ways.	Provide children with 8 facts (number sentences) for them to find the odd one out. Explain why it is the odd one out. Explain the mistakes that have been made. 5 + 2 = 7 7 = 5 + 2 2 + 5 = 7 7 = 2 + 5 7 – 2 = 5 7 = 5 – 2 7 – 5 = 2 7 = 2 – 5	Susan has 8 lollies. Some are red and the rest are purple.  Write 8 related number sentences about the lollipops.	

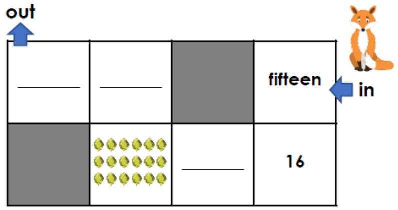
learn about the use of zero.				
Subtraction – counting back - Children begin to work on the abstract when subtracting. - Children recognise not to include the starting number when subtracting.	 7 − 3 = ___  4 − 4 = ___ Key to model this process to the children of where to start when counting back. Use of number line to support understanding needed.	Eva is calculating 7 − 2 and does this by counting backwards on a number line. She gets an answer of 6  What mistake has she made? What should the answer be?	Game  Race to zero! Start at 10 on a number line. Roll a dice and subtract this amount. The first person to land on 0 wins. What would you like to roll? Why? Why would you not want to roll a 1?  	
Finding the difference as a form of subtraction	What's the difference between 10 and 6? The difference between 10 and 6 is ___ 10 − 6 = ___ 	Annie says, The difference in number of spots on the lady birds is 7    Write a number sentence to show why Annie is correct.	Two numbers have a difference of 4 The larger number is less than 10 What could the two numbers be?	

Begin to compare number sentences - Children use <,> and = to compare number sentences.	Complete the number sentences. ___ + ___ is equal to 7 ___ + 4 is less than 9 5 + ___ is ___________ 2 Remind children that there could be multiple answers, however they need to ensure they follow the rule.	Ellen has made a mistake. Explain what she has done wrong. **3 + 5** **A. It is equal to 8** ☐ **B. It is less than 8** ☑ **C. It is > 9** ☑	Using the numbers 0 – 10, how many different ways can you complete the boxes? ___ + 7 = ___ ___ + ___ > 4 ___ + ___ < 9	
Add or subtract 1 or 2	Tom has these cakes.  Ann has 1 more cake than Tom. How many cakes does Ann have?	Tiny is adding 2  Is Tiny correct? How do you know?	Children to write their own number sentences/ problems to share with a friend to add or subtract 1 or 2. Children to show this knowledge within their own play within different contexts.	
Year 1				
Number: Place Value (within 20)				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**
Count numbers to 20.	Match the representations to the correct numeral.  12 7 10	Alex is matching some numbers.	Ella thinks of a number	Fewer, more, equal, less than, greater than, number, pair, zero, one, two, three to twenty, and

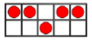
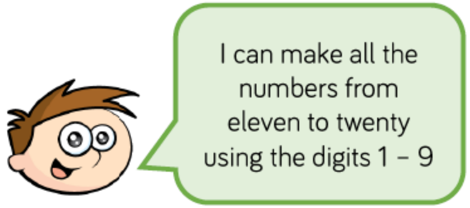
		 Is he correct? Explain why? Mr Monaghan says,  Will Mr Monaghan say 11? Explain how you know.	 What could Sara's number be? Give your answer as a number and a word.	beyond, none, zero, count (on/up/to/from/down), before, after, many, few, fewer, least, fewest, lesser, smallest, greater, same as, odd, even, units, ones, tens, ten more/less, digits, numeral, figure(s), compare, (in) order/ a different order, size, value, between, halfway between, above, below. What does ten tell us about a number? What comes after the number 10? Let's count on from 9, 10, 11, 12 etc.

<table>
<tr>
<td>Write numbers to 20 in numerals and words.</td>
<td>Use your own ten frames to show me the number:
Fourteen 18 Nine 16

Write the number shown on the ten frames in numerals and words.
</td>
<td>Circle the odd one out and explain why.

11 12 13 14
15 61 17 18</td>
<td>Fred Fox is making his way through the maze.

Which numbers are missing? Write them as numbers and words.</td>
<td rowspan="2">How do we say this number? How do we write the number……?
Do we have to count from 1 every time?
Which is the smallest – how do you know? Which is the greatest – how do you know?
How could you order?
Numerals, estimation

I know….
Beacause…..</td>
</tr>
<tr>
<td>Numbers from 11-20

- This step should be broken further for children to fully immerse into understanding numbers beyond 10.
- Understand 11,12 and 13</td>
<td>Draw a picture to show me 13
Compare yours with a partner.
What's the same? What's different?
Complete the table.<table><tr><th>Numeral</th><th>Representation</th></tr><tr><td>17</td><td></td></tr><tr><td></td><td></td></tr><tr><td>13</td><td></td></tr></table></td>
<td>Teddy says,

Do you agree?
Explain your answer.</td>
<td>Game

Use two sets of number cards.

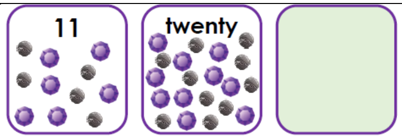
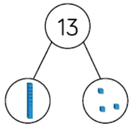
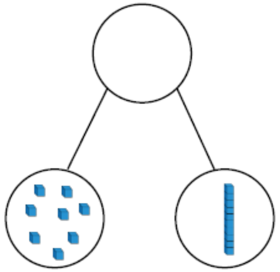
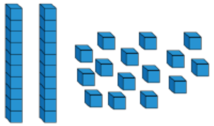
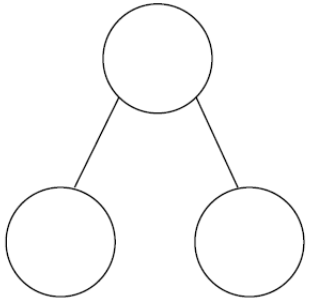
1 set with numerals 1 – 20

1 set with words 1 – 20

Play in groups of 3 or 4

Take it in turns to pick a numeral card and a word card. Say the number on each card out loud. If they match you win the pair, if they don't you put them back.

Adam is guessing the code to unlock a secret safe. He knows the first two numbers.</td>
</tr>
</table>

- Understand 14, 15 and 16. - Understand 17, 18 and 19. - Understand 20.			 **The last number is less than twenty and more than fifteen.** What could the missing number be? Give your answer as a numeral and draw the representation to go with it.	
Tens and Ones	Use the part-whole model to complete the sentences. My number is ______ One part is ______, the other part is ______ The whole is ______ 	Alex makes a part-whole model.  She says:  Explain her mistake. What is her number?	How many ways can you complete the part-whole model to show numbers up to 20, using the Base 10 equipment – you do not have to use it all.  	

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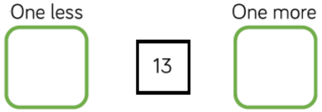
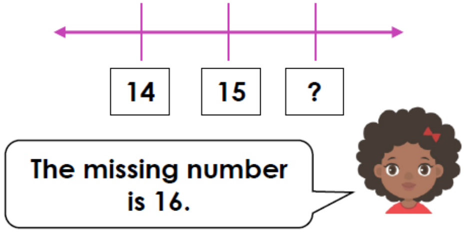
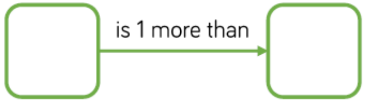
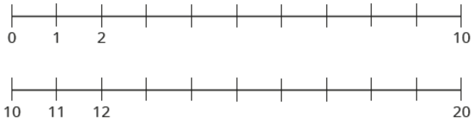
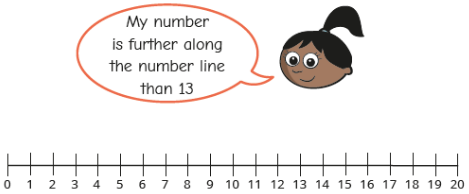
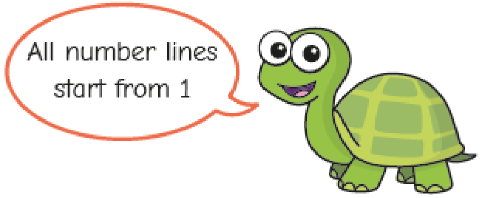
Count one more and one less	Draw to complete.  Make one more and one less than these numbers. 	Kim is filling in the gaps on her number line.  Is she correct? Explain why.	Use number cards 11 – 20 How many different ways can you complete the boxes?  	
The number line to 20	Children create a number line out on the playground – they could then find a given number. Discussion arounf what number came before/ after. Hilight t the numbesr halfway between 0-20 and 10-20. Complete the number lines.  	Sam is thinking of a number.  What could Sam's number be? Compare answers with a partner. I know the number has to be greater than 13 because…	Draw a number line for a friend to spot the mistake.	

Use a number line to 20	Ann counts from 8 to 15 Circle all the numbers that she will say.  	 Do you agree with Tiny? Why?	Children to pick a number on the number line. Can they tell you how many jumps there are from zero to their number? How many jumps are there from their number to 20? Is their number closer to zero or closer to 20? Repeat with different numbers. Ask the children what they notice.	
Estimate numbers to twenty using practical resources. - introduce the idea of estimation with the children.	Children to explore estimation through objects. Place a number of objects on the ground estimate 'make a sensible guess' – how many do you think there are? Children should use their subitising knowledge to support.	I think there are 20 counters – when there are only 4. Children to explain using the language of because they know that 20 is a greater number and on the carpet there are fewer counters.	Children to begin to use the language of estimation in other areas of their learning e.g. at forest school 'It could take 5 shovels of mud to fill this hole.	

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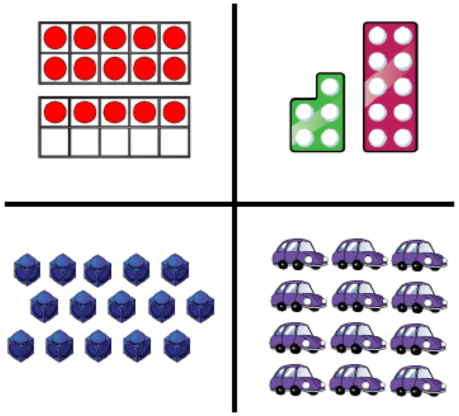
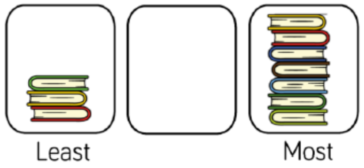
Compare groups of objects	Which is greater? A  B  By how many?	Which image is the odd one out? Why? 	How many books can go in the empty box?  Compare with your partners- have you drawn the same amount of books? How many possibilities are there? Is it possible to have 3 or 7 books in the middle pile?	

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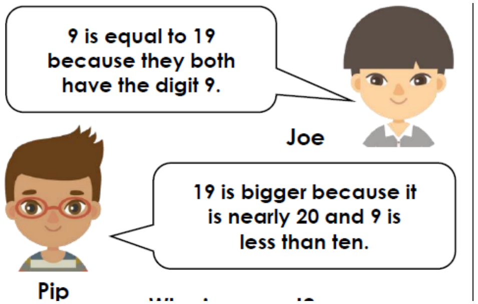
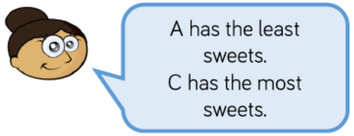
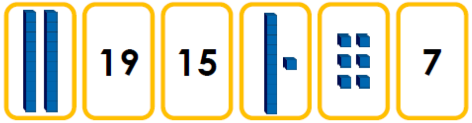
Compare numbers	Circle the greatest number. - Twelve Twenty - 8 17	Pip and joe are comparing the numbers 9 and 19.  Who is correct? Explain how you know.	Dora has three jars of sweets.  A = 12 B = ___ C = 17 She says:  How many sweets could be in B? Discussion point: can B have 12 or 17 sweets?	
Order numbers.	This could be introduced by ordering objects first then moving onto numbers. Order the numbers from greatest to smallest. 13 18 15	Sam has ordered some numbers greatest to smallest.   **What is his mistake? Explain how you know.**	Mr Monaghan says,  What could his number be?	

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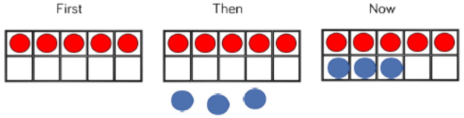
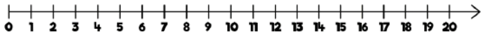
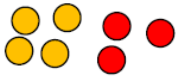
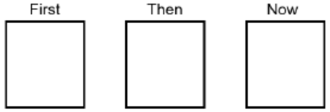
Year 1

Number: Addition and Subtraction (within 20)

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Add by counting on	Use ten frames to complete the number story.  First there were ___ cars in the car park. Then ___ more cars parked in the car park. Now there are ___ cars in the car park. Mo starts at 9 and counts on 6 9 + 6 = ☐ Show his calculation on the number line. 	Mo and Jack are working out 11 + 7 Mo says,  11, 12, 13, 14, 15, 16, 17 Jack says,  12, 13, 14, 15, 16, 17, 18 Use a number line to show who is correct.	Use the diagram and counters to tell your own number story for these calculations: 0 + 12 = ___ 7 + 0 = ___ 14 + ___ = 17  	What does part mean? What does whole mean? How many where there at the start? Which number represents the total? Number bonds, number line, add, more, plus, make, sum, total, altogether,

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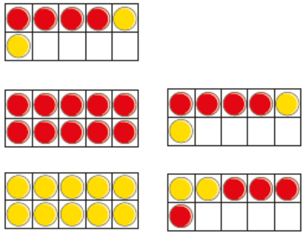
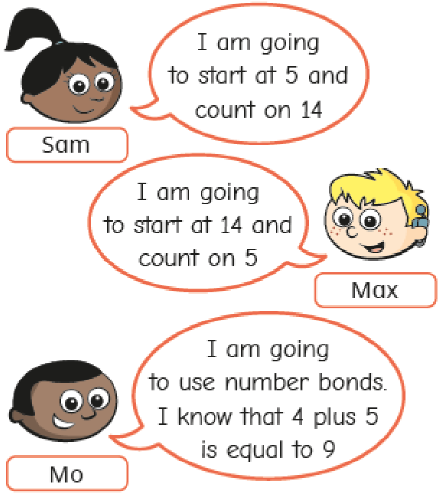
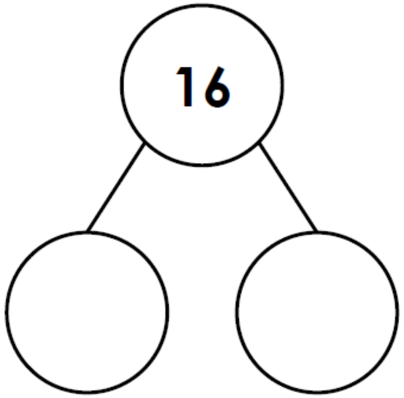
Add ones using number bonds	Complete the additions.  4 + 2 = ______ 14 + 2 = ______ 12 + 4 = ______	Sam, Max and Mo are working out 5 + 14  Use each method to work out the answer. Whose method do you prefer? Why?	**4b. Find 5 ways to complete the part-whole model.**  	inverse, double, near double, half, halve, equals, is the same as (including equals sign), difference between, how many more to, how much more is…?, subtract, take away, minus, how many fewer is… than…? How much less is…? Can you see any patterns?

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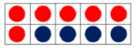
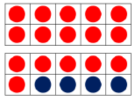
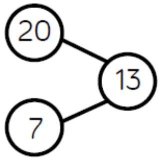
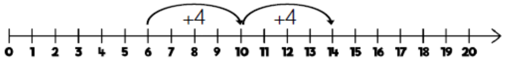
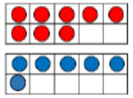
Find and make number bonds.	What number bond is represented in the pictures?  There are ___ red counters. There are ___ blue counters. Altogether there are ___ counters. ___ + ___ = ___ ___ + ___ = ___  There are ___ red counters. There are ___ blue counters. Altogether there are ___ counters. ___ + ___ = ___ ___ + ___ = ___	 Jack represents a number bond to 20 in the part whole model.  Can you spot his mistake?	Complete the number sentences using only two numbers. ☐ + four = 7 13 + 4 = ☐ 7 + ☐ = ten ☐ + ☐ = 20	
Add by making 10	Mo has used a number line to calculate 6 + 8  I partitioned 8 into 4 and 4 to make it easier.  Use Mo's method to calculate: 5 + 8 = ☐ 9 + 4 = ☐ 6 + 8 = ☐	Dexter uses ten frames to calculate eight plus six.  He says,  8 + 6 = 16 Do you agree? Explain why.	Choose a digit card to complete the number sentences below. You can use the digit card more than once. eight one two six two + ☐ + ☐ = eleven 9 + ☐ + ☐ = sixteen	

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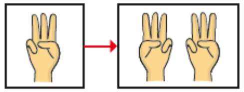
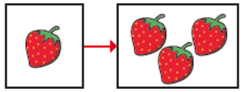
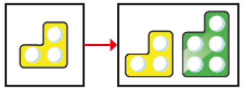
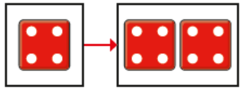
Doubles

Which pictures show doubles?









Ben has some cakes.

He doubles the number of cakes.

Here are Ben's cakes now.

How many cakes did Ben start with?

Who do you agree with?

Why?

Double each number.

Complete the table.

Number	Double
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

What patterns can you see?

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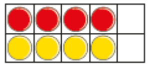
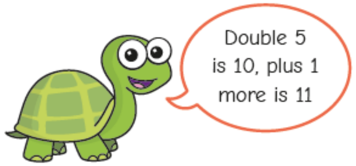
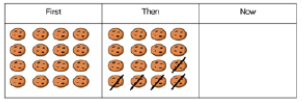
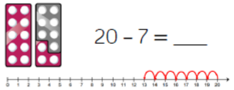
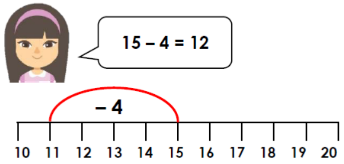
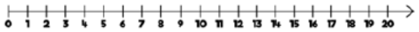
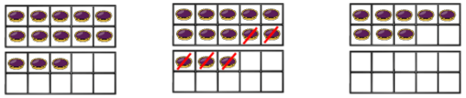
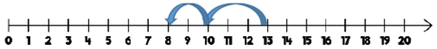
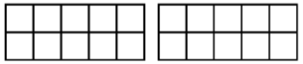
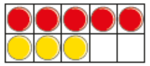
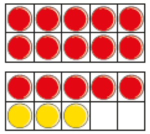
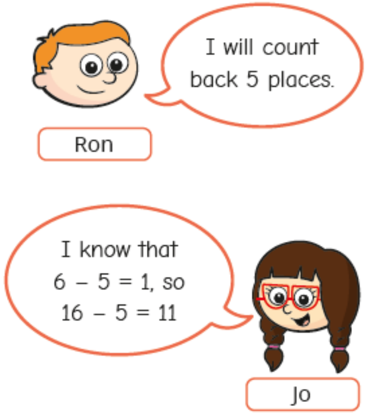
Near doubles	What double is shown on the ten frame?  Add one more red counter to the ten frame. What addition is shown now? Complete the sentence. ______ + ______ is equal to double ______ plus 1	Tiny uses doubles to work out 5 + 4  What mistake has Tiny made? What is the correct answer?	Write <, > or = to complete the number sentences. double 6 ○ 6 + 7 double 9 ○ 9 + 8 9 + 8 ○ double 8	
Subtraction – not crossing 10	There are 16 biscuits on a plate. Mo eats 5 of them. Complete the sentences. First there were ___ biscuits. Then ___ were eaten. Now there are ___ biscuits. 16 – 5 = ___  Use the number pieces and the number line to complete the number sentences.  20 – 7 = ___ Use this method to calculate: 20 – 8 18 – 6 19 – 4	Rose has written a number sentence to describe the image below.  Is she correct? Prove it. Children could use physical resources to prove their thinking.	How many ways can you complete this number sentence? Use the number line to help you.  ☐ – ☐ = 11	
Subtraction – crossing 10	First there were 13 jam tarts Then 5 were eaten Now there are 8 jam tarts.  	True or False? 12 – 5 = 7  Use the ten frames to prove your answer.	I'm thinking of a number. When I subtract 5 from the number, the answer is 7. What is the number I am thinking of?	

	There are 12 cars in the car park. 5 of them are blue. How many are red? ☐ – ☐ = ☐ ___ of the cars are red.	Amir has 16 apples. Ron has none. Amir gives Ron 9 apples. Who has the most apples now? Explain how you know.	Look at the following objects.  Teddy works out these calculations. 15 – 4 = ___ 15 – 11 = ___ 11 – 4 = ___ What question could he have asked each time?	

Subtract ones using number bonds	Complete the subtractions.  8 – 3 = ______  18 – 3 = ______	Ron and Jo are working out 16 – 5  Whose method do you prefer? Why?	**6a. Choose the correct cards to complete the number sentence.** ☐ – ☐ = 12  	

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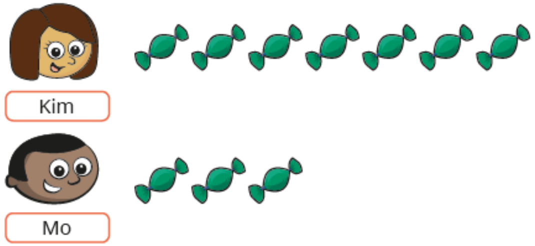
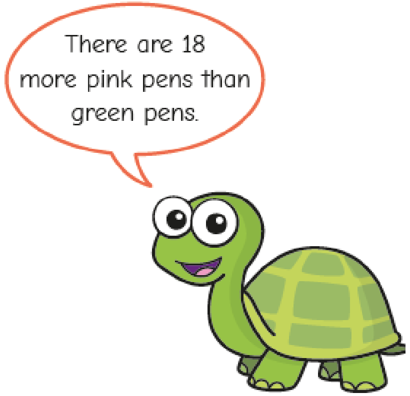
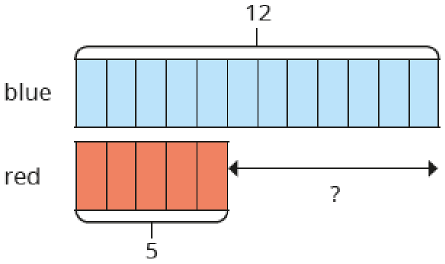
Subtract finding difference	Kim has 7 sweets and Mo has 3 sweets.  How many more sweets does Kim have than Mo? How many fewer sweets does Mo have than Kim?	There are 11 pink pens and 7 green pens in a pot. How many more pink pens are there than green pens?  What mistake has Tiny made? Draw a picture to show the correct answer.	Think of a subtraction problem to match the bar model.  	

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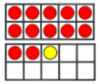
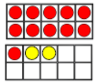
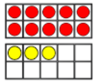
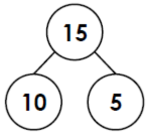
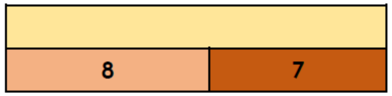
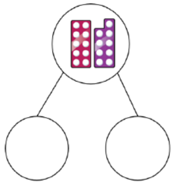
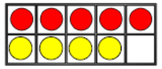
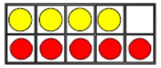
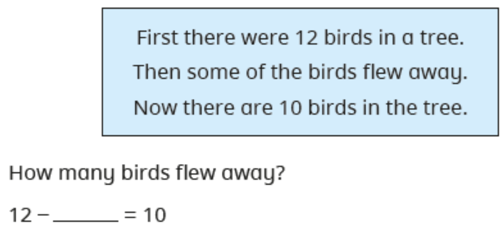
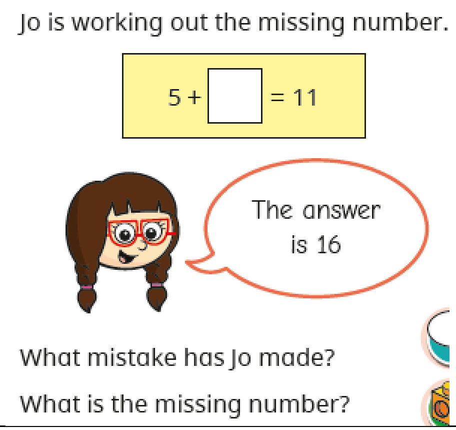
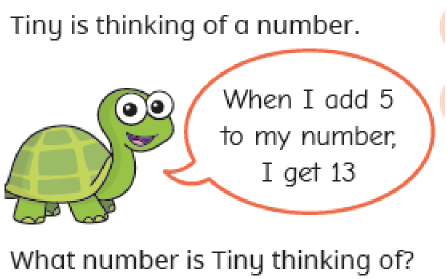
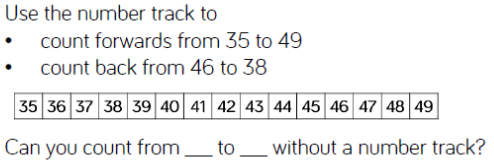
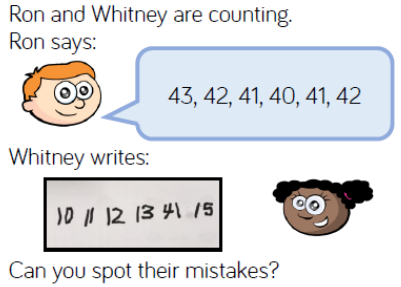
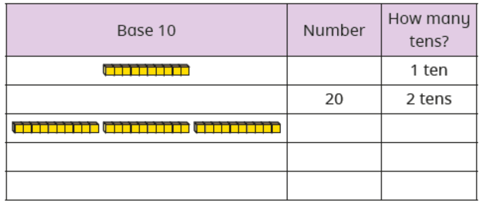
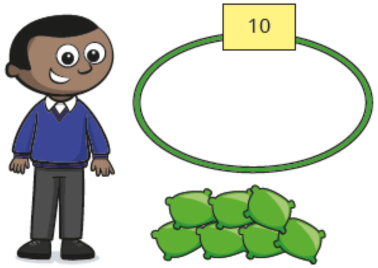
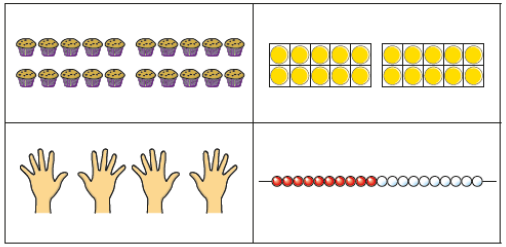
Related facts – explore addition and subtraction fact families.	Complete the addition sentences.  12 + 1 = 13  11 + __ = 13  __ + __ = __ Can you write a subtraction sentence for each? 13 – 1 = 12 13 – __ = __ __ – __ = __	Which representation below matches the calculation 8 + 7 = 15 **A.**  **B.**  **Explain your answer.**	Use the cards to write as many addition and subtraction sentences as you can.  nine add ten subtract nineteen is equal to	
Compare number sentences	Which card completes the number sentence?  5 + 4 is more than is less than is equal to  4 + 5	 Whitney has 16 sweets and eats 7 of them. Mo has 17 sweets and eats 8 of them.  Who has more sweets left? Explain how you know.	What number sentence could be hidden behind the paint splat? 19 – 3 >  > 6 + 7 **Find 3 possibilities.**	

Missing number problems	 First there were 12 birds in a tree. Then some of the birds flew away. Now there are 10 birds in the tree. How many birds flew away? 12 – ______ = 10	 Jo is working out the missing number. 5 + ☐ = 11 The answer is 16 What mistake has Jo made? What is the missing number?	 Tiny is thinking of a number. When I add 5 to my number, I get 13 What number is Tiny thinking of? Can you make your own?	

Year 1				
Number: Place Value (within 50)				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**
Numbers to 50	 Use the number track to • count forwards from 35 to 49 • count back from 46 to 38 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 Can you count from ___ to ___ without a number track?	 Ron and Whitney are counting. Ron says: 43, 42, 41, 40, 41, 42 Whitney writes: 10 11 12 13 41 15 Can you spot their mistakes?	Will is counting forwards from 37 to 46 using the digit cards below.	Fewer, more, equal, less than, greater than, number, pair, zero, one, two, three to twenty, and beyond, none, zero, count (on/up/to/from/down),

<table>
<tr>
<td></td>
<td></td>
<td></td>
<td>43 38 46 40
41 39 37

Which digit cards are missing?</td>
<td rowspan="2">before, after, many, few, fewer, least, most, fewest, lesser, smallest, greater, same as, odd, even, units, ones, tens, ten more/less, digits, numeral, figure(s), compare, (in) order/ a different order, size, value, between, halfway between, above, below. How many tens are there? How many ones are there? How do we record this number in words? Which digit represents the tens? Which digit represents the ones? Can you record your ideas in a different way?</td>
</tr>
<tr>
<td>20, 30, 40 and 50</td>
<td>Complete the table and continue the pattern.

<table>
<tr><th>Base 10</th><th>Number</th><th>How many tens?</th></tr>
<tr><td></td><td></td><td>1 ten</td></tr>
<tr><td></td><td>20</td><td>2 tens</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table></td>
<td>Mo is playing a game.


He scores 10 points for every bean bag that lands in the hoop.
He scores 50 points in total.
How many bean bags does Mo get in the hoop?
Ben scores 10 fewer points than Mo.
How many points does Ben score?
How do you know the number of points Ben has scored?</td>
<td>How many ways can you show each number?
One has been done for you.
10 ~~20~~ 30 40 50
</td>
</tr>
</table>

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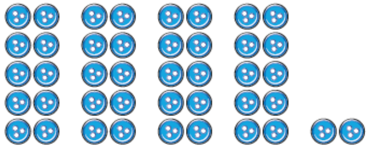
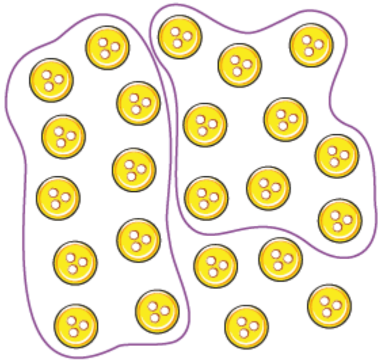
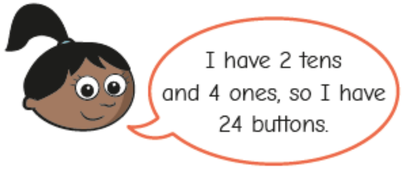
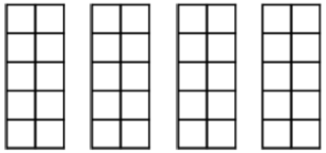
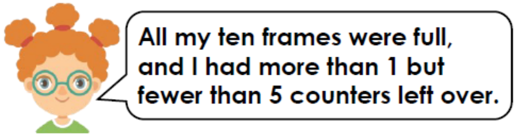
Counting by making groups of 10	Complete the sentences.  There are _____ groups of ten buttons and _____ buttons. There are _____ buttons in total.	Sam counts by grouping 10 buttons.   What mistake has Sam made? How many buttons are there?	**3b. Milly has dropped all her counters!**  **She says,**  **How many counters could she have?**	

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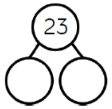
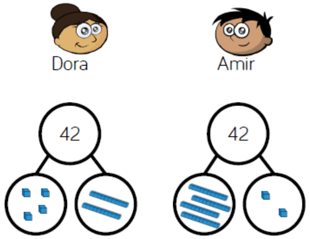
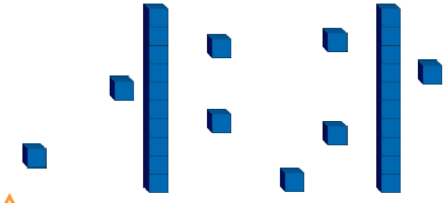
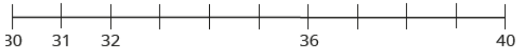
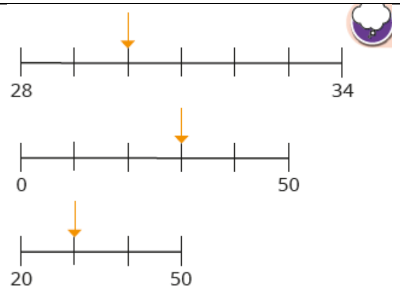
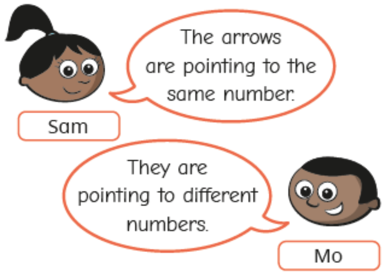
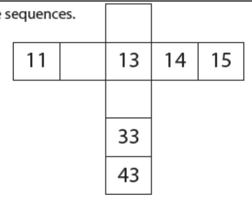
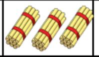
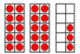
Tens and ones - Include partitioning into tens and ones	Count out 23 straws. How many bundles of 10 can you make?  There are ___ tens and ___ ones. ___ tens + ___ ones = 23 	Dora and Amir both try to build the same number.  Who is correct? Can you explain the mistake that has been made?	Circle the numbers that can be represented by the equipment below. 17 | 25 | 30 | 26 | 48 	

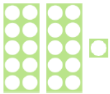
The number line to 50	Complete the number lines.  	  Who is correct?	Write the numbers missing from these sequences.  Can you make your own?	
Estimate up to 50	Children to explore estimation through objects. Place a number of objects on the ground estimate 'make a sensible guess' – how many do you think there are? Children should use their subitising knowledge to support.	I think there are 50 counters – when there are only 7. Children to explain using the language of because they know that 50 is a greater number and on the carpet there are fewer counters.	Children to begin to use the language of estimation in other areas of their learning.	

Represent numbers to 50

Complete the table.

Number	Tens and Ones	Ten Frame	Straws	Words
26	2 tens 6 ones			Twenty-six
	__ tens __ ones			Thirty
	__ tens __ ones			
	__ tens __ ones			Seventeen

Which is the odd one out?

A. 

B. 

C. 31

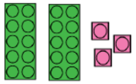
D. thirty-one

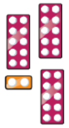
Explain why.

Sort the representations in to two groups.

23

Three tens and 2 ones





Twenty and three

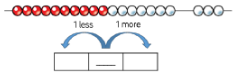
Explain how you have sorted them.

Can you add your own representations?

One more one less

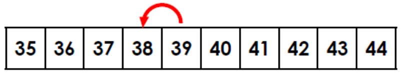
Build and find one more and one less.

One more than __ is __
One less than __ is __



One more than __ is __
One less than __ is __

Stan has drawn a number track to show one more than 39.



Is he correct? Explain your answer.

Use the clues to work out the number.

- I have a number with 3 tens.
- One less than my number makes the tens digit change.
- One more than my number has 1 one.

What is my number?
Can you make some clues to describe your secret number?

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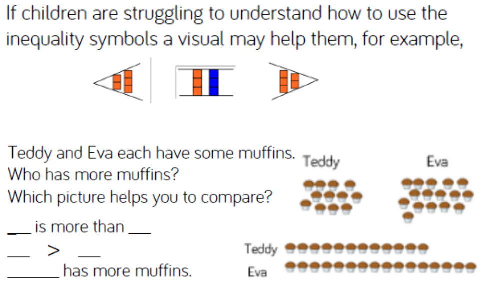
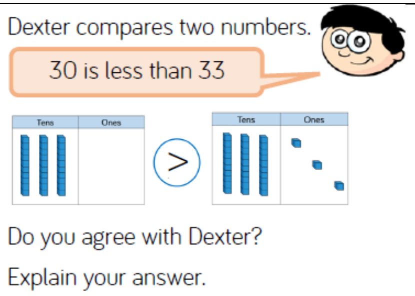
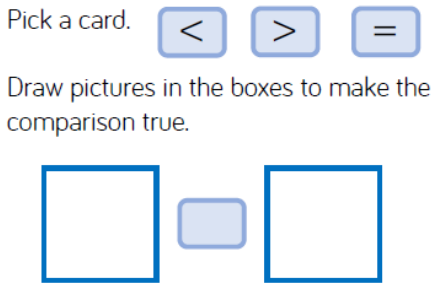
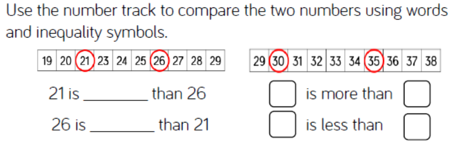
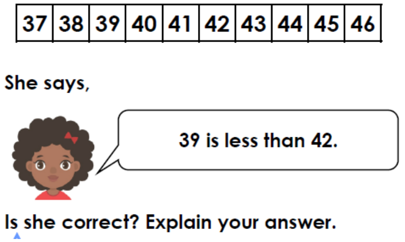
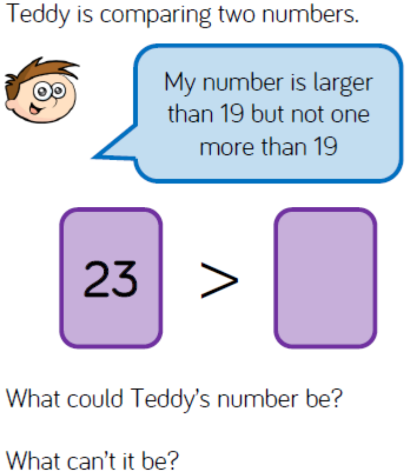
Compare objects within 50	 If children are struggling to understand how to use the inequality symbols a visual may help them, for example, Teddy and Eva each have some muffins. Who has more muffins? Which picture helps you to compare? ___ is more than ___ ___ > ___ ______ has more muffins. 	 Dexter compares two numbers. 30 is less than 33 Do you agree with Dexter? Explain your answer. Dexter is correct but he has used the wrong symbol.	 Pick a card. < > = Draw pictures in the boxes to make the comparison true. Children to be confident in using the language; more than, less than and equals to.	
Compare numbers within 50	 Use the number track to compare the two numbers using words and inequality symbols. 19 20 ㉑ 23 24 25 ㉖ 27 28 29 29 ㉚ 31 32 33 34 ㉟ 36 37 38 21 is _______ than 26 26 is _______ than 21 ☐ is more than ☐ ☐ is less than ☐	Kya is using a number track to compare numbers.  37 38 39 40 41 42 43 44 45 46 She says, 39 is less than 42. Is she correct? Explain your answer.	 Teddy is comparing two numbers. My number is larger than 19 but not one more than 19 23 > ☐ What could Teddy's number be? What can't it be?	

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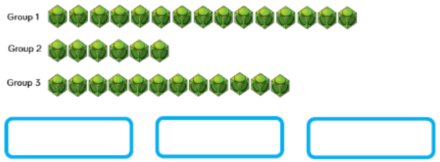
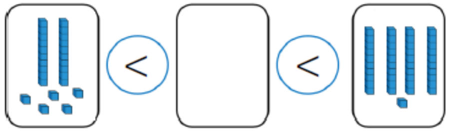
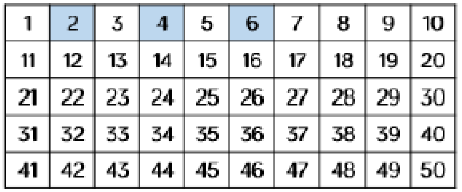
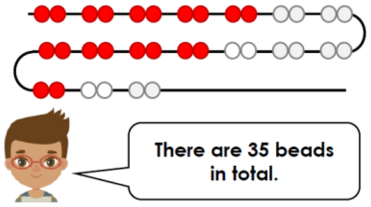
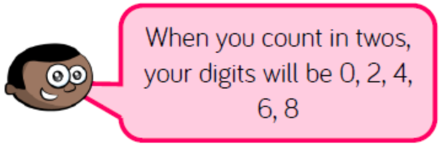
<table>
<tr>
<td>**Order numbers within 50**</td>
<td>Order the groups of cubes from smallest to largest.

 </td>
<td>Explain the mistake and can you correct it?
12 > 21 > 33 > 35</td>
<td>Find at least 5 different numbers that could complete the statement.

 </td>
<td></td>
</tr>
<tr>
<td>**Count in 2's within 50**</td>
<td>How many socks are there?

There are ___ socks in total.
Continue colouring in 2s on the grid.

<table>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr>
<tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr>
<tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr>
<tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr>
<tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr>
</table></td>
<td>Tim is counting the beads in 2s.


Is Tim correct? Prove it.</td>
<td>Always, sometimes, never…


Prove it!
Children should be provided with the opportunity to explore counting in 2s not from zero every time.</td>
<td></td>
</tr>
</table>

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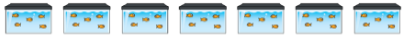
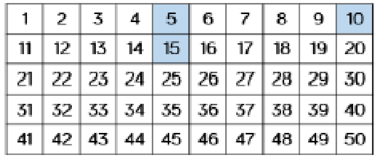
Count in 5's within 50	How many fish are there?  There are ___ fish in each tank. There are ___ tanks. There are ___ fish altogether. Continue counting in 5s on the grid.  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50	Odd One Out 25 30 27 45 Which is the odd one out? Explain your answer.	Work in groups. Create a circle with your hands. You can choose to put in one hand or both hands.  Count how many fingers and thumbs you can see altogether. Can you predict how many? Count to check.	

Year 1				
Number: Multiplication and Division				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**

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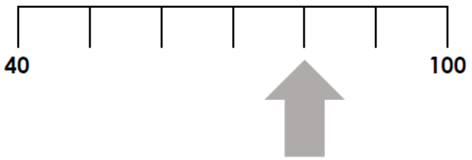
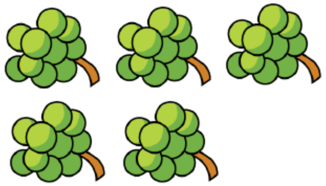
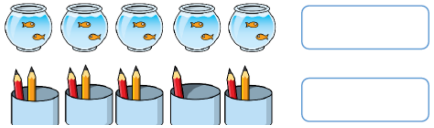
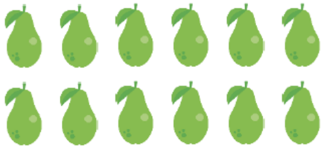
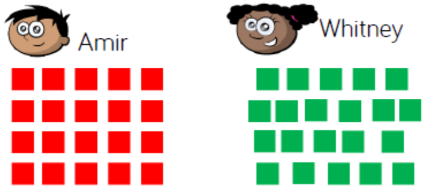
Count in 10s - Use 100 square, beads, pictures to support their understanding.	How many birds are there altogether?  There are ____ birds in each tree. There are ____ trees. There are ____ birds altogether.	Mia thinks the arrow is pointing at 90.  **Is he correct? Explain how you know.** In a shop, grapes come in bunches of 10  Max wants to buy forty grapes. Are there enough grapes?	Jemima is counting in 10s on part of a hundred square. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 She starts at 10 Shade in all the numbers Jemima will say. What is the same about the numbers she says? What is different about the numbers?	Odd, even, count in twos, threes, fives, count in tens (forwards from/ backwards from), how many times, lots of, groups, once, twice, three ties, five times, multiple of, multiply, multiply by, repeated addition, array, row, column, double, halve, share, share equally, group in pairs, threes etc., equal groups of, divide, divided by, left, left over, there are…… groups of……, What does equal mean?
Make equal groups - Begin by using stories which link picture and concrete manipulatives.	Complete the sentences  There are __ groups of __ pencils.  There are __ groups of __ flowers.	Carl has 17 marbles. Can he make 8 equal groups of 2?	Use concrete materials or pictures to complete the questions. Alex has 4 equal groups. Show me what Alex's groups could look like. Whitney has 3 unequal groups. Show me what Whitney's groups could look like.	

	Are the groups equal or unequal? Write a label for each. 	 **Explain your answer.**	Children could then go on to showing it in another way. How many different ways can they show?	
Make arrays	 **There are ☐ pears in each column.** **There are ☐ columns.**	Amir and Whitney are making arrays.  Who has made a mistake? Explain why.	Eva begins to make an array with 40 counters. She has finished her first row and her first column. Complete her array.  Write two different number sentences to describe the finished array.	

Add equal groups - Children use equal groups to find a total.	How many fingers altogether?  5 + 5 + 5 =	Eva and Whitney are making equal groups of bread rolls.  Eva  We need one more group to make 40 We need 10 more rolls to make 40  Whitney Who do you agree with? Explain why.	Ellie has three train carriages and she puts ten blocks in each.  **How many blocks does she have altogether? Show your working.**	

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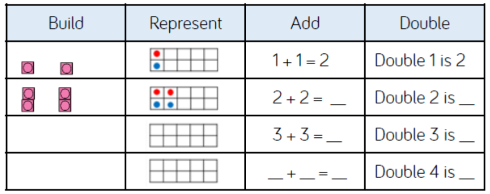
<table>
<tr>
<td>Make doubles
- Numbers up to 20.
- Record doubling using the sentence double…… is ……
- Use repeated addition to represent doubles in an abstract concept.</td>
<td>Take a number piece and double it. Complete the sentence.
 Double ___ is ___  Double ___ is ___
See children select the same numicon piece again to support learning here.
Complete and continue the table.

<table>
<tr><th>Build</th><th>Represent</th><th>Add</th><th>Double</th></tr>
<tr><td></td><td></td><td>1 + 1 = 2</td><td>Double 1 is 2</td></tr>
<tr><td></td><td></td><td>2 + 2 = __</td><td>Double 2 is __</td></tr>
<tr><td></td><td></td><td>3 + 3 = __</td><td>Double 3 is __</td></tr>
<tr><td></td><td></td><td>__ + __ = __</td><td>Double 4 is __</td></tr>
</table></td>
<td>James buys two jars of sweets.

Each jar has 7 sweets inside. How many sweets will I have I buy 2 jars?
Explain your answer.</td>
<td>Complete the table by doubling each number.
<table>
<tr><td>1</td><td></td></tr>
<tr><td>2</td><td></td></tr>
<tr><td>3</td><td></td></tr>
<tr><td>4</td><td></td></tr>
<tr><td>5</td><td></td></tr>
<tr><td>6</td><td></td></tr>
<tr><td>7</td><td></td></tr>
<tr><td>8</td><td></td></tr>
<tr><td>9</td><td></td></tr>
<tr><td>10</td><td></td></tr>
</table>
What patterns do you notice?</td>
<td></td>
</tr>
<tr>
<td>Make equal groups – grouping
- Start with a given total and group amounts equally.</td>
<td>Take 20 cubes. Complete the sentences.
I can make ___ equal groups of 2
I can make ___ equal groups of 5
I can make ___ equal groups of 10

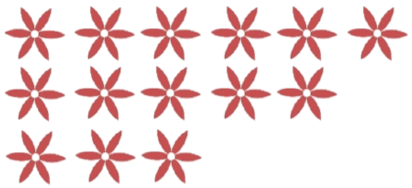
Children should be exposed to questions with numbers that cannot be grouped equally.</td>
<td>Frankie is grouping some flowers. She wants to make 3 equal groups of 5. Does she have enough flowers to do this?</td>
<td>I am thinking of a number between 20 and 30

I can only make equal groups of 5

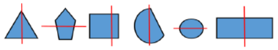
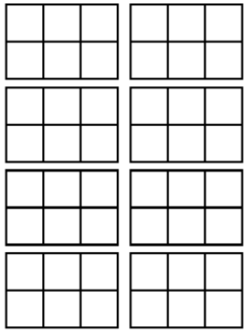
What must my number be?

What happens when I try to make groups of 2 with it?

What happens when I try to make groups of 10 with it?</td>
<td></td>
</tr>
</table>

				
Make equal groups – sharing	Children should be exposed to questions with numbers that cannot be shared equally. Share the muffins equally between the two plates. Complete the sentence. ___ cakes shared equally between 2 is ___ 	Jane needs to share her biscuits equally. She has 2 biscuits. Her friends have some things she can put the biscuits into. **Floella has 3 bags.** **Dexter has 2 boxes.** **Which friend should he ask for help? Explain your choice.**	Dora has 10 biscuits.  She wants to share them equally at her party. How many people could be at the party?	

Year 1				
Number: Fractions				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**
Recognise that fractions are part of a whole.	Explore the use of language around a fraction. Whole/ Equal parts.			Whole, equal parts, four equal parts, one half, two

	'Here is a whole cake. I have shared it into 2 equal parts' – from this discuss the half is a fractions. 'part of my whole cake.'			halves, a quarter, two quarters, fraction.
Find a half - Children use shapes and objects to find half to begin with then move onto quantity. - Children recognise that half means two equal parts of a whole.	Show the children real life objects and how they can be cut in half. How can we cut these objects in half?  Can any of the objects be cut in half in more than one way? Find half of each amount. 	Mo is finding halves. It is hard to find half of an odd number.  Do you agree with Mo? Explain your answer.	Sort the shapes into the table. Shapes that are split in half Shapes that are not split in half  Can you add any more shapes to the table? How many different ways can you shade one half of the shapes? 	

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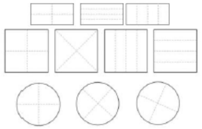
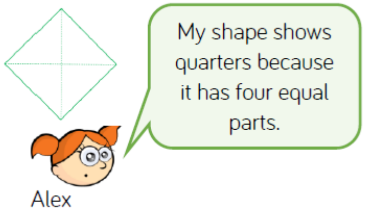
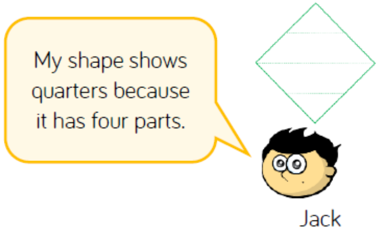
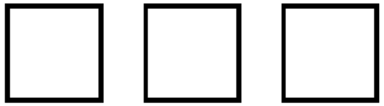
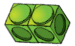
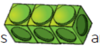
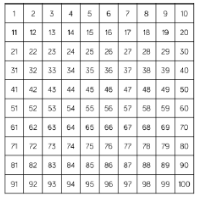
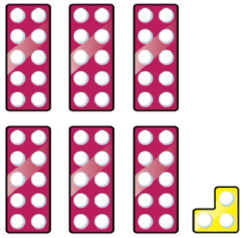
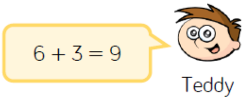
Find a quarter - Children use shapes and objects to find quarters to begin with then move onto quantity. - Children begin to recognise between equal and unequal parts.	Colour a quarter of each shape. Can you colour it in different ways?  Share each quantity into four equal groups.  There are ___ cakes. There is ___ cake in each quarter. A quarter of ___ is ___	Alex and Jack are talking about quarters.   Are they correct? Explain your answer.	Use the squares to show: • Less than a quarter shaded. • Exactly a quarter shaded. • More than a quarter shaded.  One cube  is a quarter, what could the whole look like? Two cubes  are a quarter, what could the whole look like? Three cubes  are a quarter, what could the whole look like? How many different possibilities can you make?	

Year 1

Number: Place Value (within 100)

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Counting to 100 - Children introduced to 100 square. - Children use knowledge of counting to 50 to support. - Continue counting in 10s.	How many flowers are there altogether? Can you represent the flowers using ten frames and counters?  Use the hundred square to: • Count forwards from 80 to 92 • Count backwards from 73 to 65 • Write down the numbers between 75 and 81 • Find what number comes between 46 and 48  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	Teddy has made a number using the number shapes.  He says  What mistake has Teddy made?	Correct the mistake in each sequence. • 34, 35, 36, 38, 39 • 98, 97, 96, 95, 93 • 78, 79, 18, 81, 82	Fewer, more, equal, less than, greater than, number, pair, zero, one, two, three to twenty, and beyond, none, zero, count (on/up/to/from/down), before, after, many, few, fewer, least, fewest, lesser, smallest, greater, same as, odd, even, units, ones, tens, ten more/less, digits, numeral, figure(s),

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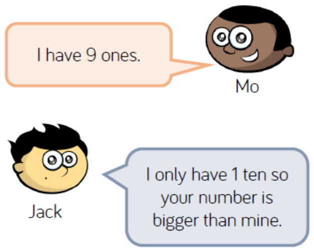
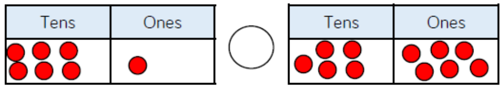
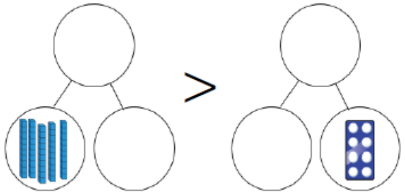
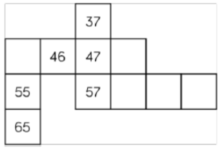
Partitioning numbers - Continue to identify how many 10s and 1s are in a number.	Use Base 10 to make these numbers. Complete the stem sentences. 70 36 64 81 22 66 49 70 has 7 tens and 0 ones.	 Is Jack correct? Prove it.	Use Base 10 to make a number: • Greater than 84 • Less than 70 • Greater than 75 but less than 87	compare, (in) order/ a different order, size, value, between, halfway between, above, below. What happens when we have 10 ones? Why do we look at the tens before the ones? How are we going to order these objects/numbers?
Comparing numbers - Children able to use a range of equipment to make comparison more visual. - Children able to compare using < , > , = as well as language linked to this. - Use concrete manipulatives then move	Use Base 10 to make these numbers on place value charts. Write how many tens and ones are in each number. 78 and 61 Tens Ones 90 and 89 Tens Ones 64 and 92 Tens Ones Which number from each pair is the largest? Discuss how you know. Compare the amounts using <, > or = 	Max says, My number is < 55 but more than 45.  **Is she correct? Explain why.**	How many ways can you complete the part-whole models to make the calculation correct?  How many different ways can you complete the place value charts to make the statement correct? Tens Ones 5 < Tens Ones 3	

onto ordering number using the knowledge of tens and ones.				
Ordering numbers - Children to start by ordering sets of objects and then moving onto quantities (largest to smallest and smallest to largest).	In groups of 4 roll some different equipment. The furthest roll wins. Give a high five to the person who came first, second, third and fourth. Order the numbers from smallest to largest. 57 8 21 100 93 72	How have these objects and numbers been ordered?  72 **Explain how you know.**	Mo creates a traffic jam using some toy cars on the carpet. The red car is 3rd from the front. It is also the 2nd from the back. Use some cars or manipulatives to find out how many cars are in the traffic jam.	

One more, one less	Use concrete manipulatives and ask children to show one more and one less than the given amounts e.g. cars, fingers, counters etc. Complete the missing numbers.  	Dora started with this number.  Has Dora shown the correct amount? Explain how you know. Important for the children to be recognising the place value of 10s and 1s.	Can you move two of the counters so Rosie has 1 more than Alex and Whitney has 1 less than Alex?  Expectation of children to have tens frame in front of them to support their thinking.	

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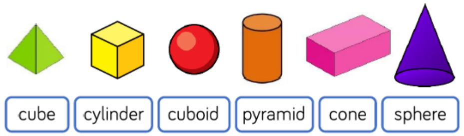
Year 1

Geometry: Shape

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Recognise and name 3-D shapes - Cuboids (including cubs), cylinders, pyramids, cones, spheres. - Children can name shapes in different orientations. - Children begin to consider the 2D shapes they see on 3D faces.	Match the shape to its name.  Children build a model of their choice out of 3-D shapes. They then write sentences to say which 3-D shapes they used. Are there any they didn't use? Could they write a sentence about those? E.g. I used 3 cuboids. I did not use a sphere.	Put a selection of 3-D shapes in a feely bag. Choose a shape. What do you think it is?  Explain how you know.	Use 3-D shapes to build a tower. Which shapes are the best for the bottom of the tower? Which shapes can only go on the top of the tower?	Group, sort, cube, cuboid, pyramid, sphere, cone, cylinder, circle, triangle, square, rectangle, shape, flat, curved, straight, round, corner (point, pointed), vertices, hollow, solid, face, side, edge, make, build, draw, direction, journey, left, right, up down, forwards, backwards, sideways, across, close, far, near,

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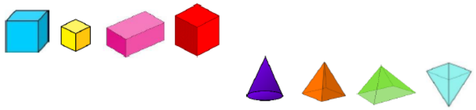
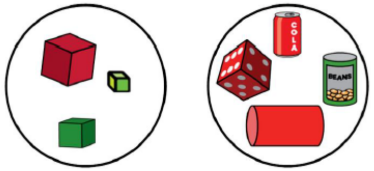
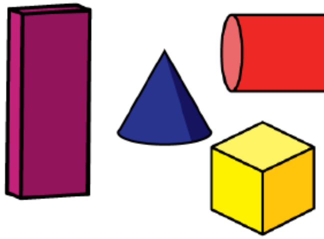
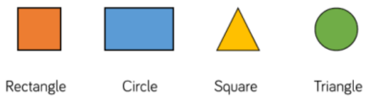
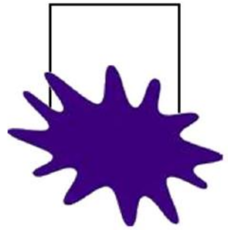
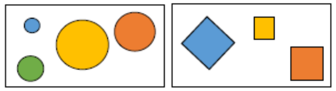
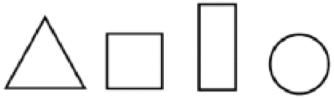
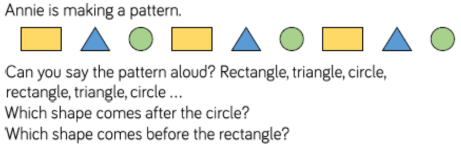
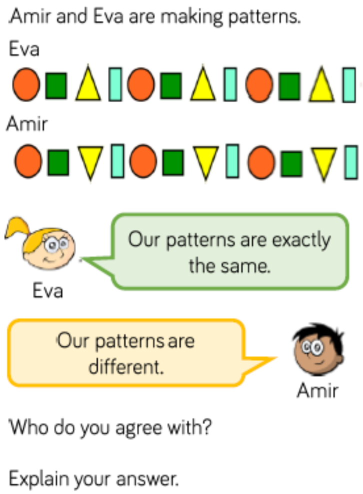
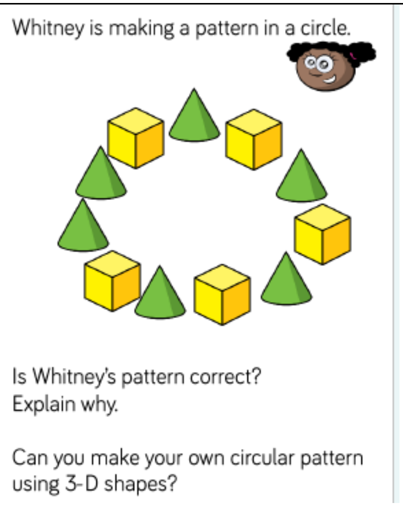
Sort 3-D shapes - Children able to sort 3-D according to simple properties e.g. size, colour, type. - Sort based on, able to roll or stack. Children are then encouraged to think about why they roll (curved face) or stack (flat face).	Circle the odd one out in each group.  Children provided with physical shapes throughout sorting.	Some 3-D shapes have been sorted.  Have the shapes been sorted correctly? Explain how you know. How else could the shapes be sorted?	How many ways can you sort the shapes into groups? 	along, through, to, from, towards, away from, movement, side, roll, turn, full turn, whole turn, half turn, stretch, bend. What makes a shape 3-D? What makes a shape 2-D? Can we see any 3-D shapes in the classroom? Can you describe this shape? What is the name of this shape?

Recognise and name 2D shapes - Children recognise that 2-D shapes are flat. - Children can name triangle, circle, rectangle, and square.	Children could use the faces of 3-D shapes as stencils or prints for 2-D shapes. Match the 2-D shapes to their names. 	Part of a shape is hidden.  What shape could it be? Is there more than one possibility? Explain your thinking.	Here is part of a shape.  How many different ways can you complete the shape using one or more straight lines? Compare your shape with a partner. What is the same and what is different?	
Sort 2-D shapes - Children sort and group 2-D shapes according to simple properties, type, colour, size. - Children recognise orientation of a shape does	Go on a shape hunt around school. Take photos of 2-D shapes then sort them by their name. Can you sort them in another way? How are the shapes grouped? Label each group. 	Tommy says that all shapes with 4 sides are squares. Is Tommy correct? Prove it. Children could draw a rectangle here to prove it or if they know of another shape.	Use a selection of triangles, rectangles, squares and circles.  Put your shapes into groups. Ask a partner to label your groups. How many different groups can you create?	

not affect its properties.				
Patterns with 2-D and 3-D shapes - Children are able to sue 2-D and 3-D shapes to create and complete simple patterns.	Encourage the children to say the pattern out loud.  Annie is making a pattern. Can you say the pattern aloud? Rectangle, triangle, circle, rectangle, triangle, circle … Which shape comes after the circle? Which shape comes before the rectangle?  Name the missing shapes in each pattern.	 Amir and Eva are making patterns. Eva Amir Eva: Our patterns are exactly the same. Amir: Our patterns are different. Who do you agree with? Explain your answer.	 Whitney is making a pattern in a circle. Is Whitney's pattern correct? Explain why. Can you make your own circular pattern using 3-D shapes? Can you make a pattern for your friend to be able to solve?	

Year 1

Geometry: Position and direction

Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**

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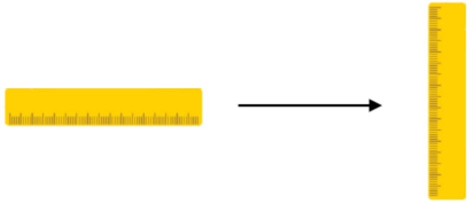
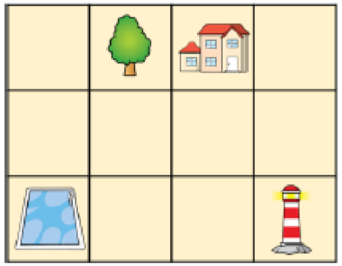
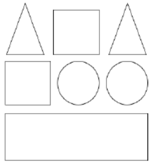
Describe turns - Children are able to practically turn objects, shapes and themselves in different directions using the language – full, half, quarter and three quarter to describe turns.	Children given instructions to turn themselves or objects. E.g. make a half turn. Once confident, children could do this within their own pairs. Draw what each shape will look like once it has turned a: - quarter turn - half turn - three-quarter turn - full turn  Children provided with the physical resource to do this.	Jennie was asked to turn the ruler one half turn.  Did she follow the instructions? Explain and correct any mistakes you find.	Alex turns her number shape and it finishes facing this direction.  What direction could it have started facing? What turn could it have made?	Over, under, underneath, above, below, top, bottom, side, on, in, outside, inside, around, in front, behind, front, back, below, after, beside, next to, opposite, apart, between, middle, edge, centre, corner, direction, journey, left, right, up, down, forwards, backwards, sideways, across,

<table>
<tr>
<td>Describe positions
- Children are able to use left, right, forwards and backwards to describe.
- Children move on to using, top, in between, bottom, above, below.</td>
<td>Board games such as snakes and ladders or playing twister will support positional language.

Using the beebots. Setting the instructions the children plan for them to get to a chosen destination.

‘Move the house 2 spaces backwards’.
‘The house is to the right of the tree’.
Think about where you are sitting in the classroom.
What can you see around you? Complete the table.
<table>
<tr><th>In front of me</th><th>Behind me</th><th>To the left of me</th><th>To the right of me</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>
</td>
<td>Abigail says she has put her boat on the right of the shelf.

Is she correct?

Explain how you know.</td>
<td>Use the clues to colour the shapes.

• The circle in the middle is blue.
• The circle on the right is red.
• The shape up from the right circle is green.
• The shape down from the circles is green.
• The square to the left of the green triangle is red.
• The four-sided shape up from the rectangle is blue.
• The triangle on the left is red.

How many different ways can you describe the position of the 2p coin?
</td>
<td>close, far, near, along, through, to, from, towards, away from, movement, side, roll, turn, whole turn, half turn, stretch, bend. Where is the……… in relation to you?</td>
</tr>
</table>

Year 1

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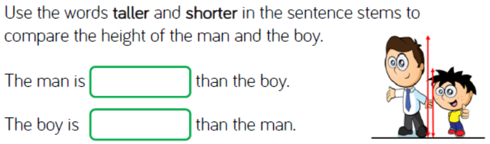
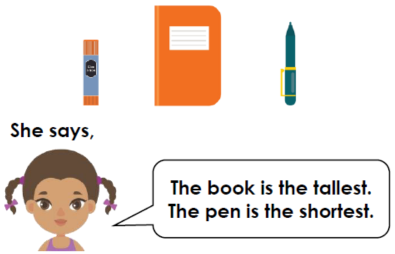
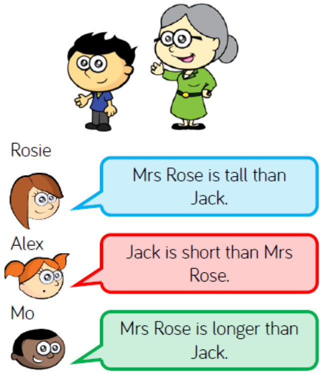
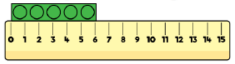
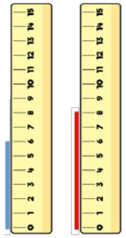
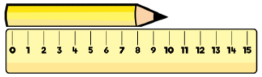
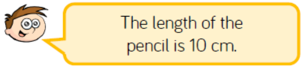
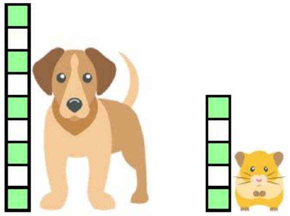
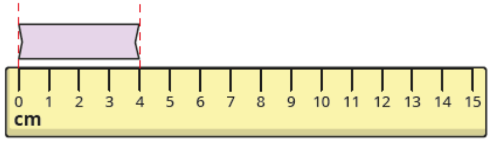
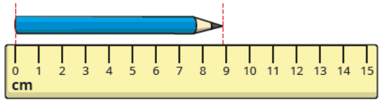
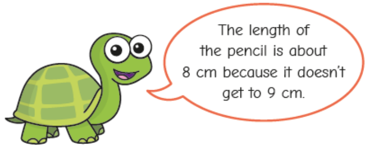
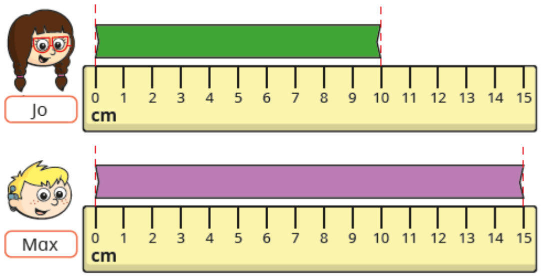
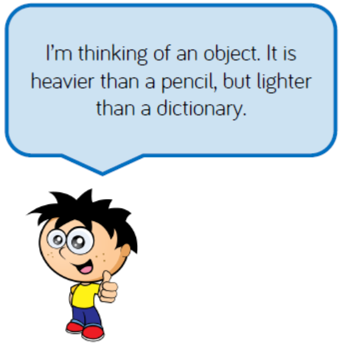
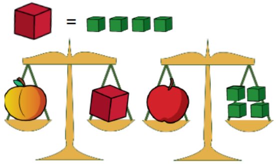
Measurement: Length and height

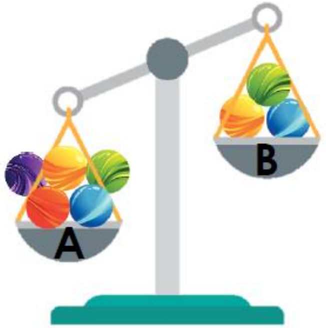
Objective	Skill it	Apply it	Deepen it	Mathematical talk
Compare lengths and heights - Children use and understand the language of length. - Children recognise language will change depending on what type of length. - Children understand that height is a type of length.	Children could compare their own heights. From this they could use them stem sentence included in the example below to compare their own height to a friend.  Use the words **taller** and **shorter** in the sentence stems to compare the height of the man and the boy. The man is ☐ than the boy. The boy is ☐ than the man.	May is comparing items at school.  **She says,** **The book is the tallest. The pen is the shortest.** **Do you agree? Explain your answer.**	Using classroom equipment, can you find an object which is longer than your rubber but shorter than your pencil? Can you find a friend who is shorter than you but taller than your other friend? Rosie, Alex and Mo are comparing the height of Mrs Rose and Jack.  Rosie: Mrs Rose is tall than Jack. Alex: Jack is short than Mrs Rose. Mo: Mrs Rose is longer than Jack. Can you improve their sentences to make them more accurate?	Height, length, compare, measure, long, short, longer, shorter, narrow, wide, are we measuring the height or length of something? What would you use to measure the length of the classroom? What would you use to measure your shoe?

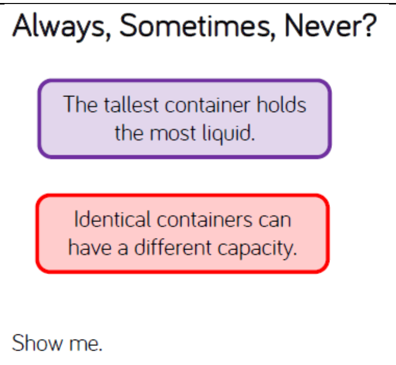
Measure length - Children able to use non-standard units, such as cubes, hands or straws to measure length and height. - Children recognise that these units have to be equal.	Use cubes to measure the length of objects around your classroom. Write a sentence for each object.  The pencil is ☐ cubes long. The ☐ is ☐ cubes long. How long is the building block?  The building block is ☐ cm. Which straw is the tallest?  The blue straw is ☐ cm tall. The red straw is ☐ cm tall. The ☐ straw is the tallest. The ☐ straw is the shortest.	True or false?  The flower is 8 cubes tall. Explain your answer. Teddy measures the length of the pencil.  He says,  Do you agree with Teddy? Explain why.	A rabbit is shorter than a dog but taller than a hamster.  **How many cubes could the <u>rabbit</u> measure? Find two possibilities.**	

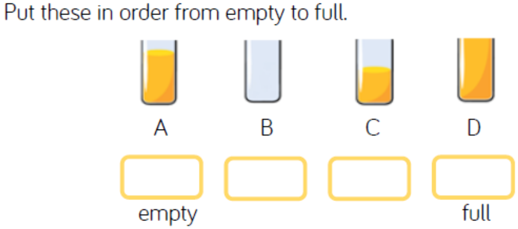
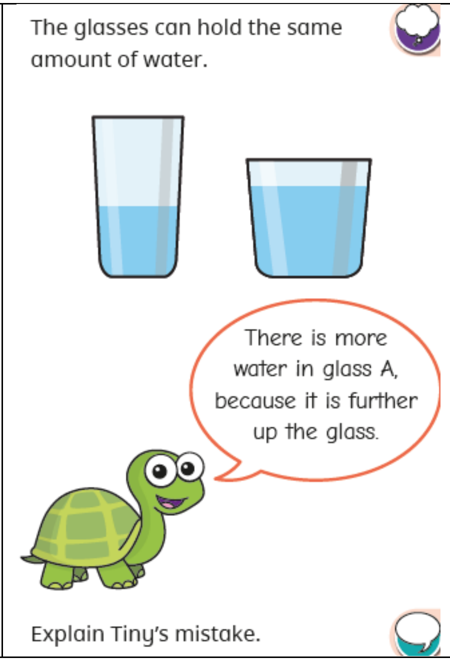
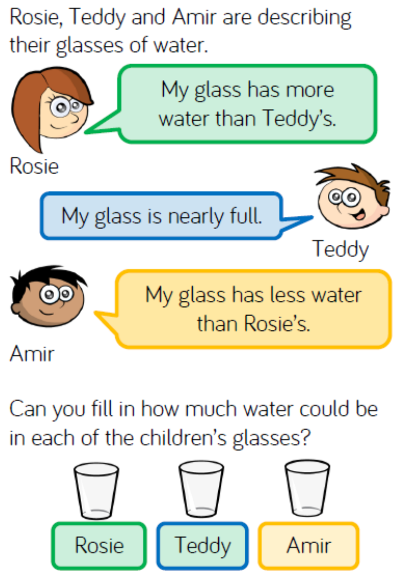
Measure length in centimetres	How long is the ribbon?  	Tiny is measuring the length of the pencil.   Do you agree with Tiny? Why?	Jo, Max and Sam are comparing the lengths of some ribbons.   How long could Sam's ribbon be?	

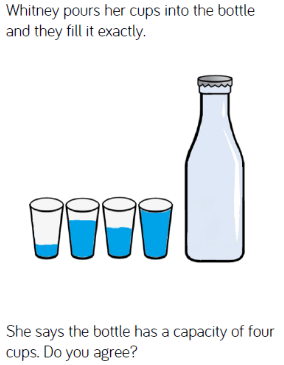
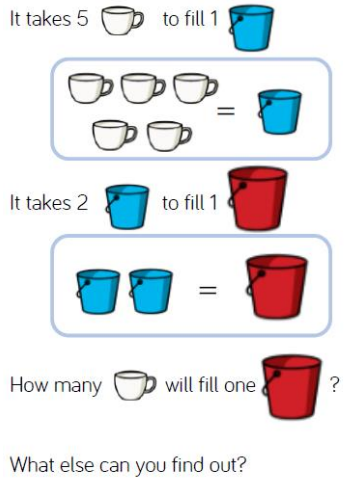
Year 1				
Measurement: weight, mass and volume				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**

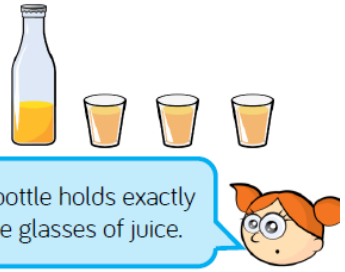
Introduce weight and mass - Heavier and lighter.	Children introduced to weight and mass by holding objects and describing them using the vocabulary such as heavy, light, heavier than, lighter than before using scales to then check. Children may believe that larger objects ae always heavier and this misconception should be explored. Choose two objects. Which is heavier? Which is lighter? Can you be a human weighing scale? Now use the weighing scale to check.  Which object is heavier? Which object is lighter? The _______ is heavier/lighter than the _______ .	I think the pencil is heavier than the book. Am I correct? Prove your answer.	 What object could Jack be thinking of? Prove it. How many objects can you think of? Encourage children to be using the balance scales to check their thinking.	Full, half full, empty, holds, weight, weighs, balances, heavy, heavier, heaviest, light, lighter, lightest, scales, capacity, volume, mass Are larger objects always the heaviest objects? Let's see shall we. If a balance scale is down what does this tell us? If the balance scale is up, what does this tell us? Look at my bottle, is it full? Is it empty?
Measure mass - Children are able to start using non-standard units e.g. cubes to measure mass of an object.	Use the non-standard units to measure each item on your table.  The _______ weighs the same as _______ cubes.	 Amir says,  The apple is heavier than the peach, because it weighs 4 cubes. Teddy says,  The apple and the peach weigh the same. Who do you agree with? Explain why.	The grapes weigh 10 blocks and the kiwi weighs half the mass of the grapes.	

			 **Draw the blocks to balance the scale.**	
Compare mass - Children are able to use non-standard units to weigh objects to support comparing of two objects. - Able to use the language of < , >, =	Can you order the objects from heaviest to lightest?  = 3 pencils Ball  = 8 pencils Teddy Bear  = 4 pencils Sock	Hettie wants the scales to balance. She thinks she could move some marbles to do this.  Is she correct? Explain your answer.	Look at the balance scales below.   Which statements are true? • The car is heavier than the van. • The van is heavier than the car. • The car is lighter than the van. • The van is lighter than the car. • The car and van weigh the same amount. Can you make a problem like this for your partner?	

Introduce capacity and volume - Empty and full	Children to practically explore capacity and volume by being provided with a range of containers using sand or water to explore capacity/volume. - Show me full containers - Show me empty containers - Show me almost full - Show me almost empty.	Always, Sometimes, Never? The tallest container holds the most liquid. Identical containers can have a different capacity. Show me. Capacity = the maximum amount the **container** can hold. Volume = how much liquid/sand there is. Amount of space it takes up.	When at forest school, children transfer water using the language of empty/ full. They explore how they are able to travel without spilling much water. I.e. they fill a container and discuss whether this is easy or hard compared to a half full container.	

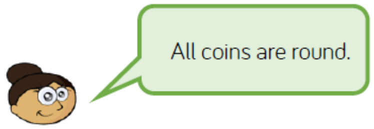
Compare volume	 Put these in order from empty to full. A B C D empty full Show this question alongside cups that represent the images.	 The glasses can hold the same amount of water. There is more water in glass A, because it is further up the glass. Explain Tiny's mistake.	 Rosie, Teddy and Amir are describing their glasses of water. Rosie: My glass has more water than Teddy's. Teddy: My glass is nearly full. Amir: My glass has less water than Rosie's. Can you fill in how much water could be in each of the children's glasses? Rosie Teddy Amir	

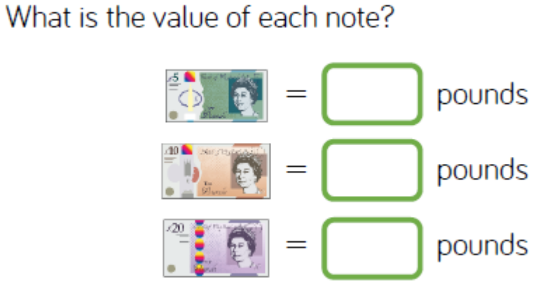
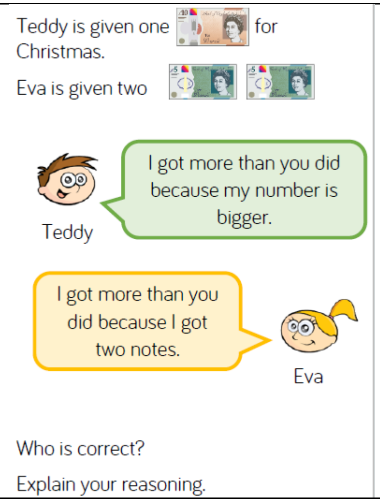
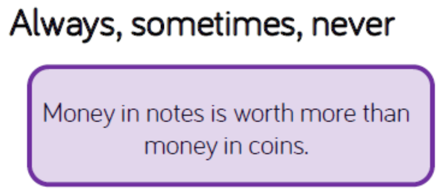
Measure capacity	Work practically using a variety of containers. How many smaller containers does it take to fill one larger container?	 Whitney pours her cups into the bottle and they fill it exactly. She says the bottle has a capacity of four cups. Do you agree? Emphasis made on the need to fill fully (equal).	 It takes 5 to fill 1 = It takes 2 to fill 1 = How many will fill one ? What else can you find out? This should be done practically with the children. They could move the liquids between the containers to support their understanding writing down how many cups they use each time.	

Compare capacity - Children able to compare using non-standard units of measure.	Take three different containers. Fill each container with liquid or rice using the same unit of measure e.g. a small cup. Order thee containers smallest to largest capacity. Children could do this in pairs and take it in turns to challenge their friend in ordering. They set the rule of largest – smallest or smallest – largest.	Alex has a bottle of juice. She pours three glasses of juice.  The bottle holds exactly three glasses of juice. Do you agree? Explain why.	Choose three containers. Investigate how you could compare the capacity of each one. 	

Year 1

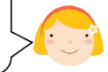
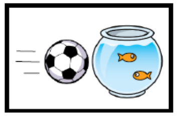
Measurement: Money

Objective	Skill it	Apply it	Deepen it	Mathematical vocabulary
Recognising coins - Children able to recognise and know the value of different coins.	Organise the coins on your table into pence and pounds. Can you name each coin? 	Dora says:  All coins are round. Do you agree with Dora? Justify your answer.	Provide children with certain coins. 'make 17p in as many different ways as possible'.	Coins, notes, pounds, pennies, £, P, money, count, what is the value of each coin? How many 1 pound coins will you need to make 2 pounds?

- Children able to use their knowledge of place value to match coin values.				
Recognising notes - Children able to recognise and know the value of different notes.	 What is the value of each note? = ☐ pounds = ☐ pounds = ☐ pounds	 Teddy is given one for Christmas. Eva is given two Teddy: I got more than you did because my number is bigger. Eva: I got more than you did because I got two notes. Who is correct? Explain your reasoning.	 Always, sometimes, never Money in notes is worth more than money in coins. Children investigate the statement using practical resources. May recognise they could have 6 pound coins which is more than a five pound note.	

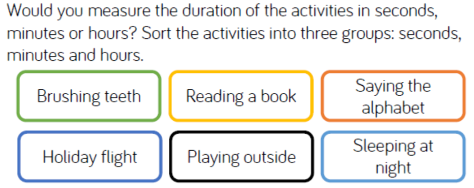
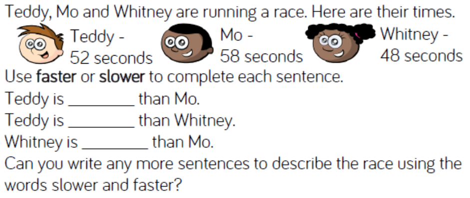
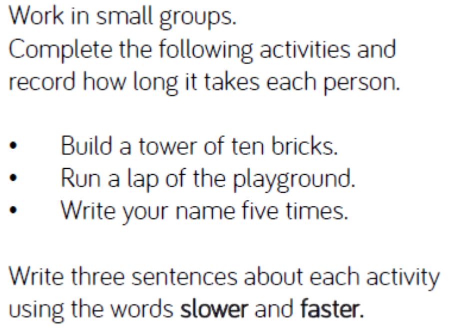
Counting coins - Children are able to combine their knowledge of counting and money to find amounts.	Use or draw coins to show the given amounts. • 10p in 5p coins. • 50p in 5p coins. • 50p in 10p coins. • 40p in 5p coins.	Alex thinks he was 30 pence in his wallet. Is he correct?  Prove it.	Tommy's piggy bank is full of 2 pence pieces, 5 pence pieces and 10 pence pieces. Using one type of coin at a time, how can he make 30 p? 	

Year 1				
Measurement: Time				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical vocabulary**

Before and after - Children use vocabulary related to time (before and after) to describe, sort and order events.	Sort the activities into **before** and **after** school.  	 **The smallest case was on the shelf before the purple case.**  **Is Effie correct?** **Explain how you know.**	Draw pictures to show what could have happened before and after. Before  After	Time, days of the week: Monday, Tuesday etc., seasons: spring, summer, autumn, winter, day, week, month, year, weekend, birthday, holiday, morning, afternoon, evening, night, midnight, bedtime, dinnertime, playtime, today, yesterday, tomorrow, before, after, next, last, now, soon, early, late, quick, quicker, quickest, fast, faster, fastest, slow, lower, slowest, slowly, takes longer, takes less
Dates - Know days of the week. - Know there are 7 days in a week. - Children know months of the year.	Link this in with children's birthdays. What month is your birthday in? Fill in the missing days of the week and complete the sente Sunday ☐ Tuesday Wednesday ☐ ☐ Saturday • Today is Wednesday, yesterday was ____ • Yesterday was Monday, today is ______. • Today is Saturday, tomorrow is ______. • Tomorrow is _______, today is Wednesda	Eva is practising chanting the months of the year. She says, January, February, May, April, March, July, June, August, September, November, October, December.  Eva is incorrect. Correct her mistakes.	Find three different ways to complete the sentence below using the months of the year. ___________ **is before**___________ **but** **after** ___________.	

Time to the hour - Children are introduced to telling the time to the hour using an analogue clock. - Know the minute hand is the longer hand and the hour hand is the shorter hand. - Know the language o'clock. - Children can read time to the hour. - Children know that when the minute handing is pointing upward to 12 it is an o'clock time.	Match the times to the clocks.    9 o'clock Two o'clock 5 o'clock	When it is 11 o'clock both hands point at 11  Alex Is Alex correct? Explain your reasoning.	Add the hands to each clock and write the tie in words to complete the pattern.    __o'clock three o'clock 1 ______ Children could play guess the time. 'I am thinking of the time. The short hand is on the 8 and the long hand is on the 12. What time am I thinking of?'	time, hour, '0' clock, half past, clock, watch, hands, minutes, how long ago?, how long will it be to…?, how long will it take to…?, how often…?, always, never, often, sometimes, usually, once, twice etc., first, second, next

Time to the half hour - Children know that, at half past the hour, the minute hand has travelled half way around the clock and now points at the 6 and the hour hand is half way between the hours.	Match the times to the clocks.    Half past twelve Half past 2 Half past nine	  The time is 6 past 1 Tommy Can you spot Tommy's mistake?	Read the instructions and draw the hands on the clock. • The minute hand is pointing at the six. • The hour hand is half way between 10 and 11  What time is it?	
Writing time - Children explore the differences between seconds, minutes and hours.	Decide which activities should be measured in which unit of time. Let's count 20 seconds in our heads. Stand up when you get to 20 seconds. How close where you? Children given the opportunity to use stop watches or sand timers to measure time. E.g. how many star jumps can you do in 20 seconds?	Are the units of time chosen sensible for these activities? • A football match measured in seconds. • A lap around the school playground measured in minutes. • A birthday party measured in hours. Explain your answers.	Children provided with stop watches or sand timers to measure different activities they do with their friends.	

	 Would you measure the duration of the activities in seconds, minutes or hours? Sort the activities into three groups: seconds, minutes and hours. Brushing teeth Reading a book Saying the alphabet Holiday flight Playing outside Sleeping at night			
Comparing time - Children ale to compare time using the language faster, slower, earlier and later.	 Teddy, Mo and Whitney are running a race. Here are their times. Teddy - 52 seconds Mo - 58 seconds Whitney - 48 seconds Use **faster** or **slower** to complete each sentence. Teddy is ________ than Mo. Teddy is ________ than Whitney. Whitney is ________ than Mo. Can you write any more sentences to describe the race using the words slower and faster? Children have a running race together and their times written down. Who was the fastest? Children then recognise a smaller time means they were quicker.	When racing or timing something… make an error in the faster/ slower e.g. Child A got to me slower than Child B (even though Child A got to you first). Am I correct? Explain your answer.	 Work in small groups. Complete the following activities and record how long it takes each person. - Build a tower of ten bricks. - Run a lap of the playground. - Write your name five times. Write three sentences about each activity using the words **slower** and **faster**.	

Year 2				
Number: Place Value				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**

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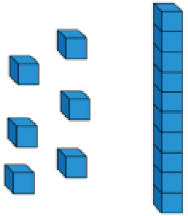
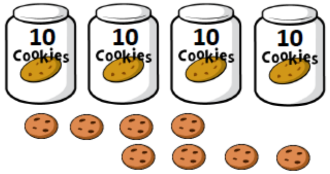
Count objects to 100 - Children able to estimate the number of objects before counting. - Children can do this by making tens.	Count and write the number of cars in the car park.  There are ______ cars in the car park.	Jack says he has 61 Is he correct?  Explain your reasoning.	Each jar contains 10 cookies.  How many cookies are there altogether? Write your answer in numerals and words. What strategy did you use? Did your partner use a different method? What is the best strategy to use?	Fewer, more, equal, less than, greater than, number, pair, zero, one, two, three to twenty, and beyond, none, zero, count (on/up/to/from/down), before, after, many, few, fewer, least, fewest, lesser, smallest, greater, same as, odd, even, units, ones, tens, ten more/less, digits,

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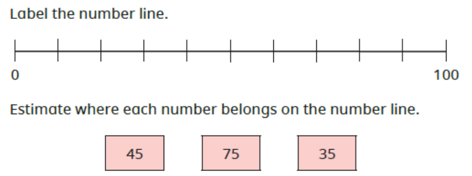
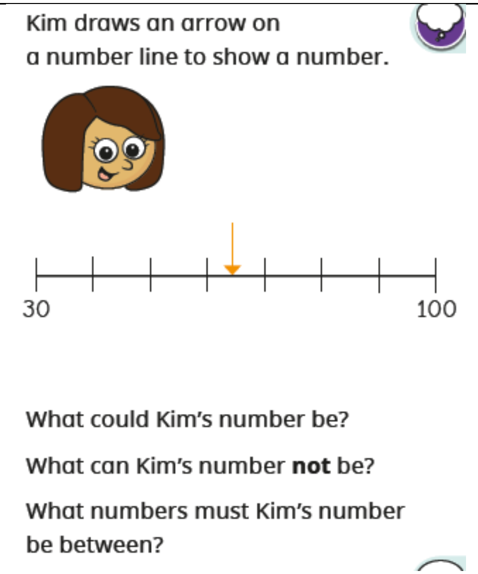
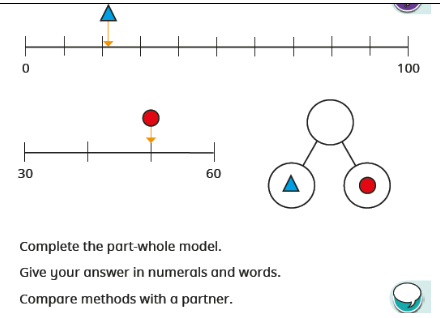
Estimate numbers - Including on a number line.	 Label the number line. Estimate where each number belongs on the number line. 45 75 35	 Kim draws an arrow on a number line to show a number. What could Kim's number be? What can Kim's number **not** be? What numbers must Kim's number be between? Explain your reasoning.	 Complete the part-whole model. Give your answer in numerals and words. Compare methods with a partner.	numeral, figure(s), compare, (in) order/ a different order, size, value, between, halfway between, above, below. Numbers to one hundred, hundreds, partition, recombine, hundred more/less, estimate, how do we say this number? What numbers complete the part-whole? How many tens are there? How many ones are there? Do groups of ten help

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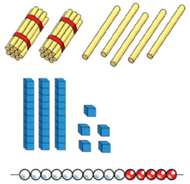
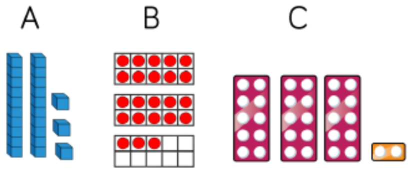
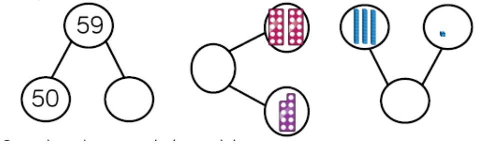
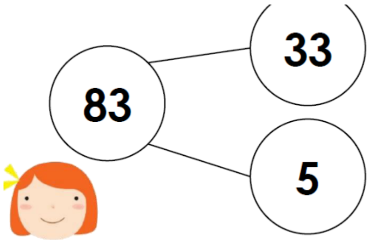
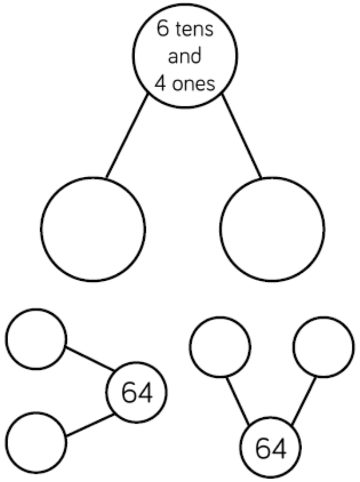
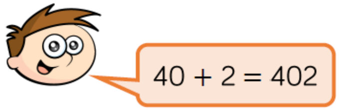
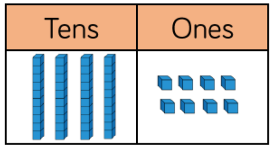
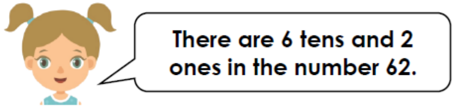
Read and write numbers in numerals and words to 100 - Children should also state how a number is made up.	Match the number to the correct representation.  One ten and five ones Thirty-five 25 Represent the number 72 in different ways.	One of these images **does not** show 23 Can you explain the mistake?  	How many two digit numbers can you make using the digit cards?  What is the largest number? Prove it by using concrete resources. What is the smallest number? Prove it by using concrete resources. Why can't the 0 be used as a tens number?	you count? When ordering your numbers do you look at the tens or ones? Are the numbers in the sequence getting larger or smaller?

Tens and ones with a part-whole model	Complete the part-whole models.  	Janine has created a part whole model of 83.  Is she correct? Explain your answer.	Complete each part-whole model in a **different** way.  	
Tens and ones using addition - Children to see partition of numbers in different ways.	Match the number sentence to the correct number. 20 + 19 10 + 4 40 + 0 80 + 1 40 14 81 39	Teddy thinks that,  Explain the mistake he has made. Can you show the correct answer using concrete resources?	Fill in the missing numbers. 1 ten + 3 ones = 13 2 tens + ___ ones = 23 3 tens + 3 ones = _____ ___ tens + 3 ones = 43 What would the next number in the pattern be?	

<table>
<tr><td></td><td></td><td></td><td>Children could continue this pattern. Use resources to start and then be encouraged to move onto using number only.</td><td></td></tr>
<tr>
<td>Using a place value chart</td>
<td>What number is represented in the place value chart?

 </td>
<td>Helen says,


Is she correct? Convince me using a place value chart.<table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr></table></td>
<td>How many two digit numbers can you make that have the same number of tens and ones?

Show each one on a place value chart.<table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr></table></td>
<td></td>
</tr>
</table>

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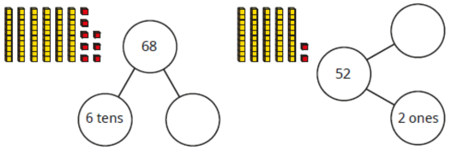
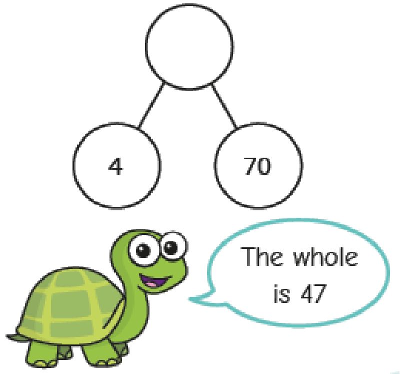
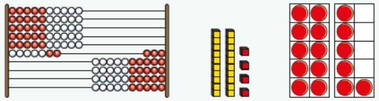
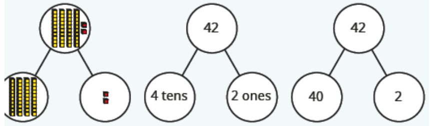
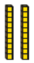
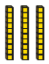
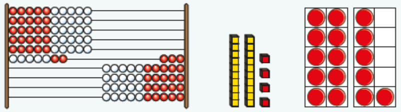
<table>
<tr>
<td>Partition numbers to 100</td>
<td>Complete the part-whole models to match the base 10
 </td>
<td>
What mistake has Tiny made?</td>
<td>Ask children to use some equipment from this block to make numbers to 100

Ask children to partition their number into tens and ones using a part-whole model.
They should be able to complete the part-whole model in different ways. For example, here are some ways they could partition 42
 </td>
<td></td>
</tr>
<tr>
<td>Write numbers to 100 in words</td>
<td>Complete the table.
<table>
<tr><th>Base 10</th><th>Numerals</th><th>Words</th></tr>
<tr><td></td><td></td><td>ten</td></tr>
<tr><td></td><td>20</td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table></td>
<td>Kim is counting.

Explain the mistake that Kim has made.</td>
<td>Consolidate learning from this block by making numbers in a variety of different ways.

Ask children to partition their numbers and then use the partitions to help them write the numbers in words.
Encourage children to work through a series of consecutive numbers, for example 72, 73, 74, and discuss with a partner any patterns that they notice.</td>
<td></td>
</tr>
</table>

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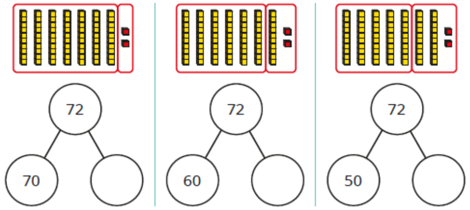
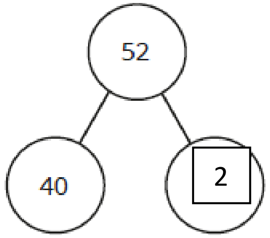
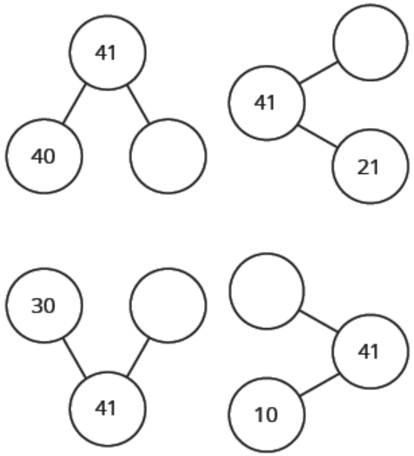
Flexibly partition numbers to 100	Complete the part-whole models to match the base 10  	 What mistake has been made?	Complete the part-whole models to partition 41 in four different ways.  What patterns can you see? Can you make your own example for a friend to spot your pattern?	

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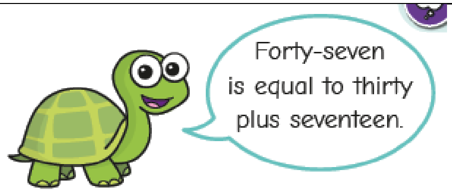
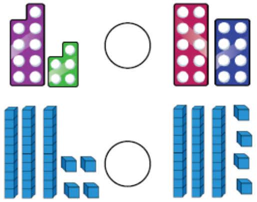
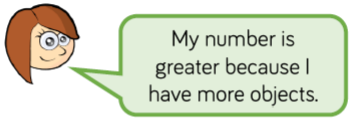
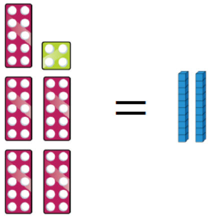
Write numbers to 100 in expanded form	Complete the number sentences to partition each number. You can use a part-whole model to help you.  68 = 6 tens + ______ ones 68 = 60 + ______	 Do you agree with Tiny? Talk about it with a partner. Can you prove this using base 10?	Complete the number sentences. 54 = 50 + ______ 54 = 40 + ______ 54 = ______ + 24 Continue the pattern. What do you notice?	
Compare objects	Use <, > or = to complete. 	Rosie and Amir are comparing numbers they have made. Rosie's number Amir's number   Is Rosie correct? Explain your answer.	Add more Base 10 to make the number shapes and the Base 10 equal.  How much did you add in total to make them equal? What is the smallest amount you could add if the symbol changed to <?	

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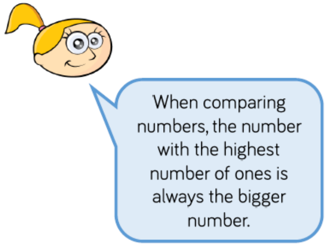
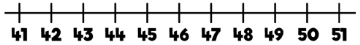
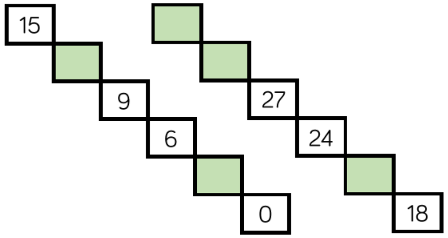
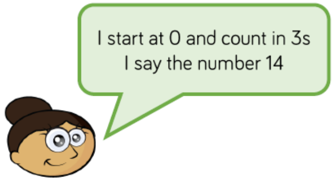
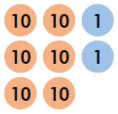
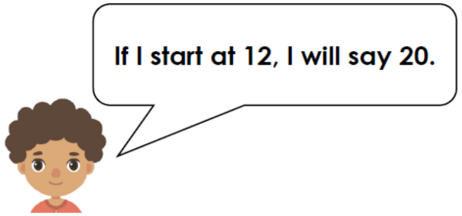
Compare numbers - Able to use the language less than, greater than and equals to.	Complete the statements using **more than**, **less than** or **equ** 42 is ________________ 46 81 is ________________ 60 + 4 30 + 8 is ________________ thirty-eight	Eva says,  Do you agree? Give some examples to support your answer.	How many different numbers can go in the box? $13 < \square < 20$ Can you prove your answer using concrete resources?	
Order objects and numbers - Able to order greatest to smallest, smallest to greatest.	Circle the numbers 48, 43 and 50 on the number line.  Put the numbers 48, 43 and 50 in order starting with the smallest. Children provided with a range of opportunities to order objects and numbers.	Which of these numbers cannot be used to complete the statement? **A) eighty and two** **B) eighty-four** **C) seven ones and eight tens** **eighty-three** < $\square$ **Convince me.**	Order the numbers below. Which would be the fourth number? 33 53 37 29 34 43 Explain how you ordered them.	

Count in 3's - Children count forwards and backwards in 3s from any multiple of 3.	Complete the number sequences.  	True or False?  Explain your answer.	Frank is counting backward in 3s starting from thirty-eight. Every time he says a number with a 3 in it, he spins around. How many times will he spin around before he says a number smaller than 15?	
Count in 2's, 5's and 10's - Children able to count in 2's, 5's and 10's from zero. - Count in 10's from any number. - Count forwards and backwards.	Circle the number you would not say if you counted forwards in 10s from 32. **A.**  **B.**  **C.** 50 + 2 **D.** eighty-two **E.** 72 True or false. This sequence of numbers increases by 5 each time. 45, 40, 35, 30, 25, 20.	James is counting forwards in 10s.  **Is he correct? Prove it.**	Find your way through the maze by counting forwards in 5s from the start number. Start → 23 | 28 | 33 | 35 25 | 20 | 38 | 40 75 | 12 | 43 | 48 → Finish 21 | 89 | 55 | 60	

<table>
<tr>
<td></td>
<td>Fill in the blanks of the number sequence
<table>
<tr><td>8</td><td>10</td><td>12</td><td></td><td>16</td><td>18</td><td></td></tr>
</table>
</td>
<td></td>
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Bromesberrow
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We're Reaching for the Stars

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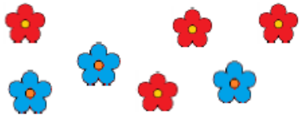
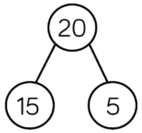
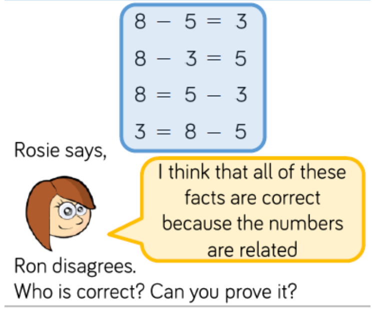
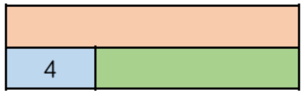
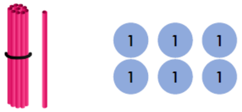
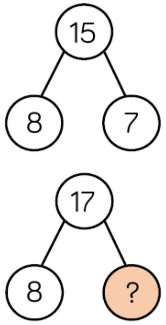
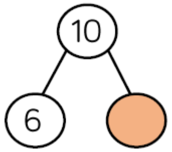
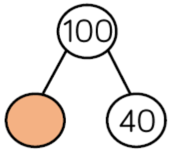
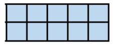
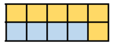
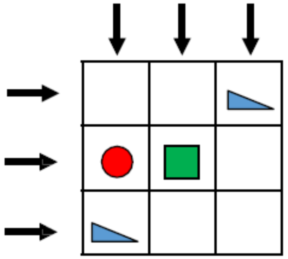
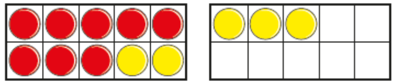
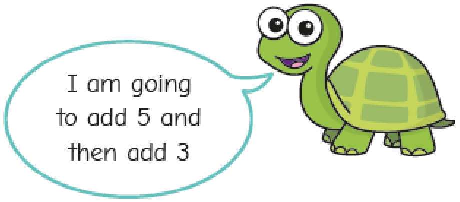
Year 2

Number: Addition and subtraction

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Fact families – addition and subtraction bond to 20	Using concrete apparatus, can you talk about the relationship between the different flowers?  One relationship shown by this part-whole model is 15 + 5 = 20 Can you write all associated number sentences in the fact family? 	 8 − 5 = 3 8 − 3 = 5 8 = 5 − 3 3 = 8 − 5 Rosie says, Ron disagrees. Who is correct? Can you prove it?	Here is an incomplete bar model. The total is greater than 10 but less than 20 What could the missing numbers be? How many different combinations can you find? 	What does part mean? What does whole mean? How many where there at the start? Which number represents the total? How many different number sentences are there in a fact family? What patterns can you see? Why do we check our calculations? Number bonds, number line, add, more, plus, make,
Check calculations	Can you use inverse operations to check 5 + 12 = 17? 	Eva did the following calculation: 12-8=4 She checked it by using the inverse. She did 12+8=20 and said that her firs calculation was wrong. What advice would you give her?	Rewrite the following to make it a subtraction word problem. I have eleven sticks in a pile. I add six more sticks to the pile. Now I have seventeen sticks all together. 	

Compare number sentences	Fill in the circles with either <, > or = 6 + 4 ○ 6 + 5 6 + 4 ○ 3 + 6 11 – 4 ○ 12 – 5 11 – 4 ○ 12 – 4	Rosie thinks she knows the missing number without calculating the answer.  Can you explain how this could be possible?	Both missing numbers are less than 10 $7 + \square < 7 + \square$ How many different possible answers can you find?	sum, total, altogether, inverse, double, near double, half, halve, equals, is the same as (including equals sign), difference between, how many more to, how much more is…?, subtract, take away, minus, how many fewer is… than…? How much less is…? Predicting, find, find all, find different, investigate, calculations, fact families, compare, commutative,
Related facts	Complete the part-whole models below:  	Alex says,  If I know 9 + 1 = 10, I can work out 90 + ___ = 100 Find the missing number and explain how Alex knows.	Continue the pattern. 90 = 100 – 10 80 = 100 – 20 70 = 100 – 30 What are the similarities and difference between this pattern and the following one? 9 = 10 – 1 8 = 10 – 2 7 = 10 – 3	

Bonds to 100 (tens)	Match the 10 frames to the sentences below:    One hundred equals eighty plus twenty 100 = 100 + 0 40 + 60 = 100	Eva thinks there are 10 different number bonds to 90 using multiples of 10 Amir thinks there are only 5 Who is correct? Can you help the person who is wrong to understand their mistake?	 Squares are worth 10 Triangles are worth 20 Circles are worth 30 Can you complete the grid above so that all horizontal and vertical lines equal 60? Can children create another pattern on an empty grid where each line equals 60? How many possible ways are there to solve this?	more, less, column addition

Add and subtract 1's	Continue the number tracks below. 31 ___ ___ 34 ___ ___ ___ ___ 45 ___ ___ 48 ___ ___ ___ ___ 67 ___ ___ 13 ___ ___ ___ ___	True or False? These four calculations have the same answer. 1 + 4 + 2 4 + 2 + 1 2 + 4 + 1 4 + 1 + 2 These four calculations have the same answer. 7 – 3 – 2 2 – 3 – 7 3 – 2 – 7 7 – 2 – 3	**/b. Insert the correct symbols into the boxes** **A. 98 ☐ 4 = 94** **B. 59 ☐ 3 = 56**	
Add by making 10	The counters show that 8 + 5 = 10 + 3  Use counters and ten frames to fill in the missing numbers. ▸ 9 + 5 = 10 + ______ ▸ 8 + 4 = 10 + ______	Tiny is working out 3 + 8  Will Tiny get the correct answer? Is there a better way to work out the addition?	Work out the missing number. 9 + 8 = ☐ + 10 How did you do it?	

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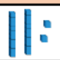
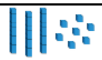
10 more and 10 less

Using concrete materials, complete the missing boxes.

10 less	Number	10 more
		
2	12	22
		
	37	

Mo says,

I know that 10 more than 72 is 82 because I only have to look at the tens digit.

Is he correct?
Explain your reasoning.

a. Each child has chosen a number.
Which number has not been chosen?

My number is ten less than twenty-eight.

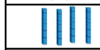
My number is ten more than sixty-three.

My number is ten less than ninety-one.

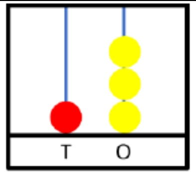
18 53 81 73

Add 10's – not crossing to next PV

Use the place value charts and concrete materials to complete the calculations.

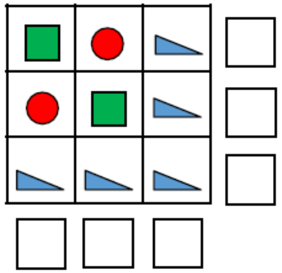
Tens	Ones
	
	

$$\begin{array}{r} 2\ 3 \\ +4\ 0 \\ \hline \end{array}$$



Tommy has three spare red beads.

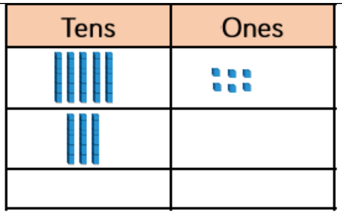
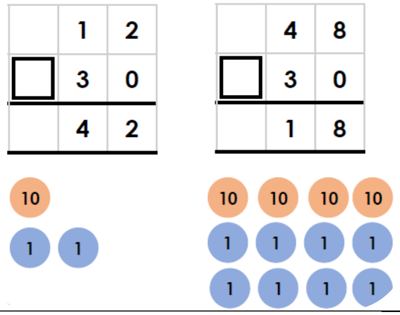
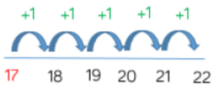
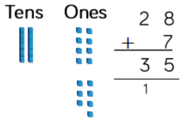
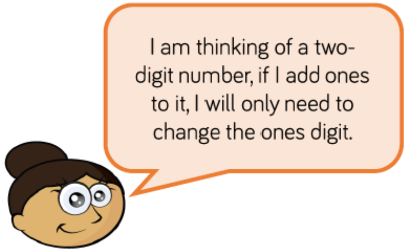
What numbers could he make?
Explain your answer.



■	●	◢	☐
●	■	◢	☐
◢	◢	◢	☐
☐	☐	☐	

Circles represent 20
Triangles represent 10
Squares represent 50

What is the value of each row and column?

Subtract 10's – not crossing to next PV	 5 6 − 3 0 ____	**Insert the correct symbols in the boxe below.** 	**a. Insert the correct symbols in the boxes below.** sixty-three ☐ 2 tens ☐ 40 = forty-three	
Add a 2-digit and 1-digit number – crossing 10	17 + 5 =  Can you put the larger number in your head and count on the smaller number? Start at 17 and count on 5 Find the total of 28 and 7  - Partition both the numbers. - Add together the ones. - Have we got 10 ones? - Exchange 10 ones for 1 ten. - How many ones do we have? - How many tens do we have?	**Always, Sometimes, Never**  Explain your answer.	Here are three digit cards. 6 7 8 Place the digit cards in the number sentence. How many different totals can you find? ☐☐ + ☐ = What is the smallest total? What is the largest total?	

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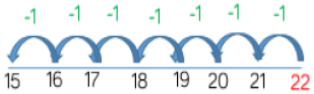
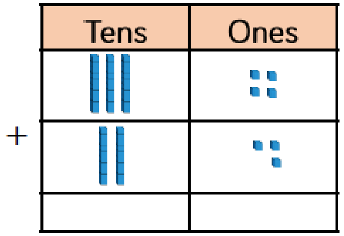
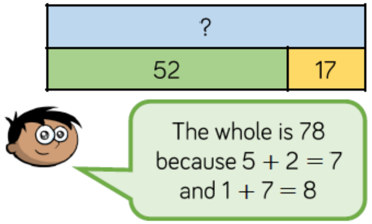
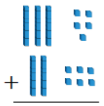
Subtract a 1 digit number from a 2 digit number – crossing 10	22 – 7 =  Can you put the larger number in your head and count back the smaller number? Start at 22 and count back 7	Mo is counting back to solve 35 – 7 He counts 35, 34, 33, 32, 31, 30, 29 Is Mo correct? Explain your answer.	Use the number card to create 3 subtractions. 43 five 46 six 47 nine	
Add two 2 digit numbers – not crossing ten. Add ones and add tens.	Find the sum of 34 and 23  	Amir has been asked to complete the bar model.  Explain to Amir what he has done wrong. How could you help him work out the correct total?	What digits could go in the boxes? ☐2 + ☐5 = 87	
Add two 2 digit numbers – crossing ten – add ones and add tens.	Find the sum of 35 and 26  - Partition both the numbers. - Add together the ones. Have we got 10 ones? - Exchange 10 ones for 1 ten. - How many ones do we have? - Add together the tens. How many do we have altogether?	Chloe says;	Can you create a calculation where there will be an exchange in the ones and your answer will have two ones and be less than 100?	

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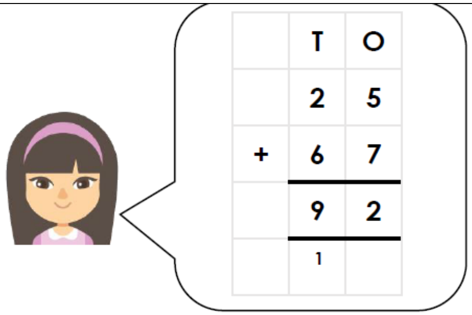
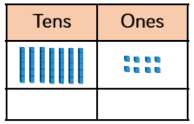
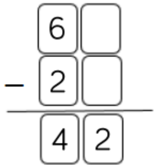
		 Is she correct? Prove it.		
Subtract a 2 digit number from a 2 digit number – not crossing ten.	78 minus 34 = ____ 8 ones – 4 ones = ____ 7 tens – 3 tens = ____ We have ____ tens and ____ones. 	Mistake in calculation can be made for the child to correct and explain where the mistake happened. Encourage the language use of place value.	Find the missing numbers.  Is this the only possible solution? Explain your answer. Make the numbers using Base 10 to help you find your answer.	

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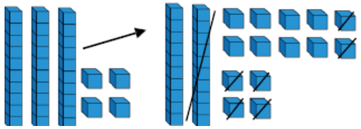
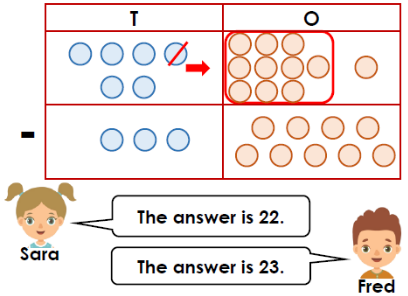
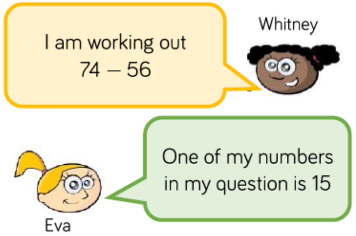
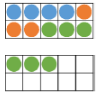
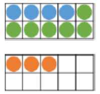
<table>
<tr>
<td>Subtract a 2 digit number from a 2 digit number – crossing ten. Subtract ones and tens.</td>
<td>Take 16 away from 34

$\begin{array}{r} \overset{2}{\cancel{3}}\,{}^{1}4 \\ -\ 1\ \ 6 \\ \hline 1\ \ 8 \end{array}$</td>
<td>Sara and Fred are subtracting 61-39


Who is correct? Explain how you know.</td>
<td>Eva and Whitney are working out some subtractions.


Whitney's answer is double Eva's answer.
What could Eva's subtraction be?</td>
<td></td>
</tr>
<tr>
<td>Number bonds to 100 (tens and ones)</td>
<td>Use a 100 square. If:

• 40 squares are shaded, how many are not shaded?
• 45 squares are shaded, how many are not shaded?
• 54 squares are shaded, how many are not shaded?</td>
<td>Teddy has completed the missing number sentence.
46 + 64 = 100
Is Teddy correct?
Explain your answer.</td>
<td>Each row and column adds up to 100.
Complete the grid.
<table><tr><td>45</td><td>45</td><td></td></tr><tr><td></td><td>35</td><td></td></tr><tr><td>15</td><td></td><td>65</td></tr></table></td>
<td></td>
</tr>
</table>

Add three 1 digit numbers.	Use ten frames and counters to add the numbers 4 + 3 + 6  Can you add the numbers in a different way to find a number bond to 10?  4 + 6 = 10 10 + 3 = 13	Always, Sometimes, Never odd + odd + odd = odd Use one-digit numbers to test if this is true e.g. 3 + 5 + 7	Which numbers would you add together first in the following number sentences? Why would you add those first? 3 + 5 + 7 = 8 + 2 + 6 = 4 + 3 + 4 = Is there always an easier order to add three one-digit numbers?	

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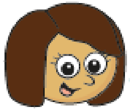
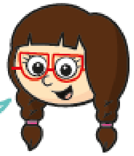
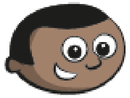
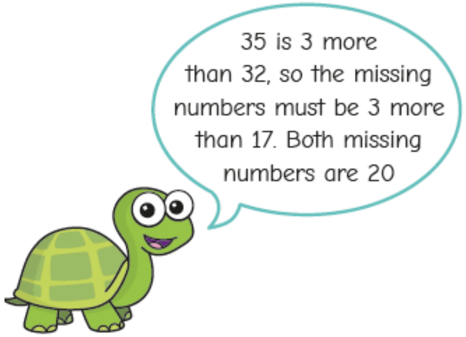
Mixed addition and subtraction	A jumper costs £25  ▸ A T-shirt costs £17 less than the jumper. How much does the T-shirt cost? ▸ Mr Trent buys a jumper and a T-shirt. How much does he spend? 	Kim, Jo and Mo are each thinking of a number.  My number is 7 less than 63 Kim Kim's number is 29 more than my number.  Jo  My number is the sum of Kim's and Jo's numbers. Mo What number is Mo thinking of? How did you work this out?	The difference between two 2-digit numbers is 42 What could the numbers be? Compare answers with a partner.	

Missing number problems	Work out the missing numbers. ▶ 45 + 8 = 50 + ______ ▶ 45 + 8 = 49 + ______	Tiny is working out the missing numbers. 32 + 17 = 35 + $\boxed{}$ 32 − 17 = 35 − $\boxed{}$  Do you agree with Tiny?	Children create their own missing number problems for peers to solve.	

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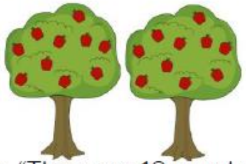
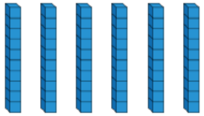
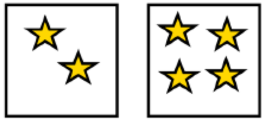
Year 2

Number: Multiplication and Division

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Recognise equal groups	Complete the stem sentences.  There are ____ equal groups with ____ in each group.	Spot the mistake.  Alex says, "There are 10 equal groups with 2 in each group. There are ten 2s."	Sort into equal and unequal groups. Equal Groups | Unequal Groups  Create your own picture to go in each column.	Odd, even, count in twos, threes, fives, count in tens (forwards from/ backwards from), how many times, lots of, groups, once, twice, three ties, five times, multiple of, multiply, multiply by, repeated addition, array, row, column, double, halve, share, share equally, group in pairs, threes etc., equal groups of, divide, divided by, left, left over, describe the rule,
Make equal groups	What else do we need to show 'five 3s'?  The Base 10 shows six equal groups with ten in each group. There are six tens.  How else can you represent these as equal groups?	Which example does not show 7 groups of 1? Provide children with a range of groups to choose from. Encourage the children to explain why they ARE NOT examples.	How can you make the groups equal? 	

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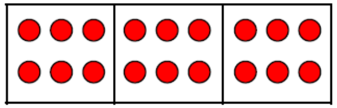
Add equal groups	Complete:  There are ___ equal groups with ___ in each group. There are three ___s. ___ + ___ + ___ = 12	True or False? $5 + 5 = 2 + 2 + 2 + 2 + 2$ Draw an image or use cubes to help you explain your answer.	Which one does not belong?  Two 5s  Ten $5 + 5$  What do we need to change to make them all represent the same?	equal, unequal, why are we using the addition symbol? Multiplication, lots of, arrays, commutative, times tables, how many do you have to begin with? Division
Multiplication sentences using 'x' symbol	Complete the sentences to describe the equal groups.  ___ + ___ + ___ = 18 ___ × ___ = 18 There are ___ equal groups with ___ in each group. There are three ___.	 $3 + 3 + 3 = 3 \times 3$ Is Mo correct? Explain why. Draw an image to help you.	Think of a multiplication to complete: 6 + 6 + 6 > ___ × ___ The total is 18, what could the addition and multiplication be?	

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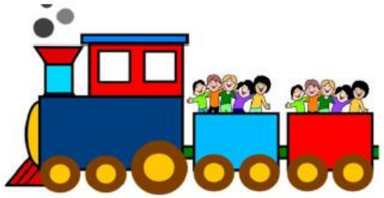
Multiplication sentences from pictures	Complete:  ___ × ___ = ___ ___ lots of 3 = ___ ___ multiplied by ___ = 12	 2 × 5 5 + 5 5 × 2 Each calculation could explain the image. Explain why.	There are four baskets. There are three dolls in each basket. How many dolls are there altogether? Draw an image and write a calculation to represent the problem. Write a story for the calculation 5 x 3. Draw an image to illustrate your story.	
Using arrays	Complete the number sentences to describe the arrays.  2 × 3 and ___ × ___  ___ × ___ and ___ × ___ Draw an array for 4 x 2 = 2 x 4	Use an array to find the odd one out.  **A. 4 lots of 5 B. 3 x 5 C. 5 x 3** Explain your answer.	Part of this array is hidden.  The total is less than 16 What could the array be?	

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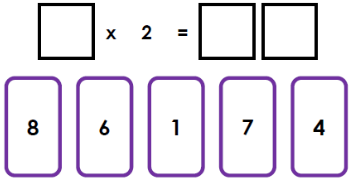
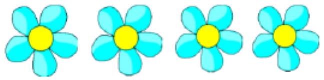
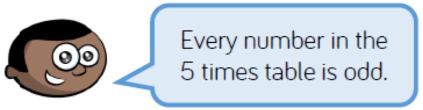
2 times table	Count in 2s to calculate how many eyes there are.  There are ___ eyes in total. ___ × ___ = ___ Resources such as number tracks can be used to support learning.	Tommy says that 10 × 2 = 22 Is he correct? Explain how you know. Children can draw an image/array to support their explanation.	Use the cards below to complete the statement. You can use the cards more than once.  Find two possibilities.	
5 times table	How many petals altogether?  Write the calculation.	Is Mo correct?  Explain your answer.	Tube of tennis balls come in packs of 2 and 5. Whitney has 22 tubes of balls. How many of each pack could she have? How many ways can you do it?	

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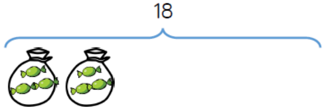
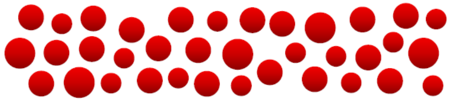
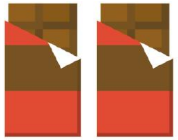
10 times table	How many crayons are there altogether?  There are ___ crayons altogether. ___ × 10 = ___	On sports day, Jack runs 10 metres, 7 times.  Which of these calculations do **not** describe this word problem? 10 + 7 7 × 10 7 + 7 + 7 + 7 + 7 + 7 + 7 + 7 + 7 + 7 10 + 10 + 10 + 10 + 10 + 10 + 10 Explain why.	Match the calculations to the correct answers. 90 70 4 x 10 40 11 x 10 110 9 x 10 Write two multiplications to match the odd one out.	
Make equal groups – sharing	Share the 12 cubes equally into the two boxes. There are ___ cubes altogether. There are ___ boxes. There are ___ cubes in each box.  Can you share the 12 cubes equally into 3 boxes?	Alex has 20 sweets and shares them between 5 friends.  Tommy has 20 sweets and shares them between 10 friends. Whose friends will receive the most sweets? How do you know? Children to draw out to support their explanation.	Miss. Blythe has 24 chairs. When she stacks them equally, there are none left over.  How many towers can she stack the chairs into so that every tower ha the same amount? Find 3 different amounts of towers.	

Make equal groups – grouping	Mrs Green has 18 sweets. She puts 3 sweets in each bag. How many bags can she fill? 18 ÷ 3 = ☐  	**6b. Ella and Wes have 36 counters.**   **Ella** **36 in equal groups of 6 makes 7 groups.**  **Wes** **36 in equal groups of 4 makes 9 groups.** **Who is correct? Explain why.**	You have 30 counters.  How many different ways can you put them into equal groups? Write down all the possible ways.	
Divide by 2	Complete the stem sentences.  I have ___ cubes altogether. There are ___ in each group. There are ___ groups. ☐ ÷ ☐ = ☐ ☐ × ☐ = ☐	Lia has 22 pieces of chocolate. She gives half of them to Joe.   **Joe will get 11 pieces.** **Is Lia correct? Explain why.**	I have 24p. I divide it equally between 2 friends. How much will they get each? I have 24p in 2p coins. How many 2p coins do I have? Consider the two questions above. What is the same and what is different?	

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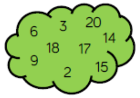
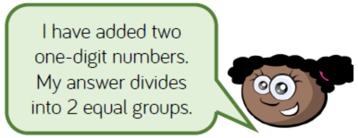
<table>
<tr>
<td>Odd and even numbers</td>
<td>Use counters to make each number and share them into two equal groups. How does this help you decide whether a number is odd or even? Show this in the table.

<table><tr><th>odd</th><th>even</th></tr><tr><td></td><td></td></tr></table>
Can you see any patterns?</td>
<td>Find the odd one out.
A. 
B. 53
C. forty-eight
D. 
Explain your answer.</td>
<td>Whitney says,

What could Whitney's numbers be?
Is this the only possible answer?
Which numbers would not be possible?
Explain your answers.</td>
<td></td>
</tr>
<tr>
<td>Doubling and halving</td>
<td>Write a multiplication or division number sentence to match the labels.
double 7
half of 14
double 12
half of 24</td>
<td>Tiny has 12 leaves.
Tiny eats half the leaves.

What mistake has Tiny made?</td>
<td>Think of a number.
Double it.
Add 4
Halve the answer.
Take away the number you first thought of.
What number do you finish with?
Try this with a different number.
Why does this always happen?</td>
<td></td>
</tr>
</table>

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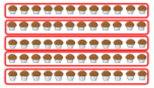
Divide by 5	40 pencils are shared between 5 children.  ☐ ÷ ☐ = ☐ How many pencils does each child get?	**4b. 55 crayons are shared equally between 5 people.**  **Bob** **I think they will get 9 crayons each** **I think they will get 11 crayons each.**  **Anna** **Who is correct? Explain why using a division picture to prove it.**	Use the number cards to make multiplication and division sentences. How many can you make? 2 20 5 10 4	
Divide by 10	I have 70p in my pocket made up of 10p coins. How many coins do I have? Draw a picture to prove your answer.	Cakes are sold in boxes of 10 Jack and Alex are trying to pack these cakes into boxes.  Jack says,  There are 5 groups of 10  Alex says,  There are 6 groups of 10  Who is correct? Explain how you know.	Mrs Owen has some sweets. She shares them equally between 10 tables. How many sweets could each table have? Find as many ways as you can. What do you notice about your answers?	

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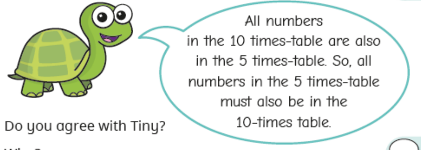
<table>
<tr>
<td>The 5 and 10 times-tables

-Children to recognise the relationship between 5 and 10 times-tables.</td>
<td>Complete the number tracks.
<table><tr><td>5</td><td></td><td>15</td><td></td><td></td><td></td><td></td><td></td></tr></table>
<table><tr><td>10</td><td></td><td></td><td>40</td><td></td><td></td><td></td><td></td></tr></table>
What do you notice?
Which numbers are in both number tracks?</td>
<td>Tiny is thinking about the 5 and 10 times-tables.


Do you agree with Tiny?
Why?</td>
<td>Use the 10 times-table to help you work out the multiplication.
5 × 18</td>
<td></td>
</tr>
</table>

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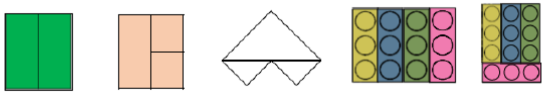
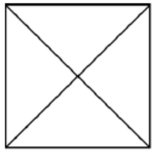
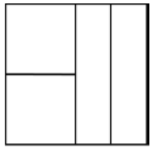
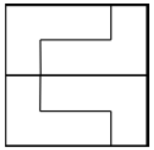
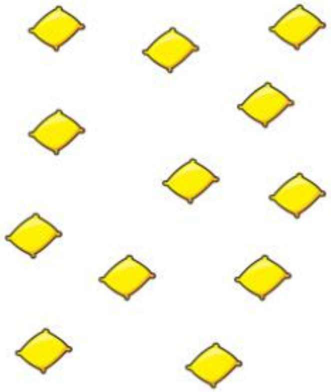
Year 2

Number: Fractions

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Make equal parts	Look at the representations. Decide which show equal parts and which show unequal parts.  Can you make some of your own representations of equal and unequal parts?	Three children are splitting a square into equal parts. Teddy  Alex  Mo  Who has split the square into equal parts? Explain why. Children could explain this by physically making the shapes with the parts.	How many different ways can you put these beanbags into equal groups? 	Whole, equal parts, four equal parts, one half, two halves, a quarter, two quarters, fraction, three quarters, one third, a third, equivalence, equivalent, unequal, are the parts equal? How do you know? Splitting a whole into two equal parts, $\frac{1}{2}$, $\frac{1}{3}$, what does the 1 represent, what does the 3 represent. How many thirds make

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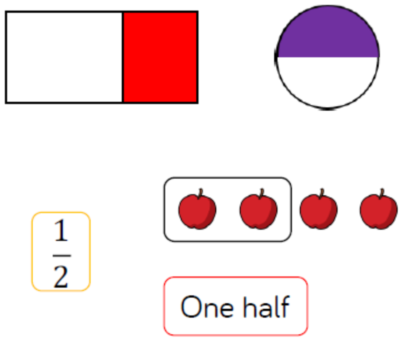
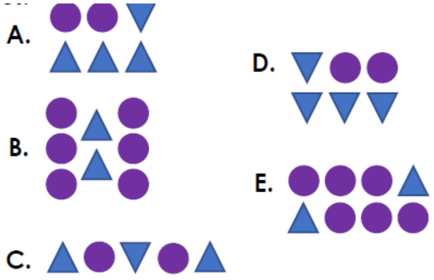
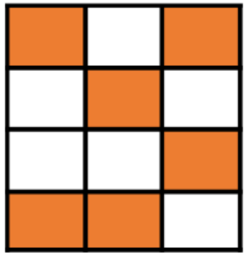
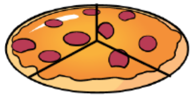
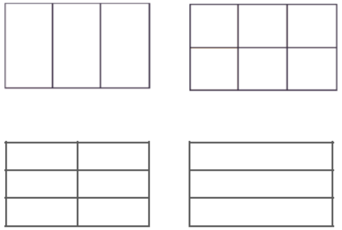
Recognise a half	The whole gummy bear is split into _____ equal parts. Each part is worth a _________ . This can be written as $\frac{☐}{☐}$ 	Odd One Out  Which is the odd one out? Explain your answer. Highlight the language of equal parts.	Match the halves to find the odd one out.  **Draw the matching half for the odd one out.**	a whole? $\frac{1}{4}$, unit fraction, non-unit fraction, numerators, denominators $\frac{3}{4}$

Find a half	Share 20 beanbags equally between two containers, then complete the stem sentences.  The whole is ____. Half of ____ is ____. Fill in the blanks. Use counters to help you if needed. $\frac{1}{2}$ of 4 = ☐ $\frac{1}{2}$ of 40 = ☐	Dora is asked to shade half of her shape. This is what she shades.  Is she correct? Explain why.	I am thinking of a number. Half of my number is more than 10 but less than 15. What could my number be?	
Recognise a third	Three friends are sharing a pizza.  The pizza is split into _____ equal parts. Each part is worth a _________ . This is the same as $\frac{\square}{\square}$	Dora says,  I have one third of a pizza because I have one slice and there are three slices left. Do you agree? Explain your reasoning.	Leave $\frac{1}{3}$ of each shape unshaded. Find four different ways. 	

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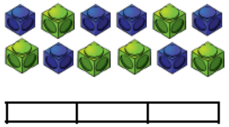
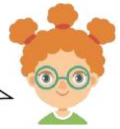
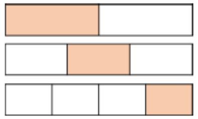
Find a third	Use the cubes to make three equal groups.  There are ___ cubes altogether. One third of ____ is ____ $\frac{\square}{\square}$ of ___ is ___	Annabel has made 21 cupcakes and wants to share them equally with 3 friends. She says, **Each friend will get 8 cupcakes because 8 is $\frac{1}{3}$ of 21.**  **Annabel**  **Is Annabel correct? Explain your answer.**	Ron is thinking of a number.  One third of his number is greater than 8 but smaller than 12. What could his number be?	
Unit fractions	Recognise one equal part of a whole. What is the same and what is different about each bar model?  Match the unit fraction to the correct picture.  $\frac{1}{4}$ $\frac{1}{3}$ $\frac{1}{2}$	Hugo is finding one third of the objects below.   **$\frac{1}{3}$ of the boxes is 2 boxes.** **Is Hugo correct? Prove it.** When proving – children to raw to support their answer.	I am thinking of a number. ? One third of my number is 12 Which will be greater, one half of my number or one quarter of my number? Use cubes or a bar model to prove your answer.	

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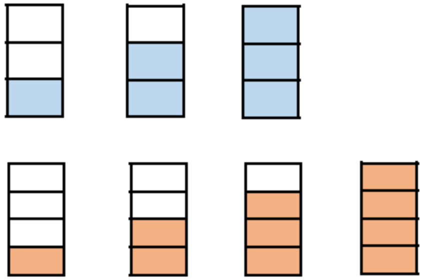
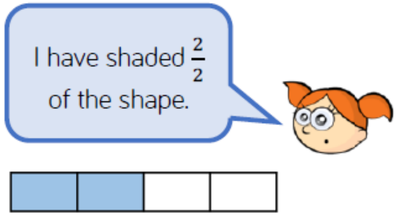
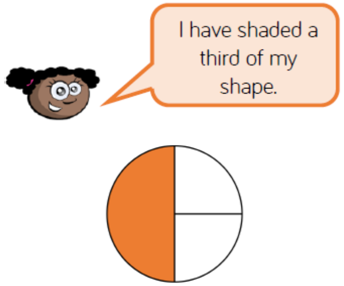
<table>
<tr>
<td>Non-unit fractions</td>
<td>$\frac{2}{3}$ $\frac{3}{4}$ Recognise non unit fractions being more than one equal part of a whole.

What fraction is shaded in each diagram?
</td>
<td>Alex says,

What mistake might Alex have made?</td>
<td>Sort the fractions into the table.
<table>
<tr><th></th><th>Fractions equal to one whole</th><th>Fractions less than one whole</th></tr>
<tr><td>Unit fractions</td><td></td><td></td></tr>
<tr><td>Non-unit fractions</td><td></td><td></td></tr>
</table>
$\frac{3}{4}$ $\frac{2}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{2}{3}$ $\frac{4}{4}$ $\frac{3}{3}$ $\frac{1}{2}$
What do you notice?

Are there any boxes in the table empty?

What fraction could you write here?</td>
<td></td>
</tr>
</table>

Equivalence of $\frac{1}{2}$ and $\frac{2}{4}$	Children to learn this practically to explore they are the same. What does equivalent mean? Using two identical strips of paper, explore what happens when you fold the strips into two equal pieces and four equal pieces. Compare one of the two equal pieces with two of the four equal pieces. What do you notice? 	Whitney says:  Do you agree? Explain why. Why do you think Whitney thinks this?	Using red and blue cubes, build two towers to convince me that $\frac{1}{2}$ and $\frac{2}{4}$ are equal.	

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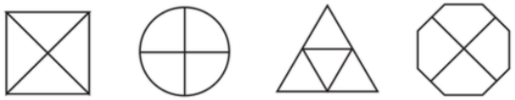
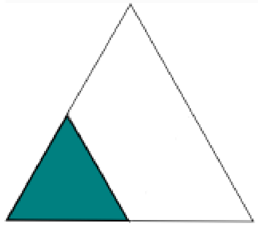
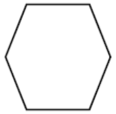
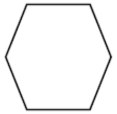
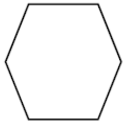
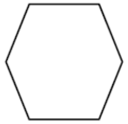
Recognise a quarter	Shade $\frac{1}{4}$ of each shape. 	True or False? $\frac{1}{4}$ of the shape is shaded.  Explain your answer.	Divide the shape into four equal parts and shade $\frac{1}{4}$. A  B  C  D  Find four solutions.	

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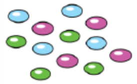
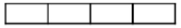
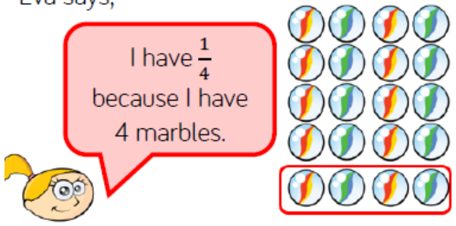
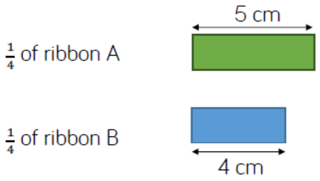
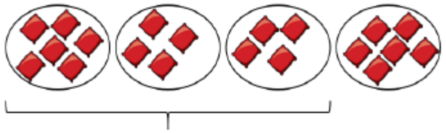
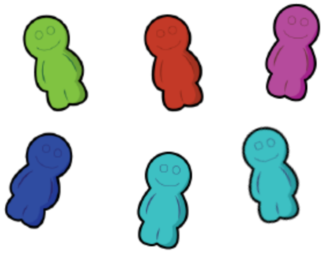
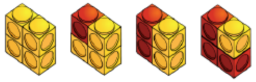
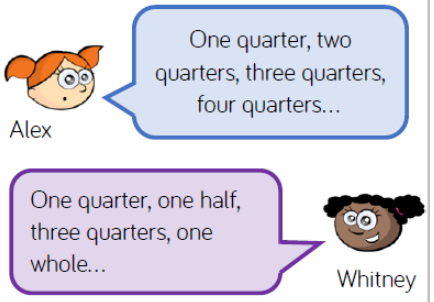
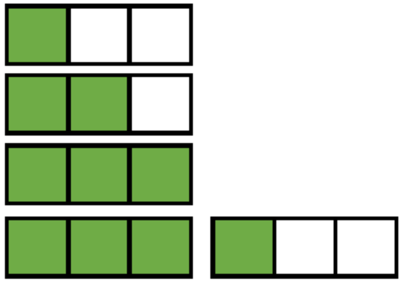
Find a quarter	Share the smarties equally between 4 people.  The smarties are split into ___ equal parts. Each part is worth a ________ .  This can be written as $\frac{\square}{\square}$	Eva says,  Do you agree? Explain why.	Mo has two ribbons. He cuts $\frac{1}{4}$ from ea ribbon.  How long were Mo's whole pieces of ribbon? Which ribbon was the longest? How much longer?	
Find three quarters	Amir shares 12 beanbags into 4 equal groups. Use the image to complete the sentences.  One quarter of 12 is equal to _____ Two quarters of 12 is equal to _____ Three quarter of 12 is equal to _____ Four quarters of 12 is equal to _____	Amir is using beanbags and hoops to find three quarters of 20 Can you spot his mistake?  $\frac{3}{4}$ of 20 = 14	Eva eats three-quarters of her sweets. She eats these sweets.  How many sweets does Eva have left? Encourage practical resource use. Children could then make up their own question using this as their model.	

Count in fractions from any number up to 10.	Begin exploring that fractions can be more than a whole. What would the next image in the sequence look like?  What do you notice about the fraction of yellow cubes? Can you count the fractions represented?	Alex and Whitney are counting in quarters.  Who is correct? Explain your answer.	Look at this pattern.  What would come next? Write the next fraction and draw the representation. What would be the 8th fraction in the pattern?	

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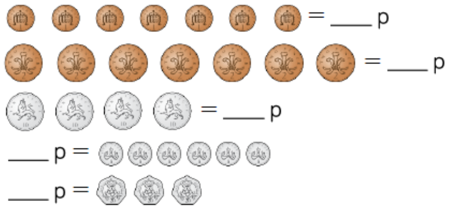
Year 2				
Measurement: Money				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**
Count money – Pence	Count the money.  = ___ p = ___ p = ___ p ___ p = ___ p =	Which is the odd one out? **A.**  **B.**  **C.** 50p **D.**  **Explain your answer.**	Jack selects four of these coins.  He can use the coins more than once. What total could he make? What is the lowest total? What is the greatest total?	Coins, notes, pounds, pennies, £, P, money, count, pence, do the notes have greater value than coins? How do you know you have made ….. amount? Greater than, less than, compare

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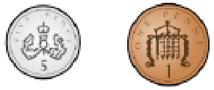
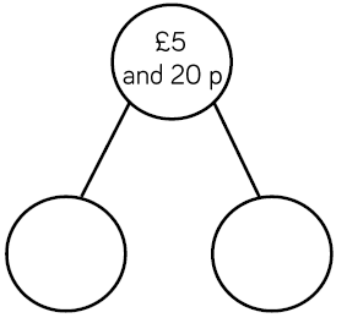
Count money – pounds	Complete the bar models.  	Ron thinks he has £13  Is he correct? Explain your answer.	Mel has more money than Tim. Mel as two notes and five coins. Time has two notes and eight coins. What notes and coins could they both have?	
Count money – notes and coins Decimal notion not used until KS2 express answer as £5 and 30p	How much money is there altogether?  There is £____ and ____p.	Mo has the following coins.  He thinks he has 51 p. Explain his mistake.	How many ways can you complete the part-whole model by drawing money?  	

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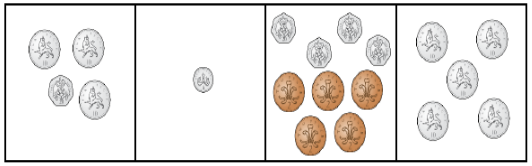
Select money	Which does **not** show 50 p? 	Circle the odd one out. 23 p = 20 p, 2 p, 1 p 25 p = 20 p, 5 p 28 p = 20 p, 8 p Explain your answer.	Use the money to fill the purses. You can only use each coin or note once. Cross them out once you have used them.  	

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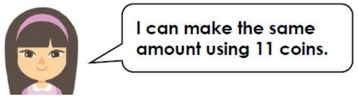
Make the same amount	Match the amounts. 	Emma has the money below,  She says,  I can make the same amount using 11 coins. Is she correct? Convince me.	How many ways can you make 10 p using only copper coins? Did you use a strategy? Make 50 p three ways using the coins below. You can use the coins more than once. 	

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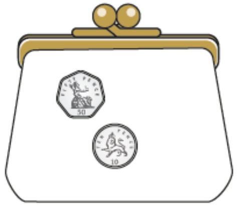
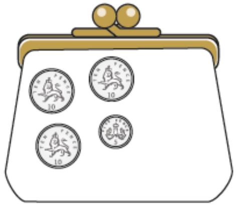
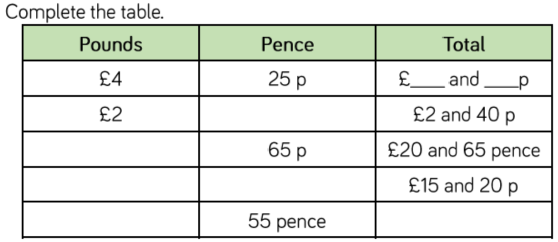
Compare money	Circle the box with the greatest amount.    	Four 5 pence coins are worth more than two 10 pence coins.  Do you agree? Explain why.	True or False? 5 copper coins can be worth more than 1 silver coin. Children to show many examples to support their conclusion.	
Make a pound	Draw money so that each purse has £1  	Dan has 20 of the same coin. He has £1 altogether. What coin does Dan have 20 of? How do you know?	Make a £1 using the same value of coin. • only 50p coins • only 20p coins • only 10p coins • only 5p coins • only 2p coins • only 1p coins What patterns can you see? What is the maximum and minimum number of coins to make £1?	

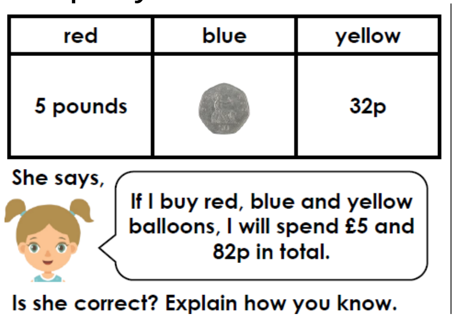
Find the total (+)



Complete the table.

Pounds	Pence	Total
£4	25 p	£____ and ____p
£2		£2 and 40 p
	65 p	£20 and 65 pence
		£15 and 20 p
	55 pence	

Olga is buying balloons for her party.

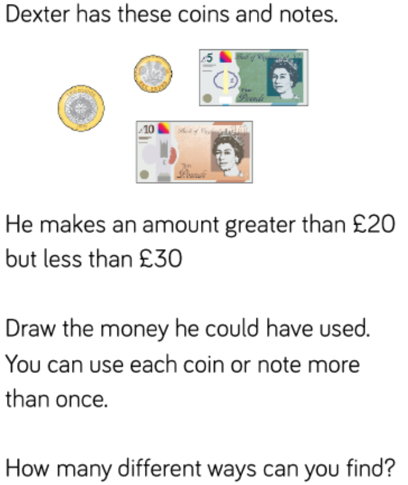


red	blue	yellow
5 pounds		32p

She says,

If I buy red, blue and yellow balloons, I will spend £5 and 82p in total.

Is she correct? Explain how you know.



Dexter has these coins and notes.

He makes an amount greater than £20 but less than £30

Draw the money he could have used. You can use each coin or note more than once.

How many different ways can you find?

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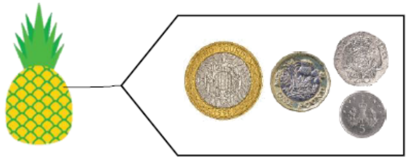
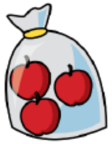
Find the difference (-)	Work out the difference between the cost of a bag of sweets and a bar of chocolate.  	Ali is shopping. **A pineapple costs £3 and 25p.**  **The difference between the price of a pineapple and a melon is £1 and 20p.** **How much is the melon? Prove it.**	 What could Mo have? Work out the difference between the amounts. How many different answers can you find?	

Find change	Dora has these coins.  She spends 53 p. What money will she have left? What coins could it be?	Pippa has 70p. She buys some cupcakes that costs 47p.   **Is Pippa correct? Explain your answer.**	I have 20 p. My change is more than 5 p but less than 10 p. What could I have bought?  **Sweet:** 7 p  **Apples:** 18 p  **Chocolate:** 12 p  **Banana:** 4 p Find as many ways.	

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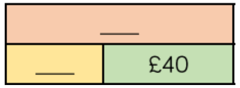
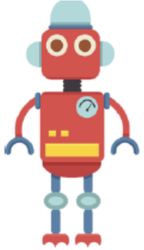
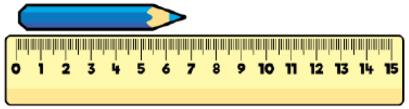
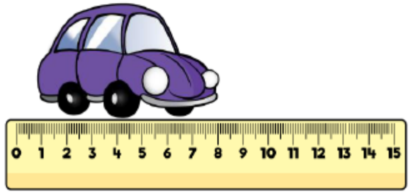
Two step problems with money	Rosie has £33 in her money bank, and gets £40 more. Fill in the bar model and write a calculation to show her total.  ___ + ___ = ___	Ghost Train: 90 p Annie finds a 20 p coin. She puts it with her other three 20p coins. Does Annie have enough to ride the ghost train? Explain why.	Hussain has one £20 note, three £1 coins and one £2 coin.  **A robot is £10.** **How many robots can he buy?** **How much change will he get?**	

Year 2

Measurement: Length and Height

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Measure lengths (cm)	Choose a variety of objects and practice measuring them using a centimetre ruler. Remember to line up the object to the 0 mark on the ruler. e.g. How long is the pencil to the nearest centimetre?  	Mo has used the ruler to measure the length of the car.  Mo says the car is 8 centimetres long. Do you agree? Explain your answer.	Franks teddy measures between 5cm and 15cm. What are the possible measurements his teddy could be? What could the possible measurements be if it is an odd number?	Height, length, compare, measure, long, short, longer, taller, shorter, narrow, wide, centimetre, metre, kilometre, nearest cm, measuring from 0, how long is? How tall is? Orientation, when would we

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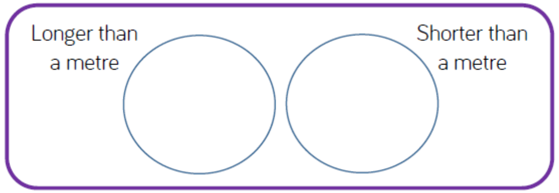
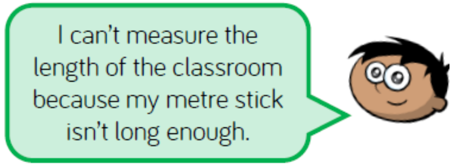
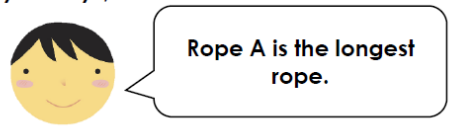
Measure lengths (m)	Use a metre stick to measure objects in your classroom and place them into the groups.  	Amir has a metre stick. He wants to measure the length of his classroom.  Explain to Amir how he could measure the length of his classroom.	Usain Bolt can run 100 m in 9.58 seconds (just under 10 seconds). How far do you think you can run in 10 seconds? Do you think it will be more or less than 100 m? Measure how far you and your friends can run in 10 seconds. Record your answers in metres and centimetres.	measure in metres? When would we measure in cm? estimating prior to measuring.
Compare lengths	Compare the lengths using **longer than**, **shorter than**, or **the same as**. 15 cm is ☐ 60 cm Sixty metres is ☐ 60 m 96 m is ☐ 69 m 80 cm is ☐ 80 m	**6b. Dylan uses a tape measure to find the length of two ropes.** **Rope A is 6 centimetres long and Rope B is 6m long.** **Dylan says,**  **Is he correct? Explain how you know.**	**7b. Nadia has the shortest sunflower which measures 108cm. Jess's sunflower measures 2m, and Claudia's sunflower is the same height as Jess's.** **2cm** **200cm** **117cm** **Choose which measurement describes Claudia's sunflower.**	

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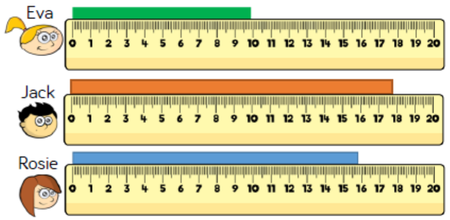
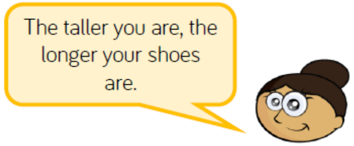
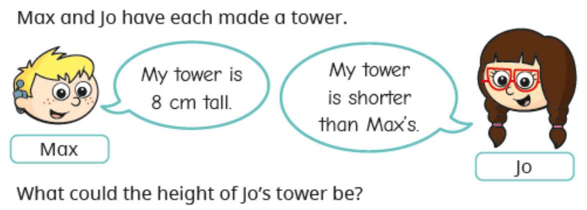
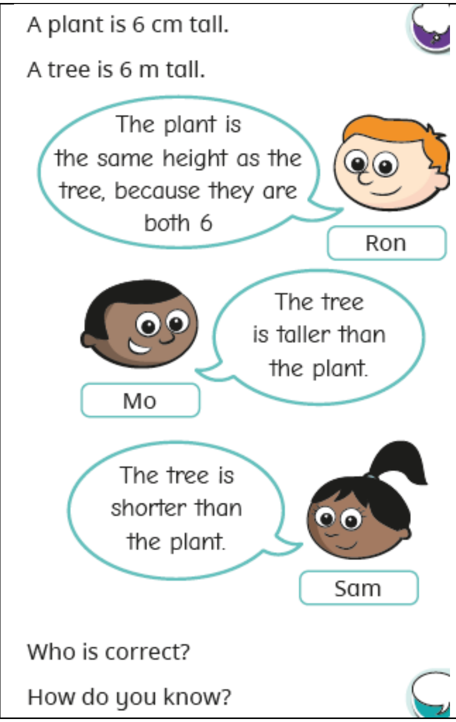
Order lengths	Eva, Jack and Rosie are comparing the length of ribbons. Complete the sentences.  __________ has the longest ribbon. __________ has the shortest ribbon. __________ 's ribbon is shorter than ________'s. __________'s ribbon is longer than _________'s.	Dora says,  Measure the height of people in your class and measure the length of their shoes. Is Dora correct?	Four children are measuring their heights. Eva is taller than Rosie, but not as tall as Mo. Dexter is taller than Mo. Write down their names in order of their heights, starting with the shortest.	

Compare heights	Max and Jo have each made a tower. Max: My tower is 8 cm tall. Jo: My tower is shorter than Max's. What could the height of Jo's tower be?	A plant is 6 cm tall. A tree is 6 m tall. Ron: The plant is the same height as the tree, because they are both 6 Mo: The tree is taller than the plant. Sam: The tree is shorter than the plant. Who is correct? How do you know?	Give each child an obkect. Ask them to measure the height of the object. Then challenge them to find something that is: - Taller - Shorter - The same height Ask them to measure the objects that they identified for each comparison. Can record their comparisons using sentences and inequality symbols.	

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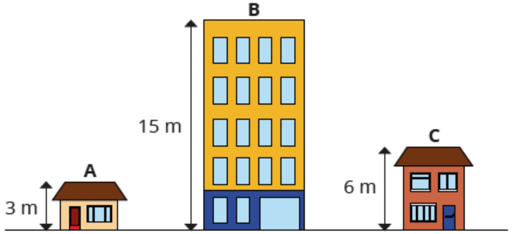
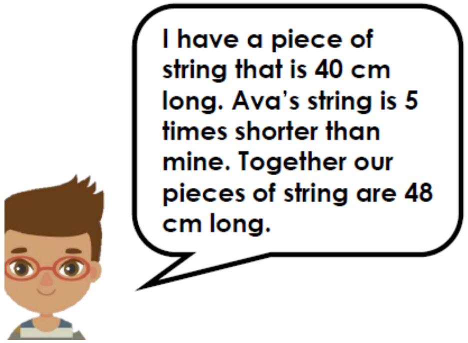
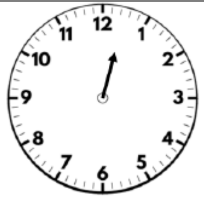
Order heights	The height of three buildings is shown.  ▸ Which building is the tallest? ▸ Which building is the shortest? ▸ Put the buildings in order, from tallest to shortest.	An oak tree is 20 m tall. An elm tree is 15 m tall. A pine tree is taller than an elm tree, but shorter than an oak tree. How tall could the pine tree be? Explain how you got to that answer.	Four children are measuring their heights. Fay is taller than Ann, but not as tall as Dan. Tom is taller than Dan. Write the children's names in order of their heights. Start with the shortest child.	
Four operations with length	Teddy has a toy train and a toy plane. The train is 28 cm long. The plane is 16 cm longer. How long is the plane?  The toy train is double the length of a toy car. How long is the toy car?  Draw bar models to help you. 	Is Joe correct? Explain why.  	There are 3 teddies in a box. The brown teddy is 15 cm taller than the yellow teddy. The yellow teddy is 3 cm shorter than the pink teddy. The pink teddy is 42 cm tall. How tall are the brown and yellow teddies? How much taller is the brown teddy than the pink teddy?	

Year 2

Measurement: Time

Objective	Skill it	Apply it	Deepen it	Mathematical talk
'O' clock and half past	Match the events to the approximate times they happen. Can you show the time on your clock? 9 o'clock – Lunchtime Half past 10 – Go to school 12 o'clock – Home time Half past 3 – Playtime	It is half past 11 so the hour hand should be on the 11 Is Alex correct? Explain your reasoning.	 Oh no! The minute hand has fallen off the classroom clock! Lunchtime is at 12:00 Have the children missed their lunchtime?	Quarter past/to, Time, days of the week: Monday, Tuesday etc., seasons: spring, summer, autumn, winter, day, week, month, year, weekend, birthday, holiday, morning, afternoon,

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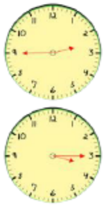
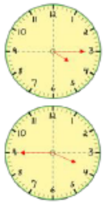
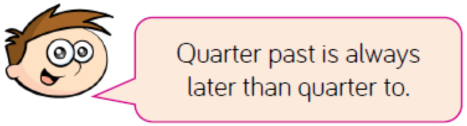
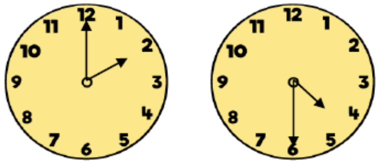
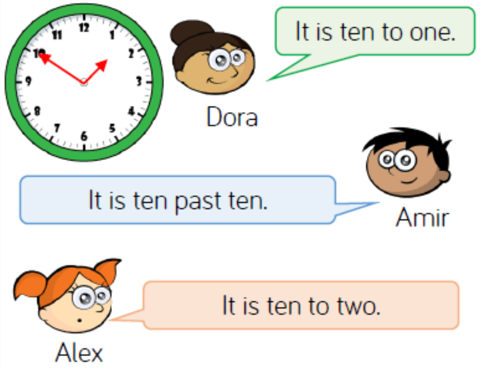
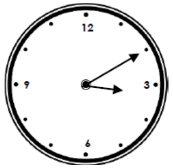
Quarter past and quarter to	Match the clocks to the correct time.  Quarter to four Quarter past four Quarter to three Quarter past three 	 Do you agree with Teddy? Explain why.	The train to Blackpool leaves at quarter past and quarter to every hour. Make a list of the times of the trains Oliver can catch if he gets to the train station between 2 o'clock and half past 4 	evening, night, midnight, bedtime, dinnertime, playtime, today, yesterday, tomorrow, before, after, next, last, now, soon, early, late, quick, quicker, quickest, fast, faster, fastest, slow, lower, slowest, slowly, takes longer, takes less time, hour, '0' clock, half past, clock, watch, hands, minutes, how long ago?, how long will it be to…?, how long will it take to…?, how often…?,
Telling time to five minutes	Match the times to the correct clock. 20 past 6 10 to 2 25 to 3  5 to 9 20 to 11 10 past 1 	 Who is correct? Explain your answer.	**9b. Saffie gets in from school at 10 past 3.** **She plays outside for 5 minutes, reads her book for 5 minutes and then draws for 5 minutes.** **What time does she finish drawing?** 	

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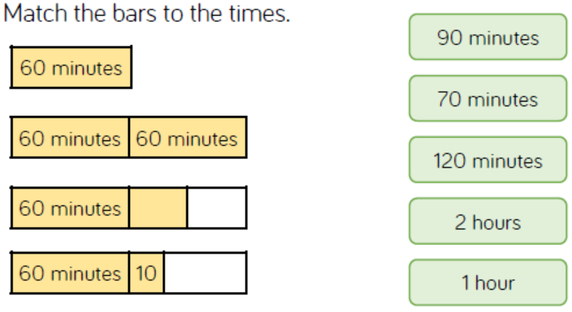
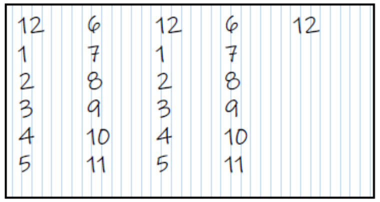
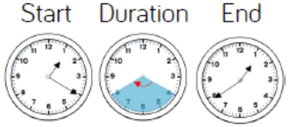
Hours and days	Match the bars to the times.  	 Tommy There must be 12 hours in a day because we start from midnight and go up to 12 o'clock then start again from 1 Do you agree with Tommy? Explain why.	 Eva The day starts at 12 o'clock and ends at 12 o'clock. Here are Eva's calculations for working out how many hours there are in a day.  12 6 12 6 12 1 7 1 7 2 8 2 8 3 9 3 9 4 10 4 10 5 11 5 11 I counted them up, and there are 25 hours in a day.  What mistake has Eva made?	always, never, often, sometimes, usually, once, twice etc., first, second, next, analogue, can you show me…, duration, compare
Find durations of time	How much time has passed from the start to end time?  	**5b. Riaz says,**  **It takes 35 minutes to get to the cinema by bus. The bus leaves the station at 5 minutes past 2. It will get to the cinema for 20 minutes to 3.** **Is he correct?** **Explain why.**	Aimee is planning her birthday. She wants to plan something to do from 9am to 5pm. Here are the things she wants to do: • Visit the zoo (3 hours) • Go to Pizza Palace (1 hour and a half) • Have breakfast (half an hour) • Play party games (1 hour) • Watch a film (2 hours) Create a timetable for Aimee's day. Compare it to your friends – is it the same?	

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<table>
<tr>
<td>Compare durations of time</td>
<td>Circle the longest time.
<table><tr><td>1 hour</td><td>40 minutes</td><td>Half an hour</td></tr><tr><td>55 minutes</td><td>Three quarters of an hour</td><td>35 minutes</td></tr></table>Can you order the times from longest to shortest?</td>
<td>4b. Who is correct? Explain how you know.
I left at five minutes to six and arrived at the shop at twenty-five minutes to seven. It took me longer to get to the shop.

Rupi

Kian
I left at five minutes past six and arrived at the shop at twenty-five minutes to seven. It took me longer to get to the shop.</td>
<td>Rosie has an hour for her lunch break. If she takes 10 minutes to eat her lunch, does she have enough time to complete all of the playground activities?
<table><tr><th>Activity</th><th>Duration</th></tr><tr><td>Skipping</td><td>7 minutes</td></tr><tr><td>Ball skills</td><td>10 minutes</td></tr><tr><td>Treasure hunt</td><td>21 minutes</td></tr><tr><td>Trim trail</td><td>19 minutes</td></tr></table>How do you know?</td>
<td></td>
</tr>
</table>

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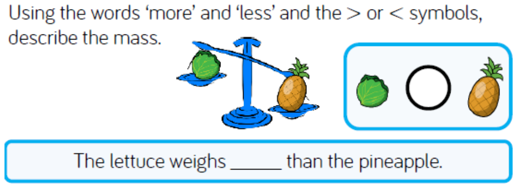
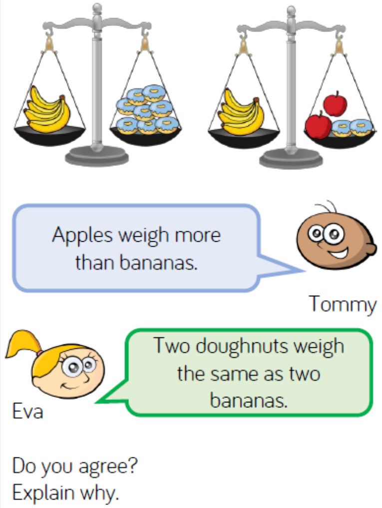
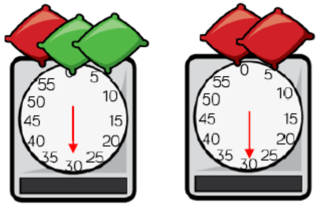
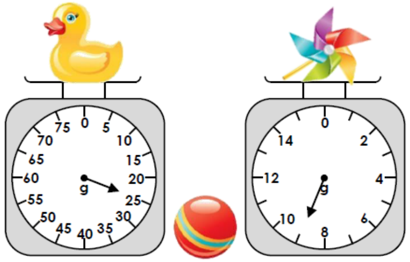
Year 2

Measurement: Mass, Capacity and temperature.

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Compare mass	 Using the words ‘more’ and ‘less’ and the > or < symbols, describe the mass. The lettuce weighs _____ than the pineapple. Investigation using a range of objects encouraging the language of less than and more than with the use of scales to support.	 Apples weigh more than bananas. Tommy Eva Two doughnuts weigh the same as two bananas. Do you agree? Explain why.	Always, sometimes or never true? The larger the box, the heavier it is. Investigation project for children to complete.	Full, half full, empty, holds, weight, weighs, balances, heavy, heavier, heaviest, light, lighter, lightest, scales, capacity, volume, mass, temperature, centigrade, thermometer, degrees, grams, kilograms, volume, millilitre,

Measure mass in grams	Use gram weights to measure the mass of objects using a balance scale. The _____ weighs _______ grams. 	 Which is heavier, the red or the green beanbag? Explain why.	Children use a range of everyday objects to find the heaviest/lightest object. **8b. The ball weighs more than the windmill but less than the duck.**  **How much could the ball weigh?** Give 3 possible answers.	litre, how could you tell something is lighter than….? How much heavier is…. than….? Estimate

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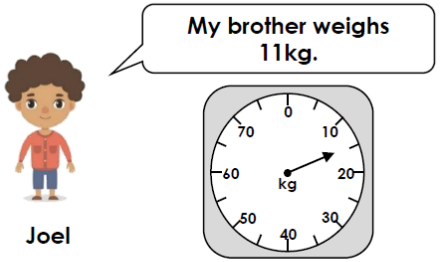
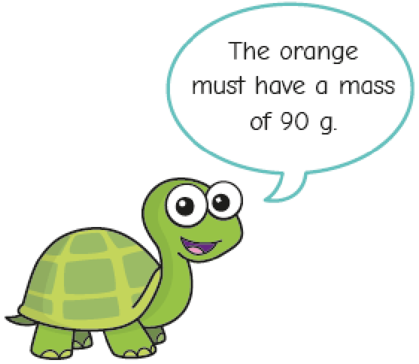
Measure mass in kilograms	Sophie's family are going on holiday. Compare the mass of their suitcases.  Sophie's suitcase is ______ than Dad's suitcase Mum's suitcase weighs ____ kg more than Dad's suitcase.	The scale shows how much the child weighs.  Is Joel correct and how can you tell?	What is the mass of each barrel?  Double the mass of A   Half the mass of A What is the difference between the mass of B and C?	

Four operations with mass	Complete the sentences.  The mass of the strawberry is ______ g. The mass of the cherry is ______ g. The total mass of a strawberry and a cherry is ______ g.	Tiny is finding the mass of an orange and a pear. The mass of the pear is 20 g more than the orange. The pear has a mass of 70 g.  What mistake has Tiny made? What is the mass of the orange?	Children to use their knowledge to transfer into other areas of their lives e.g. whilst cooking.	

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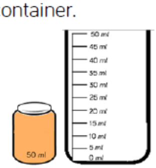
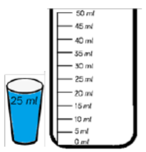
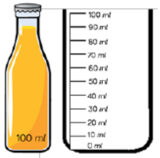
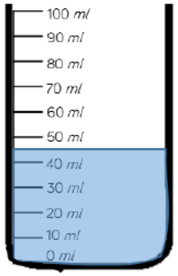
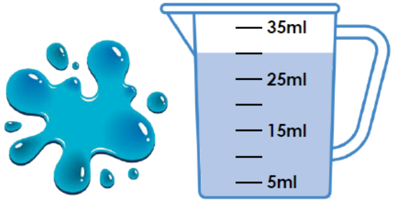
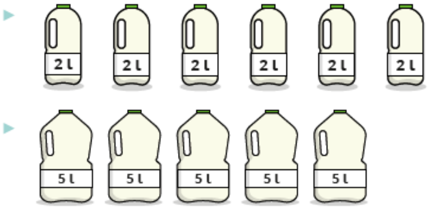
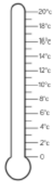
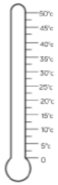
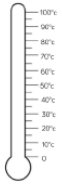
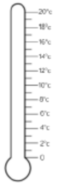
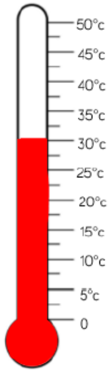
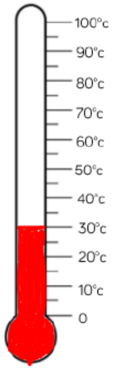
Compare volume and capacity	Complete the sentences:  The bottle can fill _____ mugs. The pot can fill _____ mugs.  Use other containers to investigate how many mugs of rice they take to fill.	Whitney had two full bottles of juice. She poured some juice into two glasses.  Which glass has the most juice in? Which has the least juice in? Explain how you know.	Choose a selection of different sized containers. Decide how you will measure how much liquid each container can hold. Order your containers from smallest to largest. Compare the containers using <, > or =  	
Millilitres	Draw the level on the scale to show the capacity of each container.  The container's capacity is ____ *ml*  The container's capacity is ____ *ml*  The container's capacity is ____ *ml*	Estimate the amount of water in the container.  Explain why you have given your answer.	**7b. Megan and Amit are measuring liquids. Megan spilt hers on the floor. She knows she has 15ml less than Amit.**  **Amit's jug** **How much has she spilt?**	

Litres	Provide a variety of different containers with litres clearly labelled e.g. cola bottle, paint bottle, milk etc. Introduce litres and discuss how these are the same but different to millilitres. Identify how many litres fill each container. Show how much liquid is in each cylinder after you: • Pour 3 litres of water into the cylinder. • Leave 1 litre of cola in the bottle. • Pour half of the juice into the cylinder. 	Mo puts 4 litres of water in bucket A. He then pours 3 litres from bucket A into bucket B.  Which sentence is correct? A B • There is more in bucket A. • There is less in bucket A. • There are equal amounts in each bucket. Explain why.	3 bowls each have more than 20 l of water in but less than 50 l The green bowl has 5 l more than the red bowl. The blue bowl has 10 l more than the green bowl. How much could each bowl have in? 	

Four operations with volume and capacity	How much milk is there altogether in each set of cartons?  	Will all the juice fit into the jug?  How do you know?	Children to transfer this knowledge into other areas of the curriculum e.g. cookery/ Science.	

Temperature	Complete the thermometers to show the temperatures.  16 °C  35 °C  70 °C  9 °C	What is the same and what is different about the thermometers/temperatures?   	Mollie took the temperature at 12 p.m and again at 5 p.m. There was a difference of 7°C What could the temperatures be? Children could have any answer but those who have a cooler temperature in the evening are showing a greater understanding of temperature.	

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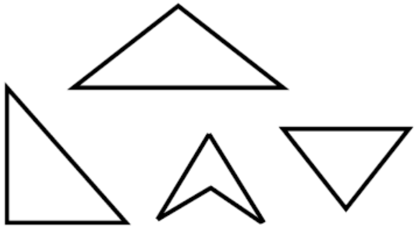
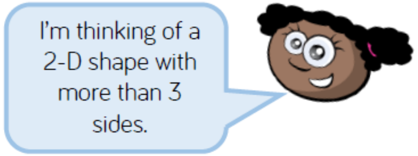
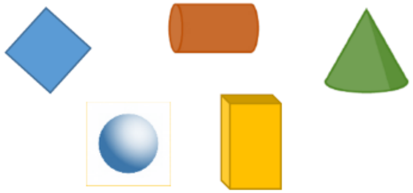
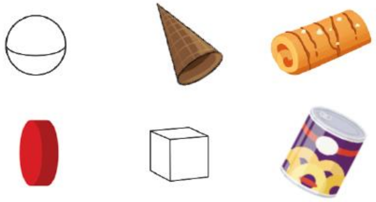
Year 2				
Geometry: Properties of Shape				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**
Recognise 3d shapes	Shape hunt. Hide shapes in a feely bag and children try to locate the given shape using the properties of the shapes they know.	Which shape is the odd one out? Explain your reasoning. 	 What shape could Whitney be thinking of? Are there any other shapes it could be? What shape is Whitney definitely not thinking about? How do you know?	Group, sort, cube, cuboid, pyramid, sphere, cone, cylinder, circle, triangle, square, rectangle, pentagon, hexagon, octagon shape, flat, curved, straight, round, corner (point, pointed) hollow, solid, face, side, edge, vertices, make, build, draw, direction, journey, left, right, up down, forwards, backwards,
Recognise 2d shapes	Match the names of the shapes to the pictures. Square Triangle Rectangle Circle 	Which shape is the odd one out? Explain why. 	Cross out all the shapes that do not have circular faces. 	

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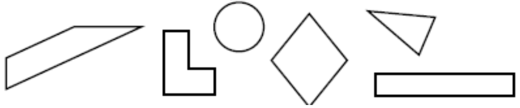
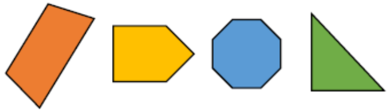
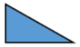
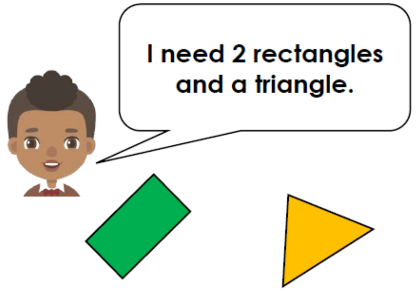
Count sides of 2d shapes	Colour the four-sided shapes. 	If I put these shapes into order from the smallest number of sides to the largest, which shape would come third?  Where would a hexagon come in the list? Why?	Here are 18 lollipop sticks. How many hexagons can you make?  How many octagons can you make? What other shapes can you make with 18 lollipop sticks?	sideways, across, close, far, near, along, though, to, from, towards, away from, movement, side, roll, turn, full turn, whole turn, half turn, stretch, bend, size, bigger, larger, smaller,

<table>
<tr>
<td>Count vertices in 2d shapes</td>
<td>Complete the table.
<table>
<tr><th>Name</th><th>Shape</th><th>Number of vertices</th></tr>
<tr><td>Pentagon</td><td></td><td></td></tr>
<tr><td>Rectangle</td><td></td><td></td></tr>
<tr><td>Square</td><td></td><td></td></tr>
<tr><td>Triangle</td><td></td><td></td></tr>
<tr><td>Hexagon</td><td></td><td></td></tr>
</table>
</td>
<td>Jai wants to collect a total of 11 vertices. He says,


Is he correct? Explain how you know.</td>
<td>Jack has created a pattern using shapes.


How many vertices does each step in the pattern have?
What do you notice?
Can you predict how many vertices the next step in the pattern will have?
Is there more than one way to continue the pattern?
Can you create your own pattern and explore how the vertices change?</td>
<td>symmetrical, right angle, 2d, 3d, dimensional, flat, what is the difference between 2d and 3d shapes? Regular and irregular shapes, show me a vertex, vertical, horizontal, how have these shapes been sorted? repeating pattern</td>
</tr>
</table>

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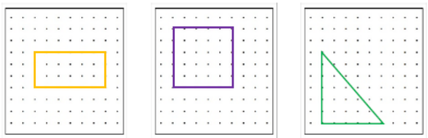
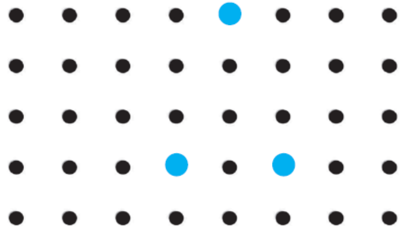
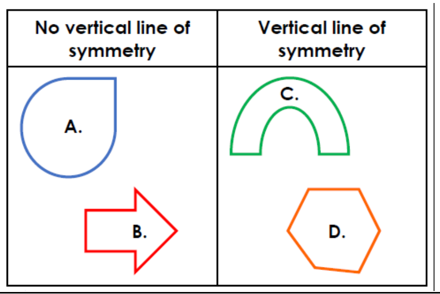
Draw 2d shapes	Use a geoboard to make different 2-D shapes. Can you make a rectangle? Can you make a square? Can you make a triangle?  Could move on to compare sizes with friends.	Josh says if he adds two more dots he can draw a hexagon.  **Is he correct? Prove it.**	Draw a large rectangle on squared paper or dotted paper. Draw a square inside the rectangle. Draw a triangle below the rectangle. Draw a pentagon that is bigger than the square. Can you give instructions to your partner to help them draw different shapes?	
Lines of symmetry	Draw the vertical lines of symmetry on these shapes. 	Ritesh has completed the table below. Is her correct? Explain your answer. 	Can you draw more than one four-sided shape that has a vertical line of symmetry?	

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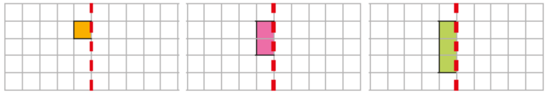
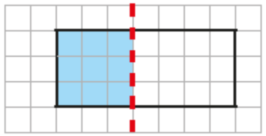
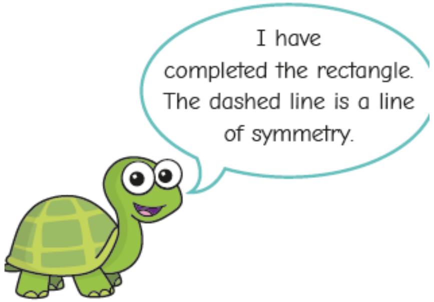
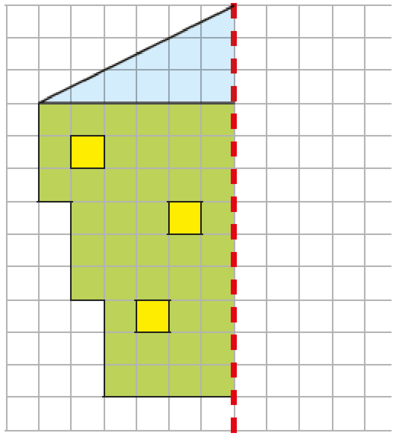
Use lines of symmetry to complete shapes	Each diagram shows half a shape and the line of symmetry. Complete the shapes. 	Tiny is completing shapes.   Do you agree with Tiny?	Use symmetry to complete the picture.  Draw your own picture like this for a partner to complete.	

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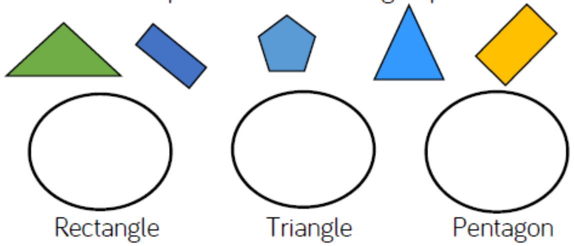
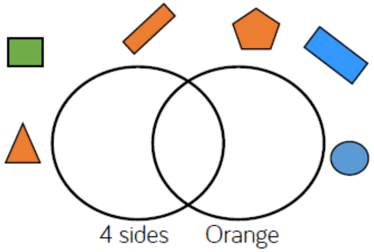
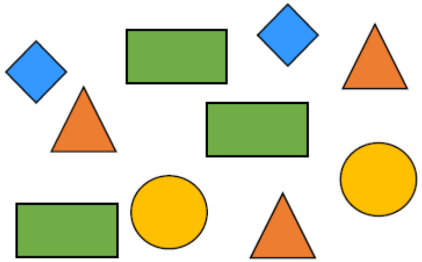
Sort 2d shapes	Sort the 2-D shapes into the correct group: 	Ron sorted the shapes in order of the number of sides. Has he ordered them correctly? Explain why. 	Where should these shapes go in the Venn diagram?  Create your own labels and sort the shapes in a different way. Can you sort the shapes in a different way?	
Make patterns with 2d shapes	Continue this pattern:  Can you circle the set of shapes that repeat? What is the next shape in the pattern? What is the 9th shape in the pattern?	Explain the pattern Dora says that the 12th shape in this pattern will be a triangle.  Is she correct? How do you know?	How many different ways can you arrange these shapes to make a repeating pattern? 	

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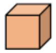
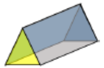
Count faces on 3d shapes

Complete the table:

Shape	Name of shape	Number of flat faces	Draw the faces
			
			
			
			

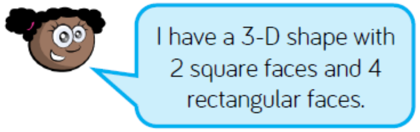
Teddy says my 3-D shape has 6 faces.

Mo says he must have a cube.

Is Mo correct?

Explain your answer.

Whitney says,



What shape does Whitney have?

Play this game with a friend. Describe the faces of a 3-D shape and they need to guess what it is.

Count edges on 3d shapes

Complete the table:

Shape	Name	Edges	Faces
			
			
			

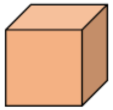
Eva says her 3-D shape has 12 edges.

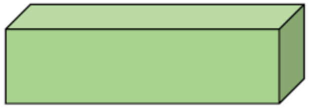
Dora says she could have a cube, cuboid or square-based pyramid.

Is Dora correct?

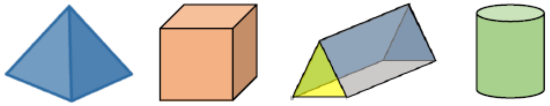
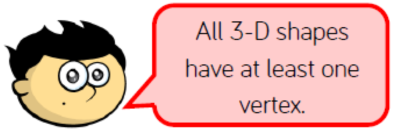
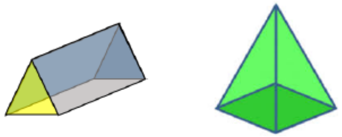
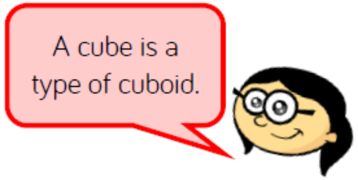
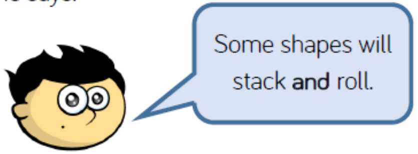
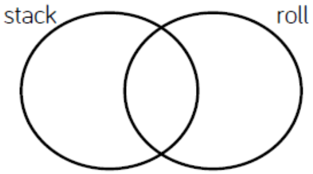
Explain your answer.

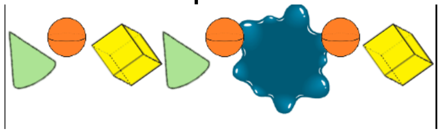
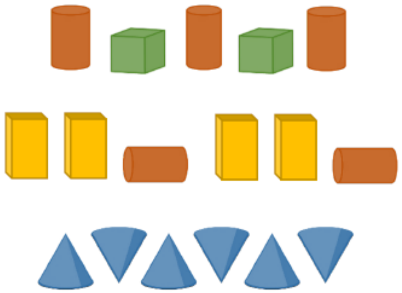
Compare these 3-D shapes.





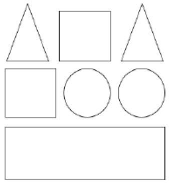
What is the same and what is different?

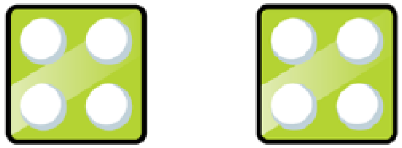
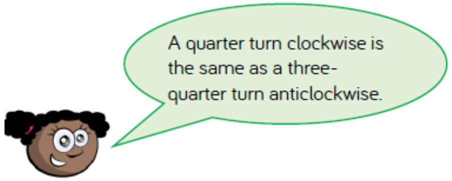
Count vertices on 3d shapes	Look at these 3-D shapes:  How many vertices does each shape have?	Jack says:  Is this true or false? Explain why	What is the same about these 2 shapes?  What is different about them? Talk about faces, edges and vertices in your answer.	
Sort 3d shapes	How could you sort these objects? Can you find some other classroom objects to add to each set?  	Annie is sorting 3-D shapes. She puts a cube in the cuboid pile.  Do you agree? Why?	Jack is investigating which shapes stack and which shapes roll. He says:  Is he correct?  Sort your shapes using the Venn diagram. Explain what you notice about each set. Do all shapes with flat surfaces stack?	

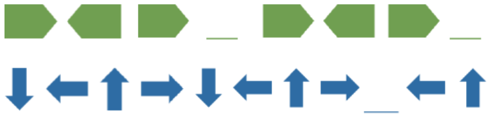
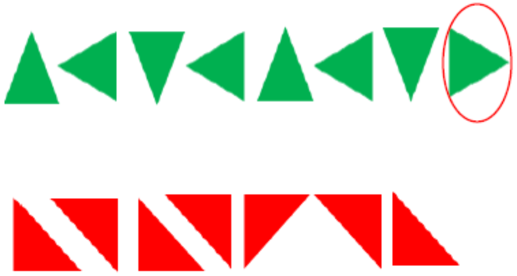
Make patterns with 3d shapes	Use some different coloured cubes to make a repeating pattern. Can you describe the pattern to your partner? Using colours? Using letters? Using sounds?	Name the hidden shapes under the splats.  Explain how you know.	What is the same about these patterns? What is different about these patterns? 	

Year 2

Geometry: Position and direction

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Describe movement	Use cones to create a route for a partner. Describe the route the partner takes using position and directional language. Complete the sentences using 'left' and 'right' to describe the position of the coins.  The £1 coin is to the _______ of the 1p coin. The 50p coin is to the _______ of the 1p coin.	 Who is correct? Explain how you know.	Use the clues to colour the shapes.  • The circle in the middle is blue. • The circle on the right is red. • The shape up from the right circle is green. • The shape down from the circles is green. • The square to the left of the green triangle is red. • The four-sided shape up from the rectangle is blue. • The triangle on the left is red.	Over, under, underneath, above, below, top, bottom, side, on, in, outside, inside, around, in front, behind, front, back, below, after, beside, next to, opposite, apart, between, middle, edge, centre, corner, direction,

Describe turns	Turn a figure. Ask a partner to describe the turn using the language, 'full turn', 'half turn', 'three-quarter turn', 'clockwise' and 'anticlockwise'.	Could there be more than one answer? Why? Always, Sometimes, Never. If two objects turn in different directions they will not be facing the same way. Support this question with the use of physical resources.	Look at the number shape below  How could the number shape ha turned? Describe all possibilities.	journey, left, right, up, down, forwards, backwards, sideways, across, close, far, near, along, through, to, from, towards, away from, movement, side, roll, turn, whole/ full turn, half turn, three-quarter turn, quarter turn, stretch, bend, rotation, clockwise, anticlockwise, straight line, ninety degree turn, what direction was the turn,
Describe movement and turns together **COMPUTING could be used within this objective.**	Describe the route taken. Draw a line to show the route taken. Write directions for the route taken.	Is Whitney correct?  Convince me.	Are there any other routes that could be taken?	

			How many different routes can you find to get from start to finish. Use the words 'forwards', 'backwards', 'clockwise', 'anti-clockwise' and 'quarter turn'.  	
Making patterns with shapes	Describe, continue and create patterns that involve using direction and turns. Fill in the missing shapes to complete the patterns. 	Spot the mistake in each pattern. Explain why they are incorrect. 	How many different patterns can you create using this shape? 	

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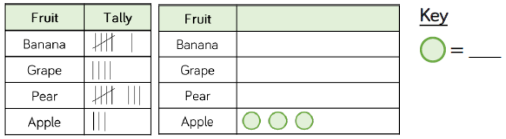
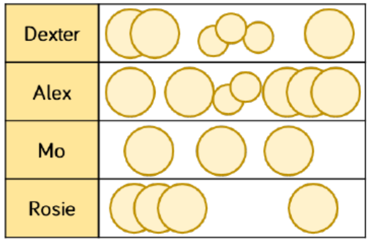
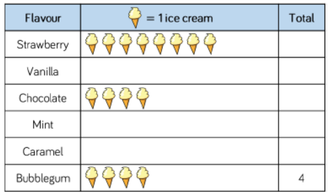
<table>
<tr><th colspan="5">Year 2</th></tr>
<tr><th colspan="5">Statistics (can link across curriculum e.g. COMPUTING/Topic/P.E)</th></tr>
<tr><th>Objective</th><th>Skill it</th><th>Apply it</th><th>Deepen it</th><th>Mathematical talk</th></tr>
<tr>
<td>Interpret and construct simple pictograms.</td>
<td>Children to use counters to support this learning and build pictograms using concrete resources as a foundation.
Use the tally chart to help you complete the pictogram.

<table>
<tr><th>Fruit</th><th>Tally</th></tr>
<tr><td>Banana</td><td>𝍸 |</td></tr>
<tr><td>Grape</td><td>||||</td></tr>
<tr><td>Pear</td><td>𝍸 |||</td></tr>
<tr><td>Apple</td><td>|||</td></tr>
</table>
<table>
<tr><th>Fruit</th><th></th></tr>
<tr><td>Banana</td><td></td></tr>
<tr><td>Grape</td><td></td></tr>
<tr><td>Pear</td><td></td></tr>
<tr><td>Apple</td><td>○ ○ ○</td></tr>
</table>
Key
○ = ____

Data collection in science e.g. favourite animal in class 2 data collection.</td>
<td>Here is a pictogram showing the number of counters each child has.


How could you improve the pictogram?</td>
<td>Use the clues below to help you complete the pictogram.
• More Caramel was sold than Bubblegum flavour, but less than Strawberry flavour.
• Mint was the most popular flavour.
• Vanilla was the least popular.

<table>
<tr><th>Flavour</th><th>🍦 = 1 ice cream</th><th>Total</th></tr>
<tr><td>Strawberry</td><td>🍦🍦🍦🍦🍦🍦🍦🍦</td><td></td></tr>
<tr><td>Vanilla</td><td></td><td></td></tr>
<tr><td>Chocolate</td><td>🍦🍦🍦🍦</td><td></td></tr>
<tr><td>Mint</td><td></td><td></td></tr>
<tr><td>Caramel</td><td></td><td></td></tr>
<tr><td>Bubblegum</td><td>🍦🍦🍦🍦</td><td>4</td></tr>
</table>
Can you find more than one way to complete the pictogram?</td>
<td>Chart, bar chart, table, axis, block diagrams, tally chart, quantity, diagram, pictograms, one to one correspondence, what will each symbol be worth? What will each block be worth?</td>
</tr>
</table>

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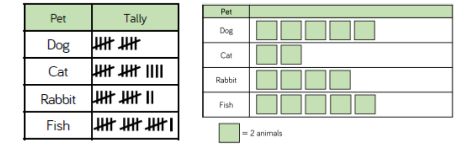
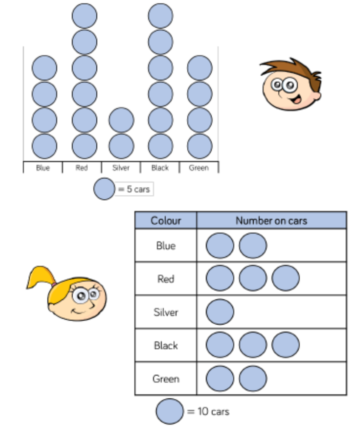
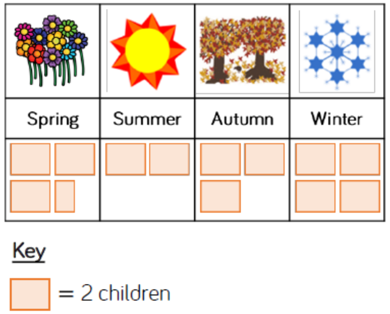
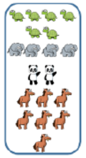
	Children to move on to where the symbol represents 2,5 or 10. Use the tally chart to complete the pictogram. 	Teddy and Eva both draw a pictogram to show how many cars they counted driving past their school.  What is the same? What is different? Whose pictogram do you prefer? Why?	Create a pictogram to show who was born in what season in your class. Use what you know about pictograms to help you. Here is an example. 	

<table>
<tr>
<td>Interpret and construct simple tally charts.</td>
<td>Complete the tally chart.
<table>
<tr><th>Favourite Colour</th><th>Tally</th><th>Total</th></tr>
<tr><td>Blue</td><td>卌 |||</td><td></td></tr>
<tr><td>Red</td><td>卌 卌 ||</td><td></td></tr>
<tr><td>Yellow</td><td>||</td><td></td></tr>
<tr><td>Green</td><td>|||</td><td></td></tr>
</table>
What does the data tell you? Tell me the story.</td>
<td>Dexter makes a tally chart of the animals he saw at the zoo
<table>
<tr><th>Animal</th><th>Tally</th></tr>
<tr><td></td><td>卌</td></tr>
<tr><td></td><td>||||</td></tr>
<tr><td></td><td>||</td></tr>
<tr><td></td><td>卌 ||</td></tr>
</table>
Tick one box below that shows all of the animals Dexter saw and explain why the others are incorrect.
Box 1

Box 2

Box 3

Box 4
</td>
<td>Class 1 and Class 2 were each asked their favourite ice-cream flavours. Their results are shown in the tally charts.
<table>
<tr><th colspan="2">Class 1</th></tr>
<tr><th>Flavour</th><th>Total</th></tr>
<tr><td>Vanilla</td><td>卌 卌 卌</td></tr>
<tr><td>Chocolate</td><td>卌 卌 卌 卌</td></tr>
<tr><td>Strawberry</td><td>卌 ||</td></tr>
<tr><td>Mint</td><td>|</td></tr>
</table>
<table>
<tr><th colspan="2">Class 2</th></tr>
<tr><th>Flavour</th><th>Total</th></tr>
<tr><td>Vanilla</td><td>卌 卌 ||</td></tr>
<tr><td>Chocolate</td><td>卌 卌 卌 卌</td></tr>
<tr><td>Strawberry</td><td>卌</td></tr>
<tr><td>Mint</td><td>|||</td></tr>
</table>
What is the same? What is different?</td>
<td></td>
</tr>
</table>

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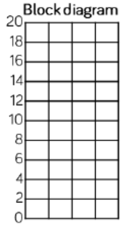
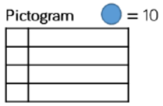
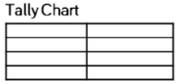
<table>
<tr>
<td>Interpret and construct simple block diagrams.</td>
<td>
Class 4 are collecting data about favourite colours.
<table>
<tr><th>Colour</th><th>Number of children</th></tr>
<tr><td>Red</td><td>5</td></tr>
<tr><td>Green</td><td>8</td></tr>
<tr><td>Blue</td><td>7</td></tr>
<tr><td>Yellow</td><td>2</td></tr>
</table>
Make a block diagram using cubes to represent the data.
Now draw the block diagram.
What will the title be?
Remember to label the blocks and draw a clear scale.
</td>
<td>
Here are three tables of data.
Which set of data could you display using the block graph?
Which could use the pictogram?
Which could use the tally chart?
Explain your reasoning.
Data Set 1
<table>
<tr><th>Team</th><th>Goals scored</th></tr>
<tr><td>A</td><td>20</td></tr>
<tr><td>B</td><td>32</td></tr>
<tr><td>C</td><td>27</td></tr>
<tr><td>D</td><td>16</td></tr>
</table>
Data Set 2
<table>
<tr><th>Player</th><th>Points</th></tr>
<tr><td>1</td><td>20</td></tr>
<tr><td>2</td><td>65</td></tr>
<tr><td>3</td><td>80</td></tr>
<tr><td>4</td><td>45</td></tr>
</table>
Data Set 3
<table>
<tr><th>Name</th><th>Score</th></tr>
<tr><td>Ron</td><td>20</td></tr>
<tr><td>Eva</td><td>12</td></tr>
<tr><td>Amir</td><td>6</td></tr>
<tr><td>Mo</td><td>16</td></tr>
</table>






</td>
<td>
Split into groups.
Everyone needs to write their name on a sticky note.
Use your sticky notes to create a block diagram to answer each question.

How many boys and how many girls are there in your group?
Which month has the most birthdays for your group?
What is your favourite sport?

What other information about your group could you show?

</td>
<td></td>
<td></td>
</tr>
</table>

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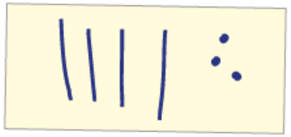
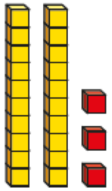
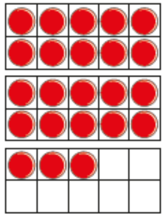
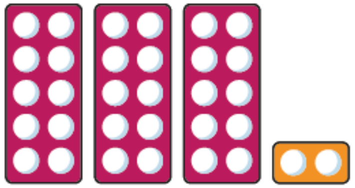
Year 3

Number: Place Value

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Represent numbers to 100	Dora has used lines and dots to draw the number 43  Use lines and dots to draw each number. 26 52 74	Which picture does **not** show 23? A  B  C  How do you know?	Here are three digit cards. 7 0 2 List the 2-digit numbers that can be made using these digit cards. What is the greatest 2-digit number you can make? What is the smallest 2-digit number you can make? Why can the zero not be used for the number of tens?	Fewer, more, equal, less than, greater than, number, pair, zero, one, two, three to twenty, and beyond, none, zero, count (on/up/to/from/down), before, after, many, few, fewer, least, fewest, lesser, smallest, greater, same as, odd, even, units, ones, tens, ten more/less, digits, numeral, figure(s), compare, (in) order/ a different order, size, value, between, halfway between,

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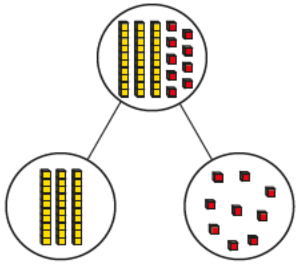
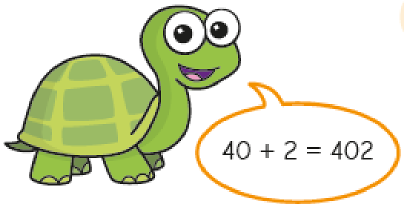
<table>
<tr>
<td>Partition numbers to 100</td>
<td>Here is a part-whole model.
Complete the sentences.
The whole is ______
One part is ______
The other part is ______
______ = ______ + ______
</td>
<td>
Explain the mistake Tiny has made.
Use base 10 to show the correct answer.</td>
<td>Fill in the missing numbers.
1 ten + 3 ones = 13
2 tens + ______ ones = 23
3 tens + 3 ones = ______
______ tens + 3 ones = 43
Can you see a pattern?
What will the next number sentence be?</td>
<td rowspan="2">above, below. Numbers to one hundred, hundreds, partition, recombine, hundred more/less, estimate, how do we say this number? What numbers complete the part-whole? How many tens are there? How many ones are there? Do groups of ten help you count? When ordering your numbers do you look at the tens or ones? Are the numbers in the sequence getting larger or smaller? Thousands, 3 digit numbers, 100s, 10s and 1s, place value grid, place holder (0),</td>
</tr>
<tr>
<td>Hundreds</td>
<td>Use base 10, bundles of straws in 10 to see how many tens make 100.
Complete the number tracks.
<table><tr><td>200</td><td>300</td><td></td><td>500</td><td></td><td></td><td>800</td><td></td></tr></table>
<table><tr><td></td><td>900</td><td>800</td><td></td><td></td><td>500</td><td></td><td></td></tr></table>
Also share hundreds using place value grid.</td>
<td>True or False?
If I count in 100s from zero, all of th numbers will be even.
Convince me.</td>
<td>Whitney thinks the place value grid is showing the number eight.
<table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td>○ ○ ○
○ ○
○ ○ ○</td><td></td><td></td></tr></table>
Do you agree? Explain why.
Using all of the counters, what is the smallest number you can make?
What other numbers could you make?</td>
</tr>
</table>

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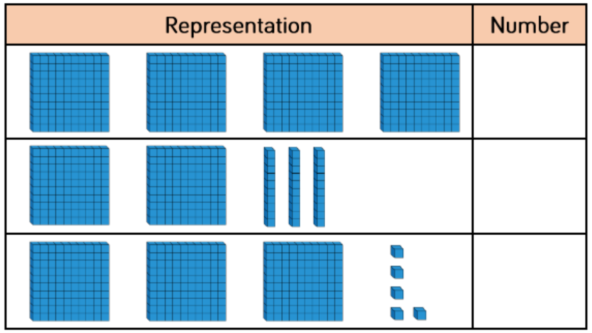
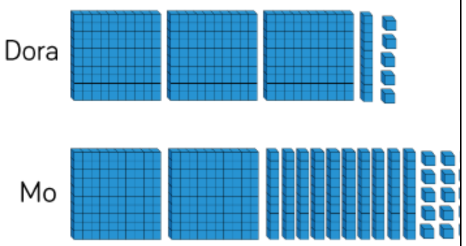
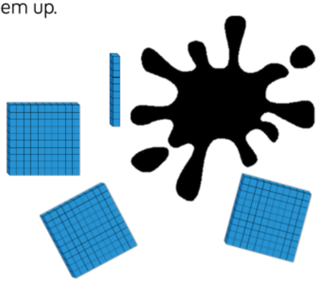
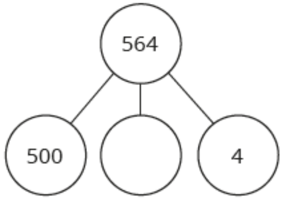
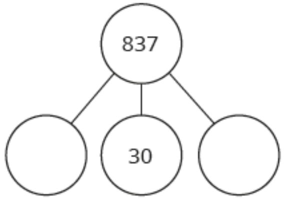
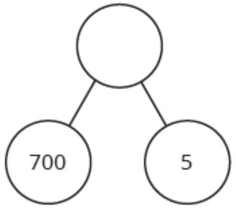
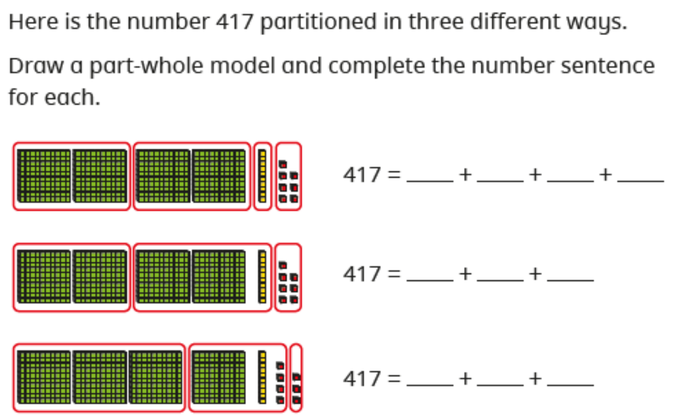
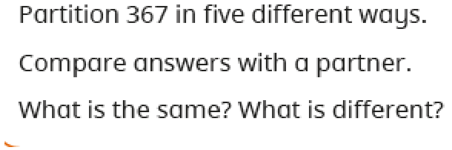
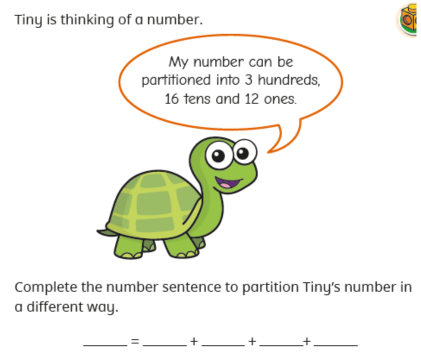
Represent numbers to 1000	Use base 10 to represent 701 325 879 Write down the number represented with Base 10 in each case.  Representation Number	Which child has made the number 315?  Explain how you know.	Teddy has used Base 10 to represent the number 420. He has covered some of them up.  Work out the amount he has covered up. How many different ways can you make the missing amount using Base 10?	what is the value of each interval on the number line? How many hundreds are there? 10 more, 10 less, 100 more, 100 less, compare, what strategies did you use to compare the numbers?, order, ascending, descending, how do you know when you have created the

Partition numbers to 1000	Complete the part-whole models.   	Tiny is completing a part-whole model.   Explain the mistake that Tiny has made. What is the whole?	Use the digit cards to make a 3-digit number. 3 7 8 Partition your number into hundreds, tens and ones. Compare answers with a partner. How many numbers can you find?	smallest/greatest number?

Flexible partitioning of numbers to 1000	 Here is the number 417 partitioned in three different ways. Draw a part-whole model and complete the number sentence for each. 417 = ____ + ____ + ____ + ____ 417 = ____ + ____ + ____ 417 = ____ + ____ + ____	 Partition 367 in five different ways. Compare answers with a partner. What is the same? What is different?	 Tiny is thinking of a number. My number can be partitioned into 3 hundreds, 16 tens and 12 ones. Complete the number sentence to partition Tiny's number in a different way. _____ = _____ + _____ + _____+ _____ How many ways can you find?	

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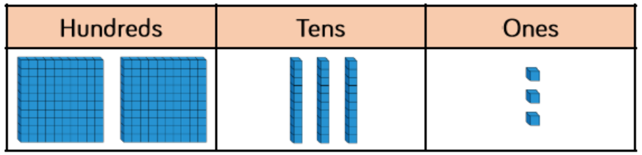
100's, 10's and 1's

Write numbers in numerals and on a place value grid.

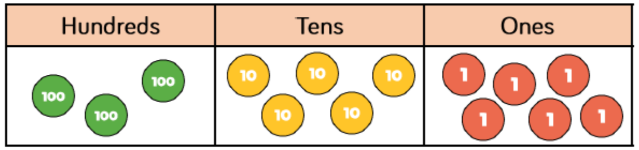
What is the value of the number represented in the place value chart?



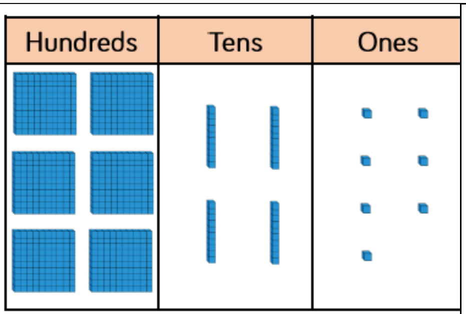
Write your answer in numerals and in words.

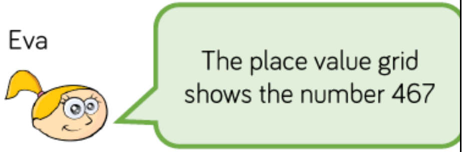
How many different ways can you make the number 452?
Can you write each way in expanded form? (e.g. 400 + 50 + 2)

What number is shown on the place value chart?



If one more 10 is added, what number would be shown?





Is Eva correct? Explain your reasoning.

What do you notice about the number shown?

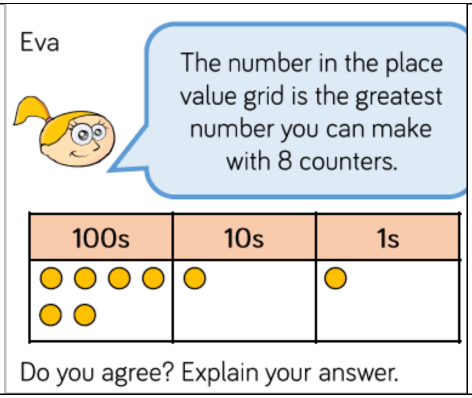
5 0 3

Using each digit card, which numbers can you make?

Use the place value grid to help.

Hundreds	Tens	Ones

Compare your answers with a partner.

		 Eva The number in the place value grid is the greatest number you can make with 8 counters. 100s: ● ● ● ● ● ● — 10s: ● — 1s: ● Do you agree? Explain your answer.		

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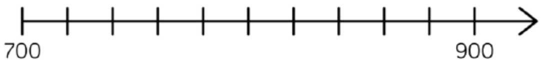
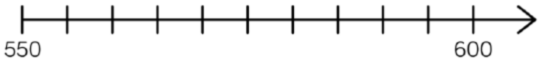
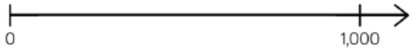
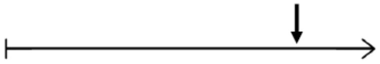
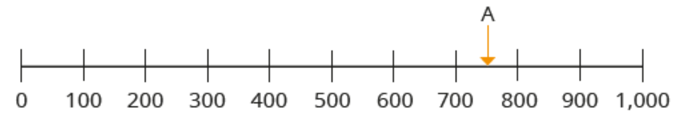
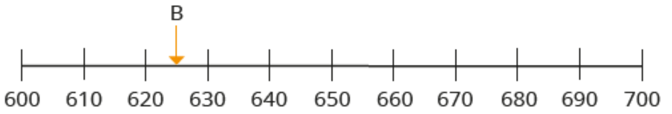
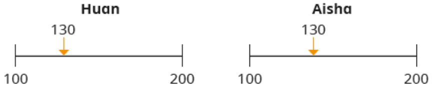
Number line to 1,000	Share number lines with or without start/end numbers. Draw an arrow to show the number 800  Draw an arrow to show the number 560  Where appropriate, use estimation to decide where a value could be on a number line.	Estimate where seven hundred and twenty-five will go on each of the number lines.    Explain why it is not in the same place on each number line.	If the arrow is pointing to 780, what could the start and end numbers be? Find three different ways and explain your reasoning. 	
Estimate on a number line to 1000	Estimate the numbers that the arrows are pointing to.   	Huan and Aisha have estimated where 130 belongs on the same number line.  Can Huan and Aisha both be correct? Explain your answer.	Here is a number line from 0 to 1,000  Estimate where the numbers belong on the number line. 100 250 330 500 20 670 Compare answers with a partner. Which number was the easiest to estimate?	

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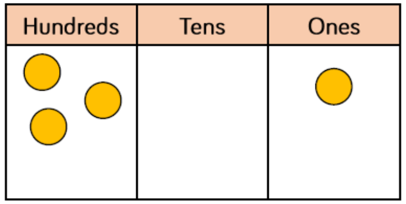
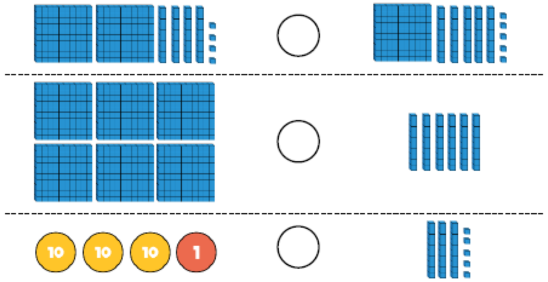
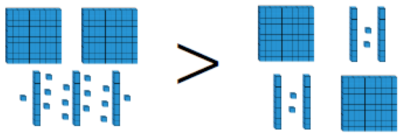
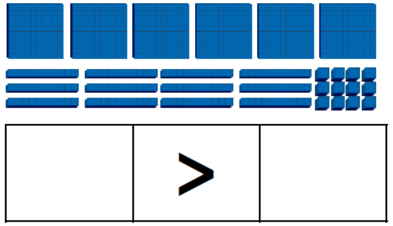
Find 1, 10, 100 more or less than a given number	Show ten more and ten less than the following numbers using Base 10 and place value counters. 550 724 302	10 more than my number is the same as 100 less than 320 What is my number? Explain how you know.	A counter is missing on the place value chart.  What number could it have been?	
Compare objects to 1000	Children use objects to represent number to 1000. Use <, > or = to make the statements correct. 	True or False?  Explain your answer.	**8b. How could all the Base 10 below be arranged to make the statement correct?**  **Find 5 possible answers.**	

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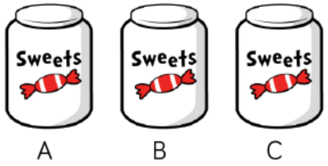
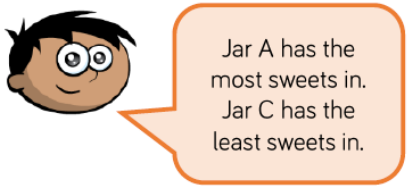
<table>
<tr>
<td>Compare numbers to 1000</td>
<td>Use <, > or = to make the statements correct.
399 ○ 501
800 ○ 80 tens</td>
<td>Amir has 3 jars of sweets.

Jar A contains 235 sweets.
Jar C contains 175 sweets.

How many sweets could be in jar B? Explain how you know.</td>
<td>Look at the statement below.
3 hundreds, 11 tens and 10 ones < ? < four hundred and fifty-seven
Which numbers could fill the gap?</td>
<td></td>
</tr>
<tr>
<td>Order numbers</td>
<td>Here is a list of numbers.
312, 321, 123, 132, 213, 231
Place the numbers in ascending order.
Now place them in descending order.</td>
<td>True or False?
When ordering numbers you only need to look at the place value column with the highest value.</td>
<td>7b. Binky the rabbit wants to reach the carrot. She can only travel in the maze by finding up to 6 descending numbers.

<table>
<tr><td>322</td><td>300 + 15</td><td>three hundred and thirty</td><td>200 + 171</td></tr>
<tr><td>350 + 35</td><td>363</td><td>three hundred and forty</td><td>32 tens and 5 ones</td></tr>
<tr><td>2 hundreds, 10 tens and 71 ones</td><td>300 + 68</td><td>352</td><td></td></tr>
<tr><td>→ 200 + 186</td><td>372</td><td>1 hundred, 21 tens and 9 ones</td><td>300 + 8</td></tr>
</table>
</td>
<td></td>
</tr>
</table>

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<table>
<tr><td></td><td></td><td></td><td>How many routes can Binky take?</td><td></td></tr>
<tr><td>Count in 50's</td><td>Use knowledge of counting in 5s to support.
Complete the number tracks.<table><tr><td>50</td><td></td><td>150</td><td>200</td><td></td><td></td><td>350</td><td></td><td>450</td><td></td></tr></table><table><tr><td></td><td>750</td><td>700</td><td>650</td><td></td><td></td><td>500</td><td></td><td></td><td>350</td></tr></table></td><td>Which is quicker: counting to 50 in 10s or counting to 150 in 50s?

Explain your answer.</td><td>9b. Betsy has been saving 50p coins to buy her mum a present. She has saved seven coins. Does she have enough coins to buy the present for £8 and 50p?
</td><td></td></tr>
</table>

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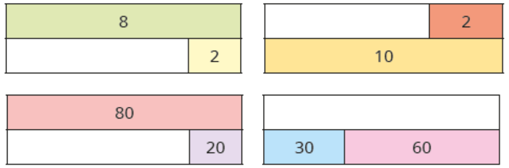
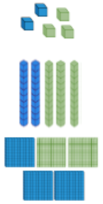
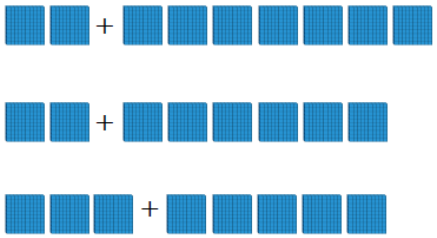
Year 3

Number: Addition and Subtraction

Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**
Apply number bonds within 10	Complete the bar models.  Write the fact family for each bar model.	I know that 5+2 = 7. I also know that 50 + 2 = 70, because 50 is ten times 5 and 70 is ten times 8. Do you agree? Explain your answer.	Complete part – whole models. Is there more than one way to complete?	What does part mean? What does whole mean? How many where there at the start? Which number represents the total? Number bonds, number line, add, more, plus, make, sum, total, altogether, inverse, double, near double, half, halve, equals, is the same as (including equals sign), difference between, how
Add and subtract multiples of 100	Complete:  2 ones and 3 ones is equal to ____ ones. 2 tens and 3 tens is equal to ____ tens. 2 hundreds and 3 hundreds is equal to ____ hundreds.	Odd One Out Which is the odd one out? Explain why. 	____ + ____ = 800 Each of the missing numbers are multiples of 100 Find all the possible missing numbers.	

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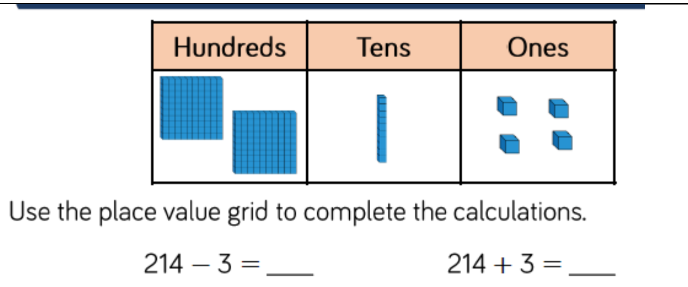
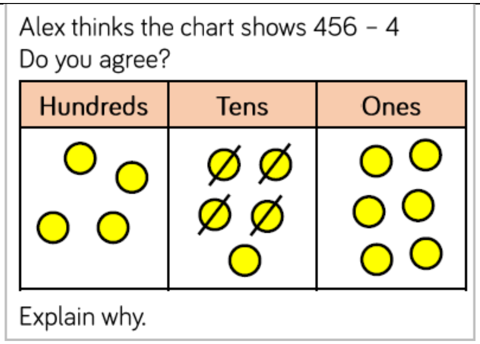
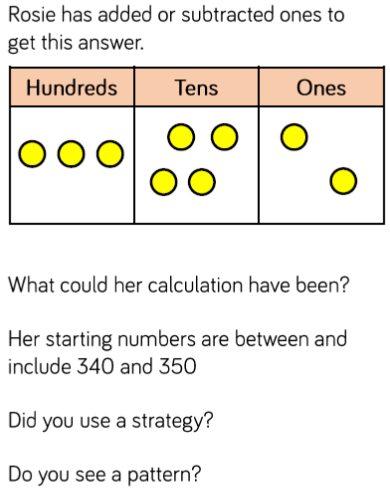
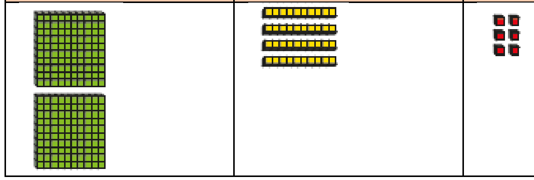
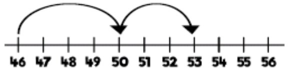
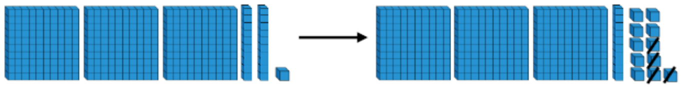
Add 3 digit and 1 digit numbers – not crossing 10	 Hundreds, Tens, Ones Use the place value grid to complete the calculations. 214 – 3 = ___ 214 + 3 = ___	 Alex thinks the chart shows 456 – 4 Do you agree? Hundreds, Tens, Ones Explain why.	 Rosie has added or subtracted ones to get this answer. Hundreds, Tens, Ones What could her calculation have been? Her starting numbers are between and include 340 and 350 Did you use a strategy? Do you see a pattern?	many more to, how much more is…?, subtract, take away, minus, how many fewer is… than…? How much less is…? Predicting, find, find all, find different, investigate, column addition, column subtraction, multiples, exchange, place holder (zero), how many tens can be added without exchanging? Patterns between calculations, which strategy
Subtract a 3 digit number and a 1 digit number – not crossing 10.	Hundreds, Tens, Ones  246 – 5 =	When subtracting a number in the ones column, all the other numbers will stay the same. Is this statement correct? Convince me.	How many ways can you make the number 789? You can only subtract from the ones column.	

Add a 3 digit number and a 1 digit number – crossing 10	We can use a number line to calculate 346 + 7  46 + 4 = 50 50 + 3 = 53 so 346 + 7 = 353 Use this method to calculate: 564 + 8 716 + 9 327 + 5	Which questions are harder to calculate? 234 + 3 = 506 + 8 = 455 + 7 = 521 + 6 = Explain your answer.	**Always, Sometimes, Never** When 7 and 5 are added together in the ones column, the digit in the ones column of the answer will always be 2 What other digits would always give a 2 in the ones column? Prove it.	would you use and why? Near numbers, estimate, reasonable, inverse
Subtract a 1 digit number from a 3 digit number – crossing 10	Teddy uses Base 10 to calculate 321 – 4   Use this method to calculate: 322 – 4 322 – 7 435 – 7	Explain how you would solve these calculations: 564 – ___ = 558 ___ – 8 = 725 352 = 361 – ___	**7b. Use four of these digit cards to write a subtraction sentence that gives an answer between 690 and 700.** **8** **5** **0** **7** **4** **Find two possibilities.**	
Add 3 digit number and 2 digit number – not crossing 100	Complete using <, > or = 773 + 1 ○ 773 + 10 653 + 10 ○ 653 – 10 647 + 10 ○ 657 – 10 721 + 10 ○ 653 + 10	When I calculated 392 subtract 20 I used my known fact that 9 – 2 = 7  Rosie Explain Rosie's method.	Write **one** calculation that could complete **all** of the statements. 456 – 10 < ☐ 466 + 1 > ☐ 466 + 0 = ☐ Is there more than one way?	

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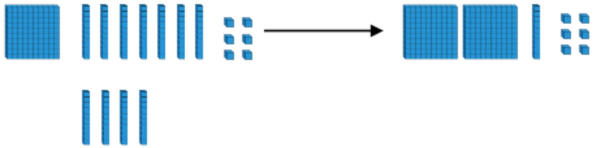
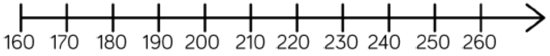
Subtract a 3 digit number and a 2 digit number – not crossing 100	478 – 24 =	Provide reasoning questions that draw out the place value of numbers.	674 - . 3 6 4 1	
Add 3 digit number and 2 digit number – crossing 100	Mo uses Base 10 to calculate 176 + 40  Use Mo's method to calculate: 276 + 40 266 + 40 266 + 70	Which is the odd one out? Why? 336 + 80 453 + 60 347 + 70 285 + 80	Sort these calculations into two groups. Justify your answer. 257 + 60 70 + 637 40 + 234 20 + 391 Compare your groups with a friend. Are they the same?	
Subtract a 3 digit number and 2 digit number – crossing 100	Count back in tens to solve 240 – 70  	Whitney thinks the rule for the function machine is subtract 60 Is she correct? Explain why. **Input** **Rule** **Output** 567 → ? → 497	How many different methods could you use to solve 837 – 90? Share your methods with a partner.	

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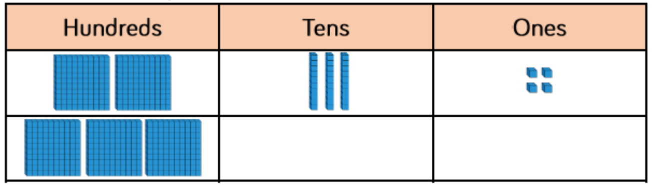
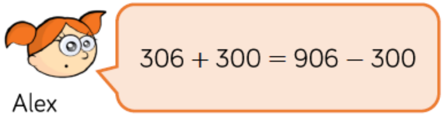
<table>
<tr>
<td>Add and subtract 100s</td>
<td>Use the place value grid and Base 10 to help you calculate two hundred and thirty-four add three hundred.
 </td>
<td>
Is she correct?
Explain how you know.</td>
<td>Teddy starts with the number 356
He adds a multiple of 100
His new number is greater than 500 but less than 800
Complete the table.
<table><tr><th>Numbers he couldn't have added</th><th>Numbers he could have added</th></tr><tr><td></td><td></td></tr></table></td>
<td></td>
</tr>
<tr>
<td>Spot the pattern – making it explicit</td>
<td>If we know 250 + 40 = 290, what else do we know?
Show your findings in part-whole models or bar models and write number sentences to match.

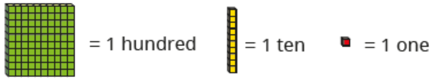
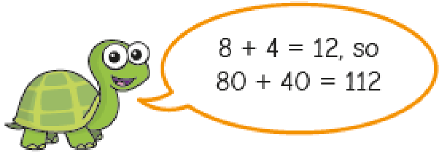
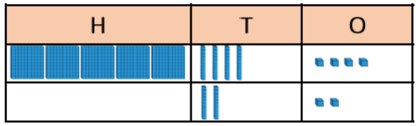
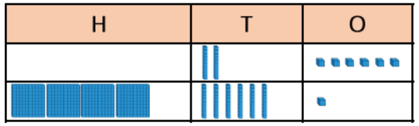
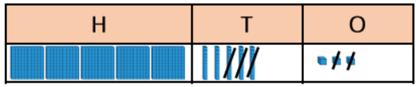
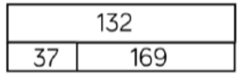
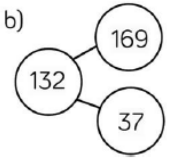
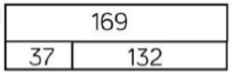
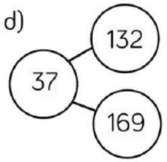
Calculate:
<table><tr><td>253 + 2</td><td>253 + 20</td><td>253 + 200</td></tr><tr><td>253 – 2</td><td>253 – 20</td><td>253 – 200</td></tr></table></td>
<td>Dora uses column addition to solve 251 + 4
<table><tr><td></td><td>2</td><td>5</td><td>1</td></tr><tr><td>+</td><td></td><td></td><td>4</td></tr><tr><td></td><td>2</td><td>5</td><td>5</td></tr></table>
Is this the most efficient method?

Explain what Dora could have done.

Tell Dora how she can use your strategy to solve 241 + 40 and 241 + 400</td>
<td>Investigate

Does adding and subtracting ones to a 3-digit number only affect the ones column?

Does adding and subtracting tens to a 3-digit number only affect the tens column?</td>
<td></td>
</tr>
</table>

Make connections	Use base 10 to help you complete the sentences.  ▸ 10 ones = ______ ten ▸ 20 ones = ______ tens ▸ 30 ones = ______ tens ▸ 10 tens = ______ hundred ▸ 40 tens = ______ hundreds ▸ ______ tens = 6 hundreds	 Do you agree with Tiny? Explain your answer.	What could the missing number be? 263 + 60 < 319 + ☐ < 434 − 80 Find all the possible solutions.	
Add a 3 digit number with a 2 digit number not crossing 10 or 100 Subtract a 3 digit number with a 2 digit number not crossing 10 or 100	Match the calculation to the correct representation and solve. 26 + 461 553 − 32 544 + 22    	Explain the mistake Jack has made. H T O 2 3 1 + 6 3 ______ ______	Eva has 169 sweets in a jar. She gives 37 sweets to Mo. Which model represents this problem? a)  b)  c)  d)  	

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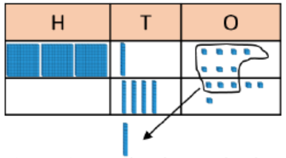
Add a 3 digit number with a 2 digit number – crossing 10 or 100

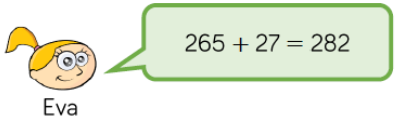
Annie uses Base 10 to calculate 317 + 46



	3	1	7
+		4	6
	3	6	3
		1	

Use Annie's method to calculate:

327 + 46   537 + 36   538 + 32   267 + 24



Here is her working out:

	2	6	5
+		2	7
	2	8	2

Is she correct? Explain why.

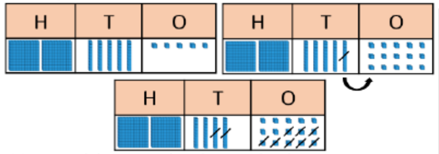
Choose one 2-digit and one 3-digit number.
Write additions that have an exchange in the ones and the tens columns.

23   35
81   56

756   467
487   619

Subtract a 3 digit number with a 2 digit number – crossing 10 or 100

Teddy uses Base 10 to subtract 28 from 255



	2	$^{4}\cancel{5}$	$^{1}5$
–		2	8
	2	2	7

Use Teddy's method to calculate:

365 – 48   492 – 38   722 – 16

Rosie thinks 352 – 89 = 337

	H	T	O
	3	5	2
–		8	9
	3	3	7

Is she correct?
Explain why.

7b. Use the column method to find the missing values.

290 ⇨ 25 less ⇨ 29 less ⇨ A
B ⇨ 84 more ⇨ plus 69 ⇨ 199
628 ⇨ minus 64 ⇨ 48 less ⇨ C

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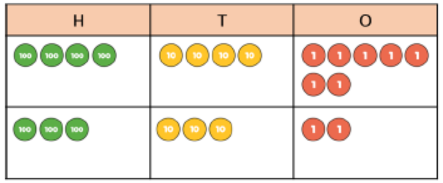
Add two 3 digit numbers – crossing 10/100

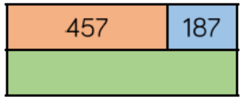
(starting with no exchange and moving onto exchange)

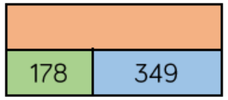
Complete the calculations.

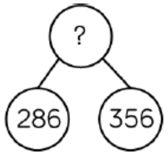


___ + ___ = ___

Complete the models.







Jack is calculating 506 + 243

Here is his working out.

		5	6
+	2	4	3
	2	9	9

Can you spot Jack's mistake?
Work out the correct answer.

Complete the statements to make them correct.

487 + 368 ○ 487 + 468

326 + 258 ○ 325 + 259

391 + 600 = 401 + ___

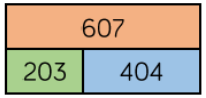
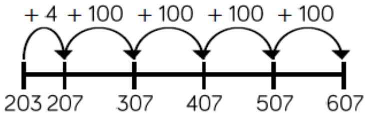
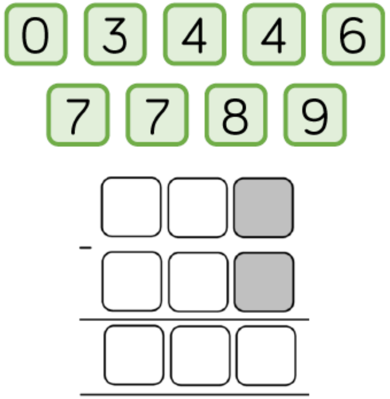
Explain why you do not have to work out the answers to compare them.

Roll a 1 to 6 die.
Fill in a box each time you roll.

☐☐☐ + ☐☐☐ =

Can you make the total:

- An odd number
- An even number
- A multiple of 5
- The greatest possible number
- The smallest possible number

Subtract a 3 digit number from a 3 digit number – no exchange	Explore efficient strategies for subtraction e.g.; number bonds, counting on (number lines), near subtraction. We can count on using a number line to find the missing value on the bar model. E.g.  	Miss calculation when counting on. Place value error. Children to spot this mistake and explain the mistake that has taken place.	Use the digit cards to complete the calculation.  The digits in the shaded boxes are odd. Is there more than one answer?	

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Subtract a 3 digit number from a 3 digit number – exchange

Complete the column subtractions showing any exchanges.

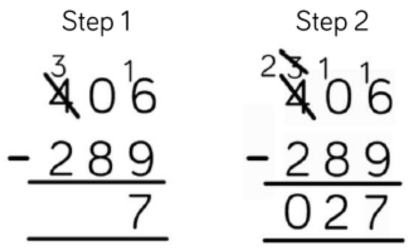
	H	T	O
	6	8	3
–	2	3	4

	H	T	O
	2	3	4
–	1	9	5

	H	T	O
	5	0	7
–	4	5	1

Eva is working out 406 – 289

Here is her working out:



Explain her mistake.

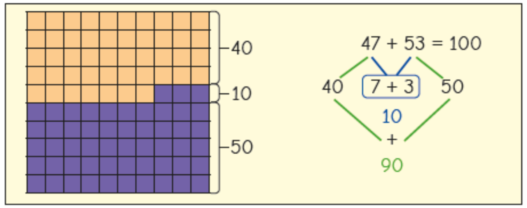
What should the answer be?

Work out the missing digits.

	H	T	O
	5	?	3
–	2	1	8
	3	1	5

Complements to 100

Dexter uses a hundred square to show that 47 + 53 = 100



Use Dexter's method to show that the total of each addition is 100

32 + 68 | 19 + 81 | 76 + 24

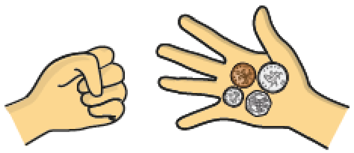
Sort the additions into the table.

32 + 78 | 83 + 17 | 55 + 55 | 49 + 16
66 + 34 | 91 + 19 | 52 + 47 | 7 + 93

Bond to 100	Not a bond to 100

Explain your thinking to a partner.

Annie has £1 in total in her hands.



What coins could be in Annie's closed hand?

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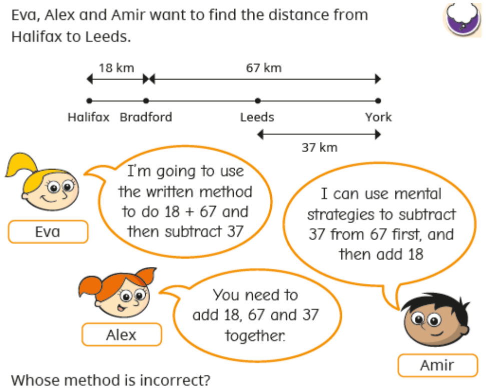
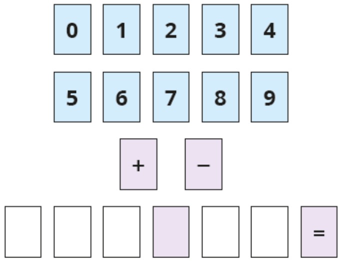
Estimate answers to calculations	Match each number to it's 'near number'. 497 304 52 27 30 500 50 300	Tommy I estimate 143 – 95 will be 50 because I will subtract 100 from 150 Is this a good estimate? Why? Are there any other ways he could have estimated?	Use the number cards to make different calculations with an estimated answer of 70 121 33 48 41 398 328 255	
Check answers. (inverse operations)	Use a subtraction to check the answer to the addition. 134 + 45 = 179		I completed an addition and then used the inverse to check my calculation. When I checked my calculation, the answer was 250. One of the other numbers was 355. What could the calculation be? ___ + ___ = ___ ___ – ___ = 250	

Make decisions	A machine packs 86 boxes on Saturday. Another 57 boxes are packed on Sunday. How many boxes are packed altogether? Draw a bar model to match the problem.	Eva, Alex and Amir want to find the distance from Halifax to Leeds.  Whose method is incorrect? Explain why they are incorrect.	 Use the cards to create additions and subtractions that give an answer between 200 and 300	

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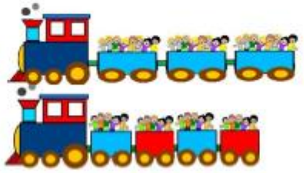
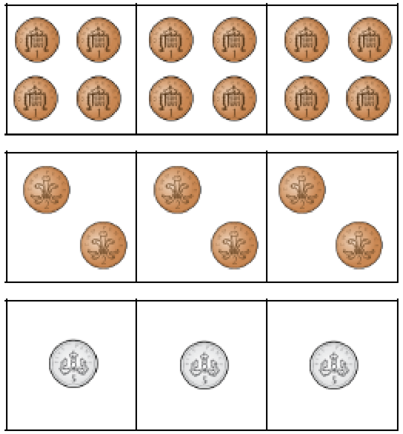
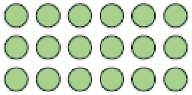
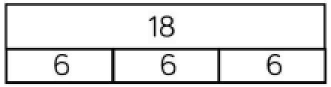
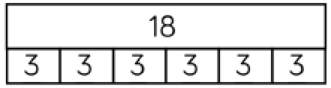
Year 3

Number: Multiplication and Division

Objective	Skill it	Apply it	Deepen it	Mathematical talk
Multiplication – equal groups	Describe the equal groups.  ___ equal groups of ___ ___ equal groups of ___	Which row of money is the odd one out?  Explain why.	8b. Sort the contents of the cooler into equal groups.  Find three ways.	Odd, even, count in twos, threes, fives, fours, eights count in tens (forwards from/ backwards from), how many times, lots of, groups, once, twice, three ties, five times, multiple of, multiply, multiply by, repeated addition, array, row, column, double, halve, share, share equally, group in pairs, threes etc., equal groups of, divide, divided by, left, left over, describe the rule,
Use arrays				
Multiples of 2				
Multiples of 5 and 10				
Sharing and grouping				

Multiply by 3	There are five towers with 3 cubes in each tower. How many cubes are there altogether? ___ + ___ + ___ + ___ + ___ = ___ ___ × ___ = ___ 	If 5 × 3 = 15, which number sentences would find the answer to 6 × 3? - 5 × 3 + 6 - 5 × 3 + 3 - 15 + 3 - 15 + 6 - 3 × 6 Explain how you know.	There are 8 children. Each child has 3 sweets. How many sweets altogether? Use concrete or pictorial representations to show this problem. Write another repeated addition and multiplication problem and ask a friend to represent it.	equal, unequal, why are we using the addition symbol? Multiplication, lots of, arrays, commutative, times tables, how many do you have to begin with? Division, what is the same/different about the groups? What do you notice about the pattern? Comparing, inequality symbols, column multiplication, exchange, how do we record the exchange? How can we partition our number? Remainder,
Divide by 3	Circle the counters in groups of 3 and complete the division.  ___ ÷ 3 = ___	Jack has 18 seeds. He plants 3 seeds in each pot. Which bar model matches the problem? A  B  Explain your choice.	**8b. Choose the digit cards that will complete this number sentence by finding the possibilities for '?'.** **3 ? ? 9 8** **☐ ÷ 3 = ☐** **Use facts up to 12 x 3 to help.**	

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3 times tables	Complete the number sentences.  1 triangle has 3 sides. 1 × 3 = 3 3 triangles have ___ sides in total. 3 × ___ = ___ ___ triangles have 6 sides in total. ___ × ___ = 6 5 triangles have ___ sides in total. ___ × ___ = ___	Start this rhythm: *Clap, clap, click, clap, clap, click.* Carry on the rhythm, what will you do on the 15th beat? How do you know? What will you be doing on the 20th beat? Explain your answer.	Sort the cards below so they follow round in a loop. Start at 18 – 3 Calculate the answer to this calculation. The next card needs to be begin with this answer. 18 – 3 | 21 ÷ 3 | 15 ÷ 3 | 8 – 5 5 × 2 | 10 × 2 | 20 + 1 | 4 × 2 14 – 2 | 12 ÷ 3 | 3 × 6 | 7 × 2	scaling, times as many, systematically, possibilities,

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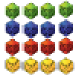
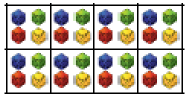
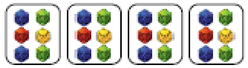
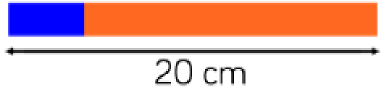
Multiply by 4	Match the multiplication to the representation. 4 × 4 4 × 6 8 × 4   	Here is a blue strip of paper.  An orange strip is four times as long.  The strips are joined end to end.  How long is the blue strip? How long is the orange strip? Explain how you know.	Tommy has four bags with five sweets in each bag. Annie has six bags with four sweets in each bag. Who has more sweets? How many more sweets do they have? Draw a picture to show this problem. Children can then move on to making their own problem for a peer to solve.	

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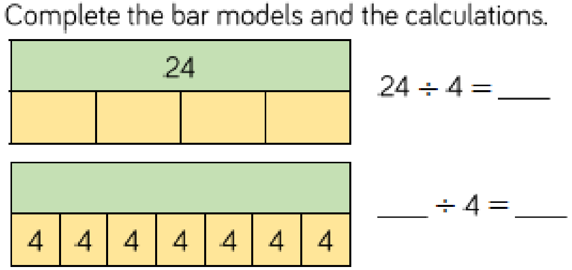
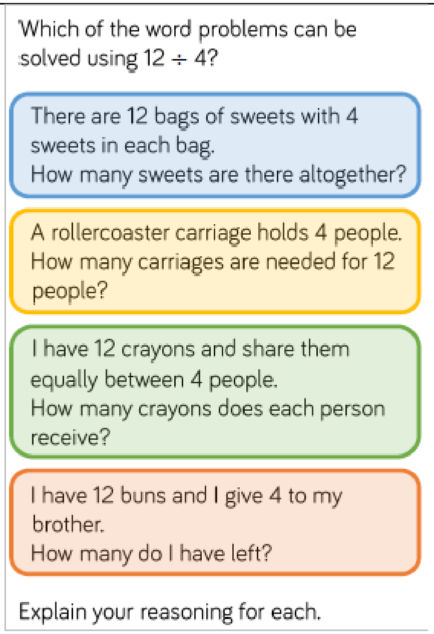
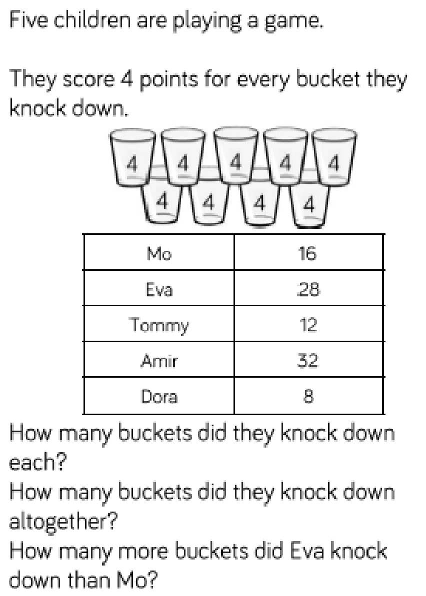
<table>
<tr>
<td>Divide by 4</td>
<td>Complete the bar models and the calculations.

24 ÷ 4 = ___
___ ÷ 4 = ___</td>
<td>Which of the word problems can be solved using 12 ÷ 4?
There are 12 bags of sweets with 4 sweets in each bag.
How many sweets are there altogether?
A rollercoaster carriage holds 4 people.
How many carriages are needed for 12 people?
I have 12 crayons and share them equally between 4 people.
How many crayons does each person receive?
I have 12 buns and I give 4 to my brother.
How many do I have left?
Explain your reasoning for each.</td>
<td>Five children are playing a game.
They score 4 points for every bucket they knock down.
<table>
<tr><td>Mo</td><td>16</td></tr>
<tr><td>Eva</td><td>28</td></tr>
<tr><td>Tommy</td><td>12</td></tr>
<tr><td>Amir</td><td>32</td></tr>
<tr><td>Dora</td><td>8</td></tr>
</table>
How many buckets did they knock down each?
How many buckets did they knock down altogether?
How many more buckets did Eva knock down than Mo?
Children to create their own version of the game to then play and find ways of extending this further independently.</td>
<td></td>
</tr>
</table>

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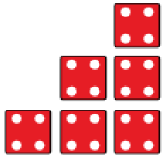
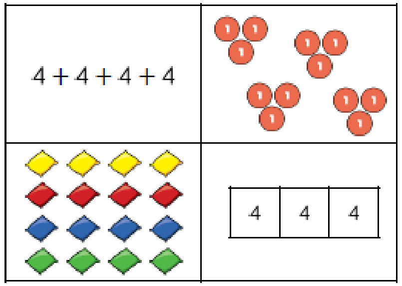
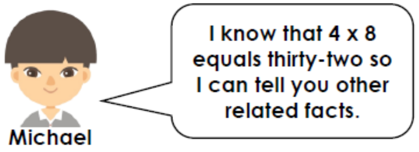
4 times tables	Use the pictorial representations to complete the calculations. 1 × 4 = ___ 2 × 4 = ___ 3 × 4 = ___  Continue the pattern.	Which part below does not show counting in fours?  Explain why.	**8b. Michael says,**  **What other facts might Michael know? List three other facts.**	

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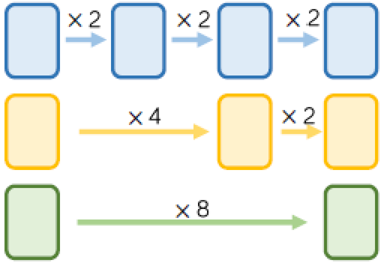
Multiply by 8	Use knowledge of multiplying by 4 to support this learning.  How many legs altogether do four spiders have? There are ___ legs on each spider. ___ + ___ + ___ + ___ = ___ ___ × 8 = ___ If there are ___ spiders, there will be ___ legs altogether.	Start each function machine with the same number.  What do you notice about each final answer? Tommy knows the 4 times table table, but is still learning the 8 times table table. Which colour row should he use? Why?	**9b. Using the digit cards, complete the number sentences below.** ☐ x 1 = ☐ x ☐ = ☐ x 2 = 48 24 48 8 6	

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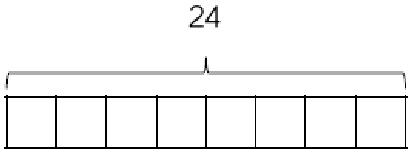
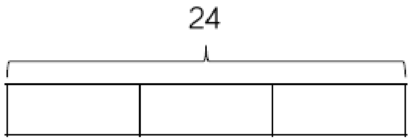
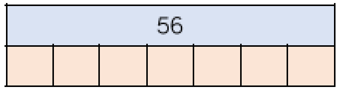
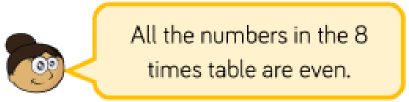
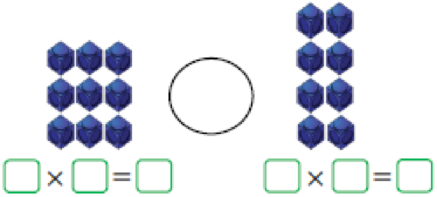
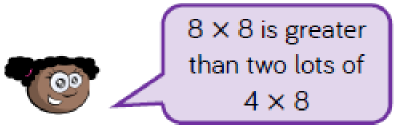
Divide by 8	Crayons are sold in packs of 8. Year 3 need 48 crayons. How many packs should be ordered? They should order ____ packs of crayons.  	Amir shares 24 sweets equally between 8 friends. How many do they get each? Which bar model would you use to represent this problem? Why?   	**9b. Lily is thinking of a number that is greater than twenty but less than fifty.**  **My number is divisible by 8 and 4.** **It has a digit sum of 6.** **Both digits are less than 6.** **What could Lily's number be?**	

<table>
<tr><td>8 times tables.</td><td>Complete the bar model.


Complete the table.
<table><tr><td>×</td><td>2</td><td>4</td><td>8</td></tr><tr><td>3</td><td>6</td><td></td><td></td></tr><tr><td></td><td>10</td><td>20</td><td></td></tr><tr><td></td><td></td><td></td><td>72</td></tr></table>
Can you spot a pattern in the numbers?</td><td>

Explain why</td><td>Rosie has some packs of cola which are in a box.
Some packs have 4 cans in them, and some packs have 8 cans in them.


Rosie's box contains 64 cans of pop.
How many packs of 4 cans and how many packs of 8 cans could there be?
Find all the possibilities.</td><td></td></tr>
<tr><td>The 2, 4 and 8 times-tables</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Comparing statements</td><td>Use <, > or = to compare.

☐ × ☐ = ☐ ☐ × ☐ = ☐
8 × 3 ○ 7 × 4 36 ÷ 6 ○ 36 ÷ 4</td><td>Whitney says,


Do you agree?
Can you prove your answer?</td><td>Can you find three different ways to complete each number sentence?
___ × 3 + ___ × 3 < ___ ÷ 3
___ ÷ 4 < ___ × 4 < ___ × 4
___ × 8 > ___ ÷ 8 > ___ × 8</td><td></td></tr>
<tr><td>Multiples of 10</td><td></td><td></td><td></td><td></td></tr>
</table>

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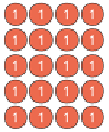
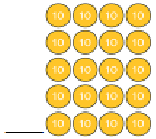
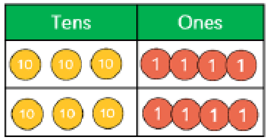
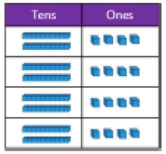
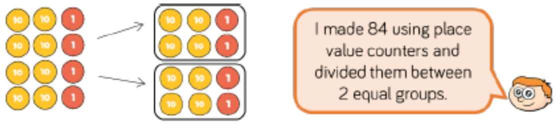
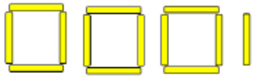
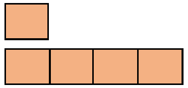
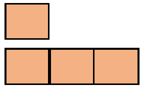
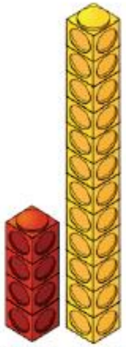
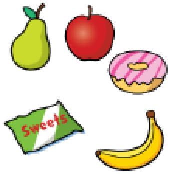
<table>
<tr>
<td>Related calculations</td>
<td>Complete the multiplication facts.

___ × ___ = ___ ___ × ___ = ___</td>
<td>
I know that when multiplying 3 by 40, 40 is ten times bigger than 4, so my answer will be ten times bigger than 3 × 4
Is Mo correct?
Explain your answer.</td>
<td>8b. Here are some digit cards.<table><tr><td>3</td><td>?</td><td>2</td><td>600</td></tr><tr><td>?</td><td>?</td><td>30</td><td>?</td></tr></table>1 card is the two 1-digit numbers multiplied together.
2 cards are the 1-digit numbers multiplied by 10.
1 card is one of the 1-digit numbers multiplied by 100.
Create five different multiplication or division calculations.</td>
<td></td>
</tr>
<tr>
<td>Reasoning about multiplication.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiply 2 digits by 1 digit – no exchange.</td>
<td>Annie uses place value counters to work out 34 × 2
<table><tr><td></td><td>T</td><td>O</td></tr><tr><td></td><td>3</td><td>4</td></tr><tr><td>×</td><td></td><td>2</td></tr><tr><td></td><td>6</td><td>8</td></tr></table>Use Annie's method to solve:
23 × 3
32 × 3
42 × 2

Jack uses Base 10 to calculate 24 × 4
<table><tr><td></td><td>T</td><td>O</td></tr><tr><td></td><td>2</td><td>4</td></tr><tr><td>×</td><td></td><td>4</td></tr><tr><td></td><td>9</td><td>6</td></tr><tr><td></td><td>1</td><td></td></tr></table>Use Jack's method to solve:
13 × 4
23 × 4
26 × 3</td>
<td>Teddy completes the same calculation as Alex.
Can you spot and explain his mistake?<table><tr><td></td><td>T</td><td>O</td></tr><tr><td></td><td>4</td><td>3</td></tr><tr><td>×</td><td></td><td>2</td></tr><tr><td>8</td><td>0</td><td>6</td></tr></table></td>
<td>9b. Create and solve a calculation using all the digit cards below.<table><tr><td></td><td>T</td><td>O</td></tr><tr><td></td><td>☐</td><td>☐</td></tr><tr><td>x</td><td></td><td>☐</td></tr><tr><td></td><td>☐</td><td>☐</td></tr></table>4 2 1 8 4</td>
<td></td>
</tr>
<tr>
<td>Multiply a 2 digit number by a 1 digit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</table>

number – with exchange.				
Link multiplication and division.				
Divide 2 digits by 1 digit – flexible partitioning	Ron uses place value counters to solve 84 ÷ 2  Use Ron's method to calculate: 84 ÷ 4 66 ÷ 2 66 ÷ 3	Teddy answers the question 44 ÷ 4 using place value counters.  Is he correct? Explain your reasoning.	**9a. Solve the problem below.** **Violet is thinking of a number.** **I subtract 5 from my number and then divide it by 4. The answer is twenty-one.** **What is Violet's number?**	
Divide a 2 – digit number by a 1 – digit number – no exchange.				
Divide 2 digit by 1 digit – remainders.	How many squares can you make with 13 lollipop sticks? There are ___ lollipop sticks. There are ___ groups of 4 There is ___ lollipop stick remaining. 13 ÷ 4 = ___ remainder ___  Use this method to see how many triangles you can make with 38 lollipop sticks.	Which calculation is the odd one out? Explain your thinking. 64 ÷ 8 77 ÷ 4 49 ÷ 6 65 ÷ 3	Jack has 15 stickers.  He sorts his stickers into equal groups but has some stickers remaining. How many stickers could be in each group and how many stickers would be remaining?	

			The children can then demonstrate how to solve this in another way.	
Scaling	In a playground there are 3 times as many girls as boys.   Which bar model represents the number of boys and girls? Explain your choice. Eva has these counters  Amir has 4 times as many counters. How many counters does Amir have?	Dora says Mo's tower is 3 times taller than her tower. Mo says his tower is 12 times taller than Dora's tower. Who do you agree with? Explain why? 	**7b. Complete the digit cards so that you can find 3 different possibilities.** 3 ? 4 ? 24 12 ☐ **is** ☐ **times bigger than** ☐	

<table>
<tr>
<td>How many ways? Systematically list possible combinations from two groups of objects.</td>
<td>Jack has 3 T-shirts and 4 pairs of trousers. Complete the table to show how many different outfits he can make.

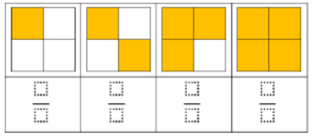
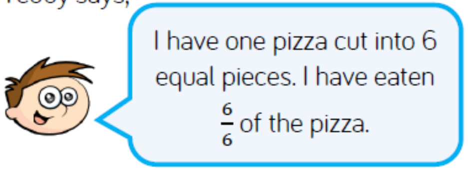
<table><tr><th>T-shirt</th><th>Trousers</th></tr><tr><td>Blue</td><td>Blue</td></tr><tr><td>Blue</td><td>Dark blue</td></tr><tr><td>Blue</td><td>Orange</td></tr><tr><td>Blue</td><td>Green</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td>
<td>5b. Ruzayynah says she can have 12 different combinations from the menu.
<table><tr><th>Drink</th><th>Snack</th></tr><tr><td>Coke</td><td>Crisps</td></tr><tr><td>Juice</td><td>Chocolate</td></tr><tr><td>Lemonade</td><td>Fruit</td></tr></table>
Is she correct? Prove it.</td>
<td>Eva chooses a snack and a drink.


What could she have chosen?
How many different possibilities are there?
____ × ____ = ____
There are ____ possibilities.
How many of the ways contain an apple?</td>
<td></td>
<td></td>
</tr>
</table>

Year 3

Number: Fractions

Objective	Skill it	Apply it	Deepen it	Mathematical talk
What is a fraction?				Whole, equal parts, four equal parts, one half, two halves, a quarter, two
Understand the denominators				

of unit fractions.				quarters, fraction, three quarters, one third, a third, equivalence, equivalent, unequal, are the parts equal? How do you know? Splitting a whole into two equal parts, $\frac{1}{2}$, $\frac{1}{3}$, what does the 1 represent, what does the 3 represent. How many thirds make a whole? $\frac{1}{4}$, unit fraction, non-unit fraction, numerators, denominators, $\frac{3}{4}$, tenths, decimals, is a fraction always less than
Compare and order unit fractions.				
Understand the numerators of non-unit fractions.				
Compare and order non-unit fractions.				
Understand the whole.	Complete the missing information.  1 whole is the same as $\frac{\square}{\square}$	Teddy says,  I have one pizza cut into 6 equal pieces. I have eaten $\frac{6}{6}$ of the pizza. Does Teddy have any pizza left? Explain your answer.	**7b. Jay, Mia and Salik are sharing strawberries.** **Together they have eaten $\frac{8}{8}$ of the strawberries.** **How many strawberries could Jay, Mia and Salik have each eaten?** **Show six combinations.**	

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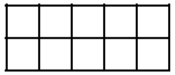
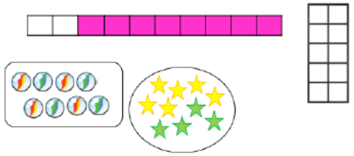
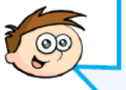
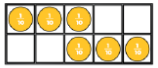
Tenths	If the frame represents 1 whole, what does each box represent? Use counters to represent: - One tenth - Two tenths - Three tenths - One tenth less than eight tenths 	Odd One Out  Which is the odd one out? Explain your answer.	**8a. Joanne is thinking of a tenth.** **My numerator is an even number.** **My fraction is a non-unit fraction.** **The numerator is a multiple of two.** **What could Joanne's fraction be?** **Write three possibilities in words.**	one? How many tenths make a whole? What is a tenth? Can you see a pattern between the fractions? How can we use our times tables to help us find equivalent fractions? Compare, order, addition and subtraction of fractions,
Count in tenths	Children to also explore what happens when counting beyond $\frac{10}{10}$ The counting stick is worth 1 whole. Label each part of the counting stick. Can you count forwards and backwards along the counting stick? 	Teddy is counting in tenths.  Seven tenths, eight tenths, nine tenths, ten tenths, one eleventh, two elevenths, three elevenths… Can you spot his mistake?	**7b. Use the clues given to find the missing fraction.** **I count backwards ten tenths.** **I count forwards seven tenths** **My answer is $1\frac{2}{10}$.** **What fraction did I start with?**	

Tenths as decimals

Complete the table.

Image	Words	Fraction	Decimal
	One tenth	$\frac{1}{10}$	0.1
			
	Nine tenths		

Here is a decimal written in a place value grid.

Ones	Tenths
0	8

Can you represent this decimal pictorially?
Can you write the decimal as a fraction?

True or False?

Dora

10 cm is one tenth of 1 metre

10 cm is 0.1 metres.

Amir

Explain your answer.

**9b. Order these numbers from smallest to largest.
Record your answers as decimals.**

$\frac{7}{10}$	two tenths	$\frac{4}{10}$	eight tenths

Smallest **Largest**

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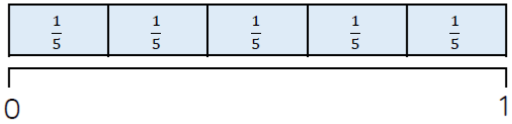
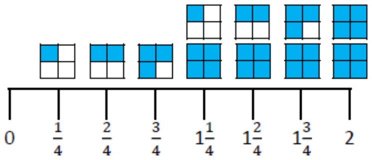
Fractions on a number line.	Show $\frac{1}{5}$ on the number line. Use the bar model to help you.  	Eva has drawn a number line.  Tommy says it is incorrect. Do you agree with Tommy? Explain why.	**8b. Zara walks home from the park.** **She stops to buy an ice-cream when she is $\frac{3}{9}$ of the way there. At $\frac{6}{9}$ of the way home, she stops to have a drink. At $\frac{8}{9}$ of the way there, she waves to her friend.**  **Show Zara's journey on the blank number line.**	
Count in fractions on a number line				

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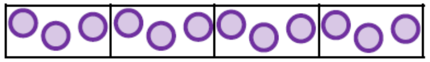
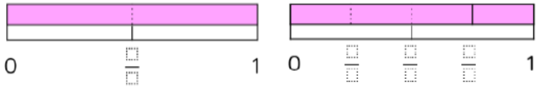
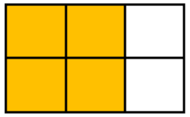
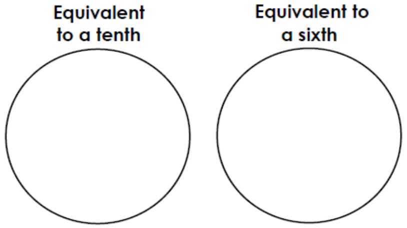
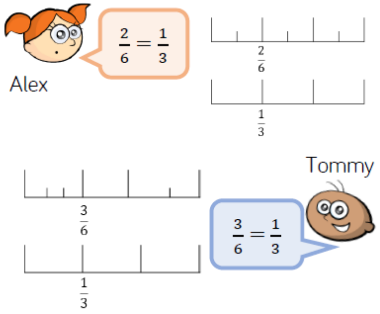
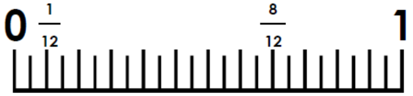
Fractions of a set of objects	Children start by finding a unit fraction of a set of objects before finding a non-unit fraction of a set of objects. Find $\frac{1}{5}$ of Eva's marbles.  I have divided the marbles into ☐ equal groups. There are ☐ marbles in each group. $\frac{1}{5}$ of Eva's marbles is ☐ marbles. Dexter has used a bar model and counters to find $\frac{3}{4}$ of 12  Use Dexter's method to calculate: $\frac{5}{6}$ of 12 $\frac{2}{3}$ of 12 $\frac{2}{3}$ of 18 $\frac{7}{9}$ of 18	**4b. Humza thinks he has found $\frac{1}{8}$ of 64 using place value counters.**  **Is Humza correct? Convince me.** **6b. Lucy and Joseph are calculating fractions of an amount.** **Out of 27 ice creams, two thirds are sold. How many are left?**  **Lucy**: There will be 9 left.  **Joseph**: There will be 18 left. **Who is correct? Explain how you know.**	Whitney has 12 chocolates.  On Friday, she ate $\frac{1}{4}$ of her chocolates and gave one to her mum. On Saturday, she ate $\frac{1}{2}$ of her remaining chocolates, and gave one to her brother. On Sunday, she ate $\frac{1}{3}$ of her remaining chocolates. How many chocolates does Whitney have left? **8b. Natalia has 66 dinosaur toys.**  **She gives $\frac{6}{11}$ to her brother and $\frac{2}{6}$ to her sister.** **How many does she have left?**	

Equivalent fractions through diagrams e.g. bar models.	The pink Cuisenaire rod is worth 1 whole.  Which rod would be worth $\frac{1}{4}$? Which rods would be worth $\frac{2}{4}$? Which rod would be worth $\frac{1}{2}$? Use Cuisenaire to find rods to investigate other equivalent fractions. Use the models on the number line to identify the missing fractions. Which fractions are equivalent?  	Explain how the diagram shows both $\frac{2}{3}$ and $\frac{4}{6}$ 	**8b. Sort the fractions into the correct circle. Are there any fractions that don't fit in the circles?**  **$\frac{5}{10}$ $\frac{3}{30}$ $\frac{5}{30}$ $\frac{5}{50}$ $\frac{6}{36}$ $\frac{3}{12}$**	
Equivalent fractions on a number line.		Alex and Tommy are using number lines to explore equivalent fractions.  Who do you agree with? Explain why.	**8b.**  **Howie** **I have to find equivalent fractions for the fractions on my number line, but each one has to have a different denominator.**  **Solve Howie's problem by finding equivalent fractions.**	

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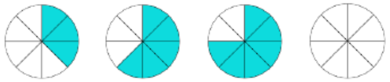
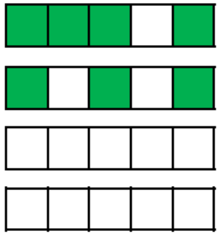
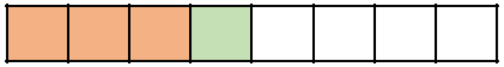
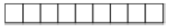
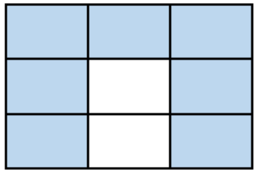
Compare fractions	Use paper strips to compare the fractions using >, < or = $\frac{3}{4}$ ○ $\frac{1}{4}$ $\frac{1}{6}$ ○ $\frac{5}{6}$ $\frac{3}{8}$ ○ $\frac{5}{8}$ When the denominators are the same, the ______ the numerator, the _______ the fraction.	 I know that $\frac{1}{3}$ is larger than $\frac{1}{2}$ because 3 is larger than 2 Do you agree with Dora? Explain how you know.	Complete the missing denominator. How many different options can you find? $\frac{1}{2} > \frac{\boxed{1}}{\boxed{}} > \frac{1}{10}$	
Order fractions	Order the fractions in descending order. $\frac{3}{8}$ $\frac{5}{8}$ $\frac{1}{8}$ $\frac{8}{8}$ $\frac{7}{8}$	 When the denominators are the same, the larger the numerator, the smaller the fraction. Is Jack correct? Prove it.	Shade the blank diagrams so the fractions are ordered correctly. Fractions in ascending order  Fractions in descending order  Create your own diagrams for a friend to solve.	

Add fractions	 We can use this model to calculate $\frac{3}{8}+\frac{1}{8}=\frac{4}{8}$ Draw your own models to calculate $\frac{1}{5}+\frac{2}{5}=\frac{\square}{5}$ $\frac{2}{7}+\frac{3}{7}+\frac{1}{7}=\frac{\square}{\square}$ $\frac{7}{10}+\frac{\square}{\square}=\frac{9}{10}$	Rosie and Whitney are solving: $\frac{4}{7}+\frac{2}{7}$ Rosie says,  The answer is $\frac{6}{7}$ Whitney says,  The answer is $\frac{6}{14}$ Who do you agree with? Explain why.	Mo and Teddy share these chocolates.  They both eat an odd number of chocolates. Complete this number sentence to show what fraction of the chocolates they each could have eaten. $\frac{\square}{\square}+\frac{\square}{\square}=\frac{12}{12}$	
Subtract fractions	Use the models to help you subtract the fractions.  $\frac{5}{7}-\frac{\square}{7}=\frac{\square}{7}$  $\frac{4}{8}-\frac{\square}{8}=\frac{\square}{8}$  $\frac{\square}{9}-\frac{\square}{9}=\frac{4}{9}$	Jack and Annie are solving $\frac{4}{5}-\frac{2}{5}$ Jack's method:  Annie's method:  They both say the answer is two fifths. Can you explain how they have found their answers?	How many fraction addition and subtractions can you make from this model? 	
Fractions and scales.				

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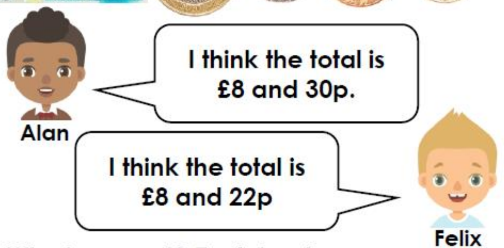
Year 3				
Measurement: Money				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**
Pounds and pence	Match the amounts that are equal. Fifteen pounds Fifteen pence Fifty pounds Fifty pence    	**6b. Alan and Felix are finding the total of the notes and coins below.**   **Who is correct? Explain why.**	Amir has 5 different coins in his wallet.  What is the greatest amount of money he could have in his wallet? What is the least amount of money?	Coins, notes, pounds, pennies, £, P, money, count, pence, change, convert, greater than, less than, compare, what is the value of the coin/note? How many pennies are there in £1, do the notes have greater value than coins? How do you know you have made ….. amount?
Convert pounds and pence	Write the amounts in pounds and pence. 	Whitney thinks that she has £10 and 3p. Is she correct?  Explain your answer.	Dexter has 202 pence. He has **one** pound coin. Show five possible combinations of other coins he may have.	

Add money (use pictorial representations to help)	What calculation does the bar model show? Find the total amount of money. 		Rosie has £5 Has she got enough money to buy a car and two apples?  £3 and 35p  £2 and 55p  85p  75p What combinations of items could Rosie buy with £5?	

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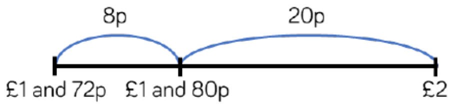
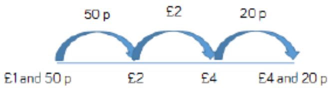
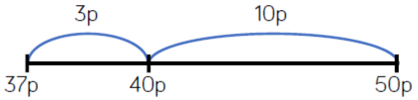
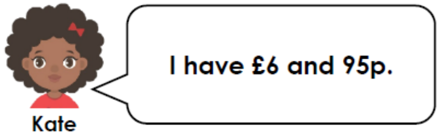
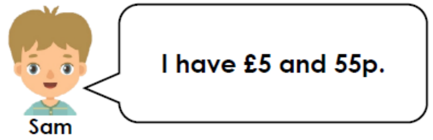
Subtract money	Tommy has £1 and 72p. Rosie has £2 How much more money does Rosie have than Tommy?  Rosie has ____ p more than Tommy.	Three children are calculating £4 and 20p subtract £1 and 50p. £4 – £1 = £2 20p – 50p = 30p £1 + 30p = £1 and 30p  Annie  Teddy  The difference is £2 and 70p. £4 and 20p – £2 = £2 and 20p £2 and 20p + 50p = £2 and 70p  Eva Who is correct? Who is incorrect? Which method do you prefer?	**9b. Complete the subtraction using the cards below so that the answer is greater than 634p but less than £8 and 42p.**  £☐☐ and ☐8 p – £6 and ☐☐p = ☐9☐ p	

Give Change	Mo buys a chocolate bar for 37p. He pays with a 50p coin. How much change will he receive?  Mo will receive ____ p change.	**4b. Kate and Sam have saved some money.**   **How much more money does Kate have than Sam? Explain how you know.**	Dora spends £7 and 76p on a birthday cake.  She pays with a £10 note. How much change does she get? The shopkeeper gives her six coins for her change. What coins could they be?	

Year 3

Measurement: Length and perimeter

Objective	Skill it	Apply it	Deepen it	Mathematical talk

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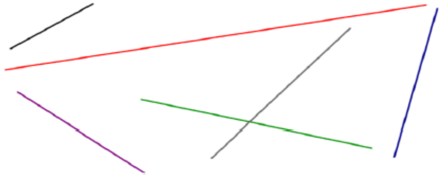
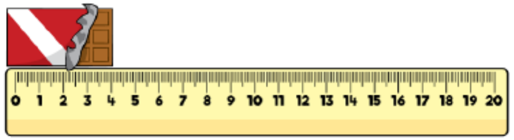
Measure in metres and centimetres.	Measure the lines to the nearest centimetre. Can you measure the lines in millimetres? 	Tommy thinks that this chocolate bar is 4 cm long. Is he correct?  Convince me.	**7b. This man is 1m and 76cm tall.** **Find 3 objects in your classroom that are shorter than the man.**  **Write the measurements of the objects carefully in m and the closest 1cm.**	Height, length, compare, measure, long, short, longer, taller, shorter, narrow, wide, centimetre, metre, kilometre, millimetre, nearest cm, measuring from 0, how long is? How tall is? Orientation, when would we measure in metres? When would we measure in cm? estimating prior to
Measure in mm				
Measure in cm and mm				
Metres, centimetres and millimetres.				

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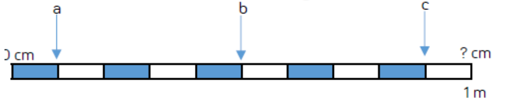
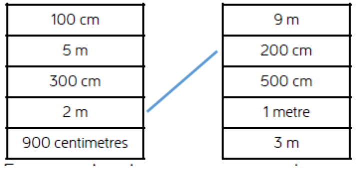
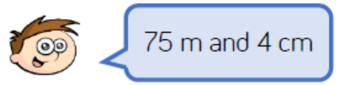
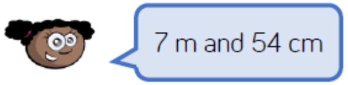
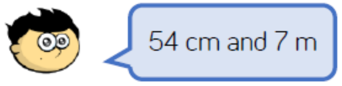
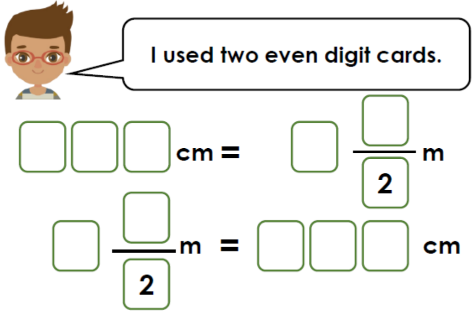
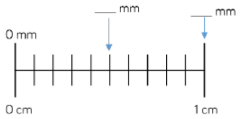
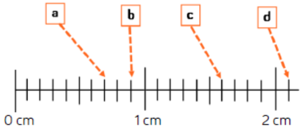
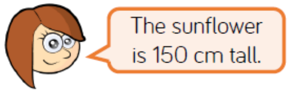
Equivalent lengths m and cm	If a = 10 cm, calculate the missing measurements.  b = ___ cm c = ___ cm 1 metre = ___ cm Can you match the equivalent measurements? 	Three children are partitioning 754 cm Teddy says,  Whitney says,  Jack says,  Who is correct? Explain why.	**9a. Stanley has used digit cards to make two pairs of equivalent lengths.**  **Which digit cards could he have used?**	measuring, perimeter, 100cm=1m 10mm=1cm Convert, what is perimeter?
Equivalent lengths mm and cm	Fill in the blanks.  There are ___ mm in 1 cm.  a = ___ cm ___ mm b = ___ cm ___ mm c = ___ cm ___ mm d = ___ cm ___ mm	Rosie is measuring a sunflower using a 30 cm ruler. Rosie says,  Rosie is incorrect. Explain what mistake she might have made. How tall is the sunflower?	**9b. Find the odd one out.** **A.**  **23 $\frac{1}{2}$ cm** **B.**  **204mm** **C.** **23m 5mm**  **D.** **235mm**  **Write 2 equivalent lengths for the odd one out.** *Not to scale*	

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Compare lengths

Complete the sentences.

Child	Height
Rosie	109 cm
Amir	1 m 5 cm
Jack	135 cm
Dora	1 m 45 mm

Rosie is ________ than Jack.

Jack is _______ than Dora.

Amir is ______ than Rosie.

Dora is _____ than Amir.

Always, Sometimes, Never?

mm lengths are smaller than cm lengths.

Sort the lengths into the table.

Longer than a metre	Shorter than a metre

1 m 65 cm

165 mm

165 m

165 cm

16 cm 5 mm

1 cm 65 mm

Are any of the lengths equivalent?

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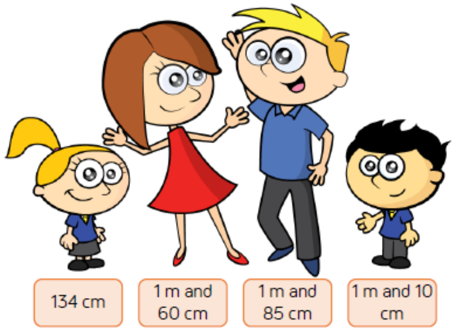
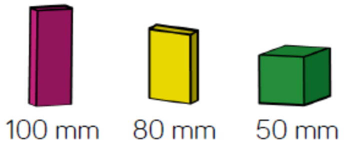
Add lengths	Ron builds a tower that is 14 cm tall. Jack builds a tower than is 27 cm tall. Ron puts his tower on top of Jack's tower. How tall is the tower altogether?	Eva and her brother Jack measured the height of their family.  Eva thinks their total height is 4 m and 55 cm Jack thinks their total height is 5 m and 89 cm Who is correct? Prove it.	Eva is building a tower using these blocks.  How many different ways can she build a tower measuring 56 cm? Can you write your calculations in mm and cm?	

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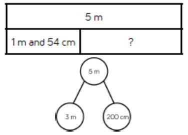
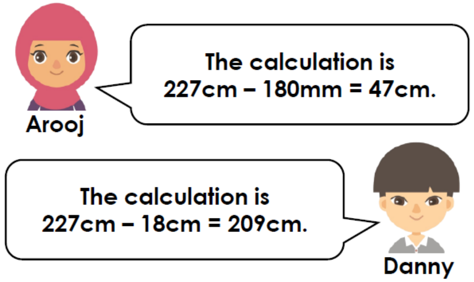
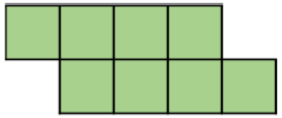
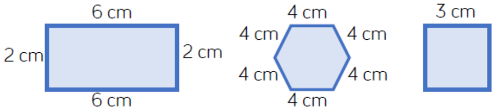
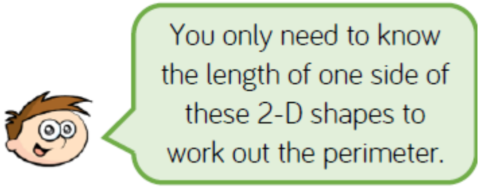
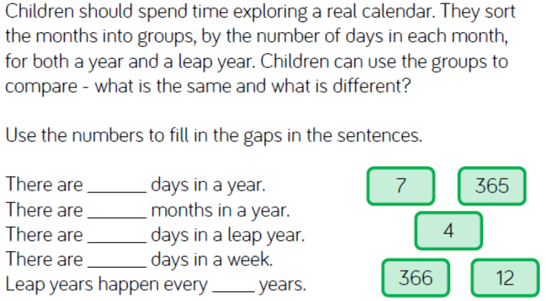
Subtract lengths	Alex has 5 m of rope. She uses 1 m and 54 cm to make a skipping rope. She works out how much rope she has left using two different models.  5 m – 1 m = 4 m 4 m – 54 cm = 3 m 46 cm 200 cm – 154 cm = 46 cm 3 m + 46 cm = 3 m 46 cm	**6a. Arooj and Danny are discussing how to subtract 180mm from 227cm.**  **Who do you agree with? Explain why.**	Annie has a 3 m roll of ribbon.  She is cutting it up into 10 cm lengths. How many lengths can she cut? Annie gives 240 cm of ribbon to Rosie. How much ribbon does she have left? How many 10 cm lengths does she have left?	
What is perimeter?				
Measure perimeter	Using your finger, show me the perimeter of your table, your book, your whiteboard etc. Tick the images where you can find the perimeter.  Explain why you can't find the perimeter of some of the images.	Whitney is measuring the perimeter of a square. She says she only needs to measure one side of the square. Do you agree? Explain your answer.	Here is a shape made from centimetre squares. Find the perimeter of the shape.  Can you use 8 centimetre squares to make different shapes? Find the perimeter of each one.	

Calculate perimeter	Calculate the perimeter of the shapes.  Can you find more than one way to calculate the perimeter?	Teddy says,  You only need to know the length of one side of these 2-D shapes to work out the perimeter.  Do you agree with Teddy? Explain your answer.	How many different rectangles can you draw with a perimeter of 20cm?	

Year 3				
Measurement: Time				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**

Months and years

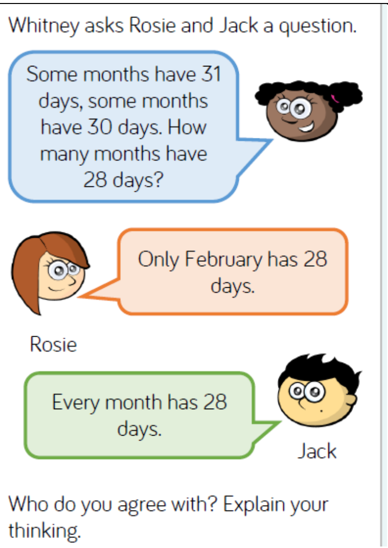


Children should spend time exploring a real calendar. They sort the months into groups, by the number of days in each month, for both a year and a leap year. Children can use the groups to compare - what is the same and what is different?

Use the numbers to fill in the gaps in the sentences.

There are ______ days in a year.
There are ______ months in a year.
There are ______ days in a leap year.
There are ______ days in a week.
Leap years happen every _____ years.

7 365 4 366 12



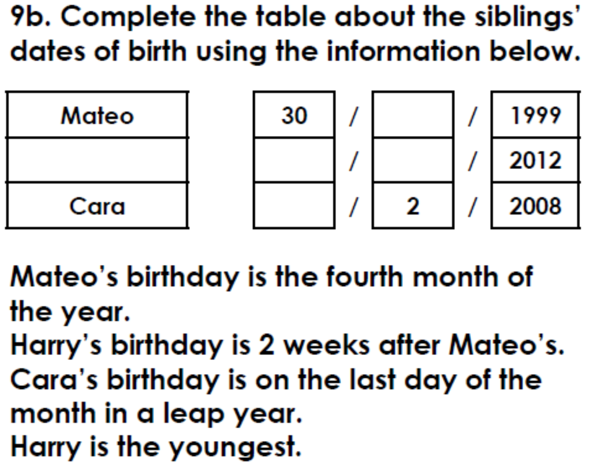
Whitney asks Rosie and Jack a question.

Some months have 31 days, some months have 30 days. How many months have 28 days?

Rosie: Only February has 28 days.

Jack: Every month has 28 days.

Who do you agree with? Explain your thinking.

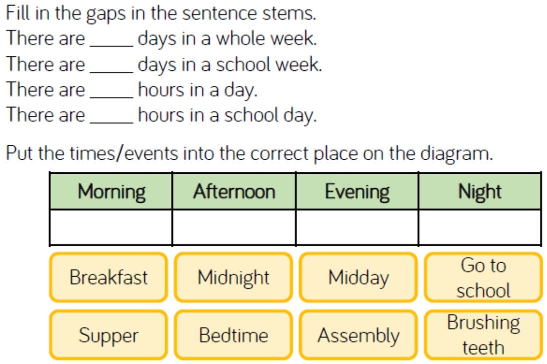


9b. Complete the table about the siblings' dates of birth using the information below.

Mateo	30	/		/	1999
		/		/	2012
Cara		/	2	/	2008

Mateo's birthday is the fourth month of the year.
Harry's birthday is 2 weeks after Mateo's.
Cara's birthday is on the last day of the month in a leap year.
Harry is the youngest.

Hours in a day

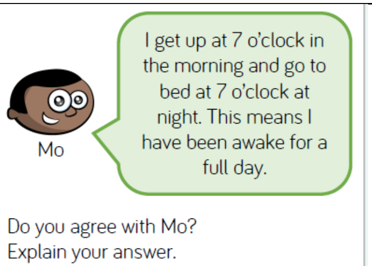


Fill in the gaps in the sentence stems.
There are _____ days in a whole week.
There are _____ days in a school week.
There are _____ hours in a day.
There are _____ hours in a school day.

Put the times/events into the correct place on the diagram.

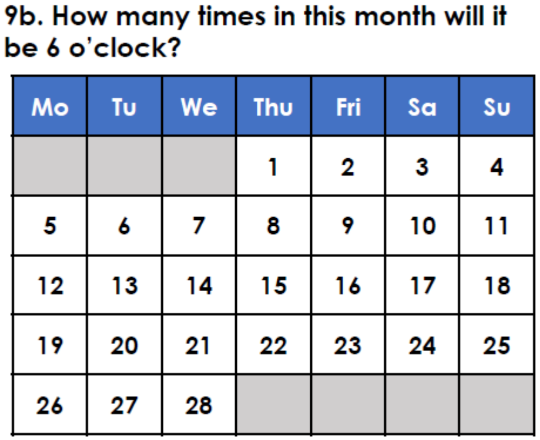
Morning	Afternoon	Evening	Night

Breakfast, Midnight, Midday, Go to school, Supper, Bedtime, Assembly, Brushing teeth



Mo: I get up at 7 o'clock in the morning and go to bed at 7 o'clock at night. This means I have been awake for a full day.

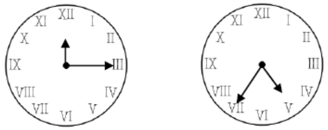
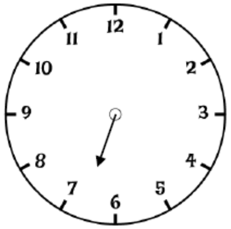
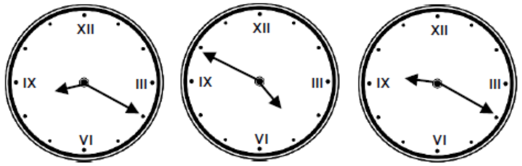
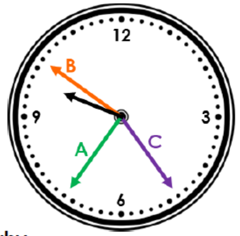
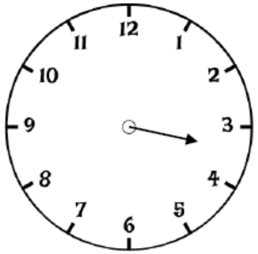
Do you agree with Mo?
Explain your answer.

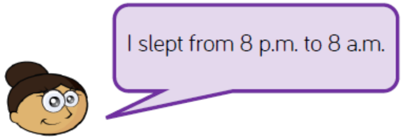
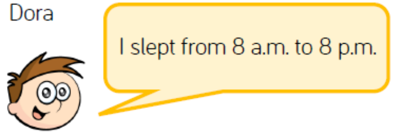
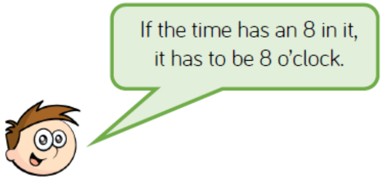


9b. How many times in this month will it be 6 o'clock?

Mo	Tu	We	Thu	Fri	Sa	Su
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

Quarter past/to, Time, days of the week: Monday, Tuesday etc., seasons: spring, summer, autumn, winter, day, week, month, year, weekend, birthday, holiday, morning, afternoon, evening, night, midnight, bedtime, dinnertime, playtime, today, yesterday, tomorrow, before, after, next, last, now, soon, early, late, quick, quicker, quickest, fast, faster, fastest, slow, lower, slowest, slowly, takes longer, takes less time, hour, '0'

Telling the time to five minutes	Give each child a clock with moveable hands. Children represent different times to the nearest 5 minutes on their own clock. Discuss whether the minute hand is past or to the hour in different times.  What time is shown on each clock? _____ minutes past _____ _____ minutes to _____	 This clock has lost its minute hand. What time could it be? Justify your answer.	**7b. Find the odd one out.**  **A. Twenty minutes to nine** **B. Twenty minutes past nine** **C. Ten minutes to four** **D. Twenty minutes past eight**	clock, half past, clock, watch, hands, minutes, how long ago?, how long will it be to…?, how long will it take to…?, how often…?, always, never, often, sometimes, usually, once, twice etc., first, second, next, twelve hour, twenty-four hour, roman numerals I to XII, analogue, digital can you show me…, duration, compare, hour, what time does the day start? Which hand shows the
Telling the time to the minute	Show children various times to the nearest minute for them to read. Give each child a clock with moveable hands. Children represent different times to the nearest minute on their own clock. Discuss whether the minute hand is past or to the hour in different times. Draw the hands on the clock from the following times.  Four minutes to 4 24 minutes to 8 24 minutes past 8	**5b. The time is twenty-four minutes to ten. Which arrow is the correct minute hand?**  **Explain why.**	This clock has lost its minute hand. What time could it be?  Could it be more than one time?	

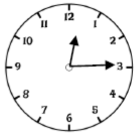
<table>
<tr>
<td>Using a.m. and p.m.</td>
<td>Using a visual timetable, sort the events into morning and afternoon.
Create sentences to describe when events take place.
For example: Maths is in the morning. Guided Reading is in the afternoon.</td>
<td>
Dora

Teddy
Who is more likely to be correct?
Explain how you know.</td>
<td>**7b. Write down an activity you might do during the times listed below. Tick to show if the time is a.m., p.m. or both.**
<table>
<tr><th>Time</th><th>Activity</th><th>a.m.</th><th>p.m.</th><th>Both</th></tr>
<tr><td>8:48</td><td></td><td></td><td></td><td></td></tr>
<tr><td>7:16</td><td></td><td></td><td></td><td></td></tr>
<tr><td>10:06</td><td></td><td></td><td></td><td></td></tr>
<tr><td>9:22</td><td></td><td></td><td></td><td></td></tr>
</table>
</td>
<td rowspan="2">minutes/hours?
Am/pm,
clockwise,
anticlockwise,
seconds,</td>
</tr>
<tr>
<td>24 hour clock</td>
<td>Create a diary using pictures to show your day from waking up to going to bed. Label these events using both 12-hour clock and 24-hour clock times.</td>
<td>Is Teddy correct?
Prove it.

Teddy</td>
<td>**7b. Here is an information board at a station. It shows when trains leave.**
<table>
<tr><td>Train A</td><td>22:09</td></tr>
<tr><td>Train B</td><td>13:34</td></tr>
<tr><td>Train C</td><td>09:48</td></tr>
<tr><td>Train D</td><td>15:27</td></tr>
<tr><td>Train E</td><td>16:21</td></tr>
</table>
Put the trains in order from latest leaving to earliest leaving in the day.</td>
</tr>
</table>

Finding the duration

Calculate the duration of the TV programmes.

TV Programme	Start Time	Finish Time	Duration
Pals	06:30	07:30	
Dennis the explorer	15:15	18:15	
The football show	12:00	14:00	
An adventure	10:40	12:40	

Lunchtime begins at:



Lunchtime ends at:

1:10

Teddy and Rosie are working out how long lunchtime lasts for.

Teddy: I did three quarters of an hour then added 10

Rosie: I did 1 hour take away 5 minutes

Whose method is correct?

8b. Piper the Witch has 1 hour and 3 minutes to brew a potion. She mixes ingredients for 27 minutes, lets it boil for 18 minutes and cackles for 13 minutes.

How much time does she have left?

Comparing durations

Use the symbols < , > and = to compare the following durations.

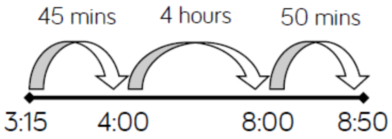
2:00 p.m. – 6:00 p.m. ○ 08:00 a.m. – 12:00 p.m.

07:30 a.m. – 09:30 a.m. ○ 11:40 a.m. – 02:40 p.m.

03:30 a.m. – 05:00 p.m. ○ 03:30 p.m. – 05:00 a.m.

Jack's school starts at ten to 9 and finishes at quarter past 3

He uses the number line to calculate how long the school day is.



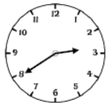
Jack works out the school day is 5 hours and 35 minutes long.
Jack is incorrect.

Explain his mistake.

9b. Which plane would get from Gatwick to Dublin the quickest?

How much longer does it take Plane 3 to get from Cardiff to Dublin than Plane 2?

Plane	Gatwick	Cardiff	Dublin	Glasgow
1	07:05	07:51	08:47	09:34
2	09:54	10:32	10:58	11:56
3	12:02	12:42	13:37	14:10

Start and end times	Which activity ends the latest? Gymnastics starts at 15:30 and lasts 1 hour 15 minutes. Football starts at 16:05 and lasts 45 minutes.	 School ends in 45 minutes. What time will it be? Amir says,  It's 20 minutes to 3 o'clock, so school finishes at 3:25 p.m. Whitney says,  School ends at 2:85 Who do you agree with? Explain why.	Tommy is halfway through watching his favourite TV programme. He looks at his watch and it shows this time. 15:45 The show is less than 1 hour long. What could the start and end time be? How many different start and end times can you find?	
Measuring time in seconds	Match the times in words to the times shown on the stopwatches. Two minutes five seconds 10 seconds less than 2 minutes Two minutes 50 seconds 150 seconds 00:01:50 00:02:30 00:02:05 00:02:50 Children could also record time using stopwatches completing different activities e.g. 10 star jumps.	Alex takes 153 seconds to skip around the playground.   Jack takes 2 minutes 23 seconds. Who is the quickest? Explain how you know.	**9b. Sue's answers could be incorrect.** **6 minutes 39 seconds = 389 seconds** **424 seconds = 7 minutes and 4 seconds** **5 minutes 38 seconds = 338 seconds** **376 seconds = 6 minutes and 16 seconds** **Can you spot and correct any mistakes?** 	

Use Roman numerals I to XII to tell and write the time	Through reading a range of analogue clocks – children start to recognise roman numerals I – XII as 1-12.	[redacted]	

Year 3				
Measurement: Mass, Capacity and temperature				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**
Use scales				Full, half full, empty, holds, weight, weighs, balances, heavy, heavier, heaviest,
Measure mass in grams				

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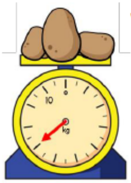
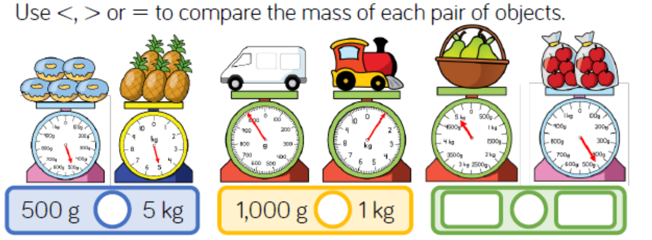
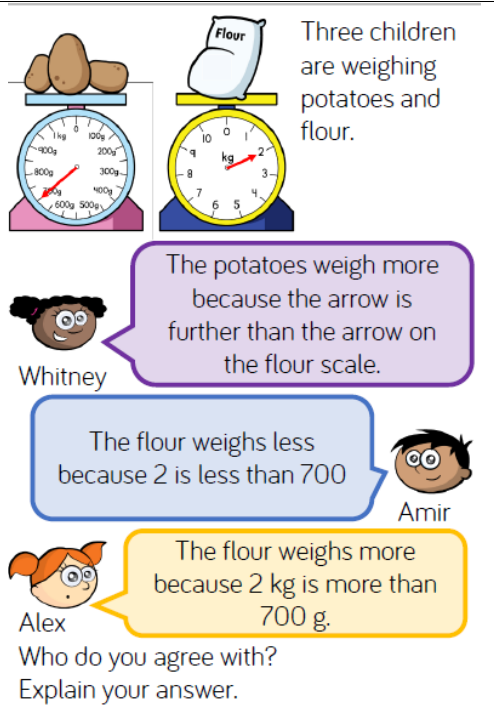
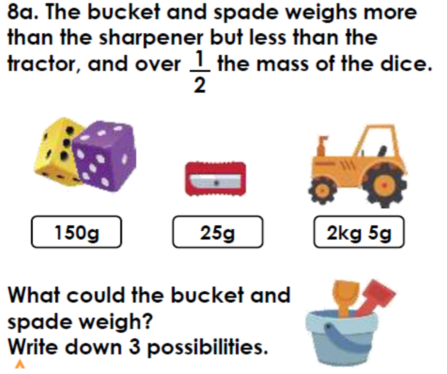
Measure Mass in kilograms and grams.	Find the mass of each item.  	 Who do you agree with? Explain why.  Amir: The potatoes weigh 13 kg  Jack: We don't know how much the potatoes weigh because the number is hidden.  Rosie: The potatoes weigh more than half of 10 kg Can you calculate the weight of the potatoes? Explain how you did it.	Using only 3 objects and a weighing scale, try to get as close to 2 kg as possible. Explain why you chose those objects. Work out how much more or how much less is needed to make it 2 kg.	light, lighter, lightest, scales, capacity, volume, mass, temperature, degrees, grams, kilograms, millilitre, litre, centigrade, thermometer, volume, millilitre, litre, how could you tell something is lighter than….? How much heavier is…. than….? Estimate, scale, how is scale like a number line? Compare, what is the same/different
Equivalent masses (kilograms and grams)				

Compare Mass	 Use <, > or = to compare the mass of each pair of objects. 500 g ○ 5 kg 1,000 g ○ 1 kg ☐ ○ ☐	 Three children are weighing potatoes and flour. Whitney: The potatoes weigh more because the arrow is further than the arrow on the flour scale. Amir: The flour weighs less because 2 is less than 700 Alex: The flour weighs more because 2 kg is more than 700 g. Who do you agree with? Explain your answer.	 **8a. The bucket and spade weighs more than the sharpener but less than the tractor, and over $\frac{1}{2}$ the mass of the dice.** **150g** **25g** **2kg 5g** **What could the bucket and spade weigh?** **Write down 3 possibilities.**	between capacity and volume?

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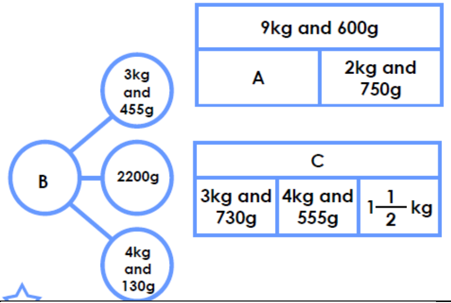
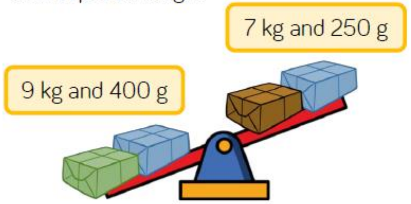
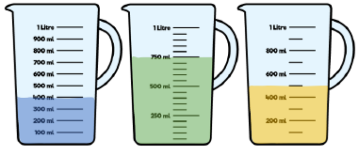
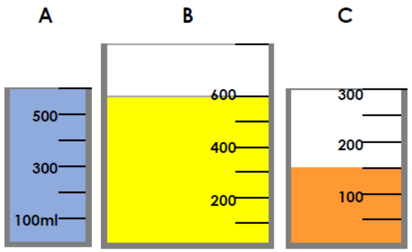
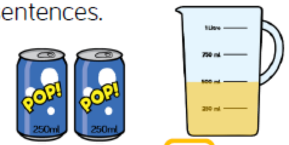
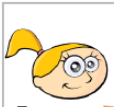
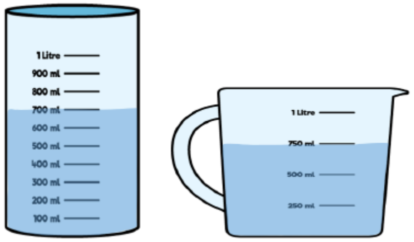
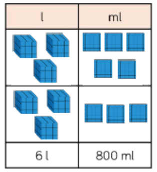
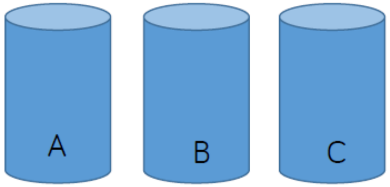
Add and subtract Mass	 The jar of cookies has a mass of 800 g. The empty jar has a mass of 350 g. How much do the cookies weigh? 3 kg and 450 g + 4 kg and 200 g	**6a. Which missing weight is the odd one out – A, B or C? Convince me.**  	The green parcel weighs 5 kg. Can you work out what the blue and brown parcel weigh?  How much would the green and brown parcel weigh altogether?	
Measure capacity and volume in millilitres.	Use a variety of scales, discuss what's the same, what's different about the scales. Using different containers explore which measurement (litres or millilitres) would be used to measure the liquid inside. Discuss what things would be measured in litres and in millilitres. Use the sentence stem to describe the capacity and volume of each container. The volume of liquid is ___. The capacity of the container is ______.  	**4b. Which is the odd one out? Explain your answer.**  	Use a variety of containers. Can you estimate how much liquid they hold? Check your estimates using measuring jugs and cylinders to see how accurate you were.	
Measure capacity and volume in litres and millilitres.				
Equivalent capacities				

and volumes (litres and millilitres).				
Compare capacity and volume.	Complete the sentences.  ☐ cans of pop are equal to ☐ jug of orange juice. 1 can of pop is equal to ☐ jug of orange juice.	 Eva I know container 1 has more than container 2 in it because the water goes further up the side.  Container 1 Container 2 Is Eva correct? Explain your answer.	Rosie has a litre bottle of water.  She pours a drink for herself and two friends. Their glasses can hold up to 250 ml.  Teddy has more than Amir. Rosie has the most. How much could each child have in their glass? How much would be left in the bottle? Is this the only way?	

Add and subtract capacity	Teddy uses Base Ten and a place value chart to add 3 l and 500 ml and 3 l and 300 ml  Use the same approach to calculate: • 4 l and 600 ml + 2 l and 100 ml • 7 l and 320 ml + 1 l and 125 ml • 3 l and 950 ml – 3 l and 50 ml • 800 ml – 375 ml	**6b. Sam says, 'The jug has a capacity large enough to make 2 servings of smoothie.'** **Smoothie Recipe** **2L and 800ml tropical juice** **1L and 100ml yoghurt**  **7L and 500ml** **Is she correct? Prove it.** **What is the difference between the capacity of the jug and the volume of liquid?**	Here are some measuring cylinders. The total liquid in all three cylinders is 400 ml. Cylinder A has half of the total amount in it. Cylinder B has 67 ml less than Cylinder A. How much liquid does each cylinder contain?  	
Temperature	Children to continue to read temperature within real life situations. Children to make comments on the weather and relate to temperature (Geography, science link).			

Year 3

Geometry: Properties of Shape

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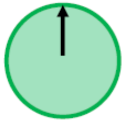
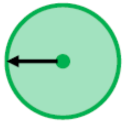
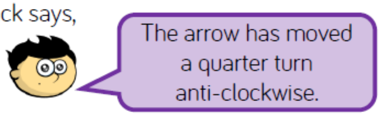
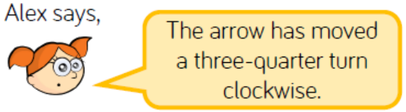
Objective	Skill it	Apply it	Deepen it	Mathematical talk
Turns and angles	Take children outside or into the hall where they can practice moving in turns themselves. Label 4 walls/points (for example: North, South, East, West). Give children instructions to encourage them to make $\frac{1}{2}, \frac{1}{4}, \frac{3}{4}$ and whole turns from different starting points. Allow children the opportunity to give instructions too. Look at the hands of the clock. Turn the minute hand one quarter of a turn clockwise. Where is the large hand pointing? What is the new time? 	The arrow on a spinner started in this position.  After making a turn it ended in this position.  Jack says,  Alex says,  Who do you agree with?	The letter 'X' has four angles.  Write your name in capital letters. How many angles can you see in each letter? How many angles are there in your full name?	Group, sort, cube, cuboid, pyramid, prism, sphere, cone, cylinder, circle, triangle, square, rectangle, shape, flat, curved, straight, round, corner (point, pointed) hollow, solid, face, side, edge, make, build, draw, direction, journey, left, right, up down, forwards, backwards,

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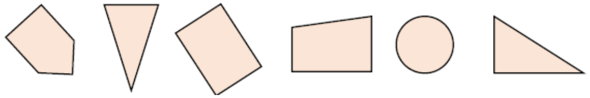
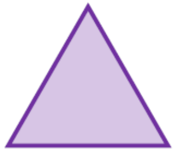
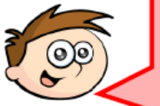
Right angles in shapes	Sort the shapes based on the number of right angles they have. Record your answer in a table. 	**True or False?** This shape has two right-angles.  Explain your answer.	How many right angles can you see in this image?  Can you create your own image with the same number of right angles?	sideways, across, close, far, near, along, though, to, from, towards, away from, movement, side, roll, turn, full turn, whole turn, half turn, quarter turn, three quarter turn, stretch, bend, size, bigger, larger, smaller, symmetrical, right angle, horizontal, vertical, perpendicular, parallel, greater/ less than ninety degrees, ninety degrees, right angle, orientation, straight lines, pentagon,
Compare angles	Label any acute or obtuse angles in these images. 	**6b. Year 3 have been asked to describe the angles in this shape:**   Rosie **It has a corner cut out so it only has 3 angles inside.**  Thomas **It has three right angles.** **Who is correct? Explain how you know.**	Teddy describes a shape.  My shape has 3 right angles and 2 obtuse angles. What could Jack's shape look like? Describe a shape in terms of it's angles for a friend to draw.	

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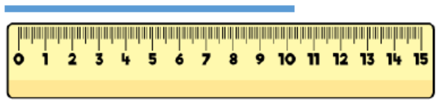
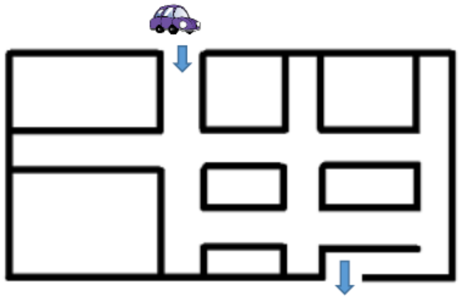
Draw straight lines accurately through measuring	Measure these lines. Record your measurements in cm and mm.  ____ cm and ____ mm ____ cm and ____ mm ____ cm and ____ mm	Alex measures the line.  She says it is 10 cm 4 mm Is Alex correct? Explain why.	 Use straight lines to show the route the car could take to get out of the maze. Work out the length of the route to the nearest cm Is this the shortest route?	polygon, hexagon, octagon, vertices, 2d, 3d, quadrilateral, dimensional, flat, acute, obtuse, curved faces, what is the difference between 2d and 3d shapes? Regular and irregular shapes, show me a vertex, vertical, horizontal, how

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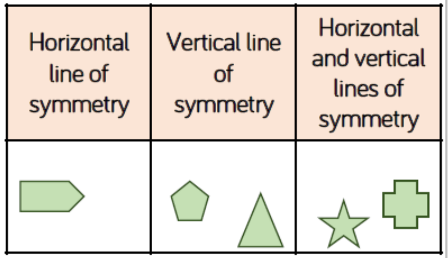
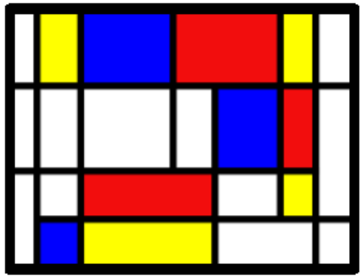
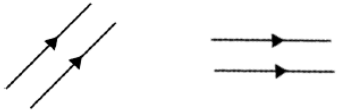
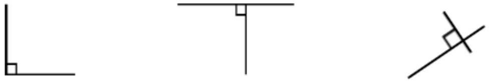
Horizontal and vertical	 A line that runs from left to right across the page is called a ________________ line.  A line that runs straight up and down the page is called a ________________ line. Find 3 horizontal and 3 vertical lines in the classroom.	 Horizontal line of symmetry Vertical line of symmetry Horizontal and vertical lines of symmetry Eva completes the table by drawing shapes. Can you spot and correct her mistake?	 How many horizontal and vertical lines can you spot in this image by Mondrian? Create your own piece of art work using only horizontal and vertical lines.	have these shapes been sorted? Repeating pattern, where would you position the ruler when measuring a line? Link to horizon
Parallel and perpendicular	 Lines that never meet are called ______________ lines.  Straight lines that meet at a right angle are called ______________ lines.	These lines are NOT parallel.  Convince me.	Mark 3 sets of parallel lines and 3 sets of perpendicular lines in this flag.  Design your own flag containing parallel and perpendicular lines.	

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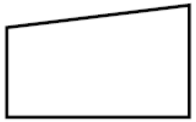
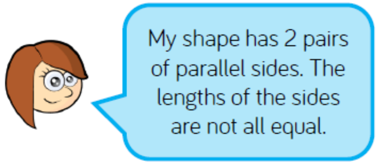
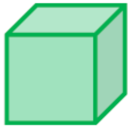
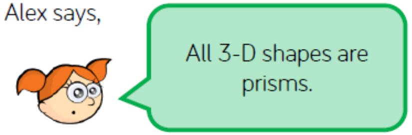
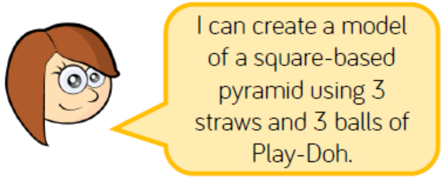
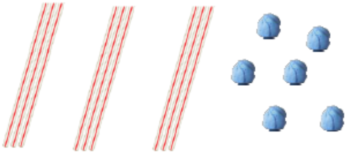
<table>
<tr>
<td>Recognise and describe 2d shapes</td>
<td>Describe this quadrilateral.

It has _____ angles.
It has _____ right angles.
It has _____ obtuse angle.
It has _____ acute angle.
It has _____ lines of symmetry.</td>
<td>Rosie describes a 2-D shape.

Draw the shape that Rosie is describing.
Could this square be Rosie's shape?

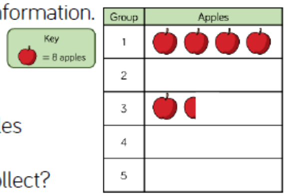
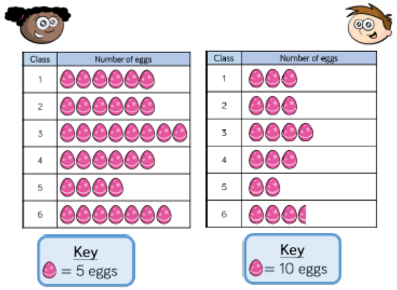
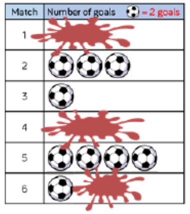
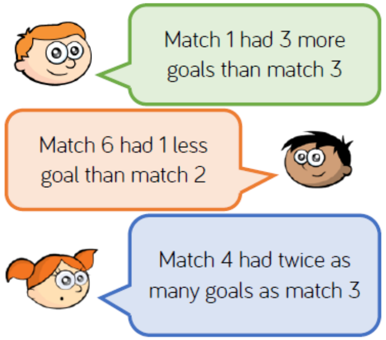
Explain why.</td>
<td>Draw at least one shape in each section of the diagram.
<table>
<tr><th></th><th>At least one right angle</th><th>No right angles</th></tr>
<tr><td>4 sided</td><td></td><td></td></tr>
<tr><td>Not 4 sided</td><td></td><td></td></tr>
</table>
</td>
<td></td>
</tr>
<tr>
<td>Recognise and describe 3d shapes</td>
<td>Describe this 3-D shape.

This shape is a _______.
It has _____ faces.
It has _____ edges.
It has _____ vertices.</td>
<td>Alex says,

Do you agree with Alex?
Explain why.</td>
<td>Sort a selection of 3-D shapes using the criteria in the table.
<table>
<tr><th></th><th>At least one triangular face</th><th>No triangular faces</th></tr>
<tr><td>Prism</td><td></td><td></td></tr>
<tr><td>Not a prism</td><td></td><td></td></tr>
</table>
Change the headings of the table and re-sort your shapes.</td>
<td></td>
</tr>
</table>

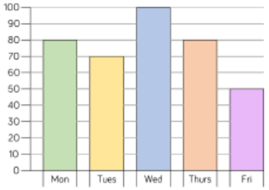
Making 3d shapes	Children make a 3-D shape using Play-Doh/clay/plasticine/ polydron. Ask them to make a different one to their partner. Write down the similarities and differences between them. Discuss what the properties of each shape are.	Rosie says,  Explain the mistake Rosie has made. How many straws and balls of Play-Doh would you need to create a pyramid?	I have 9 straws and 6 balls of Play-Doh.  What 3-D shape can I create using all of the straws and Play-Doh? Have a go at making it.	

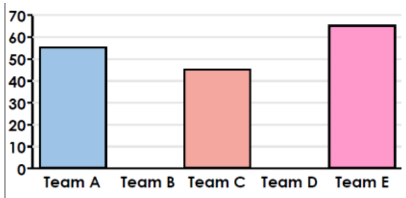
Year 3

Statistics (can link across curriculum e.g. COMPUTING/Topic/P.E)

Objective	Skill it	Apply it	Deepen it	Mathematical Talk

Pictograms	Complete the pictogram using the information. • Group 2 collected 40 apples. • Group 4 collected half as many apples as Group 1 • Group 5 collected 20 more apples than Group 3 How many apples did each group collect?  	Whitney and Teddy are making pictograms to show how many chocolate eggs each class won at the school fair.  What's the same and what's different about their pictograms? Whose pictogram do you prefer and why?	Ron, Amir and Alex record the scores of six football matches. Unfortunately, Ron spilt paint on them. Record the results based on what the children remember.   	Chart, bar chart, frequency table, Carroll diagram, Venn diagram, axis, axes, diagram pictograms, Chart, bar chart, table, axis, block diagrams, tally chart, quantity, diagram, one to one correspondence, what will each symbol be worth? What will each

<table>
<tr>
<td>Bar charts</td>
<td>
The bar chart shows how many children attend after school clubs.


Which day is the most popular?
Which day is the least popular?
What is the difference between the number of children attending on Tuesday and on Thursday?
What information is missing from the bar chart?
</td>
<td>
Which would be more suitable to represent this information, a bar chart or a pictogram?
Explain why.
<table>
<tr><th>Child</th><th>Number of Skips in 30 Seconds</th></tr>
<tr><td>Teddy</td><td>12</td></tr>
<tr><td>Annie</td><td>15</td></tr>
<tr><td>Whitney</td><td>17</td></tr>
<tr><td>Ron</td><td>8</td></tr>
</table>
</td>
<td>
The bar chart shows quiz scores.


Team B have more points than Team D, and Team D have fewer than Team C. Complete the bar chart to show how many points Teams B and D could have.
</td>
<td>block be worth?, read and interpret, construct, tables, one and two step problems,</td>
</tr>
</table>

Tables

The table shows the increase in bus ticket prices.

- The cost of Ron's new ticket is 60p. How much was his ticket last year? How much has the price increased by?
- Which ticket price has increased the most from 2016 to 2017? Which ticket price has increased the least?

1st January	
2016	2017
44p	49p
56p	60p
64p	69p
76p	85p
85p	93p
98p	£1.03
£1.05	£1.11

Eva has created a table to show how many boys and girls took part in after school clubs last week.

Day	Boys	Girls
Monday	11	9
Tuesday	18	12
Wednesday	13	11
Thursday	8	8
Friday	9	7

Eva says,

106 boys took part in after school clubs last week.

Is Eva correct?

Explain why.

How many questions can you create for your partner about this table?

Day	Number of hours shop is open
Monday	8
Tuesday	8
Wednesday	4
Thursday	10
Friday	7
Saturday	12

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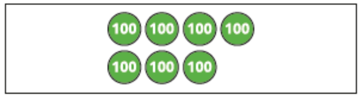
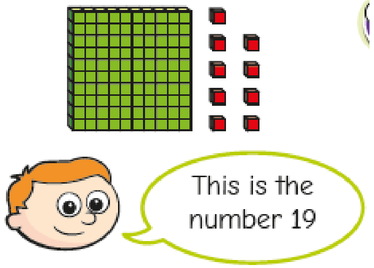
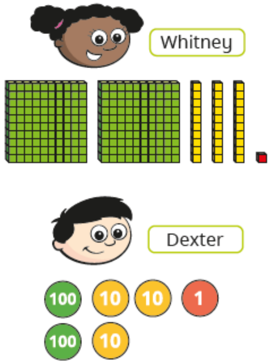
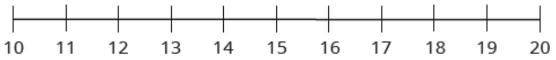
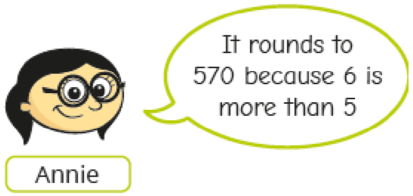
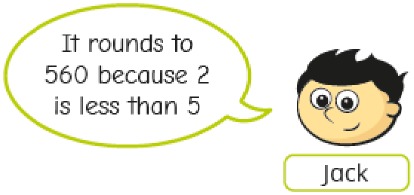
Year 4

Number: Place Value

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Represent numbers to 1000	There are ______ hundreds, ______ tens and ______ ones. The number is ______ When a number has no ______, then we use ______ as a placeholder. What numbers are represented?  	 What mistake has Ron made? What is the number?	Whitney and Dexter have each made a number.  What numbers have they made? What is the same about their numbers? What is different?	Fewer, more, equal, less than, greater than, number, pair, zero, one, two, three to twenty, and beyond, none, count (on/up/to/from/down), before, after, many, few, fewer, least, fewest, lesser, smallest, greater, same as, odd, even, units, ones, tens, ten more/less, digits, numeral, figure(s), compare, (in) order/ a different order,

Round to the nearest 10 up to 10,000	The two multiples of 10 the number lies between are ______ and ______ ______ is closer to ______ than ______ ______ rounded to the nearest 10 is ______ Use the number lines to help you complete the sentences.  13 is closer to ______ than ______ 13 rounded to the nearest 10 is ______	Annie and Jack are rounding 562 to the nearest 10   Who do you agree with? Explain your answer.	When rounded to the nearest 10, there are 350 children in a running club. How many children could there be?	size, value, between, halfway between, above, below. Numbers to one hundred, hundreds, partition, recombine, hundred more/less, numbers to one thousand, numbers to 10,000, tenths, hundredths, decimal (places), round (to nearest), thousand more/less than, negative integers, counting through zero, roman numerals (I to C). estimate, how do we say this number? What numbers

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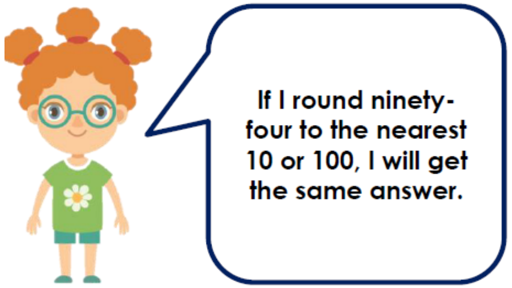
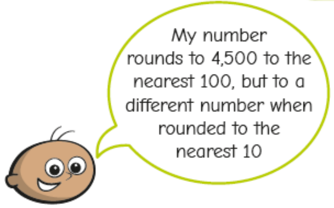
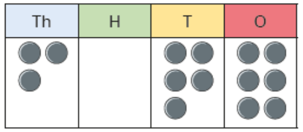
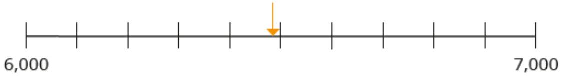
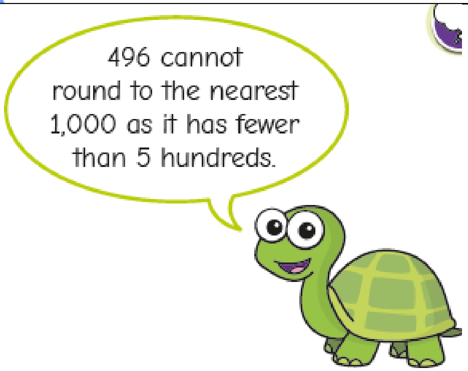
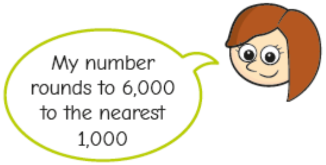
Round to the nearest 100 up to 10,000	- Round each number to the nearest 100 403 350 728 4,551 76 7,005 49 1,925	**5b. Juliette says,**  **Do you agree? Explain why.**	Tommy is thinking of a number.  What number could Tommy be thinking of? How many answers can you find?	complete the part-whole? How many tens are there? How many ones are there? Do groups of ten help you count? When ordering your numbers do you look at the tens or ones? Are the numbers in the sequence getting larger or smaller? Thousands, 3 digit numbers, 100s, 10s and 1s, place value grid, place holder (0), what is the value of each interval on the number line? How many hundreds are there? 10 more, 10 less, 100 more, 100 less, compare, what strategies did you use to compare the numbers?, order, ascending, descending, how do you know when you
Round to the nearest 1000	- Round each number to the nearest 1,000 Th H T O 3 7 4 2   four thousand, six hundred and forty-three	 Do you agree with Tiny? Explain your answer.	Rosie makes a 4-digit number using the digit cards. 6 4 9 5  What number could Rosie have made? Is there more than one possibility?	

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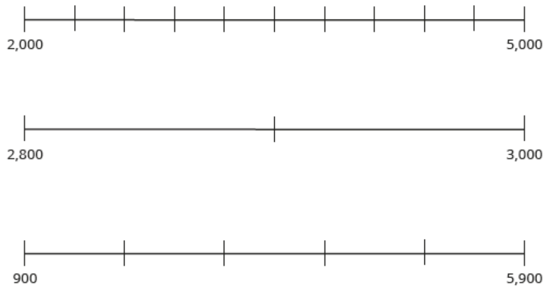
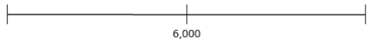
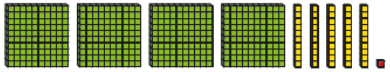
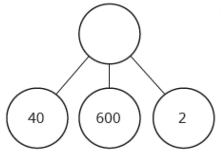
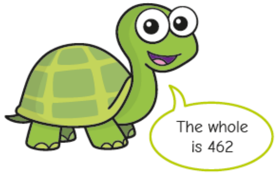
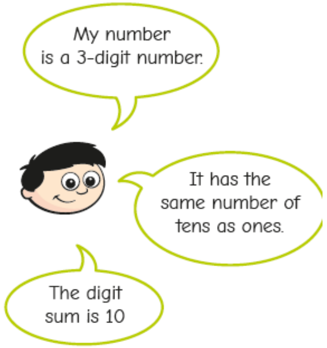
Number line to 10,000	Mark the positions of the numbers on the number line. 6,000 5,000 1,500 8,000 	Label 2,900 on each number line.  What do you notice?	What could the start and end numbers be? 	have created the smallest/greatest number? What does each base ten represent? Can you represent the number in another way? Part-whole, what are the values at the start and end point of the number line? Estimate, greater than, less than, equal to, inequality symbols, order, ascending, descending, what patterns do you see in the Roman Numeral system? Negative numbers
Partition four digit numbers	______ has ______ hundreds, ______ tens and ______ ones. ______ = ______ + ______ + ______ The number that is made up of ______ hundreds, ______ tens and ______ ones is ______ Use the base 10 to help you complete the number sentences.  451 = 400 + ______ + ______	  Explain the mistake that Tiny has made. What is the whole?	Dexter is thinking of a number.  What could Dexter's number be? Find each possibility and partition it.	

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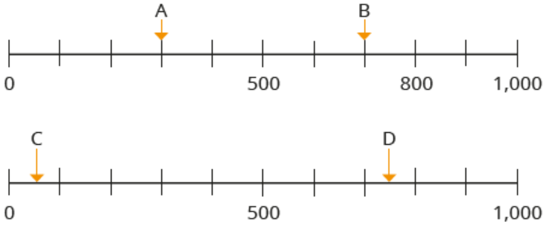
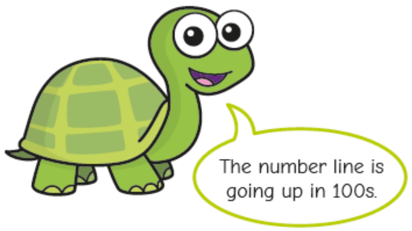
Read and use a number line to 1,000

What numbers are the arrows pointing to?

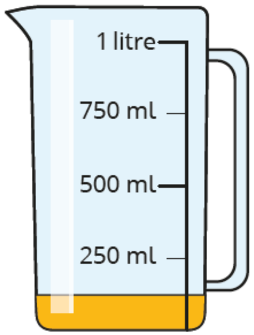




Do you agree with Tiny?

Talk about your answer with a partner.

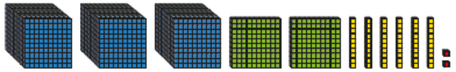
Filip has poured some juice from a jug.



Estimate how much juice is left in the jug.

Find 1, 10, 100 , 1000 more or less

Complete the sentences.



The number is ______

1 less than the number is ______

10 less than the number is ______

100 less than the number is ______

1,000 less than the number is ______

Are the statements always true, sometimes true or never true?

When you find 100 more or less than a number, the tens column changes.

When you find 10 more or less than a number, the tens column changes.

When you find 1 more or less than a number, the thousands column changes.

Explain your reasoning.

Tiny has put some counters on a place value chart.

One counter has fallen off.

Th	H	T	O
●●●●●		●●●●	●●●

List all the possible numbers that Tiny could have started with.

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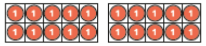
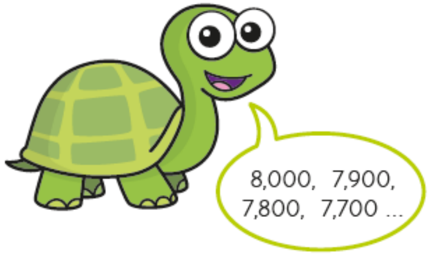
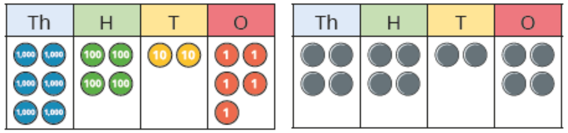
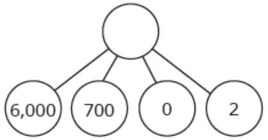
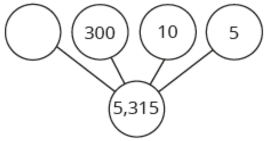
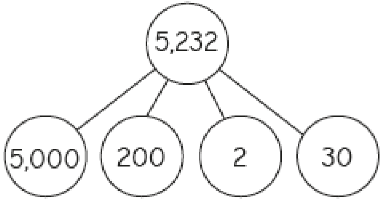
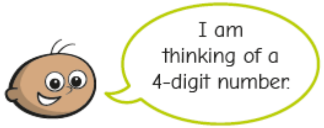
<table>
<tr>
<td>Thousands</td>
<td>Complete the sentences to match the ten frames.

______ ones = ______ tens

______ tens = ______ hundreds

______ hundreds = ______ thousands
Complete the number tracks.
<table><tr><td>1,000</td><td>2,000</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td>7,000</td><td>8,000</td><td>9,000</td></tr></table></td>
<td>Tiny is counting back in 1,000s from 8,000


What mistake has Tiny made?</td>
<td>Is the statement true or false?
When counting in 1,000s, the numbers will always have four digits.
Find 3 ways to prove your answer.</td>
<td></td>
</tr>
<tr>
<td>Compare numbers to 10,000</td>
<td>If the digits in the ______ column are the same, I need to look in the ______ column.
______ is greater than ______ because ...
______ is less than ______ because ...</td>
<td>3672 is less than 1938
True or False. Explain your answer.</td>
<td>Use the digit cards to complete the comparison.
1 2 3 4 5
You can use each digit once only.
5,64__ < __,73__
2,__38 > 2,3__5</td>
<td></td>
</tr>
</table>

	Write <, > or = to compare the numbers. 321 g ○ 3,012 g 7,000 m ○ 4,629 m 98 ○ 1,032 £5,612 ○ £5,628 3,402 ○ 1,897 4,002 ○ 865 4,283 ○ 4,238 1,902 ○ 1,920			
Represent numbers to 10,000	What numbers are represented on the place value charts?  Write your answers in words and numerals.	In this number there are 5 thousands. 7450 True or False? Explain your answer.	Jack has two 1,000 counters and three 100 counters.  What 4-digit numbers can he make?	

Partition numbers to 10,000	Complete the part-whole models.   	Tiny is partitioning the number 5,232 and representing it in a part-whole model.  Has Tiny partitioned the number correctly? Explain your answer.	 Use the clues to work out Tommy's number. - The thousands digit is 3 greater than the tens digit. - The total sum of digits is 16 - The 4-digit number is odd. - The tens digit is 2 - The hundreds digit is double the ones digit. Think of another 4-digit number and challenge a partner to work out your number from clues.	

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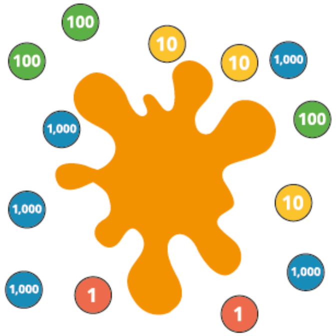
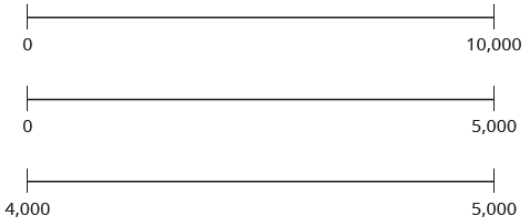
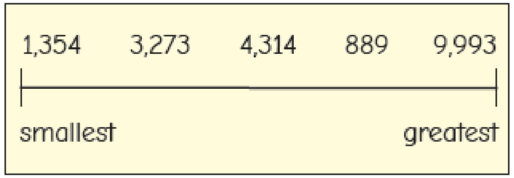
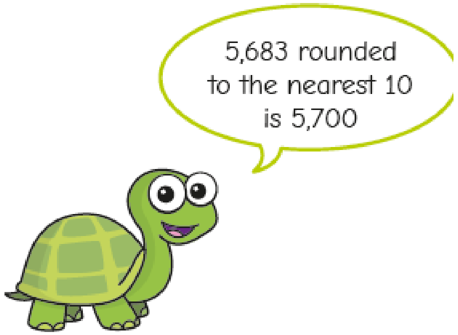
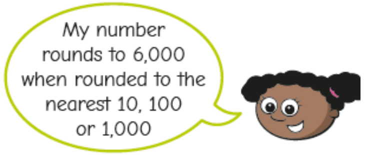
Flexible partitioning – children to recognise that whole numbers can be split into many different ways	Complete the part-whole models.  	Which is the odd one out? 3,500 3 thousands + 50 tens 2 thousands + 15 hundreds 35 tens Explain how you know.	Some place value counters are hidden. The total is six thousand, four hundred and thirty-two.  Which place value counters could be hidden? Find at least three solutions.	
Estimate on a number line to 10,000	- Mark the midpoint of each number line. What number does each midpoint represent?  	Miss Rose has spilt some paint on the number line.  Estimate three numbers that could appear under the paint. Explain your answers.	 - C is greater than A. - C is less than half of B. Give three possible values for C.	

<table>
<tr>
<td>Order numbers to 10,000</td>
<td>Here are four digit cards.
4 0 5 3
Arrange them to make five different 4-digit numbers.
Put your numbers in ascending order.</td>
<td>Aisha has written five numbers in ascending order.

What mistake has she made?</td>
<td>These numbers are in order from greatest to smallest.
3,6__4 3,__29 3,5__8
The same digit is missing from each number.
What is the missing digit?</td>
<td></td>
</tr>
<tr>
<td>Round to nearest 10,100 and 1000</td>
<td>Complete the table.
<table>
<tr><th>Number</th><th>7,126</th><th>4,996</th><th>2,006</th><th>499</th></tr>
<tr><td>Rounded to the nearest 10</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Rounded to the nearest 100</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Rounded to the nearest 1,000</td><td></td><td></td><td></td><td></td></tr>
</table>
</td>
<td>
What mistake has Tiny made?
What is the correct answer?</td>
<td>Whitney puts some counters on a place value chart to make a number.
<table>
<tr><th>Th</th><th>H</th><th>T</th><th>O</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>

What could Whitney's number be?
What must Whitney's number be if she uses exactly 30 counters?</td>
<td></td>
</tr>
</table>

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Count in 25s

Complete the number tracks

25		75		125	150				250

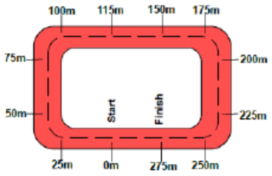
	725	700		650		600			

Ron is counting down in 25s from 790. Will he say 725?

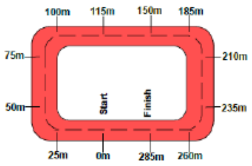
Explain your answer.

Two race tracks have been split into 25m intervals.

Race track A



Race track B



What errors have been made?

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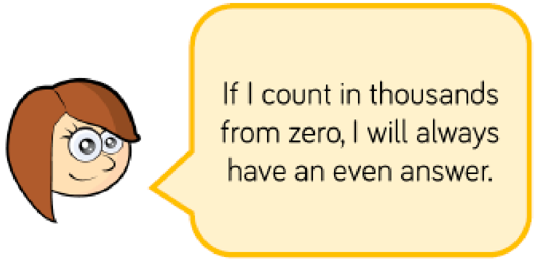
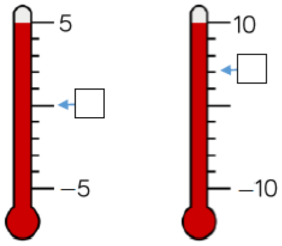
Count in 1000s	How many sweets are there altogether?  There are three jars of ____ sweets. There are ____ sweets altogether.	Rosie says,  True or false? Explain how you know.	**9b. Glenn rolls a dice to add or subtract 1,000s. If he rolls an even number he adds that number of thousands. If he rolls an odd number he subtracts that number of thousands.** **Start number: ten hundreds and 300 tens**  **If he only uses three of the dice, what could his total be? Find four possibilities.**	
Recognise negative numbers	Fill in the missing temperatures on the thermometers.  	Can you spot the mistake in these number sequences? a) 2, 0, 0, –2, –4 b) 1, –2, –4, –6, –8 c) 5, 0, –5, –10, –20 Explain how you found the mistake and convince me you are correct.	Teddy counted down in 3s until he reached –18 He started at 21, what was the tenth number he said?	

Roman numerals to 100	Write each number in Roman numerals. 20 50 60 62 64 78 85 99	Is the statement true or false? XX + II = XXII, so XXII + XXII = XXIIXXII Explain your answer.	Work out the calculation, giving your answer in Roman numerals. XIV + XXXVI Make up some other calculations using Roman numerals that have the same answer.	

Year 4				
Number: Addition and Subtraction				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**
Add 1s, 10s, 100s and 1000s – introduction of adding 1000s.	Use concrete representation Use a place value chart to complete the number sentences. 1,364 + 3 = ______ 1,364 + 30 = ______ 1,364 + 300 = ______ 1,364 + 6,000 = ______	Complete the sequence. 1,040 1,440 ☐ ☐ 2,640 What is the sequence increasing by each time? Explain how you know.	How many ways can you make the total x, using the digit cards below by adding?	What does part mean? What does whole mean? How many where there at the start?

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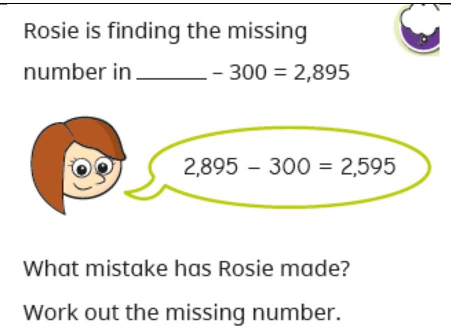
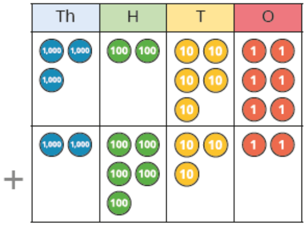
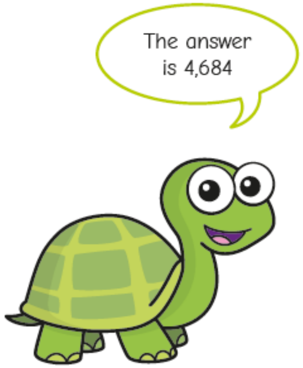
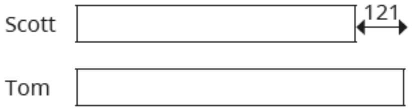
Subtract 1s, 10s, 100s and 1000s – introduction of subtracting 1000s.	Use concrete representation Use a place value chart to complete the number sentences. 1,364 − 1 = ______ 1,364 − 60 = ______ 1,364 − 200 = ______ 1,364 − 1,000 = ______	 Rosie is finding the missing number in ______ − 300 = 2,895 2,895 – 300 = 2,595 What mistake has Rosie made? Work out the missing number.	How many ways can you make the total x, using the digit cards below by subtracting?	Which number represents the total? Number bonds, number line, add, more, plus, make, sum, total, altogether, inverse, double, near

Add two 4-digit numbers – no exchange.	- Use counters and a place value chart to work out 3,256 + 2,532  Th H T O 3 2 5 6 + 2 5 3 2	Tiny works out 1,234 + 345  What mistake has Tiny made? What is the correct answer?	Dani and Aisha are raising money for charity. Dani raises £2,304 and Aisha raises £1,695 How much money have they raised altogether? Scott and Tom are also raising money for charity. So far, Scott has raised £1,423 and Tom has raised £121 more than Scott. How much have Scott and Tom raised altogether?  Compare methods with a partner.	double, half, halve, equals, is the same as (including equals sign), difference between, how many more to, how much more is…?, subtract, take away, minus, how many fewer is… than…? How much less is…? Predicting, find, find all, find different, investigate, column addition, column subtraction, multiples, exchange, place holder (zero), how many tens can be

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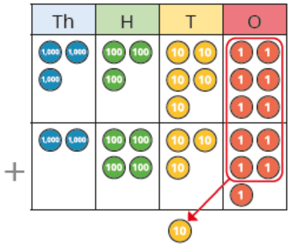
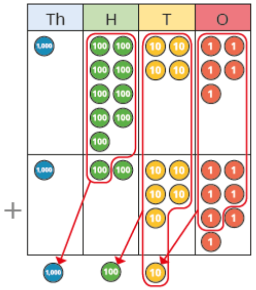
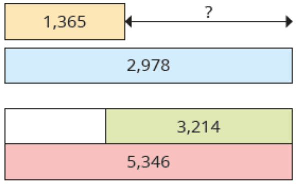
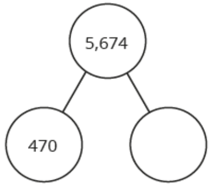
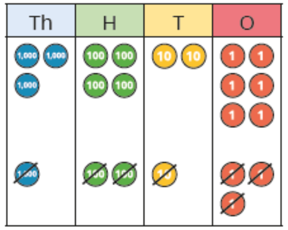
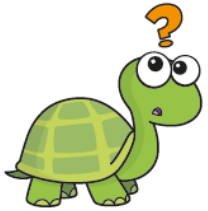
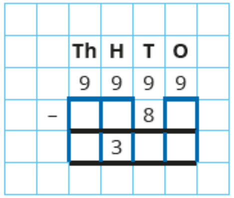
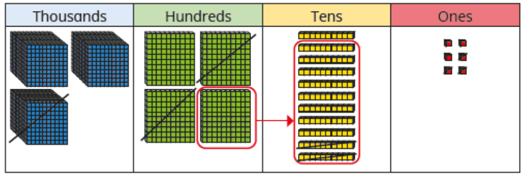
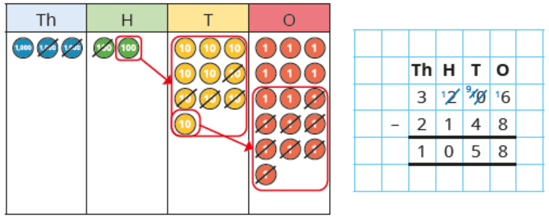
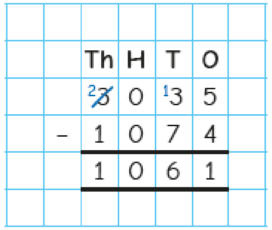
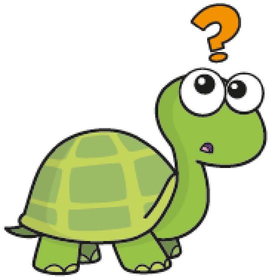
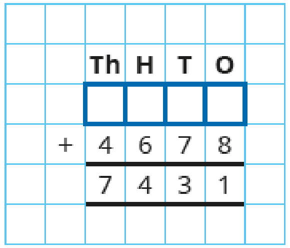
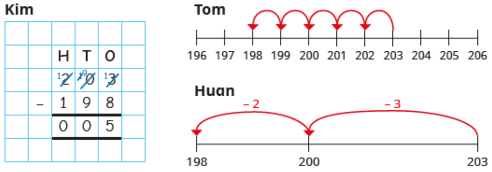
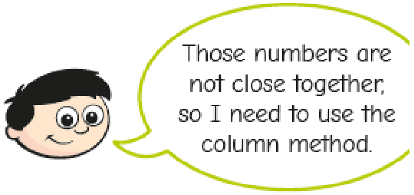
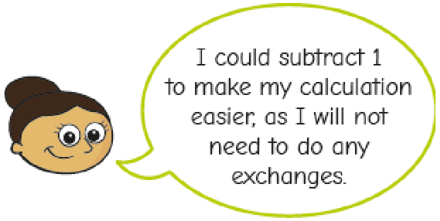
<table>
<tr>
<td>Add two 4-digit numbers – 1 exchange</td>
<td>Kim uses counters to find the total of 3,356 and 2,435

Th H T O
3 3 5 6
+ 2 4 3 5
5 7 9 1
1</td>
<td>Tiny completes this addition.
Th H T O
4 0 8 6
+ 1 5 3 2
5 5 1 9
1
What mistake has Tiny made?
Find the correct answer.</td>
<td>What is the missing 4-digit number?
Th H T O
__ __ __ __
+ 6 3 9 5
8 9 4 9</td>
<td rowspan="2">added without exchanging? Patterns between calculations, which strategy would you use and why? Near numbers, estimate, reasonable, inverse, partition, exchange, what do you notice? Does it matter which columns you add first? Do you have enough tens/hundreds/ones to make the exchange? Does it matter which column you subtract first? Efficient, estimate, checking strategies.</td>
</tr>
<tr>
<td>Add two 4-digit numbers – more than 1 exchange.</td>
<td>Jack uses place value counters to work out 1,945 + 1,257

Th H T O
1 9 4 5
+ 1 2 5 7
3 2 0 2
1 1 1
Use Jack's method to work out the additions.
4,893 + 1,758
3,546 + 1,794
2,305 + 1,896</td>
<td>Teddy works out 3,218 + 1,354
Th H T O
3 2 1 8
+ 1 3 5 4
[illegible]
2
How do you know that Teddy's answer cannot be correct?</td>
<td>7b. Use the digit cards to create addition calculations that use a 3-digit and 4-digit number, or two 4-digit numbers.
3 exchanges must be included and one number must use zero as a place holder.
6 7 9 3 0
Find four possibilities.</td>
</tr>
</table>

Subtract two 4-digit numbers – no exchange.	Find the missing numbers.   	Tiny is working out 3,426 – 1,213 using place value counters. Tiny keeps getting 3,426 as the answer.   Explain Tiny's mistake. Work out the correct answer.	Fill in the missing digits.  Compare answers with a partner. Can you find any more?	

Subtract two 4 digit numbers – 1 exchange.	Rosie uses base 10 to work out 3,416 – 1,223  Th H T O 3 $^{3}\cancel{4}$ $^{1}1$ 6 – 1 2 2 3 2 1 9 3 Use Rosie's method to help you work out the subtractions. 4,256 – 1,139 3,758 – 1,825 2,547 – 1,452 What is the same and what is different about these subtractions?	1,235 people go on a school trip. There are 1,179 children and 27 teachers. The rest are parents. How many parents are there? Explain your method to a partner.	The subtraction has exactly one exchange. Th H T O 5 6 3 2 – ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ What could the missing numbers be if the exchange is in the tens column? What if the exchange was in another column? Talk about it with a partner.	

Subtract two 4 digit numbers – more than 1 exchange.	Aisha works out 3,206 – 2,148 using place value counters.  Use Aisha's method to work out the subtractions. 2,356 – 1,427 1,205 – 398 2,037 – 889 2,037 – 1,589	Tiny has worked out 3,035 – 1,074   Do you agree with Tiny? Explain your answer.	Find the missing 4-digit number.  How did you find the answer? Is there more than one way?	

Find the most efficient method for subtraction (mental method or column).	Kim, Tom and Huan are working out 203 – 198  Whose method do you prefer? Why? Which is the most efficient method? Use your preferred method to complete the subtractions. 9,807 – 9,792 | 809 – 15 | 3,876 – 1,400 | 4,204 – 2,417 Did you use the same method each time?	Dexter is working out 4,387 – 134  Th H T O 4 3 8 7 – 1 3 4 Do you agree with Dexter? Explain your reasons.	Dora is working out 500 – 287  H T O 4 9 9 – 2 8 7 2 1 2 What mistake has Dora made? What is the correct answer? How else could you work out 500 – 287?	

Estimate answers using knowledge of rounding.

Use the number lines to help you complete the sentences.

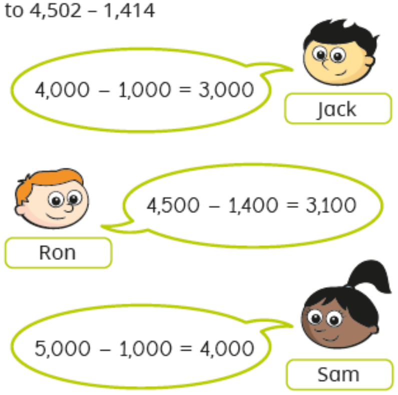
1,880 rounded to the nearest thousand is ______

3,341 rounded to the nearest thousand is ______

Use the rounded amounts to estimate 3,341 – 1,880

Use column subtraction to work out the actual answer.

The children are estimating the answer to 4,502 – 1,414



Which children have rounded correctly?

What mistake has been made?

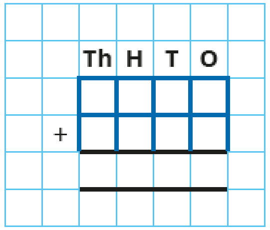
Whose calculation was easiest?

Whose estimate was most accurate?

Roll a 6-sided dice eight times.

Write each number in one of the boxes.

Now work out your addition.



Compete against a partner. Who can get an answer closest to 5,000?

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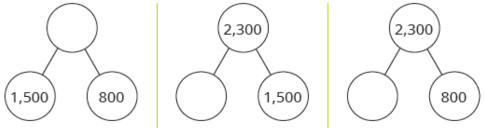
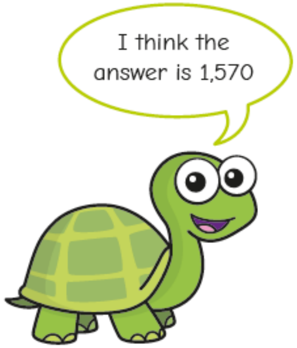
Use inverse operations to check answers. (Checking strategies).	Complete the part-whole models and number sentences.  1,500 + 800 = ______ 2,300 – 1,500 = ______ 2,300 – 800 = ______ How could you check your answers?	627 + ☐ = 943  Show by estimating that Tiny has made a mistake. What mistake has Tiny made? Find the correct answer. Complete an inverse operation to check your answer.	Here is a number sentence. 350 + 278 + 250 Add the numbers in different orders to find the answer. Is one order of adding easier? Why? Create a rule when adding more than one number of what to look for in a number.	

Year 4

Number: Multiplication and Division

Objective	Skill it	Apply it	Deepen it	Mathematical Talk

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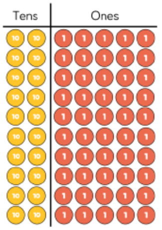
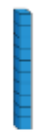
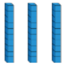
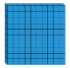
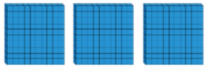
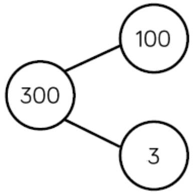
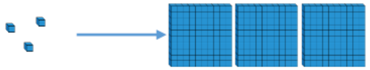
Multiply by 10 – using up to a 4 digit number	 Write the calculation shown by the place value counters. Each row has ___ tens and ___ ones. Each row has a value of ___. There are ___ rows. The calculation is ___ × ___ = ___. Use place value counters to calculate: 10 × 3 4 × 10 12 × 10	**Always, Sometimes, Never** If you write a whole number in a place value grid and multiply it by 10, all the digits move one column to the left. Explain your answer.	Annie has multiplied a whole number by 10 Her answer is between 440 and 540 What could her original calculation be? How many possibilities can you find?	Odd, even, count in twos, threes, fives, count in tens (forwards from/ backwards from), how many times, lots of, groups, once, twice, three ties, five times, multiple of, multiply, multiply by, repeated addition, array, row, column, double, halve, share, share equally, group in pairs, threes etc., equal groups of, divide, divided by, left, left over, describe the rule, product, multiples of; four, eight, fifty and one hundred, scale up, multiplication
Multiply by 100 – using up to a 3 digit number	3 ×  =  = 3 ones = 3 Complete: 3 ×  =  = ___ tens = ___ 3 ×  =  = ___ hundreds = ___	Show other way of multiplying by 100, 10 x 10, to get the same answer. Which representation does **not** show multiplying by 100? Explain your answer.    	**7b. Use the digit cards to complete the calculations. You can use each card more than once.** **9 4 1 3 0** **☐ x 8 x 100 > 5 x ☐☐ x 100** **☐ x 7 x 10 x 10 < 2 x ☐☐x 100** **Investigate the possible calculations.**	

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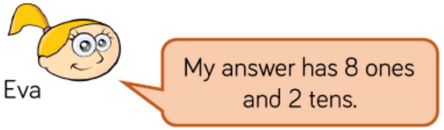
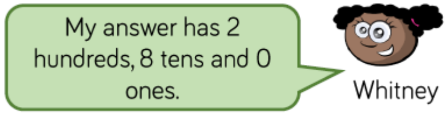
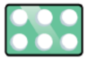
<table>
<tr>
<td>Divide by 10 – using up to a 4 – digit number</td>
<td>Use place value counters to show the steps to divide 30 by 10

Can you use the same steps to divide a 3-digit number like 210 by 10?
 </td>
<td>While in Wonderland, Alice drank a potion and everything shrank. All the items around her became ten times smaller! Are these measurements correct?
<table>
<tr><th>Item</th><th>Original measurement</th><th>After shrinking</th></tr>
<tr><td>Height of a door</td><td>220 cm</td><td>2,200 cm</td></tr>
<tr><td>Her height</td><td>160 cm</td><td>16 cm</td></tr>
<tr><td>Length of a book</td><td>340 mm</td><td>43 mm</td></tr>
<tr><td>Height of a mug</td><td>220 mm</td><td>?</td></tr>
</table>
Can you fill in the missing measurement?
Can you explain what Alice did wrong?
Write a calculation to help you explain each item.</td>
<td>Four children are in a race. The numbers on their vests are:
350 35
3,500 53
Use the clues to match each vest number to a child.
• Jack's number is ten times smaller than Mo's.
• Alex's number is not ten times smaller than Jack's or Dora's or Mo's.
• Dora's number is ten times smaller than Jack's.</td>
<td>facts up to 12 x 12, division facts, inverse, derive, equal, unequal, why are we using the addition symbol? Multiplication, lots of, arrays, commutative, times tables, how many do you have to begin with? Division, what is the same/different about the groups?</td>
</tr>
</table>

Divide by 100 – using up to a 4 digit number	Use <, > or = to make each statement correct. 3,600 ÷ 10 ○ 3,600 ÷ 100 2,700 ÷ 100 ○ 270 ÷ 10 4,200 ÷ 100 ○ 430 ÷ 10	**4b. There is 100 pence in one pound. Nate is putting the 3,400 pennies in 100p bags.** **Nate says,**  **Is he correct? Explain your answer.**	Eva and Whitney are dividing numbers by 10 and 100 They both start with the same 4-digit number. They give some clues about their answer.   What number did they both start with? Who divided by what?	What do you notice about the pattern? Comparing, inequality symbols, column multiplication, exchange, how do we record the exchange? How can we partition our number? Remainder, scaling, times as many, systematically, possibilities, ten

Multiply by 1 and 0	Complete the calculation shown by the number pieces.  There are ___ ones. ___ × ___ = ___  There is ___ six. ___ × ___ = ___ Show 3 x 0 using concrete manipulatives.	Which answer could be the odd one out? What makes it the odd one out? 3 + 0 = ___ 3 − 0 = ___ 3 × 0 = ___ Explain why the answer is different.	Circle the incorrect calculations and write them correctly. 5 × 0 = 50 19 × 1 = 19 7 × 0 = 7 1 × 1 = 2 0 × 35 = 0 0 × 0 = 1 1 × 8 = 9 Choose one calculation and create a drawing to show it.	times bigger/smaller, hundred times bigger/smaller, how can dividing by 10 help you to divide by 100? What does zero mean? Fact family, multiples, commutativity, associative law, factors, factor pairs, correspondence problems, bus stop

Divide by 1 and itself	Use counters and hands to complete. • 4 counters **shared** between 4 hands ___ ÷ ___ = ___ • 4 counters **shared** between 1 hand ___ ÷ ___ = ___ • 9 counters **grouped** in 1s ___ ÷ ___ = ___ • 9 counters **grouped** in 9s ___ ÷ ___ = ___	Mo says,  25 divided by 1 is equal to 1 divided by 25 Do you agree? Explain your answer.	Use <, > or = to complete the following: 8 ÷ 1 ○ 7 ÷ 1 6 ÷ 6 ○ 5 ÷ 5 4 ÷ 4 ○ 4 ÷ 1 Draw an image for each one to show that you are correct.	
Related facts – multiplication and division				
Multiples of 3				

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<table>
<tr>
<td>Use previous knowledge to multiply and divide to multiply by 6</td>
<td>Complete the sentences.

There are ___ lots of ___ eggs.
There are ___ eggs in total.
___ × ___ = ___

First there were ___ eggs. Then they were shared into ___ boxes. Now there are ___ eggs in each box.
___ ÷ ___ = ___</td>
<td>Always, Sometimes, Never

When you multiply any whole number by 6 it will always be an even number.

Explain your answer.</td>
<td>Draw a bar model to represent each problem.

Tom has 54 cakes.
He shares them equally into 6 boxes.
How many cakes will go in each box?

Tom puts 54 cakes into boxes.
There are 6 cakes in each box.
How many boxes will he need?</td>
<td></td>
</tr>
<tr>
<td>Know their 6 times tables and division facts with increased fluency</td>
<td>Complete the number sentences.
1 × 3 = ___
1 × ___ = 6
2 × ___ = 6
2 × 6 = ___
3 × 3 = ___
3 × 6 = ___</td>
<td>Dexter is thinking of two numbers.

The sum of my numbers is 15 and their product is 54

What are Dexter's numbers?
Explain your answer.</td>
<td>Here are some facts about multiples of 3 and 6

If an even number has a digit sum that is a multiple of 3, then the number is a multiple of 3 and 6
If an odd number has a digit sum that is a multiple of 3, then it is a multiple of 3 but not of 6

195 15 624 592 128 348
<table>
<tr><th>Multiple of 3 only</th><th>Multiple of 3 and 6</th><th>Not a multiple of 3 or 6</th></tr>
<tr><td></td><td></td><td></td></tr>
</table>
Can you think of your own numbers that follow the rules?</td>
<td></td>
</tr>
</table>

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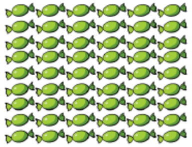
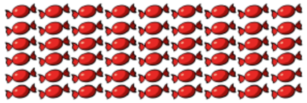
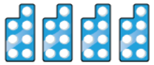
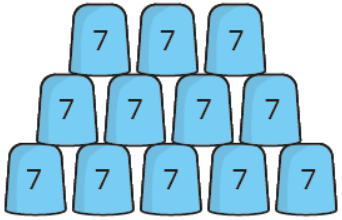
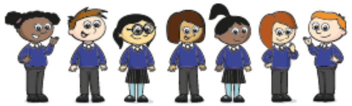
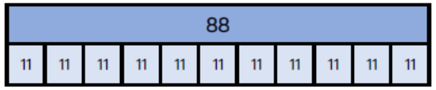
Use previous knowledge to multiply and divide to multiply by 9	Complete the fact family.  ___ × ___ = ___ ___ × ___ = ___ ___ ÷ ___ = ___ ___ ÷ ___ = ___	Amir and Whitney both receive some sweets.   Amir I have more sweets because I have more rows.  Whitney I have more sweets because I have more in each row.  Who has more sweets? Explain your reasoning.	Here are some multiples of 9 36 45 279 459 981 108 Find the digit sum of each number. What do you notice? Use what you have learnt about adding the digits together to find out which of these numbers are multiples of 9 477 418 393 999 396 576	
Know their 9 times table and division facts with increased fluency	What are the missing numbers from the 9 times table? 9 18 27 ___ 45 54 ___ 72 81 90	Is this statement always true, sometimes true or never true? Multiples of 9 are also multiples of 6 Explain your answer.	I am thinking of two numbers. The sum of the numbers in 17. The product of the numbers is 72. What are my secret numbers? Can you choose your own two secret numbers from the 9 times table and create clues for your partner?	

The 3, 6 and 9 times – tables.				
Use previous knowledge to multiply and divide to multiply by 7	Rosie uses number pieces to represent seven times four. She does it in two ways. 4 sevens 4 lots of 7 4 × 7  7 fours 7 lots of 4 7 × 4  Use Rosie's method to represent seven times six in two ways.	Show that $9 \times 7 = 9 \times 8 - 9$ Draw an array to help you explain your answer.	Three children are playing a game. They score 7 points for every cup they knock down.  Here are their scores. Esther 56 Brett 77 Alex 28 How many cups did each child knock down?	

<table>
<tr>
<td>Know their 7 times table and division facts with increased fluency</td>
<td>Complete the multiplications.
▸ 11 × 7 = ______ ▸ 7 × 9 = ______ ▸ 70 = ______ × 7
▸ ______ × 7 = 21 ▸ 7 × ______ = 35 ▸ ______ = 1 × 7</td>
<td>True or False?
7 × 6 = 7 × 3 × 2
7 × 6 = 7 × 7 + 8
Explain your answer to a friend. Prove using a drawing.</td>
<td>Children are arranged into rows of 7
There are 5 girls and 2 boys in each row.

There are 84 children in total.
How many girls are there?</td>
<td></td>
</tr>
<tr>
<td>Building on knowledge of the 1, 2 and 10 times tables, explore the 11 and 12 times-tables through partitioning.</td>
<td>Fill in the blanks.

2 × 10 = ___ 2 × 1 = ___
2 lots of 10 doughnuts = ___ 2 lots of 1 doughnut = ___
2 lots of 11 doughnuts = ___
2 × 10 + 2 × 1 = 2 × 11 = ___</td>
<td>Rosie uses a bar model to represent 88 divided by 11


Explain Rosie's mistake.
Can you draw a bar model to represent 88 divided by 11 correctly?</td>
<td>Here are the prices of tickets to see a play.
<table><tr><th>Adult</th><th>Child</th></tr><tr><td>£12</td><td>£6</td></tr></table>
What possible combination of adults and children could attend if they spend £60?
How many possibilities are there?</td>
<td></td>
</tr>
</table>

			Here is one batch of muffins.  Teddy bakes 11 batches of muffins. How many muffins does he have altogether? In each batch there are 3 strawberry, 3 vanilla, 4 chocolate and 2 toffee muffins. How many of each type of muffin does Teddy have in 11 batches? Teddy sells 5 batches of muffins. How many muffins does he have left?	
11 times-table and division facts				
12 times-table and division facts				

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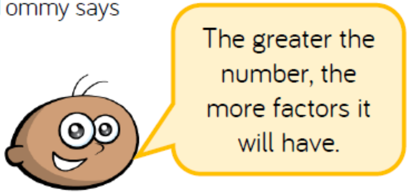
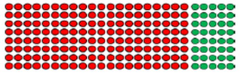
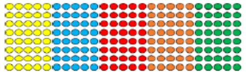
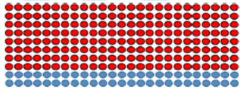
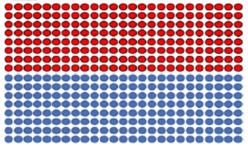
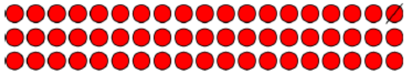
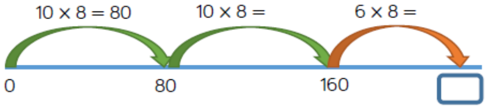
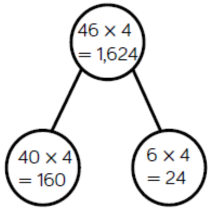
Multiply 3 numbers	Use counters or cubes to represent the calculations. Choose which order you will complete the multiplication. 5 × 2 × 6 8 × 4 × 5 2 × 8 × 6	Is the statement true or false? 9 × 8 = 9 × 4 × 2 Explain your reasoning.	Choose three digit cards. Arrange them in the calculation. ☐ × ☐ × ☐ = ☐ How many different calculations can you make using your three digit cards? Which order do you find it the most efficient to calculate the product? How have you grouped the numbers?	
Recognise factors and factor pairs	Here is an example of a factor bug for 12 Complete the factor bug for 36  Are all the factors in pairs? Draw your own factor bugs for 16, 48, 56 and 35	Tommy says  Is Tommy correct? Use arrays to explain your answer.	Some numbers are equal to the sum of all their factors (not including the number itself). e.g. 6 6 has 4 factors, 1, 2, 3 and 6 Add up all the factors not including 6 itself. 1 + 2 + 3 = 6 6 is equal to the sum of its factors (not including the number itself) How many other numbers can you find that are equal to the sum of their factors? Which numbers are less than the sum of their factors? Which numbers are greater than the sum of their factors?	
Use factor pairs				

Children develop their mental multiplication by exploring different ways to calculate (efficient multiplication).	Class 4 are calculating 25 × 8 mentally. Can you complete the calculations in each of the methods? Method 1 25 × 8 = 20 × 8 + 5 × 8 = 160 + ☐ = ☐  Method 2 25 × 8 = 5 × 5 × 8 = 5 × ☐ = ☐  Method 3 25 × 8 = 25 × 10 − 25 × 2 = ☐ − ☐ = ☐  Method 4 25 × 8 = 50 × 8 ÷ 2 = ☐ ÷ ☐ = ☐  Can you think of any other ways to mentally calculate 25 × 8? Which do you think is the most efficient? How would you calculate 228 × 5 mentally?	Teddy has calculated 19 × 3  20 × 3 = 60 60 − 1 = 59 19 × 3 = 59 Can you explain his mistake and correct the diagram?	**8b. Roll a dice four times to create a calculation that multiplies a 3-digit number by a 1-digit number.** **Solve the multiplication using an efficient method.**	
Use informal written methods to multiply 2 digit and 1 digit numbers.	There are 8 classes in a school. Each class has 26 children. How many children are there altogether? Complete the number line to solve the problem.  Use this method to work out the multiplications. 16 × 7 34 × 6 27 × 4	Ron is calculating 46 multiplied by 4 using the part-whole model.   Can you explain Ron's mistake?	Here are 6 multiplications. 43 × 5 54 × 6 38 × 6 33 × 2 19 × 7 84 × 5 Which of the multiplications would you calculate mentally? Which of the multiplications would you use a written method for? Explain your choices to a partner. Did your partner choose the same methods as you?	

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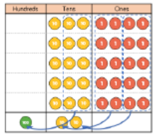
Multiply 2 digit by 1 digit numbers

Whitney uses place value counters to calculate 5 × 34



	H	T	O	
		3	4	
×			5	
		2	0	(5 × 4)
+	1	5	0	(5 × 30)
	1	7	0	

Use Whitney's method to solve
5 × 42
23 × 6
48 × 3

Here are three incorrect multiplications.

	T	O
	6	1
×		5
	3	5

	T	O
	7	4
×		7
4	9	8

	T	O
	2	6
×		4
8	2	4

Correct the multiplications.

7b. Tara's horse rode 27 miles a day for 6 days and Piers's horse rode 28 miles a day for 5 days.

x		

x		

What is the difference between the two totals?

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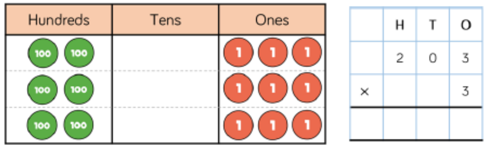
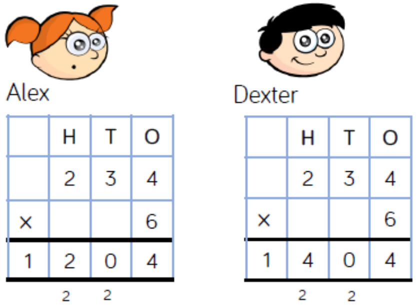
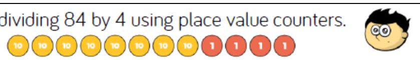
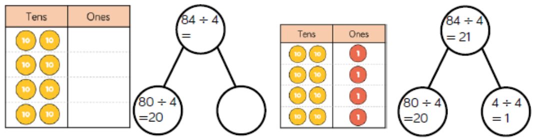
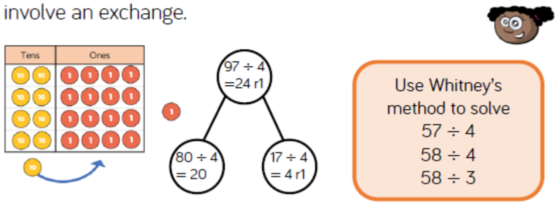
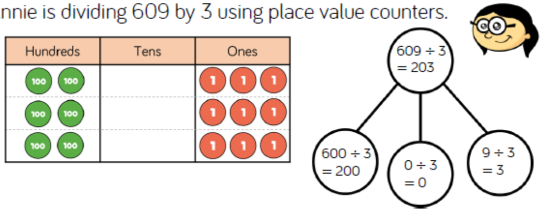
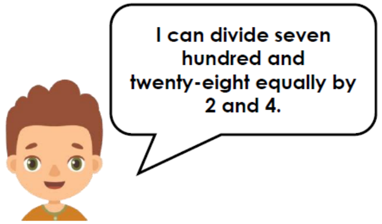
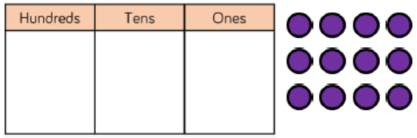
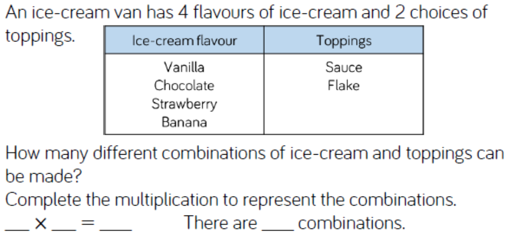
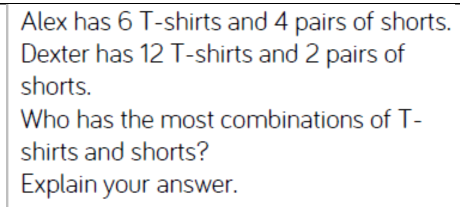
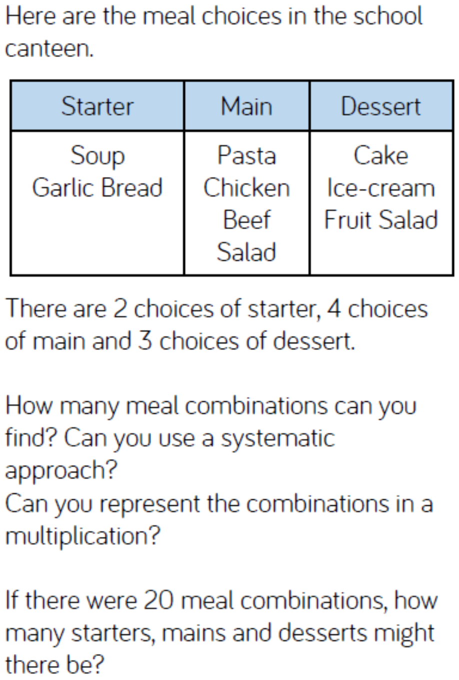
Multiply 3 digit by 1 digit numbers	Complete the calculation.  	**Spot the mistake** Alex and Dexter have both completed the same multiplication.  Who has the correct answer? What mistake has been made by one of the children?	**7b. Match the numbers which have an answer of 2,274.** **542** **3** **379** **7** **680** **5** **758** **6** **Which numbers cannot be used?**	
Divide 2 digit by 1 digit numbers – no remainders	Jack is dividing 84 by 4 using place value counters.  First, he divides the tens. Then, he divides the ones.  Use Jack's method to calculate: 69 ÷ 3 88 ÷ 4 96 ÷ 3	Dora is calculating 72 ÷ 3 Before she starts, she says the calculation will involve an exchange. Do you agree? Explain why.	Eva has 96 sweets. She shares them into equal groups. She has no sweets left over. How many groups could Eva have shared her sweets into?	

Divide 2 digit by 1 digit numbers with remainders	Whitney uses the same method, but some of her calculations involve an exchange.  Use Whitney's method to solve 57 ÷ 4 58 ÷ 4 58 ÷ 3	Rosie writes, 85 ÷ 3 = 28 r 1 She says 85 must be 1 away from a multiple of 3 Do you agree?	**9a. Divide the following number by the numbers on the digit cards.** **95** **6** **9** **7** **8** **4** **Order the calculations in ascending order by the size of their remainders.**	
Divide 3 digit by 1 digit numbers with no remainders	Annie is dividing 609 by 3 using place value counters.  Use Annie's method to calculate the divisions. 906 ÷ 3 884 ÷ 4 884 ÷ 8 489 ÷ 2	**6b. Gareth says,**  **Is he correct? Convince me.**	You have 12 counters and the place value grid. You must use all 12 counters to complete the following.  Create a 3-digit number divisible by 2 Create a 3-digit number divisible by 3 Create a 3-digit number divisible by 4 Create a 3-digit number divisible by 5 Can you find a 3-digit number divisible by 6, 7, 8 or 9?	
Once children show confidence in partition of numbers using				

<table>
<tr><td>place value grid introduce bust stop as a short division written method.</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Correspondence problems</td><td>An ice-cream van has 4 flavours of ice-cream and 2 choices of toppings.<table><tr><th>Ice-cream flavour</th><th>Toppings</th></tr><tr><td>Vanilla
Chocolate
Strawberry
Banana</td><td>Sauce
Flake</td></tr></table>How many different combinations of ice-cream and toppings can be made?
Complete the multiplication to represent the combinations.
___ × ___ = ___ There are ___ combinations.</td><td>Alex has 6 T-shirts and 4 pairs of shorts. Dexter has 12 T-shirts and 2 pairs of shorts.
Who has the most combinations of T-shirts and shorts?
Explain your answer.</td><td>Here are the meal choices in the school canteen.<table><tr><th>Starter</th><th>Main</th><th>Dessert</th></tr><tr><td>Soup
Garlic Bread</td><td>Pasta
Chicken
Beef
Salad</td><td>Cake
Ice-cream
Fruit Salad</td></tr></table>There are 2 choices of starter, 4 choices of main and 3 choices of dessert.

How many meal combinations can you find? Can you use a systematic approach?
Can you represent the combinations in a multiplication?

If there were 20 meal combinations, how many starters, mains and desserts might there be?</td><td></td></tr>
</table>

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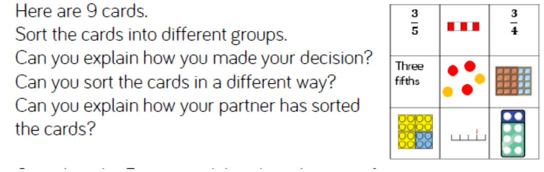
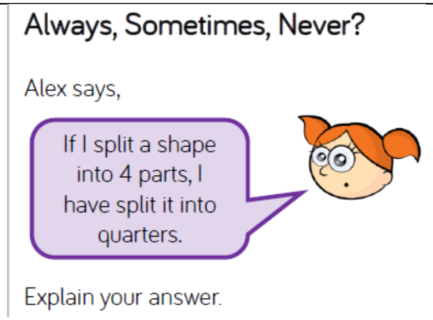
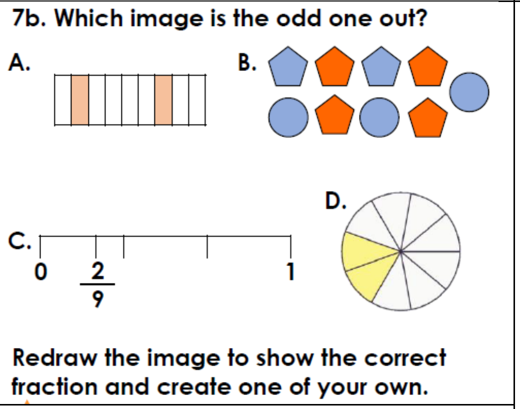
Year 4				
Number: Fractions				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**
Explore fractions in different representations – what is a fraction?	 Here are 9 cards. Sort the cards into different groups. Can you explain how you made your decision? Can you sort the cards in a different way? Can you explain how your partner has sorted the cards? 	 Always, Sometimes, Never? Alex says, If I split a shape into 4 parts, I have split it into quarters. Explain your answer.	 7b. Which image is the odd one out? Redraw the image to show the correct fraction and create one of your own. 	tenths, equivalent decimals and fractions, Whole, equal parts, four equal parts, one half, two halves, a quarter, two quarters, fraction, three quarters, one third, a third, equivalence, equivalent, unequal, are the
Understand the whole.				

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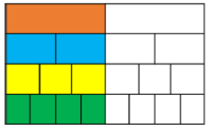
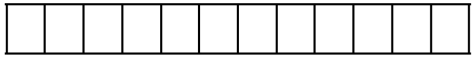
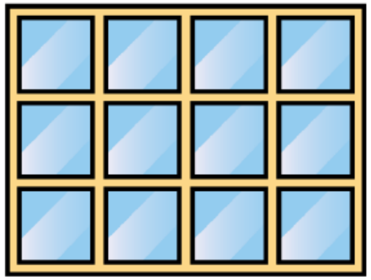
Equivalent fractions through diagrams starting to recognise a link with multiplication/ division	How many fractions that are equivalent to one half can you see on the fraction wall?  Draw extra rows to show other equivalent fractions. Using the diagram, complete the equivalent fractions.  $\frac{1}{4} = \frac{\square}{12}$ $\frac{1}{\square} = \frac{6}{12}$ $\frac{2}{3} = \frac{\square}{12}$ $\frac{5}{12} = \frac{\square}{24}$	Eva says,  I know that $\frac{3}{4}$ is equivalent to $\frac{3}{8}$ because the numerators are the same. Is Eva correct? Explain why. Tommy is finding equivalent fractions. $\frac{3}{4} = \frac{5}{6} = \frac{7}{8} = \frac{9}{10}$ He says,  I did the same thing to the numerator and the denominator so my fractions are equivalent. Do you agree with Tommy? Explain your answer.	How many equivalent fractions can you see in this picture?  Use the digit cards to complete the equivalent fractions. 1 2 3 4 6 8 $\frac{\square}{\square} = \frac{\square}{\square}$ How many different ways can you find?	parts equal? How do you know? Splitting a whole into two equal parts, 1/2 , 1/3 , what does the 1 represent, what does the 3 represent. How many thirds make a whole? 1/4, unit fraction, non-unit fraction, numerators, denominators, 3/4 , tenths, decimals, is a fraction always less than one? How many tenths make a whole? What is a tenth? Can you see a pattern between the fractions? How can we use our

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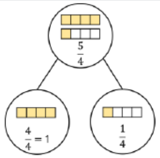
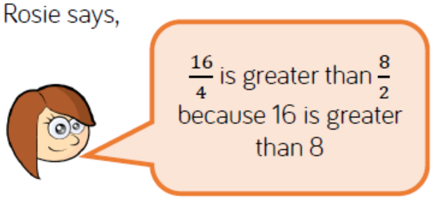
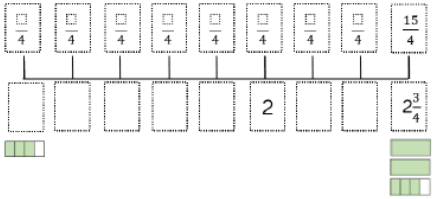
Equivalent fractions on a number line.				times tables to help us find equivalent fractions? Compare, order, addition and subtraction of fractions, greater than, how many x make a whole? Quantity,
Fractions greater than 1	Complete the part-whole models and sentences. There are ____ quarters altogether. ___ quarters = ____ whole and ____ quarter. 	Rosie says,  Do you agree? Explain why.	3 friends share some pizzas. Each pizza is cut into 8 equal slices. Altogether, they eat 25 slices. How many whole pizzas do they eat?	
Count in fractions beyond 1. – include number lines with mixed fractions.	Complete the number line. 	Circle and correct the mistakes in the sequences. $\frac{5}{12}, \frac{8}{12}, \frac{11}{12}, \frac{15}{12}, \frac{17}{12}$ $\frac{9}{10}, \frac{7}{10}, \frac{6}{10}, \frac{3}{10}, \frac{1}{10}$	Here is a number sequence. $\frac{5}{12}, \frac{7}{12}, \frac{10}{12}, \frac{14}{12}, \frac{19}{12}$, ____ Which fraction would come next? Can you write the fraction in more than one way?	
Partition a mixed number.				
Compare and order mixed numbers.				
Understand improper fractions.				

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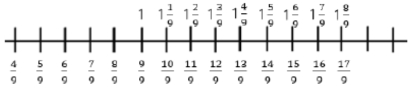
Convert mixed numbers to improper fractions.				
Convert improper fractions to mixed numbers.				
Add 2 or more fractions – same denominator	Use the number line to add the fractions.  $\frac{4}{9}+\frac{4}{9}+\frac{8}{9}=$ $\frac{4}{9}+\frac{5}{9}+\frac{8}{9}$ $\frac{1}{9}+\frac{11}{9}+1$ $\frac{\square}{9}+\frac{5}{9}+\frac{7}{9}=\frac{17}{9}$	Alex is adding fractions. $\frac{3}{9}+\frac{2}{9}=\frac{5}{18}$  Is she correct? Explain why.	How many different ways can you find to solve the calculation? $\frac{\square}{\square}+\frac{\square}{\square}=\frac{11}{9}$	

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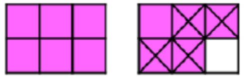
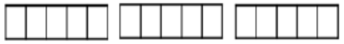
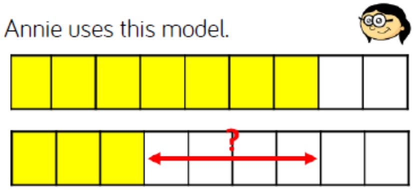
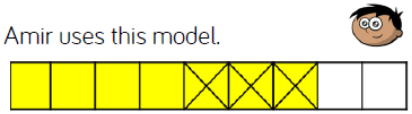
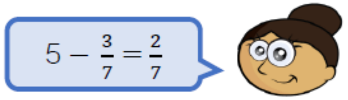
Subtract 2 fractions – same denominator	Use the bar models to subtract the fractions.  $\frac{6}{7} - \frac{2}{7} =$  $\frac{11}{6} - \frac{\square}{6} = \frac{\square}{6}$  $\frac{13}{5} - \frac{\square}{5} = \frac{6}{5}$	Annie and Amir are working out the answer to this problem. $\frac{7}{9} - \frac{3}{9}$ Annie uses this model.  Amir uses this model.  Which model is correct? Explain why.	How many different ways can you find to solve the calculation? $\frac{\square}{7} - \frac{3}{7} = \frac{\square}{7} + \frac{\square}{7}$ $\frac{\square}{7} - \frac{3}{7} = \frac{\square}{7} - \frac{\square}{7}$	
Subtract fractions from whole amounts	Use cubes, strips of paper or a bar model to solve: $\frac{9}{9} - \frac{4}{9} = \frac{\square}{9}$ $\frac{9}{9} - \frac{\square}{9} = \frac{2}{9}$ $\frac{13}{9} - \frac{9}{9} = \frac{\square}{9}$	Dora is subtracting a fraction from a whole.  Can you spot her mistake? What should the answer be?	How many ways can you make the statement correct? $2 - \frac{\square}{8} = \frac{5}{8} + \frac{\square}{8}$	

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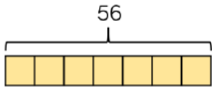
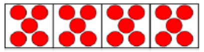
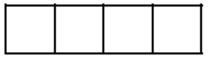
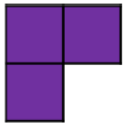
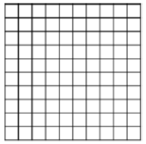
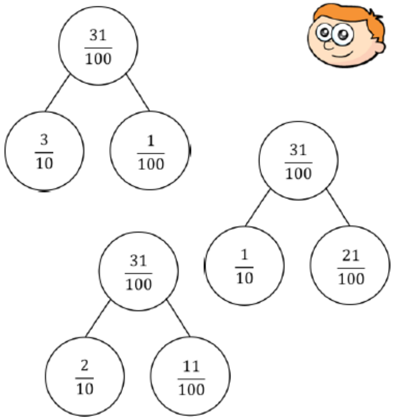
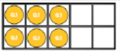
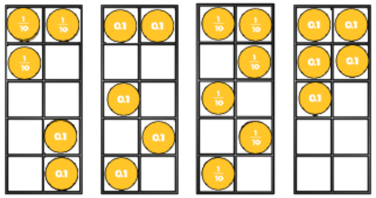
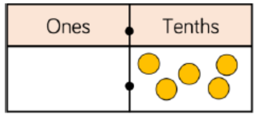
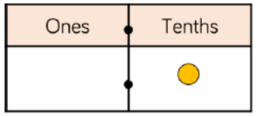
Fractions of a quantity using diagrams	Use a bar model to help you represent and find: $\frac{1}{7}$ of 56 = 56 ÷ ☐  $\frac{2}{7}$ of 56 $\frac{3}{7}$ of 56 $\frac{4}{7}$ of 56 $\frac{4}{7}$ of 28 $\frac{7}{7}$ of 28	**True or False?** To find $\frac{3}{8}$ of a number, divide by 3 and multiply by 8  Convince me.	Ron gives $\frac{2}{9}$ of a bag of 54 marbles to Alex. Teddy gives $\frac{3}{4}$ of a bag of marbles to Alex. Ron gives Alex more marbles than Teddy. How many marbles could Teddy have to begin with? $\frac{2}{9}$ of 54 > $\frac{3}{4}$ of ☐	
Calculate quantities	Use the counters and bar models to calculate the whole:  There are ___ counters in one part. $\frac{1}{4}$ = ___ $\frac{2}{4}$ = ___ $\frac{3}{4}$ = ___ $\frac{4}{4}$ or 1 whole = ___  There are 7 counters in one part. $\frac{1}{4}$ = ___ $\frac{2}{4}$ = ___ $\frac{3}{4}$ = ___ $\frac{4}{4}$ or 1 whole = ___	 The school kitchen needs to buy carrots for lunch. A large bag has 200 carrots and a medium bag has $\frac{3}{5}$ of a large bag. Mrs Rose says, I need 150 carrots so I will have to buy a large bag.  Is Mrs Rose correct? Explain your reasoning.	These three squares are $\frac{1}{4}$ of a whole shape.  How many different shapes can you draw that could be the complete shape?	

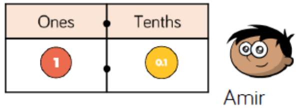
Year 4

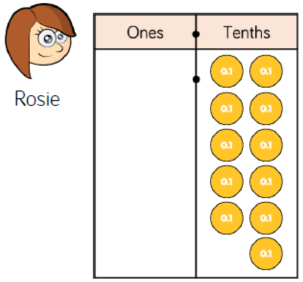
Number: Decimals

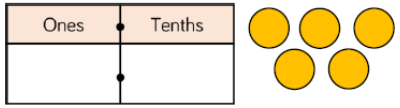
Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Recognise tenths and hundredths	If the hundred square represents one whole :  Each square is ___ out of ___ equal squares. Each square represents $\frac{\square}{\square}$ Each row is ___ out of ___ equal rows. Each row represents $\frac{\square}{\square}$	Who is correct? Dora 5 hundredths is equivalent to 50 tenths.   50 hundredths is equivalent to 5 tenths. Amir Explain why.	Ron says he can partition tenths and hundredths in more than one way.  Use Ron's method to partition 42 hundredths in more than one way.	Decimals, tenths, hundredths, equivalent decimals and fractions, order, compare, place value, what is a tenth? Where would we use tenths in real life? How many tenths are equivalent to a whole? Number line, relevant scale, divide by 10 – split into 10

<table>
<tr>
<td>Tenths as decimals</td>
<td>Complete the table.
<table>
<tr><th>Image</th><th>Words</th><th>Fraction</th><th>Decimal</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>five tenths</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td>0.9</td></tr>
</table></td>
<td>Which ten frame is the odd one out?

Explain your answer.</td>
<td>six tens
six tenths
What is the same? What's different? Show me.</td>
<td rowspan="3">equal parts, Gettegno chart, zero as a place holder, part, whole, decimal place, compare, order, ascending, descending, which digit do we use to compare these decimals? Round up, round down, integers, halves, quarters</td>
</tr>
<tr>
<td>Tenths as fractions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenths on a place value grid</td>
<td>Complete the stem sentences for the decimals in the place value grid.




There are ☐ ones and ☐ tenths.
The decimal represented is ☐</td>
<td>Two children are making eleven tenths.




Who has made it correctly?
Explain your answer.</td>
<td>Use five counters and a place value grid. Place all five counters in either the ones or the tenths column.
How many different numbers can you make?
Describe the numbers you have made by completing the stem sentences.
There are ☐ ones and ☐ tenths.
☐ ones + ☐ tenths = ☐

</td>
</tr>
</table>

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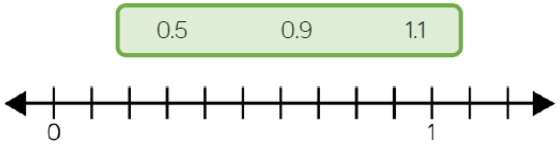
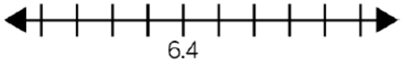
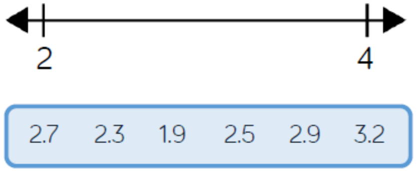
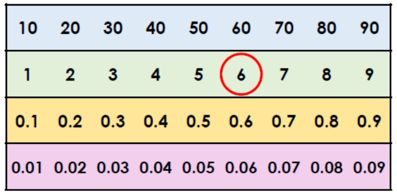
<table>
<tr>
<td>Tenths on a number line</td>
<td>Place the decimals on the number line.

 </td>
<td>What could the start and end numbers on the number line be?


Explain your reasons.</td>
<td>Place the decimals on the number line.


Which order did you place your numbers on the number line?</td>
<td></td>
</tr>
<tr>
<td>Divide 1 digit by 10</td>
<td>Here is a one-digit number on a place value chart.
<table><tr><th>Ones</th><th>Tenths</th></tr><tr><td>5</td><td></td></tr></table>
When dividing by 10, we move the digits one place to the _______.
5 ÷ 10 = ☐</td>
<td>4a. Nathan is dividing 1-digit numbers by 10 and circling the answer on the Gattegno chart.

<table><tr><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td></tr><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr><tr><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td><td>0.5</td><td>0.6</td><td>0.7</td><td>0.8</td><td>0.9</td></tr><tr><td>0.01</td><td>0.02</td><td>0.03</td><td>0.04</td><td>0.05</td><td>0.06</td><td>0.07</td><td>0.08</td><td>0.09</td></tr></table>
Explain the mistake he has made.</td>
<td>9b. Use the digit cards to make the following statement correct.
☐ ÷ 10 > ☐ ÷ 10 > ☐ ÷ 10
6 4 8 1
Give 3 possible answers.</td>
<td></td>
</tr>
</table>

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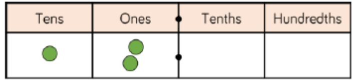
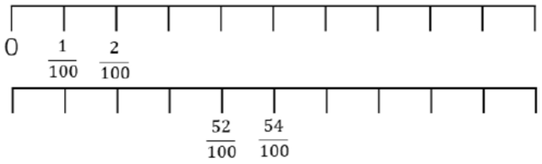
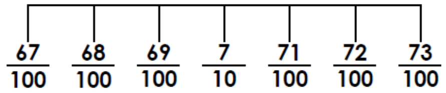
Divide 2 digit by 10	Teddy uses counters to make a 2-digit number.  To divide the number by 10, we move the counters one column to the right. What is the value of the counters now? Use this method to solve: 42 ÷ 10 = ☐ 35 ÷ 10 = ☐ ☐ = 26 ÷ 10	Dexter says,  When I divide a 2-digit number by 10, my answer will always have digits in the ones and tenths columns. Show that Dexter is incorrect.	**8b. Write numbers on the cards to create calculations to complete the statement.** ☐ ÷ 10 = ☐ < ☐ ÷ 10 = ☐ 73 4.2 ☐ 66 ☐ ☐ ☐ 5.3 ☐ **Find 3 possibilities.**	
Hundredths as fractions– recognise hundredths are dividing one equal whole into 100 parts.	Complete the number lines.  	**4a. Ollie has completed this section of a number line below.**  **Is he correct? Explain how you know.**	Complete the statements. 3 tenths and 2 hundredths = 2 tenths and ☐ hundredths 14 hundredths and 3 tenths = 4 tenths and ☐ hundredths 5 tenths and 1 hundredth < 5 tenths and ☐ hundredths 5 tenths and 1 hundredth > ☐ tenths and 5 hundredths Can you list all the possibilities?	

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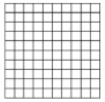
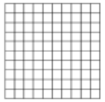
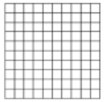
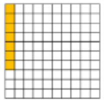
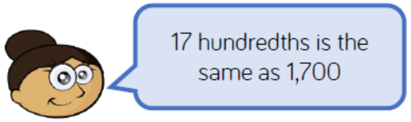
Hundredths as decimals

Complete the table.

Image	Words	Fraction	Decimals
	56 hundredths		
		$\frac{17}{100}$	
			0.2
			

Dora says,



Is she correct?
Explain your answer.

8b. Use the digit cards to make three decimals that are greater than one with a hundredths digit less than four.

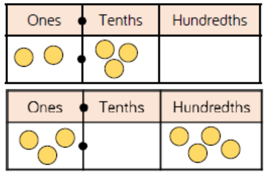
☐.☐☐

3 0 5 9 1 7

Write the equivalent fraction for each decimal you create.

Hundredths on a place value grid

Write the decimal represented in each place value grid.



There are ___ ones.

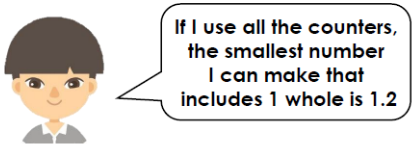
There are ___ tenths.

There are ___ hundredths.

The decimal represented is ___

5b. Paul is using a place value chart and three counters to make different numbers.

Paul says,



Is he correct? Explain how you know.

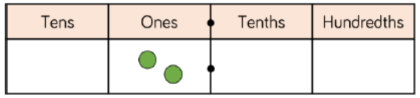
Use four counters and a place value grid.
Place all four counters in either the ones, tenths or hundredths column.

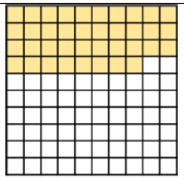
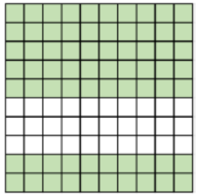
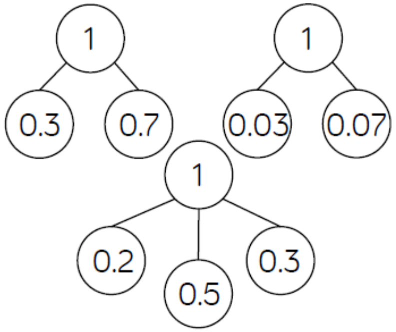
How many different numbers can you make?

Describe the numbers you have made by completing the sentences.

There are ☐ ones, ☐ tenths and ☐ hundredths.

☐ ones + ☐ tenths + ☐ hundredths = ☐

Divide 1 or 2 digits by 100	Dexter uses counters to make a 1-digit number.  To divide the number by 100, we move the counters two columns to the right. What is the value of the counters now? Use this method to solve: 4 ÷ 100 = ☐ 5 ÷ 100 = ☐ ☐ = 6 ÷ 100	Teddy says, 45 divided by 100 is 0.45 so I know 0.45 is 100 times smaller than 45  Mo says, 45 divided by 100 is 0.45 so I know 45 is 100 times bigger than 0.45  Who is correct? Explain your answer.	Describe the pattern. 7,000 ÷ 100 = 70 700 ÷ 100 = 7 70 ÷ 100 = 0.7 7 ÷ 100 = 0.07 Can you complete the pattern starting with 5,300 divided by 100?	

Make a whole from tenths and hundredths	Here is a hundred square. How many hundredths are shaded? How many more hundredths do you need to shade so the whole hundred square is shaded? ___ hundredths + ___ hundredths = 1 whole 	Which part-whole model does not match the hundred square?   Explain your answer.	**7b. Complete the calculation below. How many different solutions can you find?** **0.☐5 + 0.☐1 + 0.☐4 = 1**	

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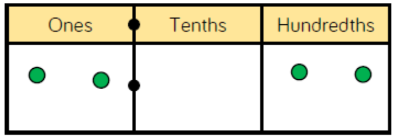
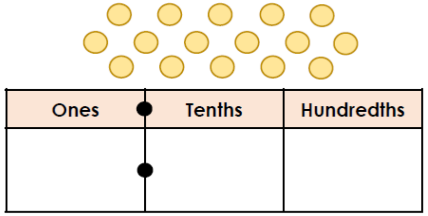
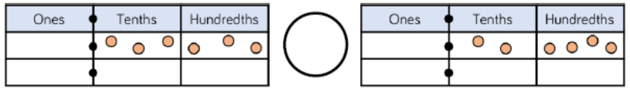
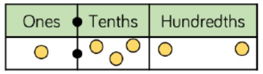
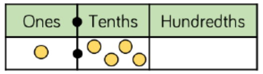
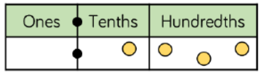
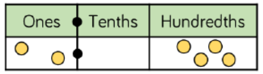
Write decimals up to 2 decimal place	Make the numbers on a place value chart and write down the value of the underlined digit. 3.47 2.15 0.6 25.03	Annie thinks the number shown is 2.2  Do you agree with Annie? Explain your answer.	**8b. What is the greatest number you can make? What is the smallest number you can make? You need to use all the counters and have a counter in each column.**  	
Compare decimals up to 2 decimal place	Write the numbers shown and compare using < or >  	**6b. Jack says:**  **I have the tallest tower because it is 3.64m high.** **Maya says:**  **I have the tallest tower because it is 3.46m high.** **Who is correct? Explain why.**	Use each digit card **once** to make the statement correct. 0 1 2 4 5 3 . ☐ ☐ > ☐ . ☐ ☐ Can you find eight different possible solutions?	

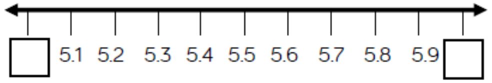
<table>
<tr>
<td>Order decimals up to 2 decimal place</td>
<td>Write down the decimals represented in the place value grid and then place them in ascending order.


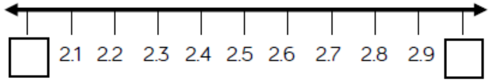


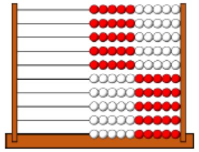



</td>
<td>Spot the Mistake
Rosie is ordering some numbers in ascending order:

0.09 < 0.99 < 10.01 < 1.35 < 9.09
Can you explain her mistake?</td>
<td>Some children have planted sunflowers and have measured their heights.
<table>
<tr><th>Child</th><th>Height</th></tr>
<tr><td>Beth</td><td>1.23 m</td></tr>
<tr><td>Tony</td><td>0.95 m</td></tr>
<tr><td>Rachel</td><td>1.02 m</td></tr>
<tr><td>Kate</td><td>1.2 m</td></tr>
<tr><td>Faye</td><td>99 cm</td></tr>
<tr><td>Emma</td><td>0.97 m</td></tr>
</table>

Order the children based on the heights of their sunflowers in both ascending and descending order.</td>
<td></td>
</tr>
<tr>
<td>Round decimals up to 1 decimal place to nearest whole number</td>
<td>Which integers do the decimals lie between?



</td>
<td>Mo says 0.4 rounded to the nearest whole number is zero.
Whitney says 0.4 rounded to the nearest whole number is one.
Who is correct? Why?</td>
<td>A number with one decimal place rounded to the nearest whole number is 45
What could the number be?</td>
<td></td>
</tr>
</table>

Write halves and quarters as decimals	Here is a rekenrek with 100 beads.  ____ out of 100 beads are red. ____ out of 100 beads are white. $\frac{\square}{100}$ are red, and $\frac{\square}{100}$ are white. Half of the beads are red, and half of the beads are white. $\frac{1}{2} = \frac{50}{100} = \frac{5}{10}$, so $\frac{1}{2}$ is ______ as a decimal.	Dexter has made a mistake when converting his fractions to decimals. $\frac{1}{2} = 1.2$, $\frac{1}{4} = 1.4$ and $\frac{3}{4} = 3.4$ What mistake has Dexter made?	**9b. I'm thinking of a fraction.** **One of the values is 36.** **It is equivalent to 0.75.** **What could my fraction be?**	

Year 4				
Measurement: Length and perimeter				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**
Measure in kilometres and metres.				Height, length, compare, measure, long,

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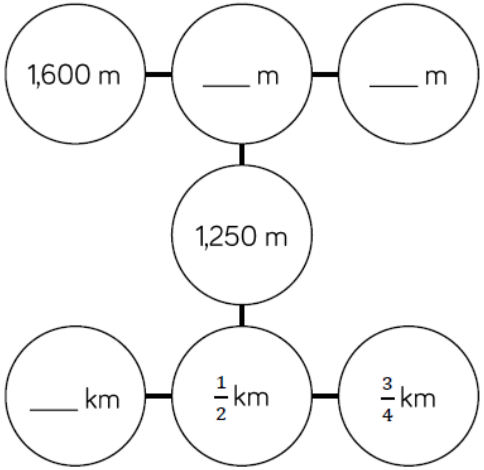
Equivalent lengths Kilometres and metres.	Complete the statements. 3,000 m = ____ km 5 km = ____ m 500 m = ____ km 9,500 m = ____ km	**2b. Is the following statement correct?** **$9\frac{1}{2}$ km > 9,500m** **Explain your answer.**	Complete the missing measurements so that each line of three gives a total distance of 2 km. 	short, longer, shorter, narrow, wide, centimetre, metre, kilometre, perimeter, rectilinear, taller, millimetre, nearest cm, measuring from 0, how long is? How tall is? Orientation, when would we measure in metres? When would we measure in cm? estimating prior to

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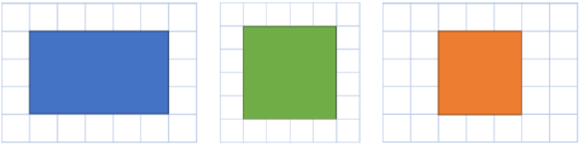
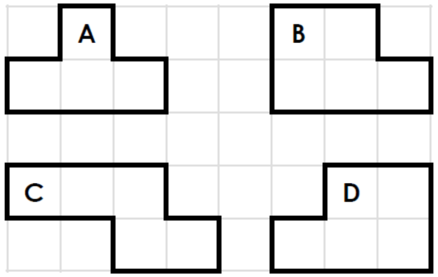
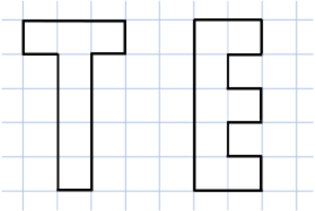
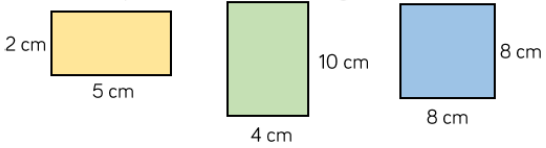
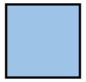
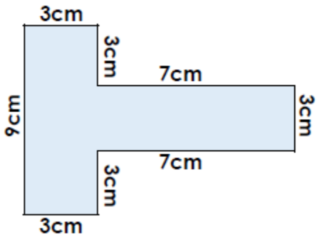
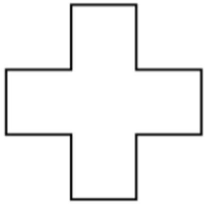
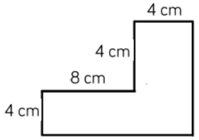
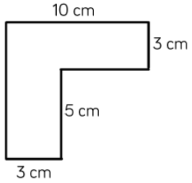
Perimeter on a grid	Calculate the perimeter of the shapes. 	**4b. Which shape is the odd one out?**  **Explain your reasoning.**	Which of these shapes has the longest perimeter?  Explore other letters which could be drawn as rectilinear shapes. Put them in order of shortest to longest perimeter. Can you make a word?	measuring, perimeter, 100cm=1m 10mm=1cm 1000M = 1km Convert, what is perimeter? What are rectilinear shapes?
Perimeter on a rectangle	Calculate the perimeter of the rectangles.  ___ cm + ____ cm + ___ cm + ____ cm = ____ cm	**Always, Sometimes, Never** When all the sides of a rectangle are odd numbers, the perimeter is even. Prove it.	Here is a square. Each of the sides is a whole number of metres.  Which of these lengths could be the perimeter of the shape? 24 m, 34 m, 44 m, 54 m, 64 m, 74 m Why could the other values not be the perimeter?	

Perimeter of rectilinear shapes	**Calculate the perimeter.**  		Here is a rectilinear shape. All the sides are the same length and are a whole number of centimetres.  Which of these lengths could be the perimeter of the shape? 48 cm, 36 cm, 80 cm, 120 cm, 66 cm Can you think of any other answers which could be correct?	
Find missing lengths in rectilinear shapes.	Find the perimeter of the shapes.   Use addition and subtraction to find missing sides.			

Perimeter of regular polygons.				
Perimeter of polygons.				

Year 4				
Measurement: Area				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**

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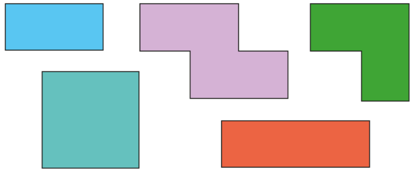
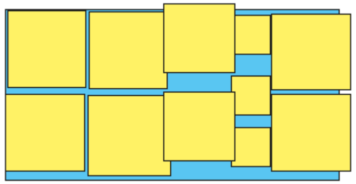
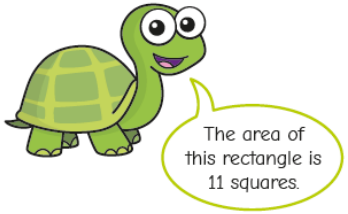
To understand that area is the amount space is taken up by a 2D shape or surface. (What is area?)	This is a square sticky note. 🟨 Estimate how many sticky notes you need to make these shapes. 	Tiny is finding the area of a rectangle.   What mistakes has Tiny made?	**8b. Ariba is making a 8-sided shape using squares and half squares. The surface of her shape will have an area of 15 squares.**  **Use the reference square and half square to create two shapes Ariba could make.**	Area, squared (cm^2) How can you measure area? The amount of space taken up by a two-dimensional shape. Working systematically, compare, greater than, less than, equal to.

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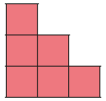
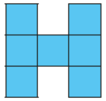
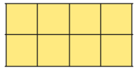
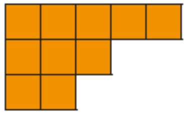
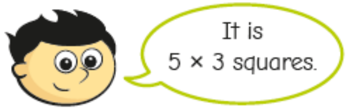
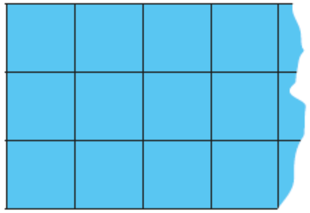
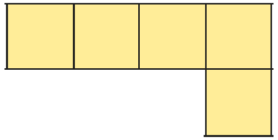
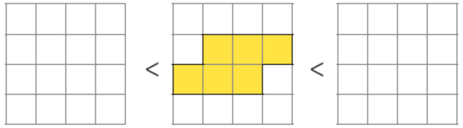
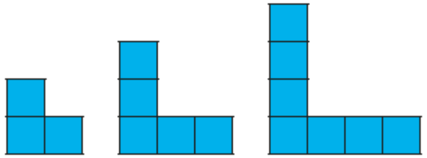
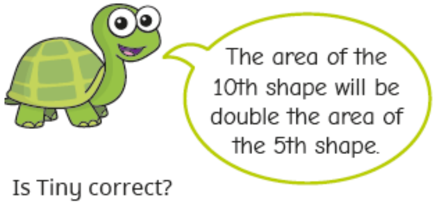
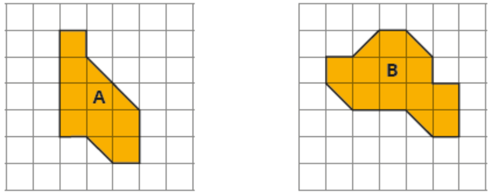
Counting squares to find area	There are ______ squares inside the shape. This means that the area of the shape is ______ squares. There are ______ squares and ______ half squares inside the shape. This means that the area of the shape is ______ squares. There are ______ rows. Each row has ______ squares. There are ______ squares in total. Count the squares to find the area of each shape. 	Jack thinks that the area of this shape is 15 squares.   What mistake has Jack made?	A rectangle is made from squares. The end of the rectangle has been torn off.  What is the smallest possible area of the original rectangle? What other possible areas could there be?	
Make shapes with a given number of squares.	Draw three rectilinear shapes, all with an area of 8 squares. What is the same about each shape? What is different?	Is the statement true or false? There is only one possible way to make a rectangle with an area of 12 squares. Draw a picture to support your answer.	Here is a rectilinear shape.  Add 7 more squares to the shape to make a rectangle. Is there more than one possible answer?	

Compare area where the same size square has been used.	Draw two shapes to complete the comparison. 	Find the areas of the shapes.  How is the area changing each time? Draw the next shape in the pattern. What is its area? Work out the area of the 6th shape.  Is Tiny correct?	Here are two shapes.  Scott draws another shape and labels it C. • the area of shape A < the area of shape C • the area of shape B > the area of shape C Draw Scott's shape. Is there more than one answer? What could the area of his shape be?	

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<table>
<tr><th colspan="5">Year 4</th></tr>
<tr><th colspan="5">Measurement: Money</th></tr>
<tr><th>Objective</th><th>Skill it</th><th>Apply it</th><th>Deepen it</th><th>Mathematical Talk</th></tr>
<tr>
<td>Pounds and Pence with the introduction of decimals and money.</td>
<td>How much money is in each purse?

There is ___ pence.
There is ___ pounds.
There is £___ and ___ p
There is £___.___</td>
<td>Some children are converting 1206 p into pounds.
Who is correct?

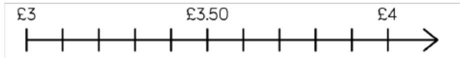
1206 p = £12.6
Whitney

1206 p = £12.06
Rosie

1206 p = £120.6
Teddy
What have the others done wrong?</td>
<td>Eva has these coins:

She picks three coins at a time.
Decide whether the statements will be always, sometimes or never true.
• She can make a total which ends in 2
• She can make an odd amount.
• She can make an amount greater than £6
• She can make a total which is a multiple of 5 pence
Can you think of your own always, sometimes, never statements?</td>
<td>Coins, notes, pounds, pennies, £, P, money, count, pence, change, convert, estimate, compare, greater than, less than, compare, what is the value of the coin/note?
How many pennies are there in £1, do the notes have greater value than coins? How do you know you have made …..</td>
</tr>
</table>

Order money	Children begin by ordering amounts represented in the same format e.g. 4,562 p and 4,652 p, or £45.62 and £46.52. Two classes save their pennies for a year. Class A saves 3,589 pennies. Class B saves 3,859 pennies. Order the amounts in ascending order. 130 p £0.32 132 p £13.20	What would you rather have, five 50p coins or twelve 20p coins? Explain your answer fully. 	Amir has these digits cards. 4 6 3 2 He uses them to fill the frame below: £ ☐ . ☐ ☐ He makes a total that is more than three pounds but less than six pounds. How many amounts can he make? Order your amounts in ascending order.	amount? Ascending, descending, order, rounding, addition, subtraction, multiplication, division

Estimate money using knowledge of rounding to support.	Place the amounts on the number line and round to the nearest pound. - £3.67 - £3.21 - £3.87 	Mo buys some socks and gloves. He estimates how much he'll spend.  £4 + £5 = £9   What could the actual price of the socks and gloves have been? Mo has £12 He says he has enough money to buy three pairs of socks. Do you agree? Explain why.	 Three children buy toys. Can you work out who buys what? Tommy buys a toy which rounds to £5 but gets change from £5 Amir buys two toys which total approximately £25 Eva's toy costs 5 p more than the number the cost rounds to. If you had £30, what combinations could you buy and what change would you approximately get?	

<table>
<tr>
<td>Four operations with money.</td>
<td>A family is going bowling.
How much does it cost for 1 child and 1 adult at peak time?
How much does it cost for 1 adult and 2 children off peak?
<table>
<tr><th>Tickets</th><th>Peak</th><th>Off Peak</th></tr>
<tr><td>Adult</td><td>£8</td><td>£6</td></tr>
<tr><td>Child</td><td>£4.20</td><td>£5.30</td></tr>
</table>
</td>
<td>Dexter buys a teddy bear for £6.00, a board game for £4.00, a CD for £5.50 and a box of chocolates for £2.50
He has some discount vouchers.
He can either get £10.00 off or pay half price for his items. Which voucher would save him more?
Explain your thinking.</td>
<td>A class has £100 to spend on books.
Book Prices
Hardback = £8
Paperback = £4
How many books could they buy for £100?
How many different ways can this be done?</td>
<td></td>
</tr>
</table>

<table>
<tr><th colspan="5">Year 4</th></tr>
<tr><th colspan="5">Measurement: Time</th></tr>
<tr><th>Objective</th><th>Skill it</th><th>Apply it</th><th>Deepen it</th><th>Mathematical Talk</th></tr>
<tr>
<td>Hours, minutes and seconds</td>
<td>Sort the activities under the headings depending on the approximate length of time they take to complete.
One hour
One minute
One second
Clap
Run around the playground
Blink
Swimming lesson
PE lesson
Tie your shoe laces</td>
<td>Dora says,

To convert hours to minutes, I multiply the number of hours by 60
Is she correct? Can you explain why?</td>
<td>Five friends run a race.
Their times are shown in the table.
<table>
<tr><th>Name</th><th>Time</th></tr>
<tr><td>Eva</td><td>114 seconds</td></tr>
<tr><td>Dexter</td><td>199 seconds</td></tr>
<tr><td>Teddy</td><td>100 seconds</td></tr>
<tr><td>Whitney</td><td>202 seconds</td></tr>
<tr><td>Ron</td><td>119 seconds</td></tr>
</table>
Which child finished the race the closest to two minutes?

What was the difference between the fastest time and the slowest time?
Give your answer in minutes and seconds.</td>
<td>Quarter past/to, Time, days of the week: Monday, Tuesday etc., seasons: spring, summer, autumn, winter, day, week, month, year, weekend, birthday, holiday, morning, afternoon, evening, night, midnight, bedtime,</td>
</tr>
</table>

Years, months, weeks and days	Use a calendar to help you complete the sentences. There are ___ months in a year. There are ___ days in February. ___ months have 30 days, and ___ months have 31 days. There are ___ days in a year and ___ days in a leap year.	Always, sometimes or never? There are 730 days in two years. Explain your answer.	Amir, Rosie and Jack describe when their birthdays are. Amir says,  My birthday is in exactly two weeks. Rosie says,  My birthday is in exactly 2 months. Jack says,  My birthday is in 35 days. Use the clues to work out when their birthdays are if today is the 8th June.	dinnertime, playtime, today, yesterday, tomorrow, before, after, next, last, now, soon, early, late, quick, quicker, quickest, fast, faster, fastest, slow, lower, slowest, slowly, takes longer, takes less time, hour, '0' clock, half past, clock, watch, hands, minutes, how long ago?, how long will it be to…?, how long will it take to…?, how often…?, always, never, often, sometimes, usually, once,
Analogue to digital – 12 hour	 The time is _______ past 10 This can also be written as ____ minutes past 10 The digital time is ____ : ____ Write each of these times in the digital format.    	Annie converts the analogue time to digital format. Here is her answer.  22 : 02 Explain what Annie has done wrong. What should the digital time be?	12 : 21 On a 12 hour digital clock, how many times will the time be read the same forwards and backwards?	

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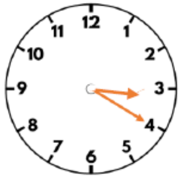
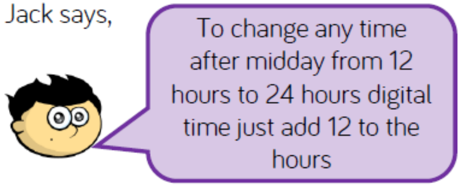
Analogue to digital – 24 hour	Sally leaves school at the time shown. She arrives home 1 hour later. What will the time be on a 24 hour digital clock? 	Jack says,  To change any time after midday from 12 hours to 24 hours digital time just add 12 to the hours Will this always be true? Are there any examples where this isn't the case?	Can you match the time dominoes together so that the touching times are the same?  Can you create your own version for your partner?	twice etc., first, second, next, twelve hour, twenty-four hour, roman numerals I to XII, convert, analogue, dialogue, 12 hour, 24 hour, digital can you show me…, duration, compare, hour, what time does the day start? Which hand shows the minutes/hours? Am/pm, clockwise, anticlockwise, seconds,

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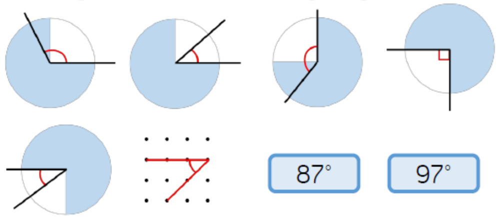
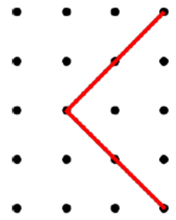
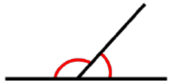
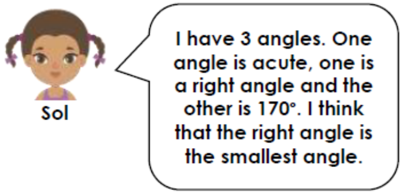
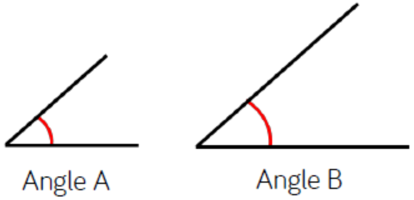
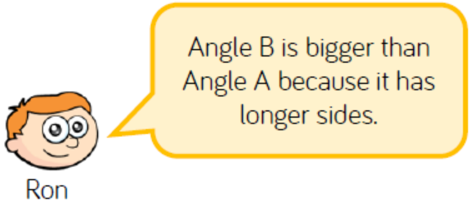
Year 4

Geometry: Properties of Shape

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Identify angles	Sort the angles into acute, obtuse and right angles.  	 Is the angle acute, obtuse or a right angle? Can you explain why?	**9b. Using the digits below can you create more obtuse or acute angles?** 2 4 8 1	Group, sort, cube, cuboid, pyramid, sphere, cone, cylinder, circle, triangle, square, rectangle, shape, flat, curved, straight, round, corner (point,

Compare angles	Circle the largest angle in each shape or diagram.   	5a. Sol is discussing angles.  Is Sol correct? Explain your answer.	  Do you agree with Ron? Explain your thinking.		pointed) hollow, solid, face, side, edge, make, build, draw, direction, journey, left, right, up down, forwards, backwards, sideways, across, close, far, near, along, though, to, from, towards, away from, movement, side, roll, turn, full turn, whole turn, half

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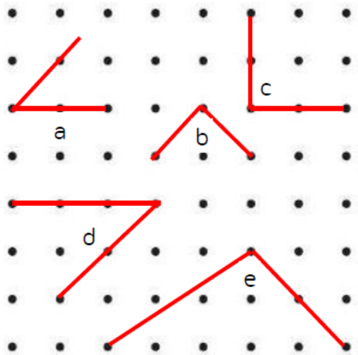
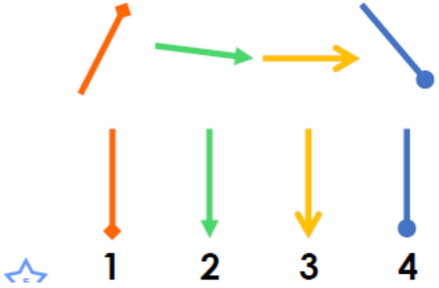
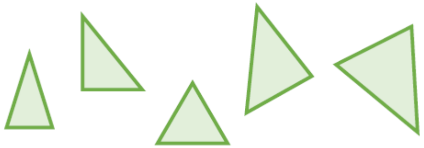
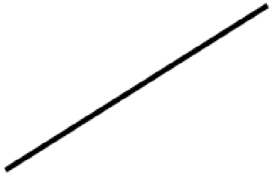
Order angles	Order the angles from largest to smallest.  Can you draw a larger obtuse angle? Can you draw a smaller acute angle?	Here are five angles. There are two pairs of identically sized angles and one odd one out. Which angle is the odd one out? Explain your reason.  	**6b. If you join together the end points of the matching lines below, do they make 4 angles in order from smallest to largest? Be sure to compare the smallest side of each angle created.**  	turn, stretch, bend, size, bigger, larger, smaller, symmetrical, right angle, horizontal, vertical, perpendicular, parallel, greater/ less than ninety degrees, ninety degrees, right angle, orientation, straight lines, prism, quarter turn, three quarter turn, pentagon, hexagon, octagon, vertices, 2d, 3d, quadrilateral, dimensional, flat, acute, obtuse, curved faces, what is the difference between 2d and 3d shapes? Regular and
Triangles	Label each of these triangles: isosceles, scalene or equilateral.  Are any of these triangles also right-angled?	 Eva If I use 6 straws to make a triangle, I can only make an equilateral triangle. Investigate whether Eva is correct.	Draw two more sides to create: - An equilateral triangle - A scalene triangle - An isosceles triangle  Which is the hardest to draw?	

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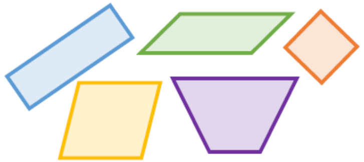
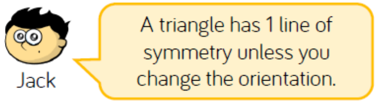
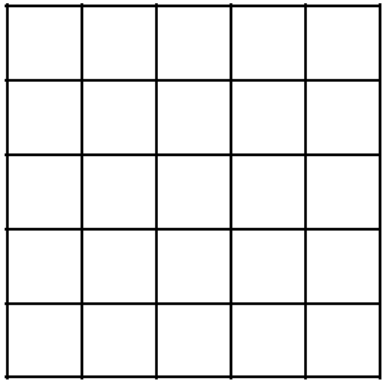
<table>
<tr>
<td>Quadrilaterals</td>
<td>Label the quadrilaterals using the word bank.

trapezium
square
rhombus
rectangle
parallelogram</td>
<td>Complete each of the boxes in the table with a different quadrilateral.
<table><tr><th></th><th>4 equal sides</th><th>2 pairs of equal sides</th><th>1 pair of parallel sides</th></tr><tr><td>4 right angles</td><td></td><td></td><td></td></tr><tr><td>No right angles</td><td></td><td></td><td></td></tr></table>
Which box cannot be completed? Explain why.</td>
<td>You will need:
Some 4 centimetre straws
Some 6 centimetre straws
How many different quadrilaterals can you make using the straws?
Calculate the perimeter of each shape.</td>
<td rowspan="2">irregular shapes, show me a vertex, vertical, horizontal, how have these shapes been sorted? Repeating pattern, where would you position the ruler when measuring a line? Link to horizon, acute, obtuse, polygon, isosceles, scalene, equilateral, quadrilaterals, rhombus, parallelogram, trapezium, orientation, mirror line</td>
</tr>
<tr>
<td>Lines of symmetry</td>
<td>Using folding, find the lines of symmetry in these shapes.
</td>
<td>

Is Jack correct? Prove it.</td>
<td>How many symmetrical shapes can you make by colouring in a maximum of 6 squares?
</td>
</tr>
</table>

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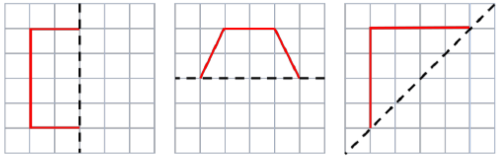
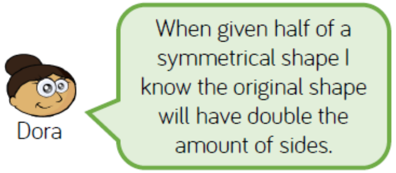
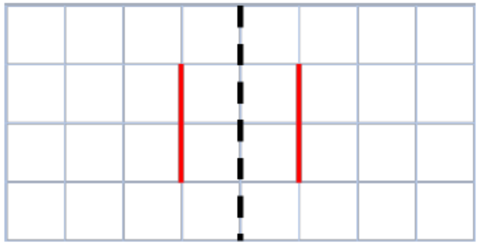
Complete a symmetrical figure	Complete the shapes according to the line of symmetry. 	 Do you agree with Dora? Convince me.	How many different symmetrical shapes can you create using the given sides? 	

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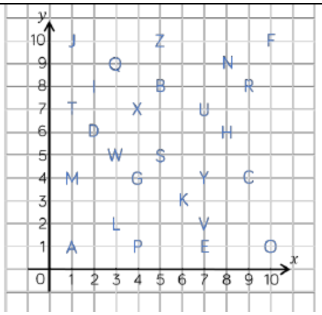
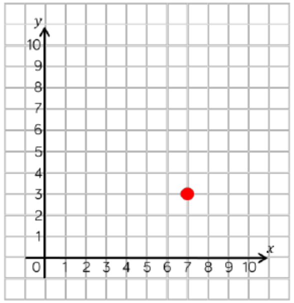
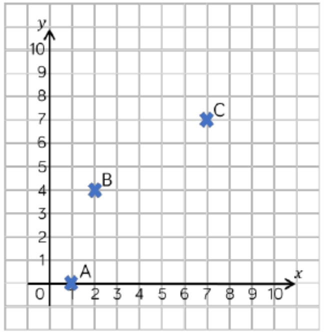
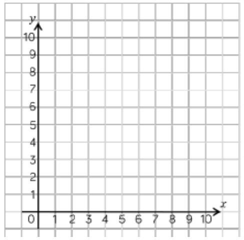
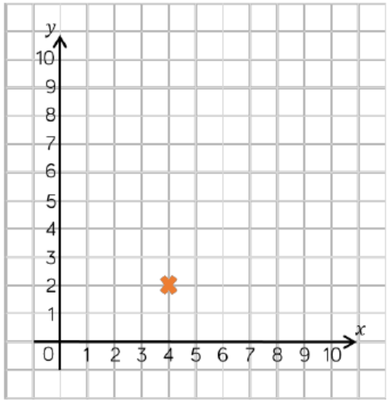
Year 4				
Geometry: Position and direction				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**
Describe position – read, use and write coordinates, become familiar with notion of brackets and the order in which to read x and y axis.	Write out the coordinates that spell your name.  	 The point is plotted at (7, 3)  Teddy  Rosie The point is plotted at (3, 7) Who is correct? What mistake has one of the children made?	 Which clue matches which coordinate? Clue 1 My x coordinate is half of my y coordinate. Clue 2 My y coordinate is less than my x coordinate. Clue 3 Both my coordinates are prime numbers.	underneath, above, below, top, bottom, side, on, in, outside, inside, around, in front, behind, front, back, below, after, beside, next to, opposite, apart, between, middle, edge, centre, corner, direction, journey, left, right, up, down, forwards, backwards, sideways, across,

Develop understanding of coordinates by plotting given points on a 2-D grid.	Draw the shapes at the correct points on the grid.  ● (7, 8) ▲ (4, 6) ■ (9, 1) ⬟ (10, 0)	When you are plotting a point on a grid it does not matter whether you go up or across first as long as you do one number on each axis.  Amir Do you agree with Amir? Convince me.	What shapes could be made by plotting three more points?  	close, far, near, along, through, to from, towards, away from, movement, side, roll, turn, whole turn, half turn, stretch, bend, rotation, clockwise, coordinates, translation, quadrant, x axis, y axis, Over,

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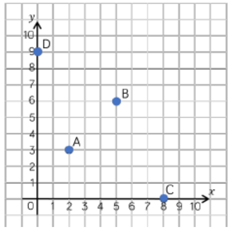
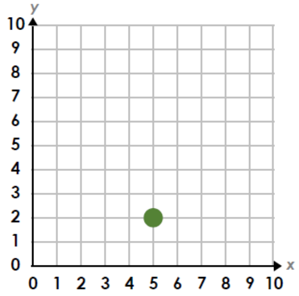
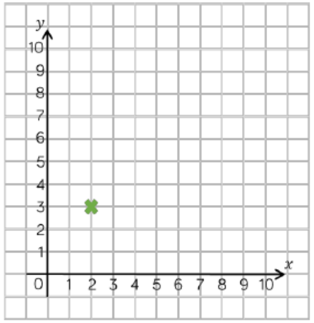
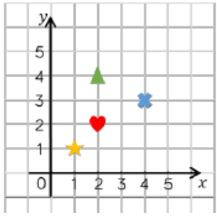
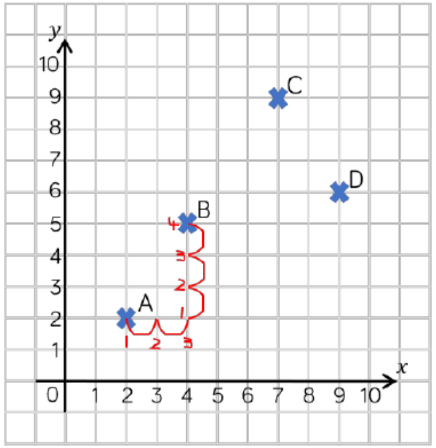
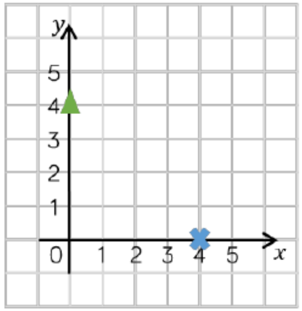
Move shapes and points on a coordinate grid following specific directions using language such as: left/right and up/down.	What do you notice? Translate A 6 right and 3 down. Record the coordinates before (__ , __) and after (__ , __) Translate B and C 4 left and 3 up. Record the coordinates before (__ , __) and after (__ , __)  	**6b. The point was moved 5 right and 1 up. Eve thinks the original coordinates were (1, 1). Is she correct? Prove it.**  	  Ron translates the point (2, 3), but realises that it has returned to the same position. What translation did he do? Is there more than one answer?	under, three-quarter turn, quarter turn, stretch, bend, rotation, clockwise, anticlockwise, straight line, ninety degree turn, what direction was the turn, plot, describe the translation, position

Describe movement on a grid	Describe the translation from: ▲ to ✖ ♥ to ★ ▲ to ♥ ★ to ✖ 	Tommy has described the translation from A to B as 3 right and 4 up.  Can you explain his mistake?	▲ to ✖ is 4 right and 4 down. ✖ to ▲ is 4 left and 4 up.  Can you plot other pairs of points where to move between them, you travel the same to left or right as you travel up or down? What do you notice about the coordinates of these points?	

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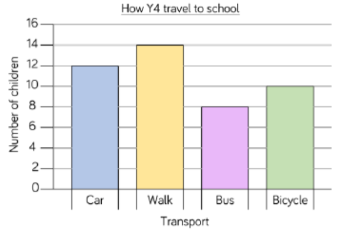
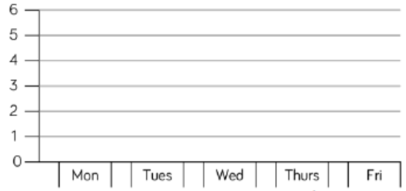
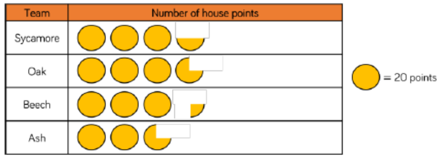
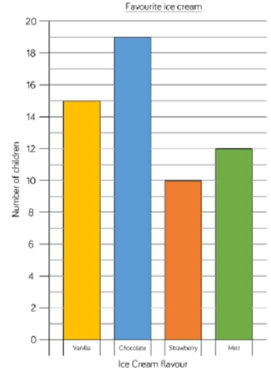
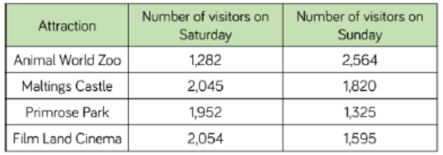
<table>
<tr><th colspan="5">Year 4</th></tr>
<tr><th colspan="5">- Statistics (can link across curriculum e.g. COMPUTING/Topic/P.E)</th></tr>
<tr><th>Objective</th><th>Skill it</th><th>Apply it</th><th>Deepen it</th><th>Mathematical Talk</th></tr>
<tr>
<td>Interpret charts</td>
<td>Bar chart, tally chart, pictograms and tables.

Complete the table using the information in the bar chart.

<table>
<tr><th>Transport</th><th>Number of children</th></tr>
<tr><td>Car</td><td></td></tr>
<tr><td>Walk</td><td></td></tr>
<tr><td>Bus</td><td></td></tr>
<tr><td>Bicycle</td><td></td></tr>
</table>
What is the most/least popular way to get to school?
How many children walk to school?</td>
<td>Alex wants to use a pictogram to represent the favourite drinks of everyone in her class.

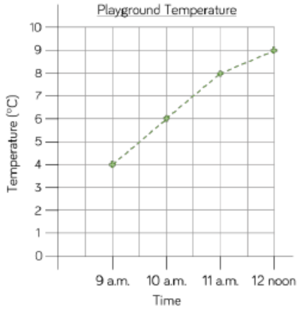
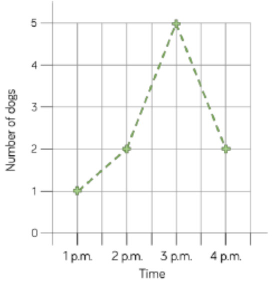
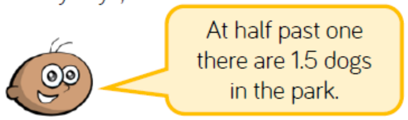
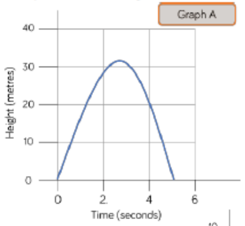
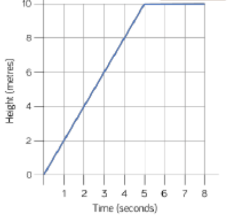
I will use this image to represent 5 children.

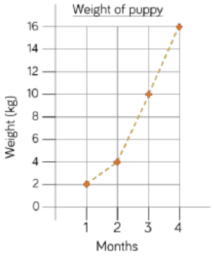
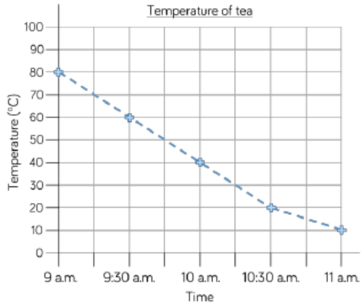
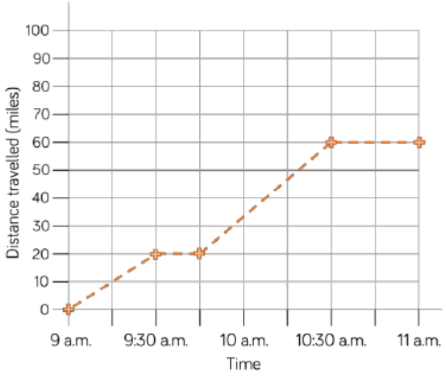
Explain why this is not a good idea.</td>
<td>Here is some information about the number of tickets sold for a concert.
<table>
<tr><th>Day</th><th>Number of tickets sold</th></tr>
<tr><td>Monday</td><td>55</td></tr>
<tr><td>Tuesday</td><td>30</td></tr>
<tr><td>Wednesday</td><td>45</td></tr>
<tr><td>Thursday</td><td>75</td></tr>
<tr><td>Friday</td><td>85</td></tr>
</table>
Jack starts to create a bar chart to represent the number of concert tickets sold during the week.

What advice would you give Jack about the scale he has chosen?
What would be a better scale to use?
Is there anything else missing from the bar chart?</td>
<td rowspan="2">Chart, bar chart, frequency table, Carroll diagram, Venn diagram, axis, axes, diagram pictograms, continuous data, line graphs, table, block diagrams, tally chart, quantity, diagram, one to one correspondence, what will each symbol be worth? What will each block be worth?, read and interpret, construct, tables, one and two step problems, what are the different</td>
</tr>
<tr>
<td>Decide what scale will be most appropriate</td>
<td>Children to be provided with data to drawer their own graphs – in an appropriate way to share the data.</td>
<td>Children self-correct as they are drawing explaining why or why not</td>
<td>Link to other areas of the curriculum e.g. science or recording data in P.E.</td>
</tr>
</table>

<table>
<tr>
<td>when drawing their own graphs</td>
<td></td>
<td>they have chosen to go in the way they have done.</td>
<td></td>
<td>ways to present data? Scale, sum, comparison, difference, how are line graphs different to bar charts? Discrete data,</td>
</tr>
<tr>
<td>Solve comparison, sum and difference problems using a given range of scales on charts.</td>
<td>
How many more points does the Sycamore team have than the Ash team?
How many points do Beech and Oak teams have altogether?
How many more points do Ash need to be equal to Oak?</td>
<td>
Rosie says,

Can you spot Rosie's mistake?
How many people were asked altogether?</td>
<td>
<table>
<tr><th>Attraction</th><th>Number of visitors on Saturday</th><th>Number of visitors on Sunday</th></tr>
<tr><td>Animal World Zoo</td><td>1,282</td><td>2,564</td></tr>
<tr><td>Maltings Castle</td><td>2,045</td><td>1,820</td></tr>
<tr><td>Primrose Park</td><td>1,952</td><td>1,325</td></tr>
<tr><td>Film Land Cinema</td><td>2,054</td><td>1,595</td></tr>
</table>

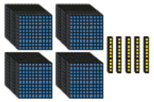
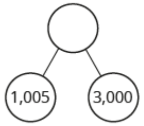
True or false?
• The same number of people visited Maltings Castle as Film Land Cinema on Saturday.
• Double the number of people visited Animal World Zoo on Sunday than Saturday.
• The least popular attraction of the weekend was Primrose Park.
What true/false questions can you make?</td>
<td></td>
</tr>
</table>

Use line graphs - exampling how it shows continuous data.	Introduction to line graphs. The graph shows the temperature in the playground during a morning in April.  The temperature at 9 a.m. is ______ degrees. The warmest time of the morning is ________.	Tommy created a line graph to show the number of dogs walking in the park one afternoon.  Tommy says,  Why is Tommy incorrect?	Jack launched a toy rocket into the sky. After 5 seconds the rocket fell to the ground. Which graph shows this? Explain how you know.   Make up your own story for the other graph.	

Solve problems (comparison, sum and difference) using line graphs.	 The graph shows the weight of a puppy as it grows. When the puppy is ____ months old the weight is ____kg Between month ____ and month ____ the puppy increased by ____ kg	Eva measured the temperature of a cup of tea every 30 minutes for 2 hours. The graph shows Eva's results.  Eva says,  In the first 45 minutes the temperature of the tea had dropped by 20 degrees. Do you agree with Eva? Explain why.	Write a story to match the graph. 	

Year 5

Number: Place Value

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Numbers to 10,000	Match the representations to the numbers.    4,005 4,500 4,050	Tommy says he can order the following numbers by only looking at the first three digits. 12,516 12,832 12,679 12,538 12,794 Is he correct? Explain your answer.	Filip has made five numbers using the digits 1, 2, 3 and 4 He is using a letter to represent each digit. Here are his numbers. AABCD ACDCB DCABA CDADC BDAAB Use the clues to work out each number. • The first number in the list is the greatest number. • The digits in the fourth number add up to 12 • The third number is the smallest number.	Fewer, more, equal, less than, greater than, number, pair, zero, one, two, three to twenty, and beyond, none, count (on/up/to/from/down), before, after, many, few, fewer, least, fewest, lesser, smallest, greater, same as, odd, even, units, ones, tens, ten more/less, digits, numeral, figure(s), compare, (in) order/ a different order, size, value, between,

<table>
<tr>
<td>Round to nearest 10, 100, 1000 and 10,000</td>
<td>8,317 people attend a pop concert.
Round the number of people at the concert to the nearest 10
Round the number of people at the concert to the nearest 100
Round the number of people at the concert to the nearest 1,000</td>
<td>
Explain why Tiny is wrong.</td>
<td>When rounded to the nearest 10, a number is 50
When rounded to the nearest 100, the number is zero.
Find all the possible whole number values of the number.</td>
<td rowspan="2">halfway between, above, below. Numbers to one hundred, hundreds, partition, recombine, hundred more/less, numbers to one thousand, numbers to 100,000, numbers to 1million, numbers to 10,000, tenths, hundredths, decimal (places), round (to nearest), thousand more/less than, negative integers, counting through zero, roman numerals (I to C). Estimate, how do we say this number? What numbers complete the part-</td>
</tr>
<tr>
<td>Numbers to 100,000</td>
<td>A number is shown in the place value grid.
<table>
<tr><th>10,000s</th><th>1,000s</th><th>100s</th><th>10s</th><th>1s</th></tr>
<tr><td>●●●●●</td><td>●●</td><td>●●●●</td><td>●●●●●●●●</td><td>●●●●●</td></tr>
</table>
Write the number in figures and in words.
• Alex adds 10 to this number
• Tommy adds 100 to this number
• Eva adds 1,000 to this number
Write each of their new numbers in figures and in words.</td>
<td>Rosie counts forwards and backwards in 10s from 317
Circle the numbers Rosie will count.
427 997 −7
1,666 3,210 5,627
−23 7 −3
Explain why Rosie will not say the other numbers.</td>
<td></td>
</tr>
</table>

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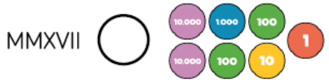
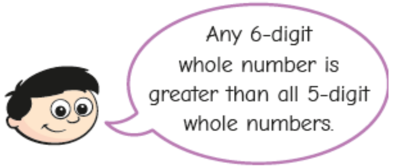
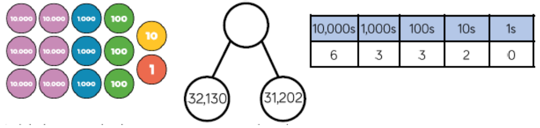
Compare numbers to 100,000	Add the symbol <, > or = to make the statement correct.  	 Do you agree with Dexter? Explain your answer.	Here are six digit cards. 7 2 5 1 9 3 Using five of the digits, what is the greatest number you can make? Using all six digits, what is the smallest number you can make?	whole? How many tens are there? How many ones are there? Do groups of ten help you count? When ordering your numbers do you look at the tens or ones? Are the numbers in the sequence getting larger or smaller? Thousands, 3 digit numbers, 100s, 10s and 1s, place value grid, place holder (0), what is the value of each interval on the number line? How many hundreds are there? 10 more, 10 less, 100 more, 100 less, compare, what strategies did you use to compare the numbers? order,
Order numbers to 100,000	Put these numbers in ascending order.  	Example of numbers being incorrectly ordered, children to explain why the ordering is incorrect and to correct. Children could prove their response by drawing within place value grids.	Use the digit cards to make three different 5-digit numbers that match the clues. 0 1 2 3 4 5 6 7 8 9 - The digit in the ones column and the digit in the hundreds column have a difference of 2 - The digit in the hundreds column and the digit in the ten-thousands column have a difference of 2 - The sum of all the digits in the number is 19 Write your numbers in ascending order.	

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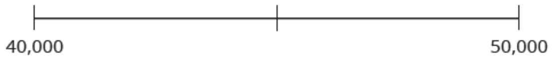
Round numbers within 100,000	The circumference of Earth is 24,901 miles. Round this distance to the nearest 1,000 miles. Round this distance to the nearest 10,000 miles. Which is the better approximation to use?  What number is halfway between 40,000 and 50,000? Draw an arrow to show the approximate position of 48,725 on the number line. Round 48,725 to the nearest 10,000	By rounding both numbers to the nearest 10,000, estimate the answer to the calculation. 47,826 + 88,112 Is your estimate greater than or less than the actual answer? How do you know?	Round 59,996 to the nearest 1,000 Round 59,996 to the nearest 10,000 What do you notice about the answers? Can you think of three more numbers where the same thing could happen?	ascending, descending, how do you know when you have created the smallest/greatest number? What does each base ten represent? Can you represent the number in another way? Part-whole, what are the values at the start and end point of the number line? Estimate, greater than, less

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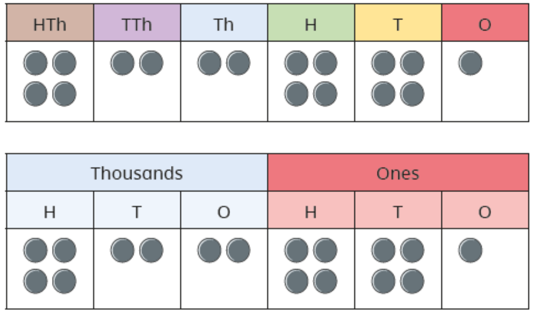
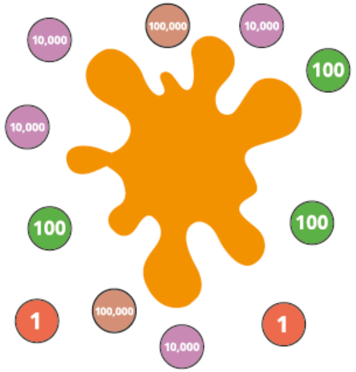
<table>
<tr>
<td>Read and write numbers to a million</td>
<td>
What number is shown in each place value chart?
Give your answers in numerals.

<table>
<tr><th>HTh</th><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr>
<tr><td>●●●●</td><td>●●</td><td>●●</td><td>●●●●</td><td>●●●●</td><td>●</td></tr>
</table>
<table>
<tr><th colspan="3">Thousands</th><th colspan="3">Ones</th></tr>
<tr><th>H</th><th>T</th><th>O</th><th>H</th><th>T</th><th>O</th></tr>
<tr><td>●●●●</td><td>●●</td><td>●●</td><td>●●●●</td><td>●●●●</td><td>●</td></tr>
</table>
</td>
<td>
Describe the value of the digit 7 in each of the following numbers. How do you know?
407,338
700,491
25,571
</td>
<td>
Use the digit cards to make as many 6-digit numbers as you can.
5 5 5
0 0 0
What is the greatest number you can make?
What is the smallest number you can make?
What is the difference between the greatest and smallest numbers?
</td>
<td>than, equal to, inequality symbols, order, ascending, descending, what patterns do you see in the Roman Numeral system? Negative numbers, what is the value of each digit in the number? In order to compare numbers what do you need to know?</td>
</tr>
</table>

Partition numbers to a million	Partition the numbers into thousands, hundreds, tens and ones. ▸ 6,789 = ______ + ______ + ______ + ______ ▸ 4,813 = ______ + ______ + ______ + ______	Which is the odd one out? 680,000 680 thousands 68 ten-thousands 5 hundred-thousands plus 180 thousands 680 hundreds Why?	Some of the place value counters are hidden. The total value of the counters is 265,312 What place value counters could be hidden? Find at least three solutions. 	

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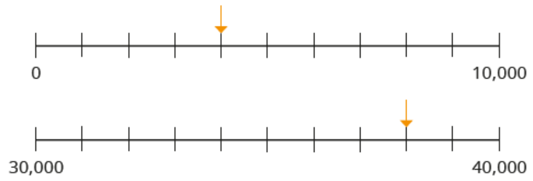
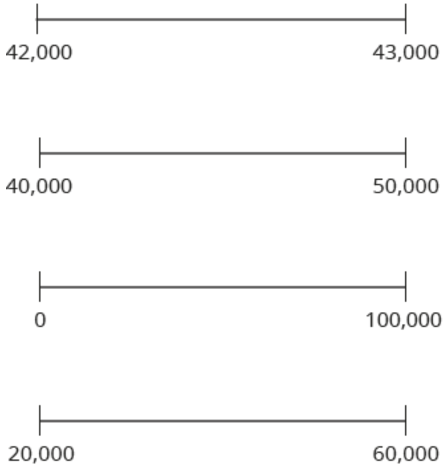
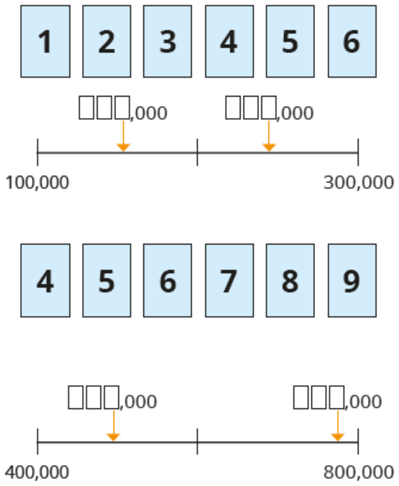
Number lines to a million	- What numbers are the arrows pointing to?  	Estimate the position of 42,500 on each number line.  Explain your method.	Use the digit cards to complete the labels on the number lines.  	
10/100/1000 /10,000/ 100,000 more or less.				

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<table>
<tr>
<td>Counting in 10s, 100s, 1000s, 10,000s and 100,000s (powers of 10)</td>
<td>Complete the sequence.
___ , ___ , 2 , ___ , 22 , ___ , 42 , ___ , ___ , 72
The rule for the sequence is ______________.
Make the number 425 on a place value chart.
<table>
<tr><th colspan="3">Thousands</th><th colspan="3">Ones</th></tr>
<tr><td>H</td><td>T</td><td>O</td><td>H</td><td>T</td><td>O</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
Now make the number 4,250
What is the same and what is different?</td>
<td>Amir writes the first five numbers of a sequence.
They are
3,666, 4,666, 5,666, 6,666, 7,666
The 10th term will be 15,322 because I will double the 5th term.
Amir

Is he correct?
Explain why.</td>
<td>1,000 × 1,000 = 1,000,000
How many other calculations using just ones and zeros can you find that have the answer 1,000,000?</td>
<td></td>
</tr>
<tr>
<td>Compare numbers to 1 million</td>
<td>Here is a table showing the population in areas of Yorkshire.
<table>
<tr><td>Halifax</td><td>88,134</td></tr>
<tr><td>Brighouse</td><td>32,360</td></tr>
<tr><td>Leeds</td><td>720,492</td></tr>
<tr><td>Huddersfield</td><td>146,234</td></tr>
<tr><td>Wakefield</td><td>76,886</td></tr>
<tr><td>Bradford</td><td>531,200</td></tr>
</table>
Use <, > or = to make the statements correct.
The population of Halifax ○ the population of Wakefield.
Double the population of Brighouse ○ the population of Halifax.</td>
<td>Identify the greater number in each pair.
▶ 59   51
▶ 59,000   51,000
▶ 590,000   510,000
What is the same and what is different?
Prove it.</td>
<td>8b. Work out which child has the number card according to their statements.
Six hundred and sixty-eight thousand, nine hundred and one
My number rounds to 700,000 and has 9 tens.

Betsy

Rob
My number has 1 more hundreds than thousands and rounds to 700,000.</td>
<td></td>
</tr>
</table>

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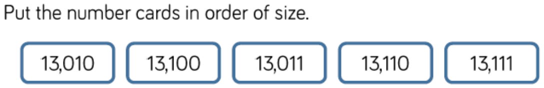
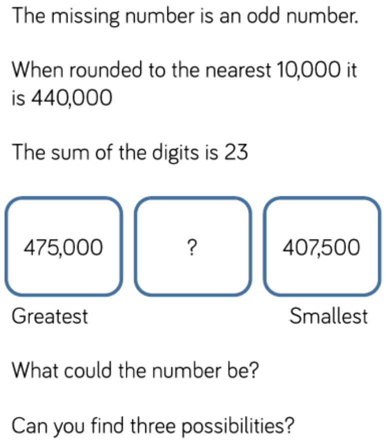
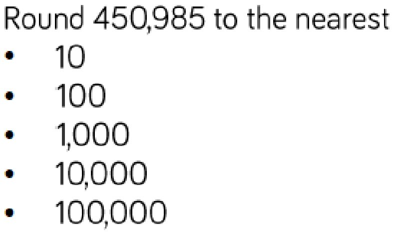
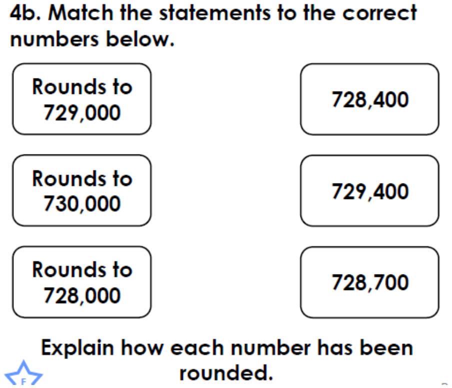
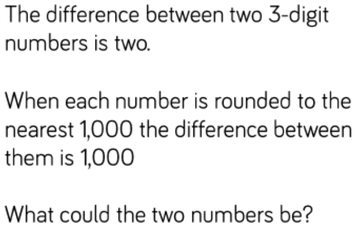
Order numbers to 1 million	 Put the number cards in order of size. 13,010 13,100 13,011 13,110 13,111	Example of numbers being incorrectly ordered, children to explain why the ordering is incorrect and to correct. Children could prove their response by drawing within place value grids.	 The missing number is an odd number. When rounded to the nearest 10,000 it is 440,000 The sum of the digits is 23 475,000 ? 407,500 Greatest Smallest What could the number be? Can you find three possibilities?	
Round numbers to 1 million	 Round 450,985 to the nearest • 10 • 100 • 1,000 • 10,000 • 100,000	 **4b. Match the statements to the correct numbers below.** **Rounds to 729,000** **728,400** **Rounds to 730,000** **729,400** **Rounds to 728,000** **728,700** **Explain how each number has been rounded.**	 The difference between two 3-digit numbers is two. When each number is rounded to the nearest 1,000 the difference between them is 1,000 What could the two numbers be?	

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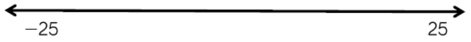
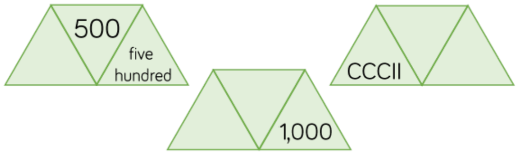
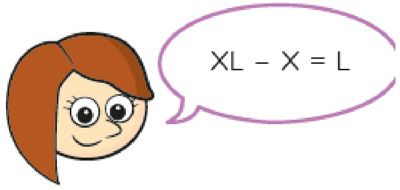
Negative numbers in context	Use of negative numbers not minus. Estimate and label where 0, −12 and −20 will be on the number line. 	**True or False?** • The temperature outside is −5 degrees, the temperature inside is 25 degrees. The difference is 20 degrees. • Four less than negative six is negative two. • 15 more than −2 is 13 Explain how you know each statement is true or false.	Put these statements in order so that the answers are from smallest to greatest. • The difference between −24 and −76 • The even number that is less than −18 but greater than −22 • The number that is half way between 40 and −50 • The difference between −6 and 7	
Roman numerals to 1000	Each diagram shows a number in digits, words and Roman Numerals. 	 Do you agree with Rosie? Explain your answer.	Solve CCCL + CL = How many calculations, using Roman Numerals, can you write to get the same total?	

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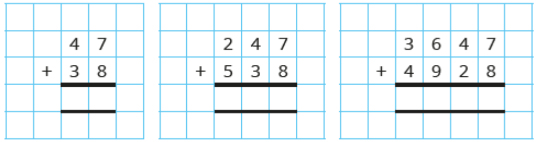
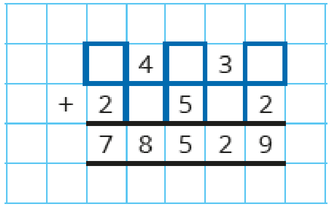
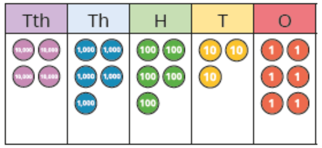
Year 5

Number: Addition and Subtraction

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Mental strategies.				
Add whole numbers with more than 4 digits (column) with exchanging- building upon previous knowledge)	Use concrete representation Use the column method to work out the additions.  4 7 + 3 8 2 4 7 + 5 3 8 3 6 4 7 + 4 9 2 8	What mistake has been made? 1,562 + 301 = 4,572	Work out the missing numbers.  □ 4 □ 3 □ + 2 □ 5 □ 2 7 8 5 2 9	Which number represents the total? Number bonds, number line, add, more, plus, make, sum, total, altogether, inverse, double, near double, half, halve, equals, is the same

			Dexter is estimating the sum of a 6-digit number and a 5-digit number. My 6-digit number rounds to 200,000 to the nearest 10,000 I have rounded my 5-digit number to the nearest 1,000 My estimate of the total is one-quarter of a million.  What could Dexter's numbers be? What is the greatest possible total of Dexter's numbers? What is the smallest possible total of Dexter's numbers?	as (including equals sign), difference between, how many more to, how much more is…?, subtract, take away, minus, how many fewer is… than…? How much less is…? Predicting, find, find all, find different, investigate, column addition, column subtraction, multiples, exchange, place holder (zero), how many tens can be added without exchanging?

Subtract whole numbers with more than 4 digits (column) with exchanging- building upon previous knowledge	Use concrete representation Work out the subtraction. Use the place value chart and the column method to help you.  4 5 5 3 6 − 8 4 2 6	 Tiny is working out a subtraction. 53,209 − 27,452 = 34,257 What mistake has Tiny made?	Eva makes a 5-digit number. Mo makes a 4-digit number. The difference between their numbers is 3,465 What could their numbers be?	Patterns between calculations, which strategy would you use and why? Near numbers, estimate, reasonable, inverse, partition, exchange, what do you notice? Does it matter which columns you add first? Do you have

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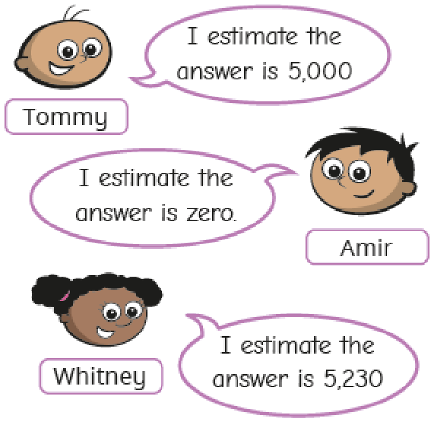
Round to estimate and approximate	Round the numbers to find an estimate of the answer to 6,789 + 2,870 6,789 rounded to the nearest 1,000 is ______ 2,870 rounded to the nearest 1,000 is ______ The estimated total is ______ + ______ = ______ Compare the estimate with the actual answer.	Tommy, Amir and Whitney are working out a subtraction. 64,942 − 59,713  Explain why the children all have different estimates. Work out the actual answer. Whose estimate is most accurate?	When two numbers are rounded to the nearest 10,000, their sum is 100,000 What could the numbers be? Discuss possible answers with a partner. What is the smallest possible actual total of the numbers? What is the greatest possible actual total of the numbers?	enough tens/hundreds/ones to make the exchange? Does it matter which column you subtract first? Efficient, estimate, checking strategies, approximate, accuracy, inverse operations,

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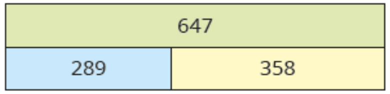
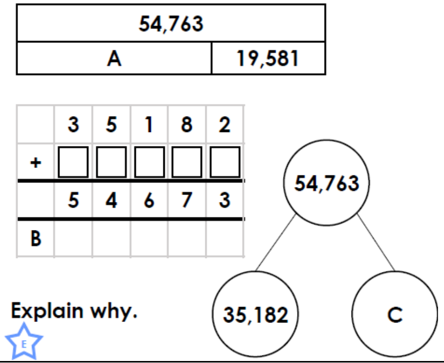
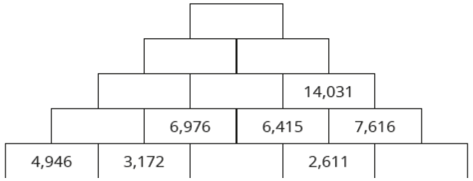
Inverse operations to check workings accuracy (Addition and subtraction).	Write two additions and two subtractions shown by the bar model.  	**6b. Spot the odd one out.**  **Explain why.**	In the number pyramid, each number is the sum of the two numbers below. Use addition and subtraction to complete the pyramid.  	

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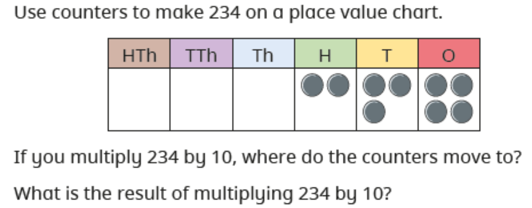
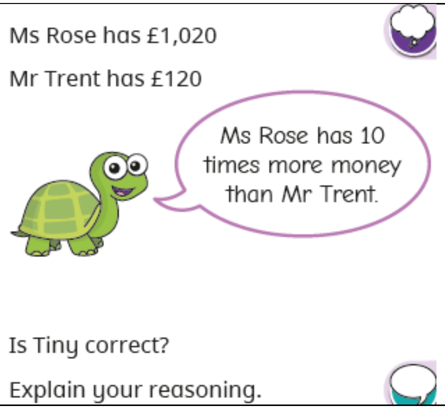
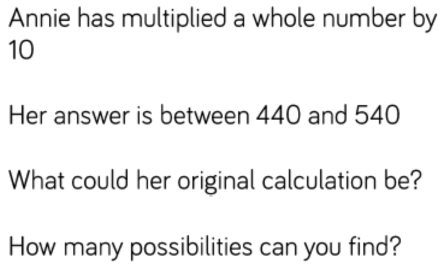
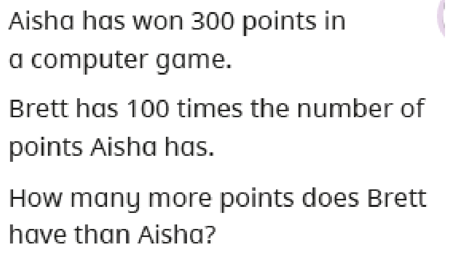
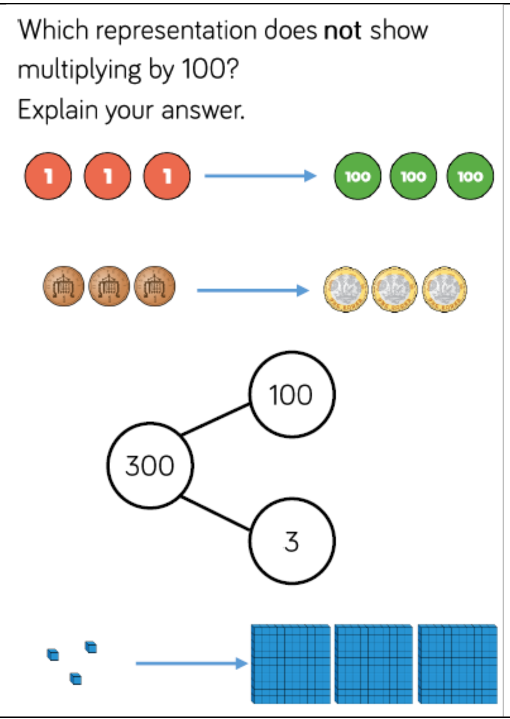
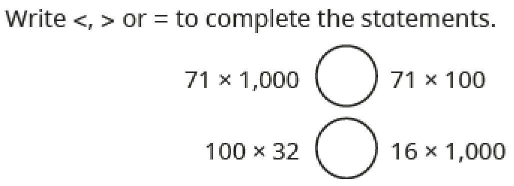
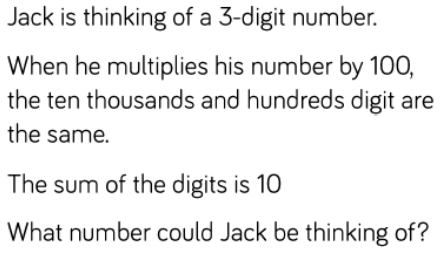
Use knowledge of addition and subtraction to solve multi step problems.	Filip is writing a report. He writes the first 460 words on Monday and another 735 words on Tuesday. The report must be at least 2,500 words long. How many more words does Filip need to write? Mr Rose is buying items for his home. He has a budget of £1,500  He buys a washing machine and a tumble dryer. Does he have enough money left to buy the dishwasher?	A milkman has 250 bottles of milk.  During the day, he collects another 160 from the dairy and delivers 375 bottles. Nijah works out how many bottles are left. 375 − 250 = 125 125 + 160 = 285 Do you agree with Nijah? Explain your answer.	On Monday, Whitney was paid £114 On Tuesday, she was paid £27 more than on Monday. On Wednesday, she was paid £27 less than on Monday. How much was Whitney paid in total? How many calculations did you do? Is there a more efficient method?	
Compare calculations				
Find missing numbers.				

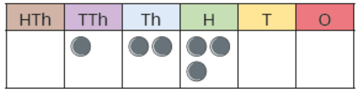
Year 5

Number: Multiplication and Division

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Multiply by 10 – using up to a 5 digit number	 Use counters to make 234 on a place value chart. If you multiply 234 by 10, where do the counters move to? What is the result of multiplying 234 by 10?	 Ms Rose has £1,020 Mr Trent has £120 Ms Rose has 10 times more money than Mr Trent. Is Tiny correct? Explain your reasoning.	 Annie has multiplied a whole number by 10 Her answer is between 440 and 540 What could her original calculation be? How many possibilities can you find?	square Squared number cube Cubed numbers Odd, even, count in twos, threes, fives, count in tens (forwards from/ backwards from), how many times, lots of, groups, once, twice, three ties, five times, multiple of, multiply, multiply by, repeated addition, array, row, column,
Multiply by 100 – using up to a 5 digit number	 4 × 100 = ______ 204 × 100 = ______ 156 × 100 = ______ ______ = 324 × 100	Show other way of multiplying by 100, 10 x 10, to get the same answer.	 Aisha has won 300 points in a computer game. Brett has 100 times the number of points Aisha has. How many more points does Brett have than Aisha?	

		 Which representation does **not** show multiplying by 100? Explain your answer. 		double, halve, share, share equally, group in pairs, threes etc., equal groups of, divide, divided by, left, left over, describe the rule, product, multiples of; four, eight, fifty and one hundred, scale up, multiplication facts up to 12 x 12, division facts, inverse, derive, equal, unequal, why are we using the addition symbol? Multiplication, lots of, arrays, commutative, times tables, how many do you have to begin with? Division, what is the
Multiply by 1000 – using up to a 5 digit number	 Write <, > or = to complete the statements. 71 × 1,000 ○ 71 × 100 100 × 32 ○ 16 × 1,000	Show other way of multiplying by 1000, 10 x 10 x 10, to get the same answer. Correct the sum below and explain the mistake. 32 x 100 = 320	 Jack is thinking of a 3-digit number. When he multiplies his number by 100, the ten thousands and hundreds digit are the same. The sum of the digits is 10 What number could Jack be thinking of?	

<table>
<tr>
<td>Divide by 10 – using up to a 5 – digit number</td>
<td>
What number is represented in the place value chart?



<table>
<tr><th>HTh</th><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr>
<tr><td></td><td>●</td><td>●●</td><td>●●●</td><td></td><td></td></tr>
</table>

If you divide the number by 10, where do the counters move to?
What is the result of dividing the number by 10?
</td>
<td>
While in Wonderland, Alice drank a potion and everything shrank. All the items around her became ten times smaller!
Are these measurements correct?

<table>
<tr><th>Item</th><th>Original measurement</th><th>After shrinking</th></tr>
<tr><td>Height of a door</td><td>220 cm</td><td>2,200 cm</td></tr>
<tr><td>Her height</td><td>160 cm</td><td>16 cm</td></tr>
<tr><td>Length of a book</td><td>340 mm</td><td>43 mm</td></tr>
<tr><td>Height of a mug</td><td>220 mm</td><td>?</td></tr>
</table>

Can you fill in the missing measurement?

Can you explain what Alice did wrong?

Write a calculation to help you explain each item.
</td>
<td>
Four children are in a race. The numbers on their vests are:

350 35
3,500 53

Use the clues to match each vest number to a child.

- Jack's number is ten times smaller than Mo's.
- Alex's number is not ten times smaller than Jack's or Dora's or Mo's.
- Dora's number is ten times smaller than Jack's.
</td>
<td>same/different about the groups? Common multiples, What do you notice about the pattern? Comparing, inequality symbols, column multiplication, exchange, how do we record the exchange? How can we partition our number? Remainder, scaling, times as many,</td>
</tr>
</table>

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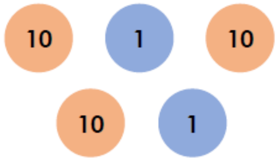
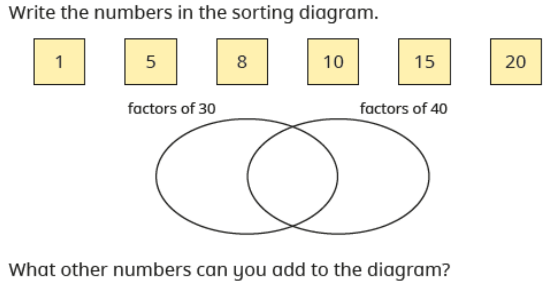
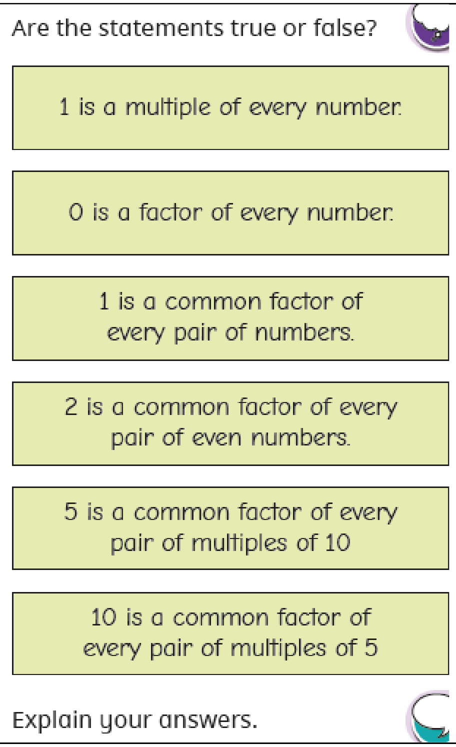
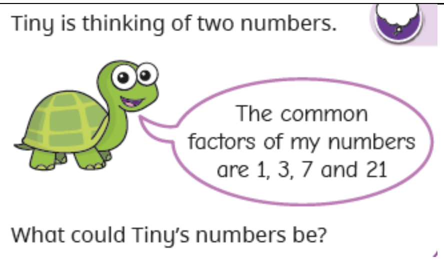
Divide by 100 – using up to a 5 digit number	604,000 ÷ 100 = ______ 64,000 ÷ 100 = ______	Show other way of dividing by 100, 10 divide 10, to get the same answer. Is the statement always, sometimes or never true? Dividing by 100 is the same as dividing by 10 twice. Explain your answer.	Use the digit cards to fill in the missing digits. 1 2 3 4 5 6 7 8 9 170 ÷ 10 = __ __ __20 × 10 = 3,__00 1,8__0 ÷ 10 = 1__6 __9 × 100 = 5,__00 6__ = 6,400 ÷ 100	systematically, possibilities, ten times bigger/smaller, hundred times bigger/smaller, how can dividing by 10 help you to divide by 100? What does zero mean? Fact family, multiples, commutativity, associative law, factors, factor pairs, correspondence problems, factors, how do you find multiples of a number? Can a number be
Divide by 1000 – using 5 digit number	Divide each number by 10, 100 and 1,000 80,000 300,000 547,000	Show other way of dividing by 1000, 10 divide 10 divide 10, to get the same answer.	Here are the answers to some problems: 5,700 405 397 6,203 Can you write at least two questions for each answer involving dividing by 10, 100 or 1,000?	

		4a. A number divided by 1,000 equals this:  **Sinead says the calculation must have been 23,000 ÷ 1,000.** **Is she correct?** **Convince me.**		a multiple of more than one number? How do you find the factors of a number? Do factors always come in pairs? Prime number, composite number, why are square numbers called square

Find multiples of whole numbers	Here are the first three multiples of 5  Use counters to make these and the next three multiples of 5 List the first six multiples of 5 What is the same and what is different about the multiples of 5?	**Always, Sometimes, Never** • The product of two even numbers is a multiple of an odd number. • The product of two odd numbers is a multiple of an even number. Explain your answer.	Find the sum of the digits of all the numbers in the 9 times-table up to 10 × 9 What do you notice? Find the digit sums of these multiples of 9 648 8,388 9,378 82,602 99,999 What do you notice? What is the connection between numbers that are multiples of 9 and their digit sums?	numbers? Why are cube numbers called cube numbers? In which direction do the digits move when you multiply//divide? Area model,

<table>
<tr>
<td>Common multiples</td>
<td>Here is a hundred square.
<table>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr>
<tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr>
<tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr>
<tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr>
<tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr>
<tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr>
<tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr>
<tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr>
<tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr>
<tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr>
</table>
Shade the first ten multiples of 5
Circle the first ten multiples of 3
List the first two common multiples of 5 and 3
What is the next common multiple of 5 and 3?
Find some more common multiples of 5 and 3
Use Venn diagrams to show common multiples of numbers.</td>
<td>Are the statements always, sometimes or never true?
Common multiples of 2 and 3 are also multiples of 6
Common multiples of 5 and 10 are also multiples of 50
Explain your answers.</td>
<td>Find different ways of completing the sentences.
All multiples of 10 are also multiples of ______ and ______
All multiples of 20 are also multiples of ______ and ______
All multiples of 30 are also multiples of ______ and ______</td>
<td></td>
</tr>
</table>

<table>
<tr>
<td>Build upon factor and factor pair knowledge.</td>
<td>Which numbers are factors of 60?
9 6 8 4 12 5 60 15 45
Which factors of 60 are not shown?</td>
<td>40 75 57 35 505 705 507
Which of the numbers is 5 a factor of? How do you know?
Which of the numbers is 3 a factor of? How do you know?</td>
<td>Here is Annie's method for finding factor pairs of 36
<table>
<tr><td>1</td><td>36</td></tr>
<tr><td>2</td><td>18</td></tr>
<tr><td>3</td><td>12</td></tr>
<tr><td>4</td><td>9</td></tr>
<tr><td>5</td><td>X</td></tr>
<tr><td>6</td><td>6</td></tr>
</table>
When do you put a cross next to a number?
How many factors does 36 have?
Use Annie's method to find all the factors of 64</td>
<td></td>
</tr>
</table>

Using knowledge of factors, children to find common factors of two numbers	 Write the numbers in the sorting diagram. 1 5 8 10 15 20 factors of 30 factors of 40 What other numbers can you add to the diagram?	 Are the statements true or false? 1 is a multiple of every number. 0 is a factor of every number. 1 is a common factor of every pair of numbers. 2 is a common factor of every pair of even numbers. 5 is a common factor of every pair of multiples of 10 10 is a common factor of every pair of multiples of 5 Explain your answers.	 Tiny is thinking of two numbers. The common factors of my numbers are 1, 3, 7 and 21 What could Tiny's numbers be?	

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Describe a prime number and a composite number	All of these numbers are prime numbers. 5 13 17 23 Use counters to find the factors of each number. What do you notice? A prime number has exactly two factors: 1 and itself. A composite number has more than two factors. Which of the numbers are prime and which are composite? 7 8 11 20 21 25 29	Decide whether each statement is true or false. All prime numbers are odd. All odd numbers are prime. The first prime number is 1 Talk about your answers with a partner.	**7b. Choose from the digit cards below to create composite numbers up to 50 that have only two prime factors.** **5 2 3 1** **Find all the possibilities.**	

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<table>
<tr>
<td>Recall prime numbers up to 19 and know how to work out a prime number up to 100</td>
<td>Sort the numbers into the table.
12 2 7 20 9 15 3 17 21
<table>
<tr><th></th><th>Prime</th><th>Composite</th></tr>
<tr><td>Even</td><td></td><td></td></tr>
<tr><td>Odd</td><td></td><td></td></tr>
</table></td>
<td>Dora says all prime numbers have to be odd.

Her friend Amir says that means all odd numbers are prime, so 9, 27 and 45 are prime numbers.

Explain Amir's and Dora's mistakes and correct them.</td>
<td>Sort all the prime numbers between 10 and 100 into the table.
<table>
<tr><th colspan="4">Number of ones</th></tr>
<tr><td>1</td><td>3</td><td>7</td><td>9</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
</table>
Why do no 2-digit prime numbers have 0, 2, 4, 6 or 8 ones?
Why do no 2-digit prime numbers have 5 ones?</td>
<td></td>
</tr>
<tr>
<td>Know what a squared number is in relation to factors</td>
<td>9 is a square number as 9 counters can be arranged to form a square array.

3 × 3 = 9
Use counters to decide whether each number is square.
12 16 4 10 20 25 24</td>
<td>Esther thinks $6^2 = 12$
Do you agree?
Explain your answer.</td>
<td>Some square numbers can be written as the sum of two prime numbers.

Here is an example. 2 + 2 = 4
Find some other square numbers that can be written as the sum of two prime numbers.</td>
<td></td>
</tr>
</table>

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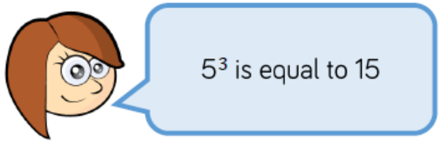
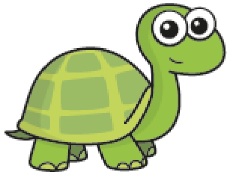
<table>
<tr>
<td>Know that a cubed number is multiplying a whole number by itself 3 times.</td>
<td>Complete the table.
<table>
<tr><th>Size of cube</th><th>Calculation</th><th>Number of cubes</th></tr>
<tr><td>1^3</td><td></td><td>1</td></tr>
<tr><td>2^3</td><td></td><td>8</td></tr>
<tr><td>3^3</td><td>3 × 3 × 3</td><td></td></tr>
<tr><td>4^3</td><td></td><td></td></tr>
<tr><td>5^3</td><td></td><td></td></tr>
<tr><td>6^3</td><td>6 × 6 × 6</td><td></td></tr>
</table>
</td>
<td>Rosie says,


Do you agree?
Explain your answer.</td>
<td>Here are three cards.
A B C
Each card represents a cube number.
Use the clues to work out the numbers.
- A × A = B
- B + B – 3 = C
- digit sum of C = A</td>
<td></td>
</tr>
</table>

Use knowledge of multiples of 10,100 and 1000 to answer questions	Work out the multiplications. Show all the steps in your thinking. 6 × 400 60 × 400 30 × 8,000 400 × 500	Tiny is working out 600 ÷ 25 Here are Tiny's workings. 600 ÷ 25 600 ÷ 2 = 300 300 ÷ 5 = 60 600 ÷ 25 = 60  Explain why Tiny is incorrect. Find the correct answer.	**9b. The target number is below.** nine thousand, nine hundred **Use all the digit cards and symbols to create related number sentences that equal the target number.** x ÷ three hundred 19,800 thirty three two 49,500 sixty six 5 150	

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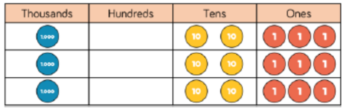
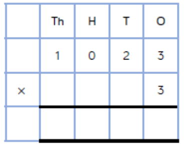
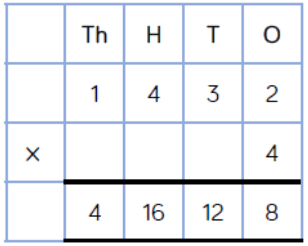
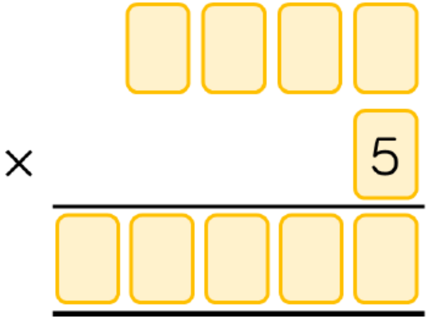
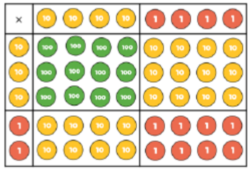
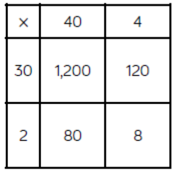
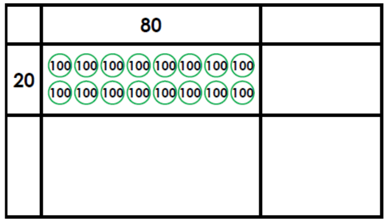
Multiply 4 digit numbers by 1 digit.	Complete the calculation.   	Alex calculated 1,432 × 4 Here is her answer.  1,432 × 4 = 416,128 Can you explain what Alex has done wrong?	Can you work out the missing numbers using the clues?  - The 4 digits being multiplied by 5 are consecutive numbers. - The first 2 digits of the product are the same. - The fourth and fifth digits of the answer add to make the third.	
Multiply 2 digit by 2 digit (arrays)	Rosie adapts the Base 10 method to calculate 44 × 32   Compare using place value counters and a grid to calculate: 45 × 42 52 × 24 34 × 43	Eva says,  To multiply 23 by 57 I just need to calculate 20 × 50 and 3 × 7 and then add the totals. What mistake has Eva made? Explain your answer.	**7b. Create an area model calculation with an answer between 1,705 and 1,904.**  **Write the calculation for the area model you have created.**	

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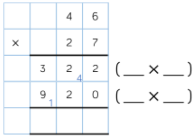
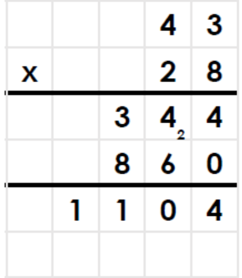
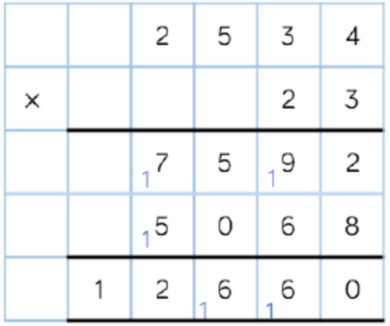
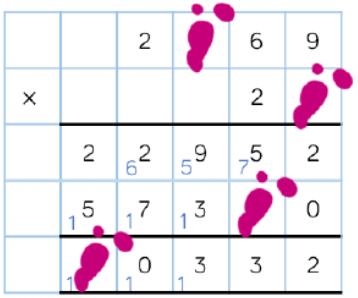
Multiply 2 digit by 2 digit (column)	Complete to solve the calculation.  4 6 × 2 7 3 2_4 2 (__×__) 9_1 2 0 (__×__) Use this method to calculate: 27 × 39 46 × 55 94 × 49	**6b. May solves the following multiplication.**   4 3 x 2 8 3 4_2 4 8 6 0 1 1 0 4 **Is she correct? Explain your answer.**	Tommy says, It is not possible to make 999 by multiplying two 2-digit numbers.  Do you agree? Explain your answer. When explaining prove your answer.	
Multiply 3 digit by 2 digit	Calculate: 637 × 24 573 × 28 573 × 82	**6a. Derek is painting the ceiling of the local church. A tin of paint covers 2,000m². The ceiling is 142m x 54m.** x  **He thinks he needs to buy 7 tins of paint. Is he correct? Explain your answer.**	**8b. Complete the calculations so that calculation B is less than calculation A.** **A.** 7 1 3 x 2 4 **B.** 7 1 ☐ x 2 ☐	

Multiply 4 digits by 2 digits	Use <, > or = to make the statements correct. 4,458 × 56 ○ 4,523 × 54 4,458 × 55 ○ 4,523 × 54 4,458 × 55 ○ 4,522 × 54	**Spot the Mistakes** Can you spot and correct the errors in the calculation? 	Teddy has spilt some paint on his calculation.  What are the missing digits? What do you notice?	

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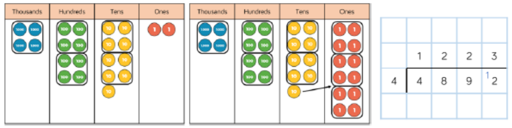
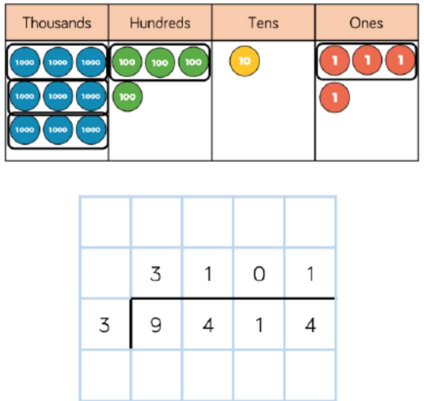
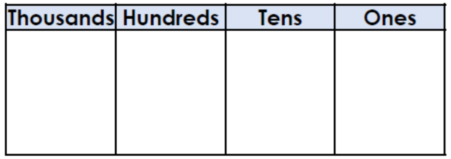
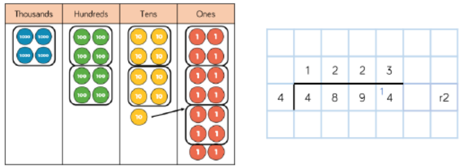
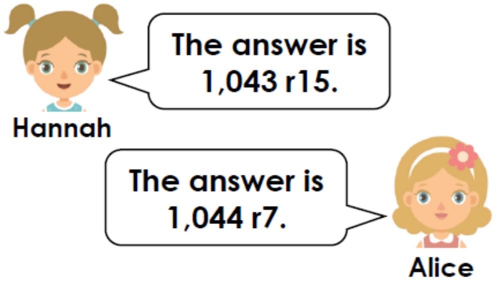
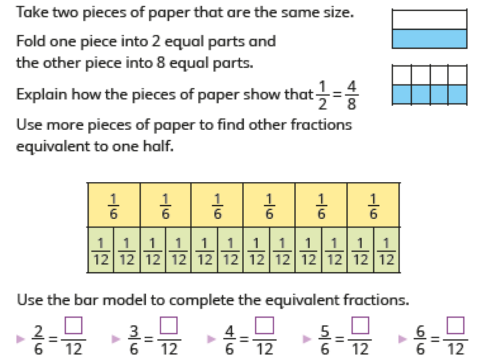
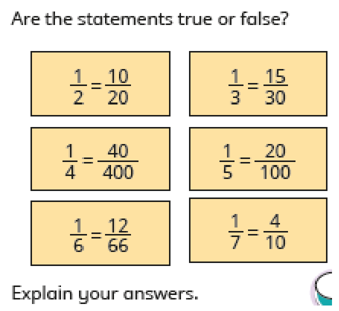
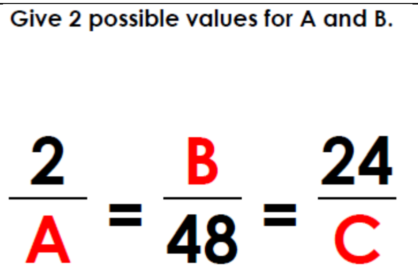
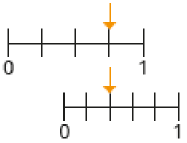
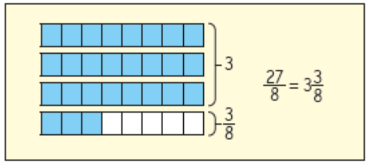
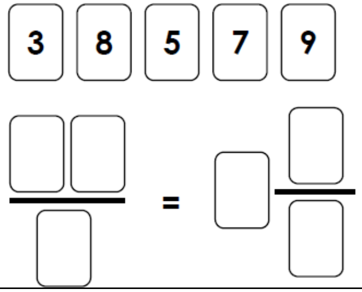
Divide 4 digit by 1 digit	Here is a method to calculate 4,892 divided by 4 using place value counters and short division.  Use this method to calculate: 6,610 ÷ 5 2,472 ÷ 3 9,360 ÷ 4	**Spot the Mistake** Explain and correct the working. 	**9b. Shahab has got 6 counters to place in the place value grid to create a calculation.** **The ones column has no counters.** **What calculation can Shahab complete if he is dividing by 6 and has no remainders?**  Thousands Hundreds Tens Ones	
Divide 4 digit by 1 digit with remainders	Here is a method to solve 4,894 divided by 4 using place value counters and short division.  Use this method to calculate: 6,613 ÷ 5 2,471 ÷ 3 9,363 ÷ 4	**4b. Hannah and Alice are calculating 8,359 ÷ 8.**  **Who is correct? Explain your reasoning.**	**Always, Sometimes, Never?** A three-digit number made of consecutive descending digits divided by the next descending digit always has a remainder of 1 765 ÷ 4 = 191 remainder 1 How many possible examples can you find?	

Short division				
Efficient division				
Solve problems with multiplication and division.				

Year 5				
Number: Fractions				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**
Find and recognise equivalent fractions using models to link between multiplication and division (both unit and non-unit fractions).	 Take two pieces of paper that are the same size. Fold one piece into 2 equal parts and the other piece into 8 equal parts. Explain how the pieces of paper show that $\frac{1}{2}=\frac{4}{8}$ Use more pieces of paper to find other fractions equivalent to one half. Use the bar model to complete the equivalent fractions. $\frac{2}{6}=\frac{\square}{12}$ $\frac{3}{6}=\frac{\square}{12}$ $\frac{4}{6}=\frac{\square}{12}$ $\frac{5}{6}=\frac{\square}{12}$ $\frac{6}{6}=\frac{\square}{12}$	 Are the statements true or false? $\frac{1}{2}=\frac{10}{20}$ $\frac{1}{3}=\frac{15}{30}$ $\frac{1}{4}=\frac{40}{400}$ $\frac{1}{5}=\frac{20}{100}$ $\frac{1}{6}=\frac{12}{66}$ $\frac{1}{7}=\frac{4}{10}$ Explain your answers.	 Give 2 possible values for A and B. $\frac{2}{A}=\frac{B}{48}=\frac{24}{C}$	tenths, equivalent decimals and fractions, Whole, equal parts, four equal parts, one half, two halves, a quarter, two quarters,

		Tiny thinks that the number lines show that $\frac{3}{4}$ is equivalent to $\frac{2}{5}$  Is Tiny correct? Explain your answer.	Here are some fraction cards. $\frac{4}{A}$ $\frac{B}{C}$ $\frac{20}{50}$ Use the clues to work out the values of A, B and C. - All three fractions are equivalent. - A + B = 16	fraction, three quarters, one third, a third, equivalence, equivalent, unequal, are the parts equal? How do you know? Splitting a whole into two equal parts, 1/2 , 1/3 , what does the 1 represent, what does the 3 represent. How many thirds make a whole? 1/4, unit fraction,
Find a whole				
Improper fractions to mixed numbers	Tommy uses a bar model to convert the improper fraction $\frac{27}{8}$ to a mixed number.  Use Tommy's method to convert $\frac{25}{8}$, $\frac{26}{8}$, $\frac{18}{7}$ and $\frac{19}{4}$ to mixed numbers.	Which is greater, $\frac{19}{3}$ or $\frac{25}{4}$? Explain your answer.	**9b. Use the number cards to show an improper fraction as a mixed number. Only one card can be used twice.** 	

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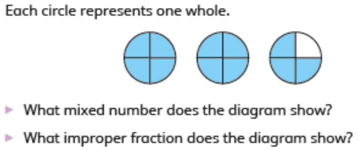
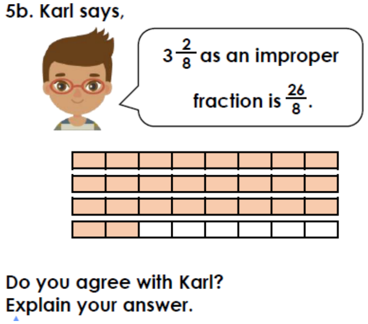
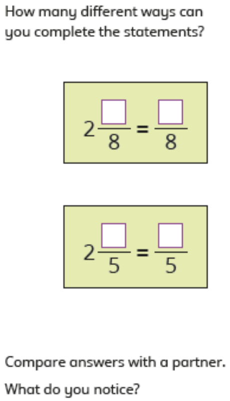
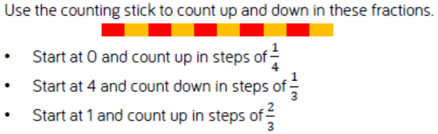
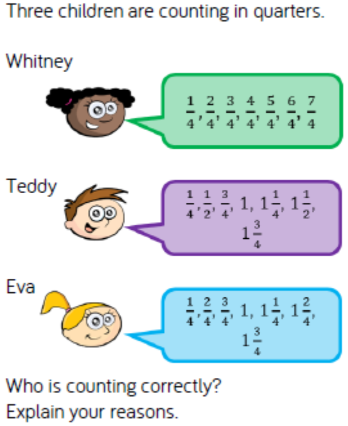
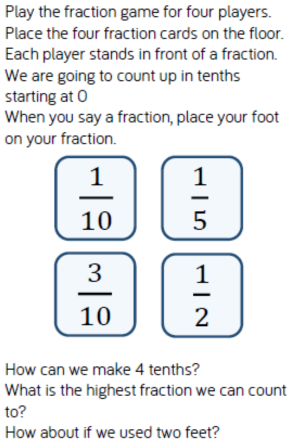
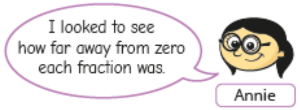
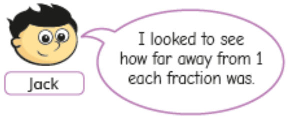
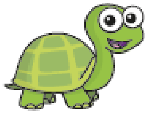
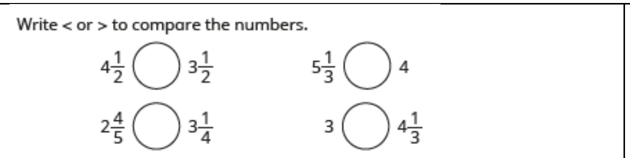
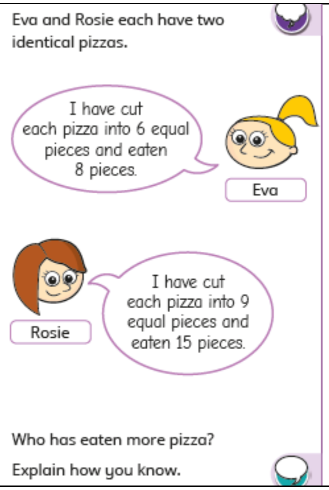
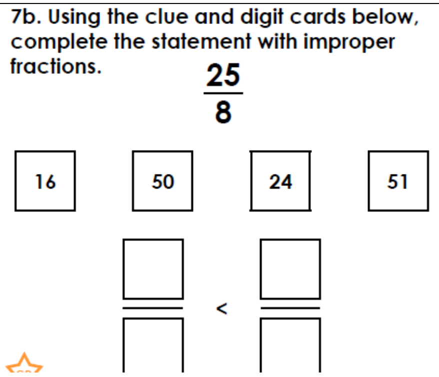
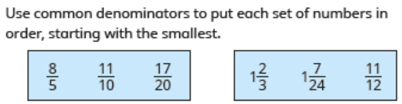
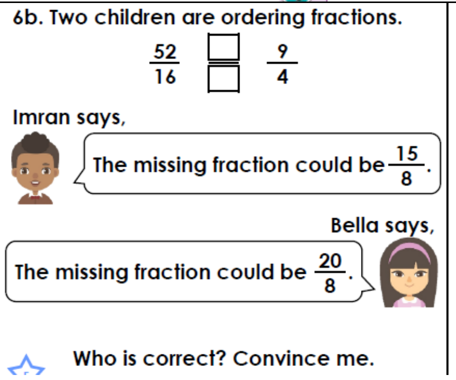
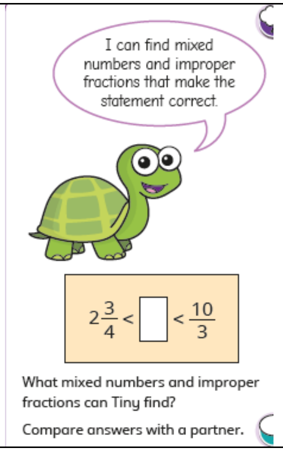
Mixed numbers to improper fractions	 Each circle represents one whole. ▸ What mixed number does the diagram show? ▸ What improper fraction does the diagram show?	 5b. Karl says, $3\frac{2}{8}$ as an improper fraction is $\frac{26}{8}$. Do you agree with Karl? Explain your answer.	 How many different ways can you complete the statements? $2\frac{\square}{8} = \frac{\square}{8}$ $2\frac{\square}{5} = \frac{\square}{5}$ Compare answers with a partner. What do you notice?	non-unit fraction, numerators, denominators, 3/4 , tenths, decimals, is a fraction always less than one? How many tenths make a whole? What is a tenth? Can you see a pattern between the fractions? How can we use our times tables to help us find equivalent fractions? Compare, order, addition and
Number sequences with fractions – count up and down	 Use the counting stick to count up and down in these fractions. • Start at 0 and count up in steps of $\frac{1}{4}$ • Start at 4 and count down in steps of $\frac{1}{3}$ • Start at 1 and count up in steps of $\frac{2}{3}$	 Three children are counting in quarters. Whitney: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}, \frac{6}{4}, \frac{7}{4}$ Teddy: $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1, 1\frac{1}{4}, 1\frac{1}{2}, 1\frac{3}{4}$ Eva: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, 1, 1\frac{1}{4}, 1\frac{2}{4}, 1\frac{3}{4}$ Who is counting correctly? Explain your reasons.	 Play the fraction game for four players. Place the four fraction cards on the floor. Each player stands in front of a fraction. We are going to count up in tenths starting at 0 When you say a fraction, place your foot on your fraction. $\frac{1}{10}$ $\frac{1}{5}$ $\frac{3}{10}$ $\frac{1}{2}$ How can we make 4 tenths? What is the highest fraction we can count to? How about if we used two feet?	

Compare fractions less than 1	Use diagrams to show that $\frac{4}{5} > \frac{3}{5}$ Explain how you can tell that $\frac{4}{5} > \frac{3}{5}$ without using a diagram.	Annie and Jack are using a number line to work out which fraction is greater, $\frac{5}{6}$ or $\frac{2}{3}$   Will Annie and Jack get the same answer? Show working to support your answer. Which method do you prefer?	**8a. Use two number cards to complete the equation.** $\frac{24}{72} < \frac{\square}{\square} < \frac{60}{72}$ **12** **25** **18** **8** **36** **Find two possibilities.**	subtraction of fractions, greater than, how many x make a whole? Quantity, what does equivalent mean? What is a unit fraction? What is a non-unit fraction? Improper fractions, mixed numbers, integer, What is an improper fraction? Convert, number
Order fractions less than 1	Order each set of fractions, from greatest to smallest. ▸ $\frac{3}{7}, \frac{3}{5}, \frac{3}{8}$ ▸ $\frac{2}{3}, \frac{5}{6}, \frac{7}{12}$ ▸ $\frac{1}{4}, \frac{2}{5}, \frac{3}{20}$	Tiny is ordering some fractions.  $\frac{1}{2} < \frac{2}{5} < \frac{3}{10} < \frac{7}{8}$ Explain the mistake Tiny has made.	Fill in the boxes to make the statement true. $\frac{3}{8} < \frac{\square}{\square} < \frac{3}{4}$ Complete the statement in two different ways. Compare answers with a partner.	

Compare fractions greater than 1	 Write < or > to compare the numbers. $4\frac{1}{2}$ ○ $3\frac{1}{2}$ $5\frac{1}{3}$ ○ 4 $2\frac{4}{5}$ ○ $3\frac{1}{4}$ 3 ○ $4\frac{1}{3}$	 Eva and Rosie each have two identical pizzas. I have cut each pizza into 6 equal pieces and eaten 8 pieces. Eva Rosie I have cut each pizza into 9 equal pieces and eaten 15 pieces. Who has eaten more pizza? Explain how you know.	 7b. Using the clue and digit cards below, complete the statement with improper fractions. $\frac{25}{8}$ 16 50 24 51 $\frac{\square}{\square} < \frac{\square}{\square}$	sequences, if two fractions have the same denominator/ numerator, how can you decide which one is greater? Why do denominators need to be the same? Multiply, fractions of amount, repeated addition, operators, commutativity, what is the same/what is different? Can you see the link between the numbers?
Order fractions greater than 1	 Use common denominators to put each set of numbers in order, starting with the smallest. $\frac{8}{5}$ $\frac{11}{10}$ $\frac{17}{20}$ $1\frac{2}{3}$ $1\frac{7}{24}$ $\frac{11}{12}$	 6b. Two children are ordering fractions. $\frac{52}{16}$ $\frac{\square}{\square}$ $\frac{9}{4}$ Imran says, The missing fraction could be $\frac{15}{8}$. Bella says, The missing fraction could be $\frac{20}{8}$. Who is correct? Convince me.	 I can find mixed numbers and improper fractions that make the statement correct. $2\frac{3}{4} < \square < \frac{10}{3}$ What mixed numbers and improper fractions can Tiny find? Compare answers with a partner.	

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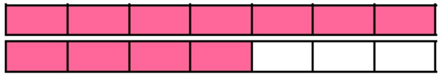
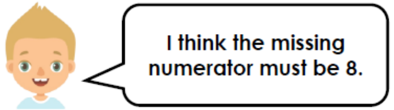
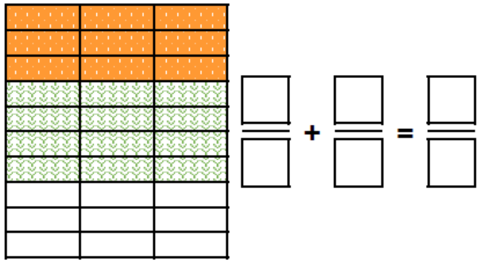
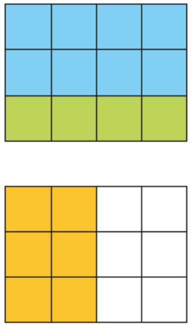
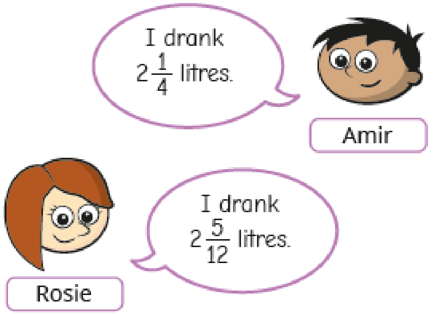
Add and subtract fractions same denominator	Use the bar model to complete the calculation.  $\frac{1}{5}+\frac{2}{5}=$ ____ Use the bar model to help you work out $\frac{9}{5}-\frac{6}{5}$ 	4b. Ted is finding the missing numerator in the following calculation: $\frac{\square}{7}+\frac{6}{7}=1\frac{4}{7}$   Is he correct? Explain why.	Find as many ways as you can to make the statement correct. $\frac{5}{9}+\frac{\square}{9}=\frac{8}{9}+\frac{\square}{9}$ Compare answers with a partner.	
Add fractions within 1 (different denominators)	What common denominator would you use to work out each addition? $\frac{1}{2}+\frac{1}{6}$ $\frac{1}{4}+\frac{5}{8}$ $\frac{3}{10}+\frac{2}{5}$ $\frac{1}{6}+\frac{1}{3}$ Work out the additions.	Annie solved this calculation.  $\frac{3}{4}+\frac{3}{16}=\frac{3+3}{4+16}=\frac{6}{20}=\frac{3}{10}$ Can you spot and explain her mistake?	7a. This model shows the addition of two fractions. All the denominators are different.  What calculation could it show?	

Subtract fractions (different denominators)	Find the difference between each pair of fractions. $\frac{5}{12}$ and $\frac{3}{4}$ $\frac{3}{5}$ and $\frac{19}{15}$ $\frac{20}{9}$ and $\frac{4}{3}$	Subtract each fraction from one whole. $\frac{3}{5}$ $\frac{4}{7}$ $\frac{5}{12}$ $\frac{2}{9}$ $\frac{3}{4}$ $\frac{5}{8}$ What connections can you see between the fractions and your answers?	Two fractions have a difference of one half. What could the fractions be? Compare answers with a partner.	
Add 3 or more fractions – denominators are multiples	Add the sets of fractions, giving your answers as mixed numbers. ▸ $\frac{2}{3}+\frac{1}{6}+\frac{7}{12}$ ▸ $\frac{1}{4}+\frac{7}{8}+\frac{3}{16}$ ▸ $\frac{1}{2}+\frac{5}{6}+\frac{5}{12}$	Eva is attempting to answer: $\frac{3}{5}+\frac{1}{10}+\frac{3}{20}$  $\frac{3}{5}+\frac{1}{10}+\frac{3}{20}=\frac{7}{35}$ Do you agree with Eva? Explain why.	Kim uses the diagram to add three fractions.  What could her fractions be? How many different combinations can you find?	

Add mixed numbers with non-unit fraction	Tom adds a fraction to a mixed number by adding the fractions separately and then adding the wholes. Use Tom's method to work out the additions. $3\frac{1}{5}+\frac{3}{5}$ $4\frac{1}{3}+\frac{1}{3}$ $\frac{2}{7}+3\frac{4}{7}$ $\frac{2}{9}+3\frac{5}{9}$	Jack and Whitney have some juice. Jack drinks $2\frac{1}{4}$ litres and Whitney drinks $2\frac{5}{12}$ litres. How much do they drink altogether? Complete this using two different methods. Which method do you think is more efficient? Why?	What could the values of A and B be? $A\frac{5}{12}+\frac{B}{4}=5\frac{1}{6}$ Compare answers with a partner.	

Add two mixed fractions	Use bar models to show that $2\frac{2}{5}+3\frac{1}{5}=5\frac{3}{5}$ Annie adds two mixed numbers by adding the wholes first and then adding the fractions. $2\frac{3}{5}+4\frac{1}{5}=6+\frac{4}{5}=6\frac{4}{5}$ Use Annie's method to find the totals. ▸ $3\frac{4}{9}+2\frac{1}{9}$ ▸ $1\frac{2}{7}+4\frac{3}{7}$ ▸ $5\frac{11}{15}+3\frac{2}{15}$	Amir and Rosie measure how much water they drink one day.  How much water do they drink altogether that day? How many different ways can you find to work out the answer? Which method do you think is most efficient? Explain your answer.	Complete the addition. $3\frac{2}{5}+\square=\frac{81}{10}$	

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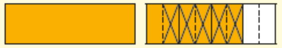
<table>
<tr>
<td>Subtract mixed number with fraction – denominators are multiples</td>
<td>
Here is Ron's method for working out $1\frac{3}{4} - \frac{5}{8}$



$1\frac{3}{4} - \frac{5}{8} = 1\frac{6}{8} - \frac{5}{8} = 1\frac{1}{8}$

Explain the steps in Ron's method.

Use Ron's method to work out the subtractions.

▸ $2\frac{3}{5} - \frac{3}{10}$ ▸ $2\frac{2}{3} - \frac{1}{6}$ ▸ $1\frac{11}{12} - \frac{5}{6}$
</td>
<td>
Tiny is trying to work out this subtraction.

$$2\frac{5}{14} - \frac{2}{7}$$

$2\frac{5}{14} - \frac{2}{7} = 2\frac{3}{7}$

Do you agree with Tiny?

Explain your answer.

Work out the correct answer.
</td>
<td>
9b. Find the route across the grid, from left to right, subtracting $\frac{1}{6}$ every time.

<table>
<tr><td>$2\frac{3}{9}$</td><td>$2\frac{6}{18}$</td><td>$2\frac{5}{12}$</td><td>$2\frac{4}{12}$</td></tr>
<tr><td>$2\frac{1}{2}$</td><td>$2\frac{7}{12}$</td><td>$2\frac{4}{6}$</td><td>$2\frac{1}{4}$</td></tr>
<tr><td>$2\frac{3}{4}$</td><td>$2\frac{6}{12}$</td><td>$2\frac{2}{4}$</td><td>$2\frac{5}{9}$</td></tr>
</table>
</td>
<td></td>
</tr>
</table>

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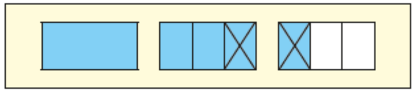
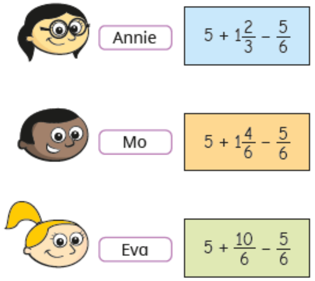
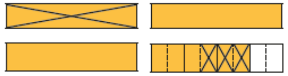
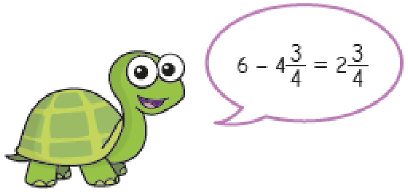
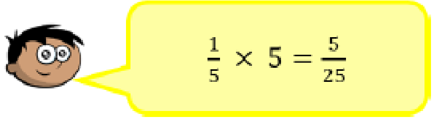
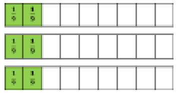
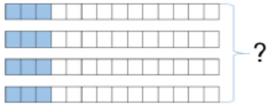
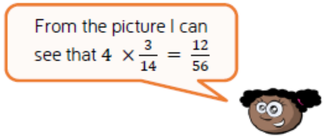
Subtract mixed number with fraction – denominators are multiples (breaking the whole)	Kim uses diagrams to show that $2\frac{1}{3} - \frac{2}{3} = 1\frac{2}{3}$  Work out the subtractions. ▸ $4\frac{1}{4} - \frac{3}{4}$ ▸ $3\frac{3}{8} - \frac{7}{8}$ ▸ $2\frac{2}{5} - \frac{4}{5}$	Three children are working out $6\frac{2}{3} - \frac{5}{6}$ They all use partitioning to help them.  Annie $5 + 1\frac{2}{3} - \frac{5}{6}$ Mo $5 + 1\frac{4}{6} - \frac{5}{6}$ Eva $5 + \frac{10}{6} - \frac{5}{6}$ Does each child have a correct starting point? Explain your answer.	Write the digits 2, 3 and 4 in the boxes to make the calculation correct. $27\frac{1}{\square} - \frac{\square}{6} = 26\frac{\square}{3}$ Children could move on to making their own questions like this for their peers to solve.	
Subtract 2 mixed numbers	Here is a bar model to help work out $3\frac{3}{4} - 1\frac{3}{8}$  $3\frac{3}{4} - 1\frac{3}{8} = 2\frac{3}{8}$ Work out the subtractions. $3\frac{7}{8} - 2\frac{3}{4}$ $5\frac{5}{6} - 2\frac{1}{3}$ $3\frac{2}{3} - 1\frac{5}{9}$	 Explain why Tiny is wrong. Find the correct answer.	**8b. Use the digit cards to complete the calculation below.** 4 3 2 7 1 10 $5\frac{\square}{5} - \square\frac{2}{\square} = 3\frac{\square}{\square}$	

Multiply unit fractions by integer	Work out $\frac{1}{6} \times 4$ by counting in sixths.  $\frac{1}{6} \times 4 = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$ Use this method to work out: $2 \times \frac{1}{3}$ $\frac{1}{5} \times 3$ $6 \times \frac{1}{10}$	Amir is multiplying fractions by a whole number.  Can you explain his mistake?	I am thinking of a unit fraction. When I multiply it by 4 it will be equivalent to $\frac{1}{2}$ When I multiply it by 2 it will be equivalent to $\frac{1}{4}$ What is my fraction? What do I need to multiply my fraction by so that my answer is equivalent to $\frac{3}{4}$? Can you create your own version of this problem?	
Multiply non-unit fractions by an integer	Count the number of ninths to work $3 \times \frac{2}{9}$  Use this method to work out: $\frac{3}{8} \times 2$ $\frac{5}{16} \times 3$ $4 \times \frac{2}{11}$	Whitney has calculated $4 \times \frac{3}{14}$   Do you agree? Explain why.	Use the digit cards only once to complete these multiplications. 9 2 4 6 3 $\square \times \frac{\square}{\square} = \frac{\square}{\square}$ 1 2 3 4 5 6 $\square \times \frac{\square}{\square} = \frac{\square}{\square}$	

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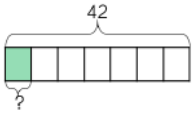
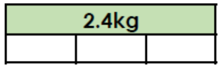
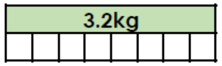
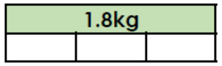
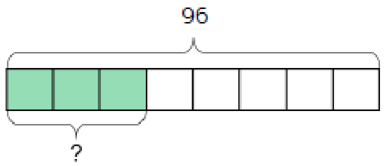
Multiply mixed numbers by integers	Use repeated addition to work out $2\frac{2}{3} \times 4$ $2\frac{2}{3} \times 4 = 2\frac{2}{3} + 2\frac{2}{3} + 2\frac{2}{3} + 2\frac{2}{3} = 8\frac{8}{3} = 10\frac{2}{3}$ Use this method to solve: $2\frac{1}{6} \times 3$ $1\frac{3}{7} \times 2$ $3\frac{1}{3} \times 4$	Jack runs $2\frac{2}{3}$ miles three times per week. Dexter runs $3\frac{3}{4}$ miles twice a week. Who runs the furthest during the week? Explain your answer.	Work out the missing numbers. $\boxed{2}\frac{\boxed{}}{\boxed{8}} \times \boxed{} = \boxed{7}\frac{\boxed{7}}{\boxed{8}}$ Explain how you worked it out.	
Fractions of an amount	Find $\frac{1}{7}$ of 42  $42 \div 7 = 6$ $\frac{1}{7}$ of 42 is 6 Use this method to find: $\frac{1}{8}$ of 56 $\frac{1}{6}$ of 480 $\frac{1}{9}$ of 81 m	**5a. Circle the odd one out.** **A.** $\frac{2}{3}$ **of 2.4kg**  **B.** $\frac{3}{8}$ **of 3.2kg**  **C.** $\frac{2}{3}$ **of 1.8kg**  **Explain your reasoning.**	Write a problem that matches the bar model.  What other questions could you ask from this model?	
Calculate a fraction of a quantity.				

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Using fractions as operators by changing the order of multiplication	Complete: 2 lots of $\frac{1}{10}$ = ☐ $\frac{1}{10}$ of 2 = ☐ 6 lots of ☐ = 3 ☐ of 6 = 3 8 lots of $\frac{1}{4}$ = ☐ $\frac{1}{4}$ of 8 = ☐ Which calculation on each row is easier? Why?	**6b. Mo and Lily are using fractions as operators.** **Mo says,**  **$\frac{3}{4}$ of 12 = 12 lots of 3** **Lily says,**  **$\frac{3}{4}$ of 12 = 12 x $\frac{3}{4}$** **Who is correct? Convince me.**	Which method would you use to complete these calculations: multiply the fractions or find the fraction of an amount? Explain your choice for each one. Compare your method to your partner. 25 × $\frac{3}{5}$ or $\frac{3}{5}$ of 25 6 × $\frac{2}{3}$ or $\frac{2}{3}$ of 6 5 × $\frac{3}{8}$ or $\frac{3}{8}$ of 5	

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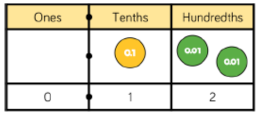
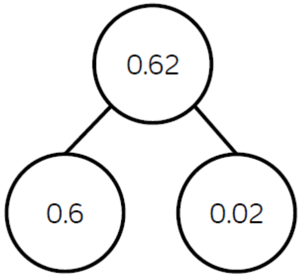
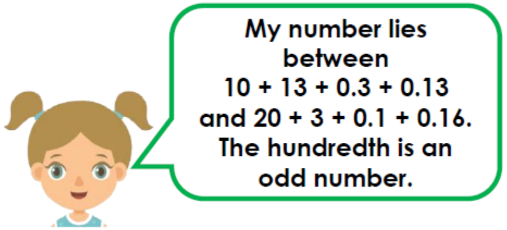
Year 5				
Number: Decimals				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**
Read and write decimal up to 2 d.p.	Which number is represented on the place value chart?  There are ____ ones, ____ tenths and ____ hundredths. The number is ____ Represent the numbers on a place value chart and complete the stem sentences. 0.28 0.65 0.07 1.26	Dexter says there is only one way to partition 0.62  Prove Dexter is incorrect by finding at least three different ways of partitioning 0.62	**8b. Tammy is thinking of a number.**  **What number is Tammy thinking of? Is there more than one possible answer?**	Decimals, tenths, hundredths, thousandths, equivalent decimals and fractions, order, compare, place value, what is a tenth? Where would we use tenths in real life? How many tenths are equivalent to a whole? Number line, relevant scale, divide by 10 – split into 10 equal parts,
Equivalent fractions and decimals (tenths).				
Equivalent fractions and decimals (hundredths).				
Equivalent fractions and decimals.				

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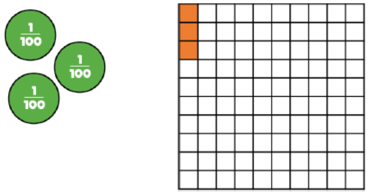
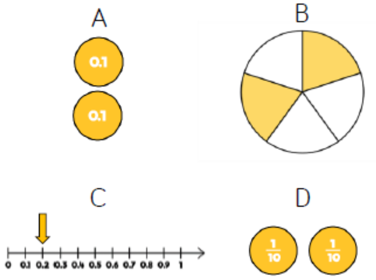
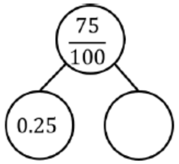
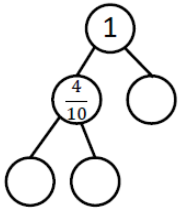
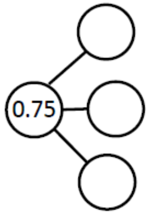
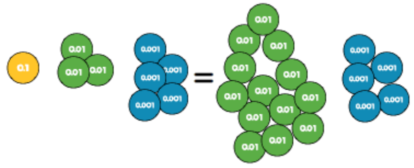
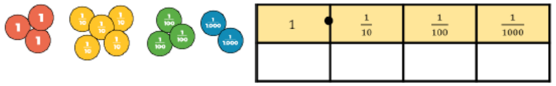
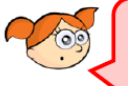
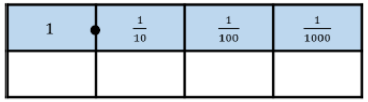
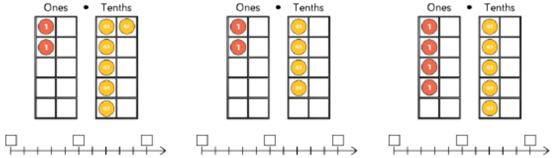
Recognise decimals as fractions Tenths, hundredths and thousandths.	What fraction is shown in both representations? Can you convert this in to a decimal?  The fraction ☐/☐ is the same as the decimal ______	**Odd one out** Which of the images below is the odd one out?  Explain why.	How many different ways can you complete the part-whole model using fractions and decimals?  Create another part-whole model like the one above for your partner to complete. Now complete the following part-whole models using fractions and decimals.  	Gettegno chart, zero as a place holder, part, whole, decimal place, compare, order, ascending, descending, which digit do we use to compare these decimals? Round up, round down, integers,

Understand thousandths using a place value chart to support.	Use the place value counters to help you fill in the final chart.  1 = ___ tenths $\frac{1}{10}$ = ___hundredths $\frac{1}{100}$ = ___ thousandths	Rosie thinks the 2 values are equal.  Do you agree? Explain your thinking. Can you write this amount as a decimal and as a fraction?	**8b. Use the digit cards to complete the statement below in 3 different ways.** **Each card can be used more than once.** $\boxed{2}$ $\boxed{7}$ $\boxed{0}$ $\boxed{8}$ $\boxed{1}$ $\frac{\square\square\square\square}{1000} = \square.\square\square\square$	halves, quarters, part-whole, what is the value of x? When do we need to use zero as a place holder? Complements, number bonds, sequences, rules, multiply, divide, what do you notice about the numbers when you multiply/ divide?
Read and write thousandths as decimals	Use the place value chart and counters to represent these numbers. Write down the numbers as a decimal. a)  b) 4 ones, 6 tenths, 0 hundredths and 2 thousandths c) $3\frac{34}{1000}$	Three children are representing the number 0.504 $0.504 = \frac{504}{1000}$  Annie  Alex $0.504 = \frac{3}{10} + \frac{2}{10} + \frac{4}{1000}$ $0.504 = \frac{5}{10} + \frac{4}{1000}$  Teddy Who is correct? Explain why.	Ron has 8 counters. He makes numbers using the place value chart. At least 3 columns have counters in. What is the largest and the smallest number he can make with 8 counters?  Can you record the numbers in different ways?	

Rounding decimals to the nearest whole and tenth	Complete the number lines and round the representations to the nearest whole number:  	Whitney is thinking of a number.  Rounded to the nearest whole her number is 4 Rounded to the nearest tenth her number is 3.8 Write down at least 4 different numbers that she could be thinking of.	A number between 11 and 20 with 2 decimal places rounds to the same number when rounded to one decimal place and when rounded to the nearest whole number? What could this be? Is there more than one option? Explain why.	
Order and compare decimals (same number of decimal place).				

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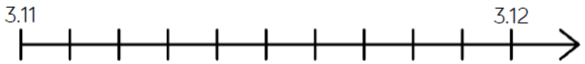
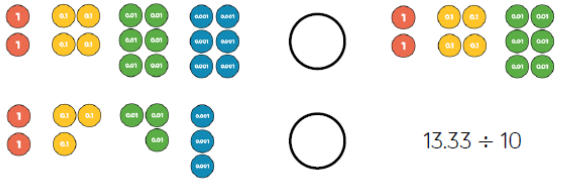
<table>
<tr>
<td>Order decimals up to 3 d.p.</td>
<td>Place the numbers in ascending order on the number line.
3.115 $3\frac{113}{1000}$ Three and 11 hundredths

 </td>
<td>1.232 , 1.322, 1.239

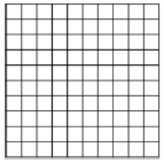
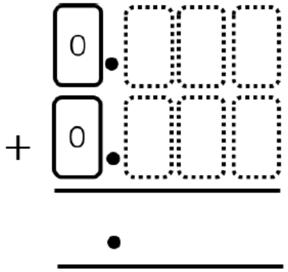
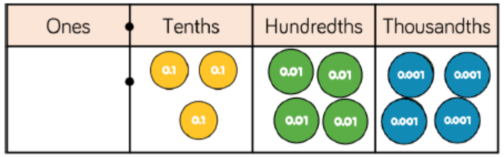
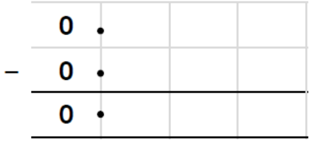
I have ordered these numbers in descending order. Agree or disagree. Explain your answer.</td>
<td>Tommy says,
I have put some numbers into ascending order:
3.015
$3\frac{51}{1000}$
3.105
$3\frac{51}{100}$

Tommy has missed one number out.
It should go in the middle of this list.
What could his number be?
What can't his number be?</td>
<td></td>
</tr>
<tr>
<td>Compare decimals up to 3 d.p.</td>
<td>Use <, > or = to make the statements correct.

13.33 ÷ 10</td>
<td>Alex says,

3.105 is greater than 3.2 because 105 is greater than 2

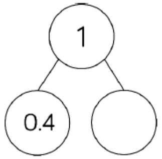
Do you agree?
Explain your answer.</td>
<td>7a. Molly made a number between 0.405 x 10 and 42.14 ÷ 10, using counters on a place value mat..
<table>
<tr><th>1</th><th>0.1</th><th>0.01</th><th>0.001</th></tr>
<tr><td>● ● ● ●</td><td></td><td></td><td></td></tr>
</table>
Six of the counters have fallen off.

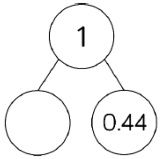
List 3 possibilities of what Molly's number could be.</td>
<td></td>
</tr>
</table>

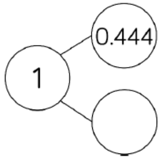
Adding decimals within one - using up to 3 d.p.	Each box in this hundred square represents one hundredth of the whole. Use this to answer: 0.07 + 0.78 0.87 + 0.07 	What mistake has Dora made? 0.41 + 0.3 = 0.413  Use at least 2 representations to show why she is incorrect.	Rosie has some digit cards. 0 1 2 3 4 5 She uses each card once to make a number sentence.  What is the largest number she can make? What is the smallest?	
Subtracting decimals within one - using up to 3 d.p.	Here is a number.  - What is three tenths less than the number? - Take away 0.02, what is your number now? - Subtract 5 thousandths. What is the final number?	**6a. Using the digit cards below for subtraction, Kayla thinks the smallest number she can make will be > 0.1** 7 3 9 5 4 1  **Is she correct? Explain your answer.**	**7b. Amaya solved these number sentences using <, > or =**  0.195 – 0.149 = 0.792 – 0.753 0.472 – 0.385 > 0.673 – 0.596 0.474 – 0.08 < 0.953 – 0.569 0.009 + 0.594 < 0.607 – 0.004 **Has she solved them correctly? Show why you think so correcting any mistakes you find.**	

Complements to make 1

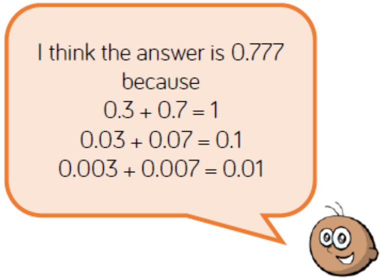
Complete the part-whole models.







$$0.333 + \boxed{} = 1$$



Do you agree with Tommy?
Can you explain what his mistake was?

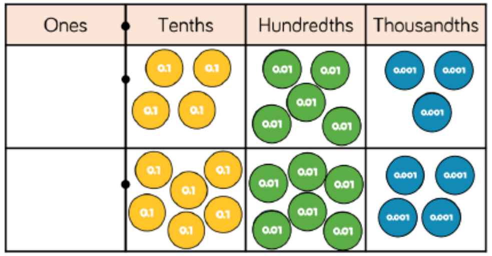
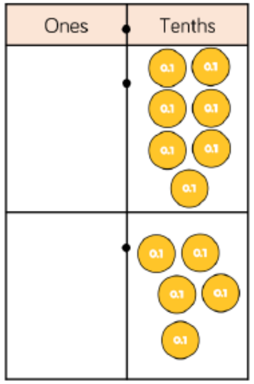
How many different ways can you find a path through the maze, adding each number at a time, to make a total of one?

Start →

0.02	0.01	0.05	0.08	0.3	0.04	0	0.001
0.2	0.06	0.07	0.09	0.001	0.004	0.02	0.04
0.005	0.04	0.2	0.02	0.05	0.06	0.07	0.6
0.5	0.005	0.05	0.02	0.03	0.017	0.006	0.06
0.009	0.8	0.001	0.05	0.015	0.01	0.008	0.007
0.09	0.2	0.08	0.03	0.199	0.01	0.04	0.05
0.01	0.008	0.1	0.09	0.005	0.08	0.02	0.02
0.05	0.03	0.01	0.22	0.07	0.003	0.04	0.09

→ 1

Once you have found a way, can you design your own smaller maze for others to solve?

Adding decimals – crossing the whole	Use the place value grid to answer 0.453 + 0.664 	A place value grid is used to solve 0.7 + 0.5  Alex thinks the answer is 0.12 What mistake has she made?	You will need a partner and a six-sided dice for this game.  Take it in turns rolling the dice twice and placing the digits in the blank spaces above. Record the number in a table. Swap over with your partner. Roll the dice again and add your new number to the first number. The winner is the person who after adding 4 numbers is the closest to 1.5 **without** going over.	

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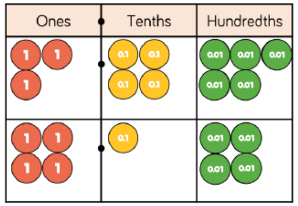
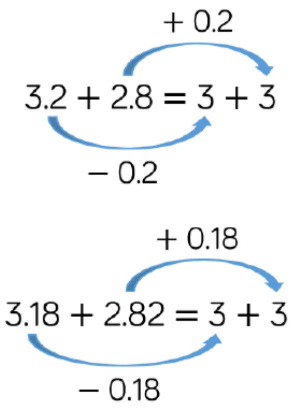
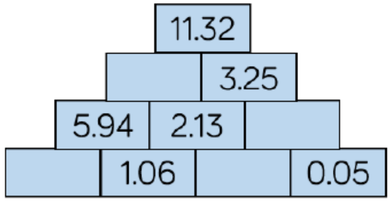
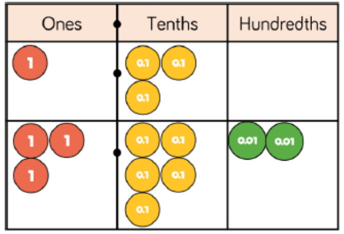
Adding decimals with the same number of decimal places	Use the place value chart to add 3.45 and 4.14  3 . 4 5 + 4 . 1 4	**6b. Order each addition from the easiest to the trickiest to solve.** **4.44 + 2.22** **0.33 + 0.77** **0.09 + 1.11** **4.32 + 6.78** **Explain your choices.**	 Using these strategies, can you find more number sentences which have the same total as 3 + 3	
Subtracting decimals with the same number of decimal places	Use the column method to answer these questions. 6 . 4 − 3 . 8 5 . 0 5 − 2 . 1 5	**5a. Abdullah has completed the following calculation but he has made a mistake.**  **5 . $\overset{3}{\cancel{2}}$ $\overset{18}{\cancel{8}}$** **- 3 . 1 9** **2 . 2 9** **Explain what he has done wrong.**	In this number pyramid, each number is calculated by adding the two numbers underneath.  	

<table>
<tr>
<td>Adding decimals with a different number of decimal places</td>
<td>
Use the place value grid to add 1.3 and 3.52



$$\begin{array}{r} 1\ .\ 3 \\ +\ 3\ .\ 5\ 2 \\ \hline \\ \hline \end{array}$$
</td>
<td>
Eva is trying to find the answer to

4.144 + 1.4

Here is her working out.

$$\begin{array}{cccccc} & 4 & . & 1 & 4 & 4 \\ + & & & 1 & . & 4 \\ \hline & 4 & . & 2 & 4 & 8 \\ \hline \end{array}$$

Can you spot and explain her error?

Work out the correct answer.
</td>
<td>
Place the calculations in the correct column in the table.

9.99 + 0.1
9.99 + 1
9.99 + 0.001
9.99 + 0.01

Some calculations might need to go in more than one place.

<table>
<tr><th>No exchange</th><th>Exchange in the ones column</th><th>Exchange in the tenths column</th><th>Exchange in the hundredths column</th><th>Exchange in the thousandths column</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Add 2 more calculations to each column.
</td>
<td></td>
</tr>
</table>

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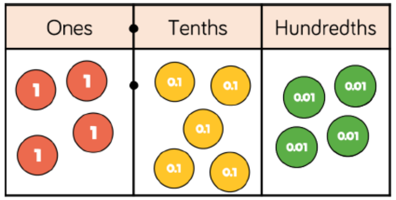
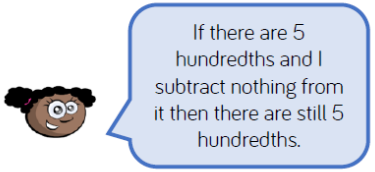
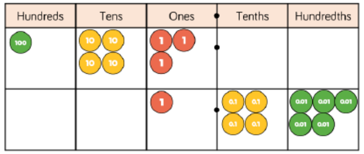
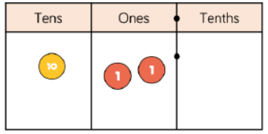
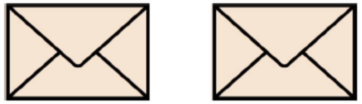
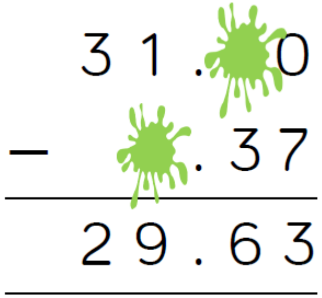
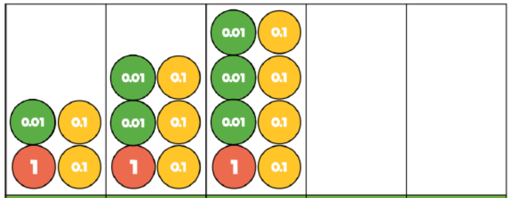
Subtracting decimals with a different number of decimal places	Use the place value grid to help subtract 1.4 from 4.54  4 . 5 4 − 1 . 4	 4 . 9 − 3 . 8 5 1 . 1 5 Do you agree with Whitney? Explain your answer.	**7a. Use the digit cards to complete the subtraction calculation.** **0 2 8 1 9** **2 1 . 4 ☐** **− 1 ☐ . ☐ 2 ☐** **2 . 4 5 9**	
Adding wholes and decimals	Use the place value grid to help add 143 and 1.45  1 4 3 . + 1 . 4 5	**5a. Jameela thinks the missing digits are 3, 4 and 1.** 1 3 4 • 0 0 + ☐ 7 • ☐ 1 1 6 ☐ • 4 ☐ **Is she correct? Prove it.**	**7b. Chris has spent £700 exactly. He bought these items and one duplicate.**  **Which item did he buy twice?**	

Subtracting wholes and decimals	Use the place value grid to help work out 12 – 1.2  1 2 . – 1 . 2	 Two envelopes contain two different numbers. - The sum of the numbers is 9.92 - The difference between the numbers is 2.32 What numbers are inside the envelopes? How can this bar model help?  	What are the missing digits in the calculation?  	

Decimal sequencing and create simple rules

Complete the sequence.



1st	2nd	3rd	4th	5th
1.21	1.32	1.43		

9.48 9.52 9.56 9.6 …

The number 9.7 will be in this sequence.

Do you agree with Jack?
Explain your answer.

	1st sequence	Relationship →	2nd sequence
1st term	0.1		1
2nd term	0.2		2
3rd term	0.3		3
4th term	0.4		4
5th term			

Eva compared the two sequences above. What do you notice about the differences between the terms in the two sequences?

Investigate Eva's sequences below and explain your thinking.

I wonder what the differences would be between sequences that go up in + 0.01 and +1 sequence…

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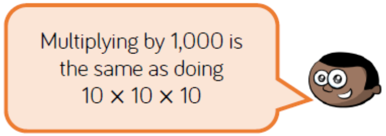
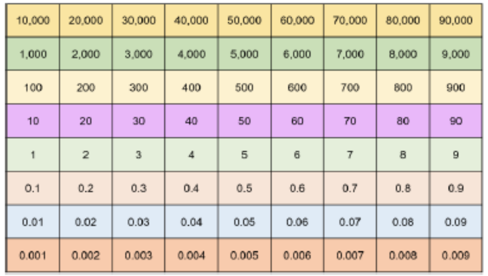
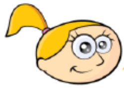
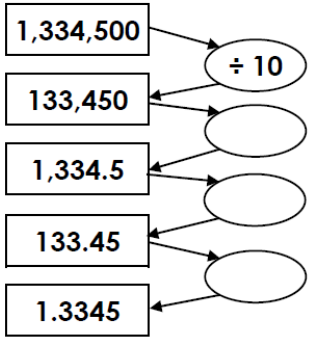
Multiply decimals by 10, 100 and 1000	Use the place value grid to multiply 3.24 by 10, 100 and 1,000  When you multiply by ___, you move the counters ____ places to the left.	 Do you agree with Mo? Explain your answer.	Using the digits 0-9 create a number with up to 3 decimal places, for example, 3.451 Cover the number using counters on your Gattegno chart.  10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 100 200 300 400 500 600 700 800 900 10 20 30 40 50 60 70 80 90 1 2 3 4 5 6 7 8 9 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.001 0.002 0.003 0.004 0.005 0.006 0.007 0.008 0.009 Explore what happens when you multiply your number by 10, then 100, then 1,000 What patterns do you notice?	

Divide decimals by 10, 100 and 1000	Use the place value grid to divide 14.4 by 10, 100 and 1,000  When you divide by ____, you move the counters _____ places to the right.	If you multiply a number by 1,000, you can just divide the answer by 1,000 to get back to your original number.  Whitney That's not true, you would need to divide the answer by ten three times.  Eva Who do you agree with? Explain your thinking.	**7a. Complete the missing functions by deciding whether these numbers have been divided by 10, 100 or 1,000.** 	

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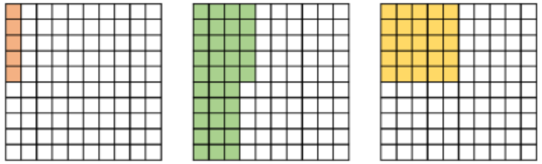
Year 5

Number: Percentages

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Introduction to percent and what percentage is.	Complete the sentence stem for each diagram.  There are ____ parts per hundred shaded. This is ____%	Dora and Amir each have 100 sweets. Dora eats 65% of hers. Amir has 35 sweets left. Who has more sweets left? Explain your answer.	**8b. Put the cards in order from largest to smallest.** **15 parts per 50** **59%** **4 parts out of 20** **32%** **7 parts per 20** **6 parts out of 10**	Percent, percentage, what is percentages, per 100, %, per cent = per hundred, fraction, decimal, equivalent,
Percentage as a fraction	**7b. True or false?** **42% is equivalent to $\frac{84}{200}$**	Teddy says,  To convert a fraction to a percentage, you just need to put a percent sign next to the numerator. Is Teddy correct? Explain your answer.	At a cinema, $\frac{4}{10}$ of the audience are adults. The rest of the audience is made up of boys and girls. There are twice as many girls as boys. What percentage of the audience are girls?	

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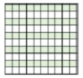
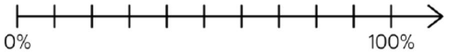
Percentage as a decimal	**1a. Match the fractions to the equivalent decimal and percentage.** **A.** $\frac{18}{100}$ **0.08** **18%** **B.** $\frac{81}{100}$ **0.18** **81%** **C.** $\frac{8}{100}$ **0.81** **8%**	**6b. Hannah and Sean are converting fractions and decimals into percentages.**  **Hannah** **0.5 as a percentage is 50%.** $\frac{50}{200}$ **as a percentage is 50%.**  **Sean** **Who is correct?** **Explain how you know.**	Three children have each read 360 pages of their own book. Ron's book has 500 pages. Dora's book has 400 pages. Eva's book has 600 pages. What fraction of their books have they each read? What percentage of their books have they read? How much of their books have they each read as a decimal? Who has read the most of their book?	

<table>
<tr>
<td>Equivalent fraction, decimal and percentages.</td>
<td>Draw arrows to show the position of each representation on the number line.

40%

$\frac{4}{5}$

</td>
<td>4b. Circle the odd one out.
<table>
<tr><td>0.4</td><td>$\frac{4}{10}$</td><td>$\frac{1}{25}$</td></tr>
<tr><td>$\frac{2}{5}$</td><td>$\frac{20}{50}$</td><td>40%</td></tr>
</table>
Explain your reasoning.</td>
<td>Sort the fractions, decimals and percentages into the correct column.
<table>
<tr><td>50%</td><td>100%</td><td>$\frac{30}{60}$</td></tr>
<tr><td>Seven tenths</td><td>60%</td><td>0.25</td></tr>
<tr><td>70 hundredths</td><td>$\frac{1}{4}$</td><td>7%</td></tr>
</table>
<table>
<tr><th>Less than $\frac{1}{2}$</th><th>Equal to $\frac{1}{2}$</th><th>Greater than $\frac{1}{2}$</th></tr>
<tr><td></td><td></td><td></td></tr>
</table></td>
<td></td>
</tr>
</table>

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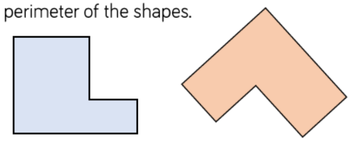
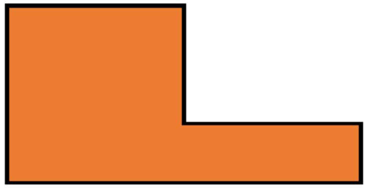
Year 5

Measurement: Perimeter

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Measure perimeter - including rectilinear shapes	Measure the perimeter of the rectangles.  Measure the perimeter of the shapes. 	**5a. Judy says,**  **I used a ruler to measure the shape below. The perimeter is 16cm.**  **What mistake has Judy made? Prove it!**	Activity Investigate different ways you can make composite rectilinear shapes with a perimeter of 54 cm.	perimeter, rectilinear, Orientation, Convert, what is perimeter? What are rectilinear shapes? Composite

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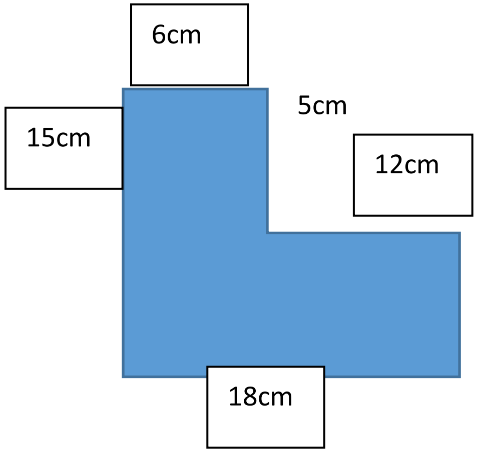
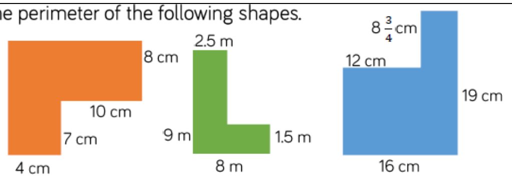
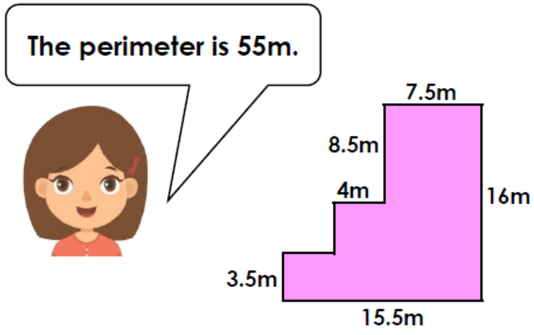
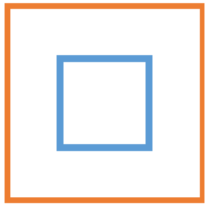
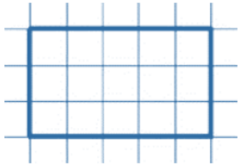
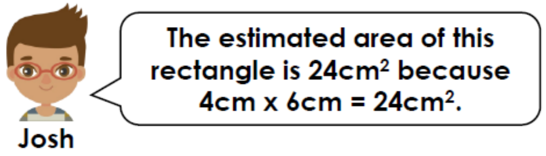
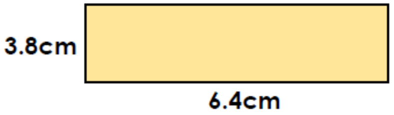
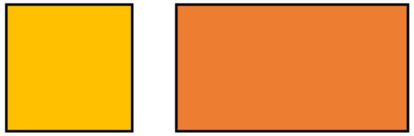
Calculate perimeter – including rectilinear shapes		The length of one side of the square is 5cm. Do I need any more information to work out the perimeter? Explain your answer.	How many shapes can you make with a perimeter of 18cm?	
Calculate perimeter – including rectilinear shapes where lengths are missing.	Find the perimeter of the following shapes. 	**6a. Lucy says,**  **Is Lucy correct? Explain your answer.**	Here is a square inside another square.  The perimeter of the inner square is 16 cm The outer square's perimeter is four times the size of the inner square. What is the length of one side of the outer square? How do you know? What do you notice?	

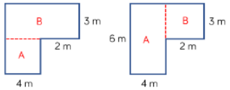
Perimeter of polygons.				

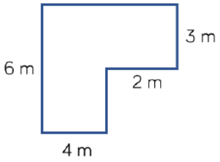
Year 5

Measurement: Area

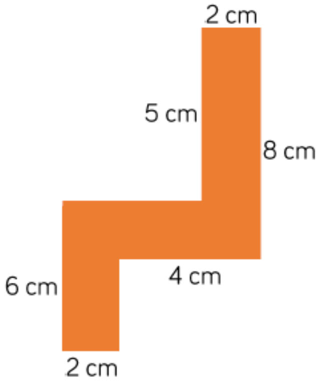
Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Calculate area of rectangles using formula	How many rectangles can you draw with an area of x cm^2 What is the area of this shape if: - each square is 2 cm in length? - each square is 3.5 cm in length? 	**6b. Josh has estimated the area of a rectangle.**   **Is Josh correct? Prove it.**	Investigate how many ways you can make different squares and rectangles with the same area of 84 cm^2 What strategy did you use? 	Area, squared (cm^2) How can you measure area? The amount of space taken up by a two-dimensional shape. Working systematically, compare, greater than,

<table>
<tr>
<td>Calculate area of compound shapes</td>
<td>
Find the area of the compound shape:
How many ways can we split the compound shape?
Is there more than one way?

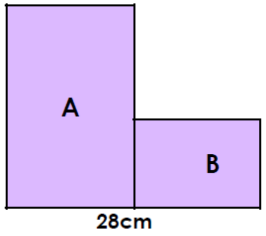




Could we multiply 6 m × 6 m and then subtract 2 m × 3 m?
</td>
<td>
Jack says this shape has an area of 34 cm^2.



Show that Jack is correct.
</td>
<td>
8b. Add the missing lengths to make the following statement correct.



A has an area that is twice as large as B.
</td>
<td>less than, equal to, height x length, what properties of the shape do you need to know work out the area? Compound shapes, irregular shapes, estimate</td>
</tr>
</table>

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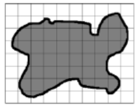
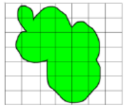
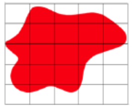
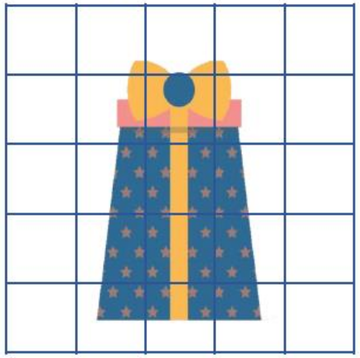
Calculate area of irregular shapes through estimation.	If all of the squares are 1 cm in length, which shape has the greatest area?   	**5b. Each square represents 4cm². Ellie estimates the shape's area to be 7cm². Is she correct? Explain your answer.**  *Not to scale*	Can you construct a 'Pirate Island' to be used as part of a treasure map for a new game? Each square represents 4 m². The island must include the following features and be of the given approximate measure: • Circular Island 180 m² • Oval Lake 58 m² • Forests with a total area of 63 m² (can be split over more than one space) • Beaches with a total area of 92 m² (can be split over more than one space) • Mountains with a total area of 57 m² • Rocky coastline with total area of 25 m²	

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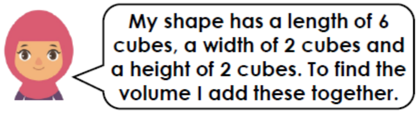
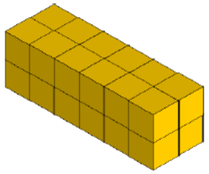
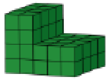
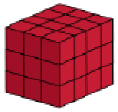
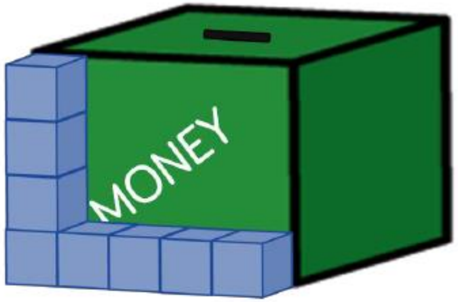
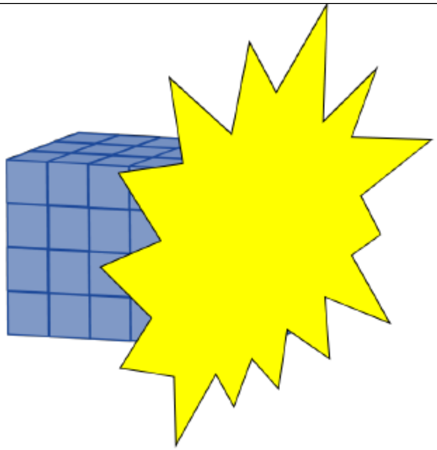
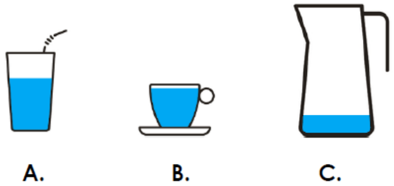
Year 5

Measurement: Volume

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Introduction to what volume is	Take 4 cubes of length 1 cm. How many different solids can you make? What's the same? What's different? Make these shapes. 	**6a. Amina is calculating the volume of her shape.**   **Is Amina correct? Explain your answer.**	How many possible ways can you make a cuboid that has a volume of 12 cm^3?	Volume, cubed, cm^3, same, difference, compare, estimate, capacity, how is capacity different to volume? Greatest, smallest, how

Compare volume counting cubes	Work out the volume of each solid. Shape A  Shape B  Shape A has a volume of ___ cm³ Shape B has a volume of ___ cm³ Which has the greatest volume?	Shape A has a height of 12 cm. Shape B has a height of 4 cm. Dora says Shape A must have a greater volume. Is she correct? Explain your answer.	Amir, Whitney and Mo all build a shape using cubes. Mo has lost his shape, but knows that it's volume was greater than Whitney's, but less than Amir's. Amir's  Whitney's  What could the volume of Mo's shape be?	can we find the volume of this shape? What is the difference between volume and capacity?

Estimate volume	Estimate and match the object to the correct capacity.    3,600 cm³ 1,000 cm³ 187,500 cm³	Jack is using cubes to estimate the volume of his money box.  He says the volume will be 20 cm³ Do you agree with Jack? Explain your answer.	 Each of the cubes have a volume of 1 m³ The volume of the whole shape is between 64 m³ and 96 m³ What could the shape look like? Encourage children to also look at this practically.	

Estimate capacity	Use five identical tumblers and some rice. • Fill a tumbler half full. • Fill a tumbler one quarter full. • Fill a tumbler three quarters full. • Fill a tumbler, leaving one third empty. • Fill a tumbler that has more than the first but less than the third, what fraction could be filled?	**6b. Poppy has poured 550ml into each of the containers. She says container C has the least capacity.**  **Is this a sensible estimation? Explain your answer.**	Give children a container. Using rice, water and cotton wool balls, can children estimate how much of each they will need to fill it? Discuss what is the same and what is different. Will everyone have the same amount of cotton wool? Will everyone have the same amount of rice? Will everyone have the same amount of water?	

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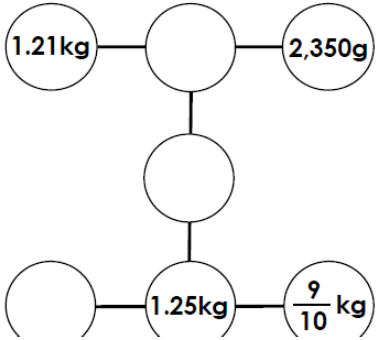
Year 5

Measurement: Converting units

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Convert kilograms and kilometres – focus on use of 'kilo' meaning 1000	Compare the measurements using <, > or = 5 kg ○ 4,500 g 12 kg ○ 12,000 g 3.7 km ○ 370 m 37,000 m ○ 3.7 km	Eva is converting measurements. She says,  I have divided by 1,000 to convert the measurements. Which conversions could Eva have completed? - 3 km ⟶ 3,000 m - 3,000 m ⟶ 3 km - 5,500 g ⟶ 5.5 kg - 2.8 kg ⟶ 2,800 g Explain your answer.	**7b. Complete the circles so that each line adds up to 8.3kg in every direction. Give your answer in kilograms.**  	Height, length, compare, measure, long, short, longer, shorter, narrow, wide, centimetre, metre, kilometre, taller, millimetre, nearest cm, measuring from 0, how long is? How tall is? When would we measure in

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Convert milligrams, millilitres and millimetres – focus on 'milli' meaning $\frac{1}{1000}$	Complete the conversions. 1,000 mm = 1 m 5,000 mm = ☐ m 50,000 mm = ☐ m 500 mm = ☐ m 5,500 mm = ☐ m 1,000 ml = 1 l ☐ ml = 3 l ☐ ml = 30 l 300 ml = ☐ l ☐ ml = 0.3 l	True or False 32 cm + 1·05 m = 150 cm – 0·13 m Explain your reasoning.	Ribbon is sold in 225 mm pieces. Teddy needs 5 metres of ribbon. How many pieces does he need to buy? Teddy would like to make either a bookmark or a rosette with his left over ribbon. Which can he make? To make 5 bookmarks you will need: 1.2 metres of ribbon 1 pair of scissors To make 1 mini rosette you will need: 4 pieces of ribbon cut to 35 mm A stapler	metres? When would we measure in cm? estimating prior to measuring, convert, 100cm=1m 10mm=1cm 1000M = 1km Kilograms, kilo = 1000 Milligrams, metric units, imperial units, pounds, pints, inches, what does approximately mean? Units of time, days, years, months, hours, minutes, seconds, timetables, when do we use
Metric units-convert between different units of length and chose appropriate unit for measurement.	Measure the height of the piles of books in centimetres.  Find the difference between the tallest and shortest pile of books in millimetres.	Dora says,  One metre is 100 times bigger than one centimetre. One centimetre is 10 times bigger than one millimetre. So, one metre is 110 times bigger than one millimetre Is Dora correct? Explain your answer.	A 10 pence coin is 2 mm thick.  Eva makes a pile of 10 pence coins worth £1.30 What is the height of the pile of coins in centimetres?	

Introduced to Imperial units for measurement (pounds, pints, and inches).	One inch is approximately 2.5 centimetres 1 inch ≈ 2.5 cm Use the bar models to help with the conversions.  16in ≈ ☐ cm 15in ≈ ☐ cm 33in ≈ ☐ m 10cm ≈ ☐ in 1cm ≈ ☐ in 5.5m ≈ ☐ in	 - Dora weighed 7.8 lbs when she was born. - Amir weighed 3.5 kg when he was born. Who was heavier, Dora or Amir? Explain your answer.	Jack's house has 3 pints of milk delivered 4 times a week. How many litres of milk does Jack have delivered each week?  He uses about 200 ml of milk every day in his cereal. Approximately, how many pints of milk does Jack use for his cereal in a week?	timetables in everyday life?
Convert units of time	Complete the conversions. 1 year = ☐ months ☐ years = 24 months ☐ years = 60 months 2.5 years = ☐ months 3 years 2 months = ☐ months ☐ years ☐ months = 75 months	Can 21 days be written in weeks? Can 25 days be written in weeks? Explain your answers.	Teddy's birthday is in March. Amir's birthday is in April. Amir is 96 hours older than Teddy. What dates could Teddy and Amir's birthdays be? 	

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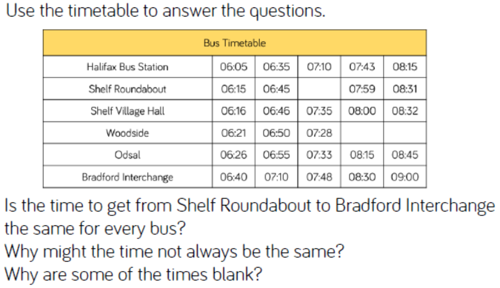
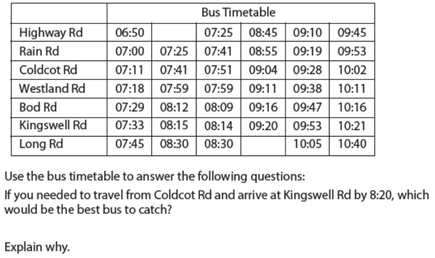
<table>
<tr>
<td>Use timetables to retrieve information</td>
<td>

Use the timetable to answer the questions.
<table>
<tr><th colspan="6">Bus Timetable</th></tr>
<tr><td>Halifax Bus Station</td><td>06:05</td><td>06:35</td><td>07:10</td><td>07:43</td><td>08:15</td></tr>
<tr><td>Shelf Roundabout</td><td>06:15</td><td>06:45</td><td></td><td>07:59</td><td>08:31</td></tr>
<tr><td>Shelf Village Hall</td><td>06:16</td><td>06:46</td><td>07:35</td><td>08:00</td><td>08:32</td></tr>
<tr><td>Woodside</td><td>06:21</td><td>06:50</td><td>07:28</td><td></td><td></td></tr>
<tr><td>Odsal</td><td>06:26</td><td>06:55</td><td>07:33</td><td>08:15</td><td>08:45</td></tr>
<tr><td>Bradford Interchange</td><td>06:40</td><td>07:10</td><td>07:48</td><td>08:30</td><td>09:00</td></tr>
</table>
Is the time to get from Shelf Roundabout to Bradford Interchange the same for every bus?
Why might the time not always be the same?
Why are some of the times blank?
</td>
<td>

<table>
<tr><th></th><th colspan="6">Bus Timetable</th></tr>
<tr><td>Highway Rd</td><td>06:50</td><td></td><td>07:25</td><td>08:45</td><td>09:10</td><td>09:45</td></tr>
<tr><td>Rain Rd</td><td>07:00</td><td>07:25</td><td>07:41</td><td>08:55</td><td>09:19</td><td>09:53</td></tr>
<tr><td>Coldcot Rd</td><td>07:11</td><td>07:41</td><td>07:51</td><td>09:04</td><td>09:28</td><td>10:02</td></tr>
<tr><td>Westland Rd</td><td>07:18</td><td>07:59</td><td>07:59</td><td>09:11</td><td>09:38</td><td>10:11</td></tr>
<tr><td>Bod Rd</td><td>07:29</td><td>08:12</td><td>08:09</td><td>09:16</td><td>09:47</td><td>10:16</td></tr>
<tr><td>Kingswell Rd</td><td>07:33</td><td>08:15</td><td>08:14</td><td>09:20</td><td>09:53</td><td>10:21</td></tr>
<tr><td>Long Rd</td><td>07:45</td><td>08:30</td><td>08:30</td><td></td><td>10:05</td><td>10:40</td></tr>
</table>
Use the bus timetable to answer the following questions:
If you needed to travel from Coldcot Rd and arrive at Kingswell Rd by 8:20, which would be the best bus to catch?

Explain why.
</td>
<td>
Make a timetable of your school day.


Calculate how many hours each week you spend on each subject.
Can you convert this into minutes?
Can you convert this into seconds?

If this is an average week, how many hours a year do you spend on each subject?
Can you convert the time into days?
</td>
<td></td>
</tr>
<tr><th colspan="5">Year 5</th></tr>
<tr><th colspan="5">Geometry: Properties of Shape</th></tr>
<tr><th>Objective</th><th>Skill it</th><th>Apply it</th><th>Deepen it</th><th>Mathematical Talk</th></tr>
</table>

Measure angles in degrees	Use the sentence stems to describe the turns made by the minute hand. Compare the turns to a right angle.   The turn from 12 to 4 is larger than a right angle. It is an obtuse angle. The turn from ___ to ___ is ______ than a right angle. It is an ______ angle.	Which angle is the odd one out? 180° 45° 79° 270° Could another angle be the odd one out for a different reason?	Pick a starting point on the compass and describe a turn to your partner. Use the mathematical words to describe your turns: • Clockwise • Anti-clockwise • Degrees • Acute • Obtuse • Reflex • Right angle Can your partner identify where you will finish?	Group, sort, cube, cuboid, pyramid, sphere, cone, cylinder, circle, triangle, square, rectangle, shape, flat, curved, straight, round, corner (point, pointed) hollow, solid, face, side, edge, make, build, draw, direction, journey, left,

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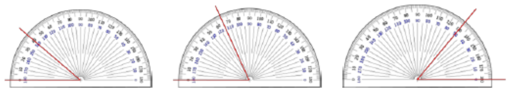
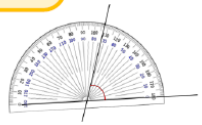
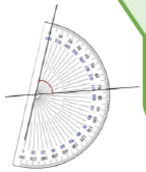
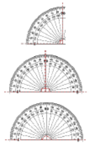
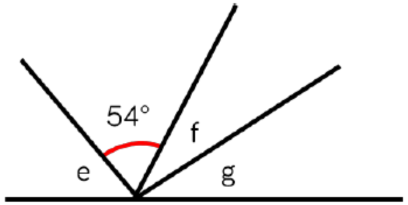
Measure angles using a protractor	Read the angles shown on the protractor.  What's the same? What's different?	I have measured the angle correctly because my protractor is the right way round. Teddy   Whitney   I have measured the angle correctly because my protractor is on the line accurately. Who do you agree with? Explain why.	Use a cut out of a circle and place a spinner in the centre.  • Point the arrow in the starting position above. • Move the spinner to try to make the angles shown on the cards below. • Check how close you are with a protractor. 40° 72° 154°	right, up down, forwards, backwards, sideways, across, close, far, near, along, though, to, from, towards, away from, movement, side, roll, turn, full turn, whole turn, half turn, stretch, bend, size, bigger, larger, protractor, smaller, symmetrical,

Draw lines and angles accurately	Draw lines that measure: 4 cm and 5 mm 45 mm 4.5 cm What's the same? What's different? Draw: • angles of 45° • angles of 80° • angles of 20°	**Always, sometimes or never true?** • Two acute angles next to each other make an obtuse angle. • Half an obtuse angle is an acute angle. • 180° is an obtuse angle Give examples to prove your answers.	Use Kandinsky's artwork to practice measuring lines and angles.  Create clues for your partner to work out which line or angle you have measured.	right angle, horizontal, vertical, perpendicular, parallel, greater/ less than ninety degrees, ninety degrees, orientation, straight lines, prism, quarter turn, three quarter turn, pentagon,

Calculate angles on a straight line	 There are ______degrees in a right angle. There are ______right angles on a straight line. There are ______degrees on a straight line.	Jack is measuring two angles on a straight line. My angles measure 73˚and 108˚  Explain why at least one of Jack's angles must be wrong.	 • The total of angle f and g are the same as angle e • Angle e is 9˚ more than the size of the given angle. • Angle f is 11˚ more than angle g Calculate the size of the angles. Create your own straight line problem like this one for your partner.	hexagon, octagon, vertices, 2d, 3d, quadrilateral, dimensional, flat, acute, obtuse, curved faces, what is the difference between 2d and 3d shapes? Regular and irregular shapes, show me a vertex, vertical, horizontal, how have these

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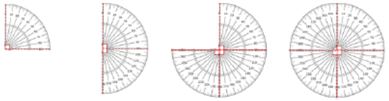
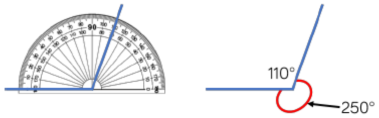
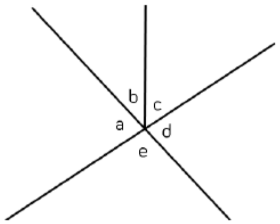
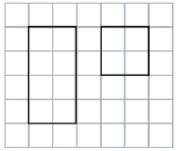
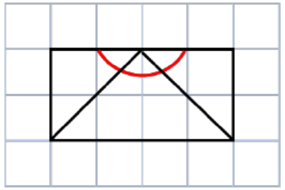
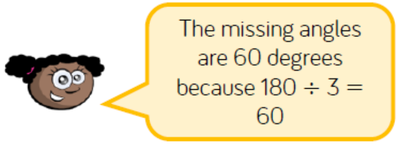
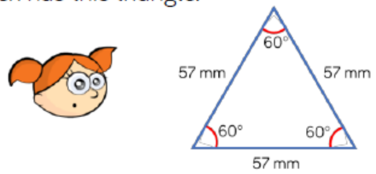
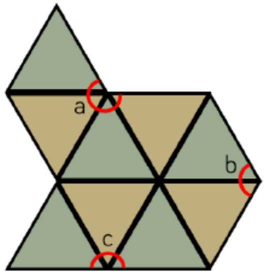
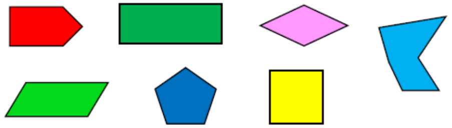
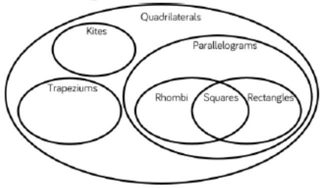
Calculate angles around a point	Complete the sentences.  $\frac{1}{4}$ of a turn = 1 right angle = 90° $\frac{1}{2}$ of a turn = __ right angles = ____° $\frac{\square}{\square}$ of a turn = 3 right angles = ____° A full turn = __ right angles = ____°	Eva says,  My protractor only goes to 180 degrees, so I can't draw reflex angles like 250 degrees. Rosie says, I know a full turn is 360 degrees so I can draw 110 degrees instead and have an angle of 250 degrees as well.   Use Rosie's method to draw angles of: • 300° • 200° • 280° Children to respond in a sentence as to why Rosie is correct.	 $a + b + c + d + e = 360^\circ$ $d + e = 180^\circ$ Write other sentences about this picture.	shapes been sorted? Repeating pattern, where would you position the ruler when measuring a line? Link to horizon, acute, obtuse, polygon, isosceles, scalene, equilateral, quadrilaterals, rhombus, parallelogram, trapezium, orientation, mirror line, 90

Calculate lengths and angles in shapes	Look at the square and the rectangle. What's the same? What's different? 	Whitney is calculating the missing angles in the shape.  She says,  Do you agree? Explain why.	Alex has this triangle.  She makes this composite shape using identical triangles to the one above.  - Calculate the perimeter of the shape. - Calculate the missing angles. Use your own triangle, square or rectangle to make a similar problem?	degrees, 180 degrees, 360 degrees, what is an angle? What is the size of the angle? What unit do we measure angles in? Angles around a point, how many right angles are there in a full turn? What is a polygon?

<table>
<tr>
<td>Distinguish between regular and irregular polygons</td>
<td>Look at the 2D shapes. Decide whether the shape is a regular or irregular polygon. Measure the angles to check.
</td>
<td>Always, sometimes or never true?
• A regular polygon has equal sides but not equal angles.
• A triangle is a regular polygon.
• A rhombus is a regular polygon.
• The number of angles is the same as the number of sides in any polygon.
Explain your answers in full sentences.</td>
<td>Cut out lots of different regular and irregular shapes. Ask children to work in pairs and sort them into groups. Once they have sorted them, can they find a different way to sort them again? Children could use Venn diagrams and Carroll diagrams to deepen their understanding, for example:

<table>
<tr><th></th><th>Regular polygon</th><th>Irregular polygon</th></tr>
<tr><td>Has at least one right angle</td><td></td><td></td></tr>
<tr><td>Has no right angles</td><td></td><td></td></tr>
</table>
</td>
<td></td>
</tr>
</table>

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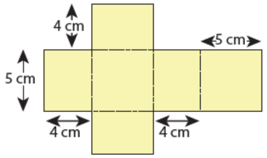
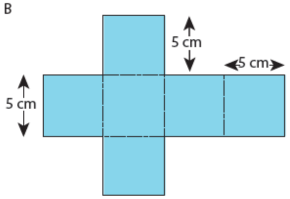
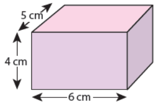
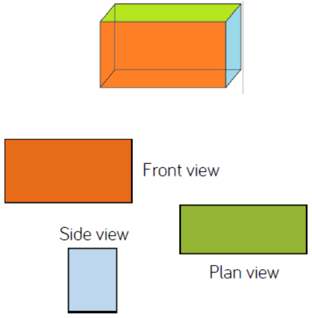
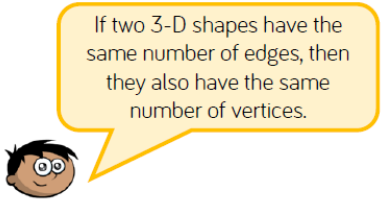
Identify 3-d Shapes with confidence	What shapes do you make when these 2-D representations (nets) are cut out and folded up to make 3-D shapes? A  B 	Draw the 2-D representation (net) that will make this cuboid when cut out and folded up.  Justify your response.	Using different 3-D solids, how can you represent them from different views? Work out which representation goes with which solid. For example, 	
Secure understanding of the language associated with 3-D shapes (faces, curved surfaces, vertices, edges).	Use equipment, such as Polydron or 2-D shapes, to build the 3-D solids being described. • My faces are made up of a square and four triangles. • My faces are made up of rectangles and triangles. Can the descriptions make more than one shape?	Amir says,  Do you agree? Explain why.	Create cubes and cuboids by using multilink cubes. Draw these on isometric paper. Would it be harder if you had to draw something other than squares or rectangles?	

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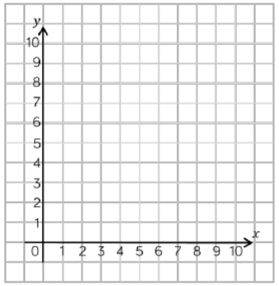
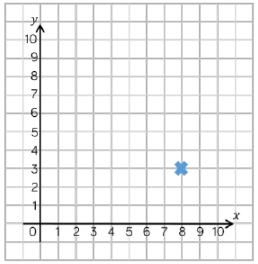
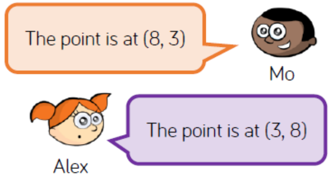
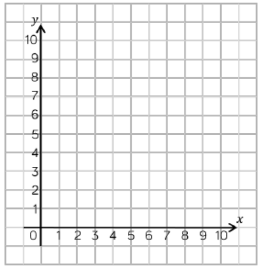
Year 5

Geometry: Position and direction

Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**
Understand coordinates and their position on the 1st quadrant	Plot the following points on the grid. (3, 5) (4, 4) (0, 2) (4, 0)  	  Who do you agree with? Can you spot the mistake the other child has made?	 Annie is finding co-ordinates where the x coordinate and the y-coordinate add up to 8. For example: (3, 5) $3 + 5 = 8$ Find all of Annie's coordinates and plot them on the grid. What do you notice? Now do the same for a different total.	underneath, above, below, top, bottom, side, on, in, outside, inside, around, in front, behind, front, back, below, after, beside, next to, opposite, apart, between, middle, edge, centre, corner, direction,

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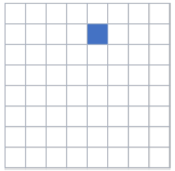
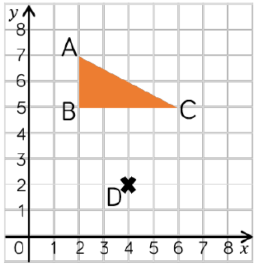
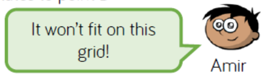
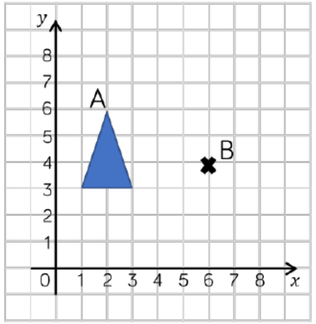
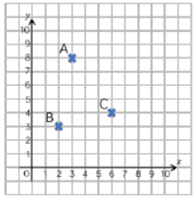
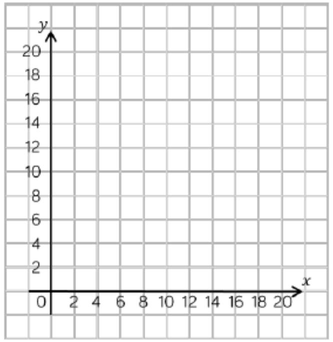
<table>
<tr>
<td>Translate shapes on a grid – translation</td>
<td>
A square is translated two squares to the right and three down.
Draw the new position of this square.</td>
<td>
Triangle ABC is translated so that point B translates to point D

Do you agree with Amir?
Explain your thinking.</td>
<td>
A triangle is drawn on the grid.
It is translated so that point A translates to point B.

What would be the coordinates of the other vertices of the translated triangle?</td>
<td>journey, left, right, up, down, forwards, backwards, sideways, across, close, far, near, along, through, to from, towards, away from, movement, side, roll, turn, whole turn, half turn, stretch, bend, rotation,</td>
</tr>
</table>

<table>
<tr>
<td>Translate coordinates on a grid</td>
<td>Translate each coordinate 2 down, 1 right. Record the coordinates of its new position.

<table><tr><th></th><th>Before translation</th><th>After translation</th></tr><tr><td>A</td><td>(3, 8)</td><td></td></tr><tr><td>B</td><td></td><td></td></tr><tr><td>C</td><td></td><td></td></tr></table></td>
<td>These three coordinates have all been translated in the same way.
(_ , _) → (3 , 1)
(_ , 5) → (4 , 3)
(4 , _) → (6 , 1)
Can you work out the missing coordinates?
Describe the translation.</td>
<td>
A rectangle is translated two to the left and 4 up.
Three of the coordinates of the translated rectangle are: (6, 8) (10, 14) and (10, 8).
What are the coordinates of the original rectangle?</td>
<td>clockwise, coordinates, translation, quadrant, x axis, y axis, Over, under, three-quarter turn, quarter turn, stretch, bend, rotation, clockwise, anticlockwise, straight line, ninety degree turn, what direction was the turn, plot, describe the</td>
</tr>
</table>

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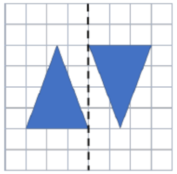
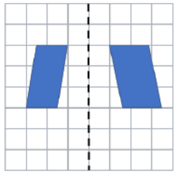
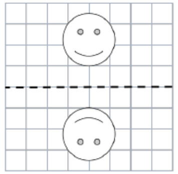
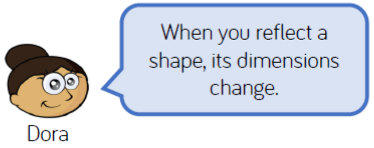
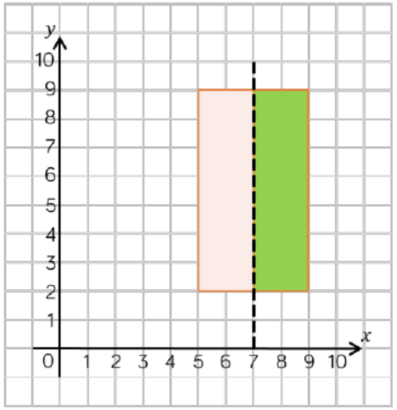
Reflect objects using lines that are parallel to the axes – object and image	Which of the diagrams show reflections in the given mirror line?   	 Do you agree with Dora? Explain your thinking.	 The rectangle is pink and green. The rectangle is reflected in the mirror line. What would its reflection look like?	translation, position, reflect, parallel, what does translate mean? Mirror line,

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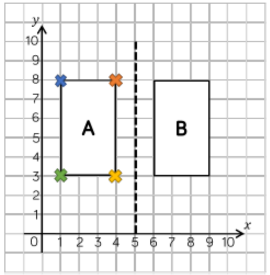
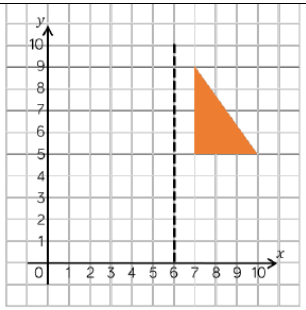
Reflect coordinates using lines that are parallel to the axes.

Object A is reflected in the mirror line to give image B.
Write the coordinates of the vertices for each shape.



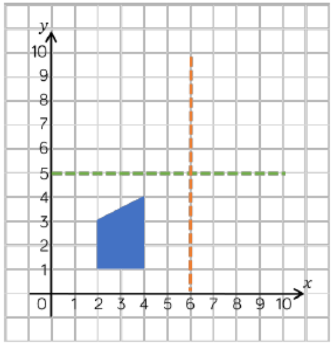
	Original Coordinate	Reflected Coordinate
✖		
✖		
✖		
✖		



Eva reflects the shape in the mirror line. She thinks that the coordinates of the vertices for the reflected shape are:

(5, 5) (2, 5) (2, 9)

Is Eva is correct?
Explain why.



This is a shape after it has been reflected. This is called the image.

Use the grid and the marked mirror lines to show where the original object was positioned.

Is there more than one possibility?

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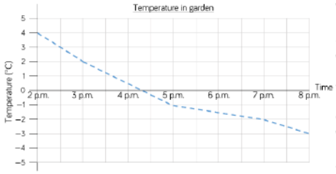
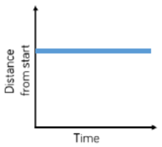
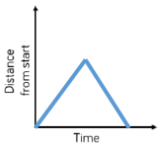
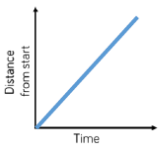
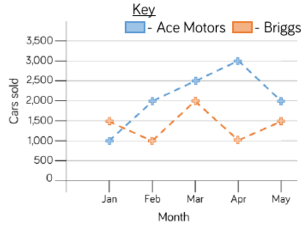
<table>
<tr><th colspan="5">Year 5</th></tr>
<tr><th colspan="5">**Statistics** (can link across curriculum e.g. COMPUTING/Topic/P.E)</th></tr>
<tr><th>Objective</th><th>Skill it</th><th>Apply it</th><th>Deepen it</th><th>Mathematical Talk</th></tr>
<tr>
<td>Read and interpret line graphs</td>
<td>Here is a line graph showing the temperature in a garden.


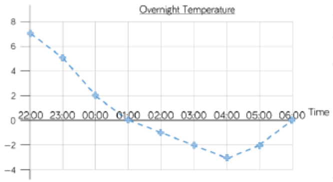
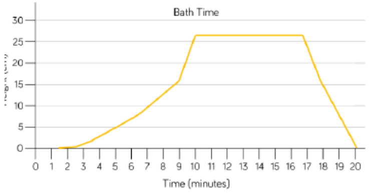
What was the temperature at 5 p.m.?
What was the difference in temperature between 3 p.m. and 7 p.m.?
When was the temperature 4°C?
Estimate the time when the temperature was 0°C.
Estimate the temperature at 6 p.m.</td>
<td>Match the graph to the activity.






A car travels at constant speed on the motorway.
A car is parked outside a house.
A car drives to the end of the road and back.
Explain why you have matched them in the way you have.</td>
<td>The graph shows the number of cars sold by two different companies.


• How many more cars did Ace Motors sell than Briggs in April?
• From January to March, how many cars did each company sell? Who sold more? How many more did they sell?
• Crooks Motors sold 250 more cars than Briggs each month.
Plot Crooks Motors' sales on the graph.</td>
<td rowspan="2">Chart, bar chart, frequency table, Carroll diagram, Venn diagram, axis, axes, diagram pictograms, continuous data, line graphs, table, block diagrams, tally chart, quantity, diagram, one to one correspondence, what will each symbol be worth? What will each block be worth? read and interpret, construct, tables, one and two step problems, what are the different ways to present</td>
</tr>
<tr>
<td>Draw line graphs</td>
<td>Here is a table showing the conversion between pounds and rupees. Present the information as a line graph.
<table><tr><td>Pounds</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>Rupees</td><td>80</td><td>160</td><td>240</td><td>320</td><td>400</td><td>480</td><td>560</td><td>640</td><td>720</td><td>800</td></tr></table></td>
<td>Here is a table of data.
<table><tr><td>Time (min)</td><td>15</td><td>30</td><td>45</td><td>60</td><td>75</td></tr><tr><td>Distance (km)</td><td>25</td><td>46</td><td>67</td><td>72</td><td>98</td></tr></table>
Which intervals would be the most appropriate for the vertical axis of the line graph?
Explain your answer.</td>
<td>Encourage the children to collect their own data and present it as a line graph.
As this objective is taken from the science curriculum, it would be a good idea to link it to investigations.
Possible investigations could be:
• Measuring shadows over time
• Melting and dissolving substances
• Plant growth
- Recording data in Science.</td>
</tr>
</table>

			- Recording data in PE e.g. distance thrown over time to show progression in throwing.	data? Scale, sum, comparison, difference, how are line graphs different to bar charts? Discrete data, two-way tables, timetables, how can we use a ruler to support us in reading line graphs? How do the vertical and horizontal lines support you in reading the line graphs, why are
Use line graphs to solve problems	 What was the highest/lowest temperature? What time did they occur? What is the difference between the highest and lowest temperature? How long did the temperature stay at freezing point or less?	Here is a line graph showing a bath time. Can you write a story to explain what is happening in the graph?  How long did it take to fill the bath? How long did it take to empty? The bath doesn't fill at a constant rate. Why might that be?	Carry out your own exercise experiment and record your heart rate on a graph like the one shown in the section above. How does it compare?  Can you make a set of questions for a friend to answer about your graph? Can you put the information into a table?	

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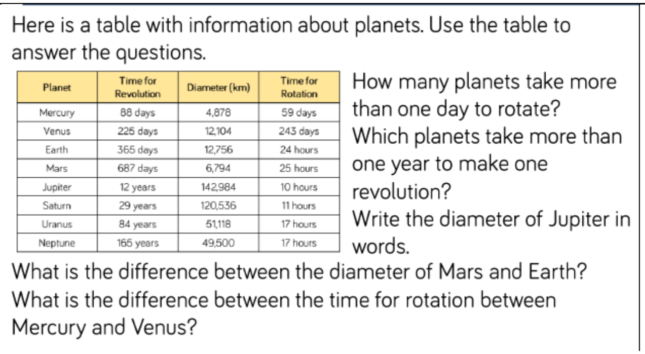
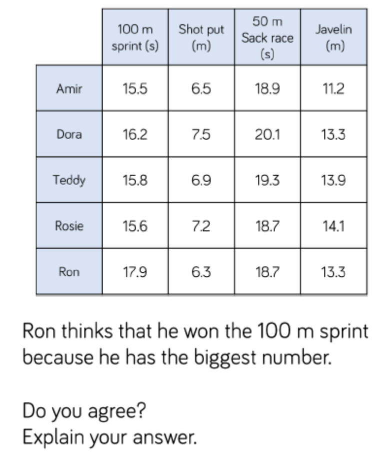
<table>
<tr>
<td>Read and interpret tables</td>
<td>

Here is a table with information about planets. Use the table to answer the questions.
<table>
<tr><th>Planet</th><th>Time for Revolution</th><th>Diameter (km)</th><th>Time for Rotation</th></tr>
<tr><td>Mercury</td><td>88 days</td><td>4,878</td><td>59 days</td></tr>
<tr><td>Venus</td><td>225 days</td><td>12,104</td><td>243 days</td></tr>
<tr><td>Earth</td><td>365 days</td><td>12,756</td><td>24 hours</td></tr>
<tr><td>Mars</td><td>687 days</td><td>6,794</td><td>25 hours</td></tr>
<tr><td>Jupiter</td><td>12 years</td><td>142,984</td><td>10 hours</td></tr>
<tr><td>Saturn</td><td>29 years</td><td>120,536</td><td>11 hours</td></tr>
<tr><td>Uranus</td><td>84 years</td><td>51,118</td><td>17 hours</td></tr>
<tr><td>Neptune</td><td>165 years</td><td>49,500</td><td>17 hours</td></tr>
</table>
How many planets take more than one day to rotate?
Which planets take more than one year to make one revolution?
Write the diameter of Jupiter in words.
What is the difference between the diameter of Mars and Earth?
What is the difference between the time for rotation between Mercury and Venus?
</td>
<td>

<table>
<tr><th></th><th>100 m sprint (s)</th><th>Shot put (m)</th><th>50 m Sack race (s)</th><th>Javelin (m)</th></tr>
<tr><td>Amir</td><td>15.5</td><td>6.5</td><td>18.9</td><td>11.2</td></tr>
<tr><td>Dora</td><td>16.2</td><td>7.5</td><td>20.1</td><td>13.3</td></tr>
<tr><td>Teddy</td><td>15.8</td><td>6.9</td><td>19.3</td><td>13.9</td></tr>
<tr><td>Rosie</td><td>15.6</td><td>7.2</td><td>18.7</td><td>14.1</td></tr>
<tr><td>Ron</td><td>17.9</td><td>6.3</td><td>18.7</td><td>13.3</td></tr>
</table>
Ron thinks that he won the 100 m sprint because he has the biggest number.
Do you agree?
Explain your answer.
</td>
<td></td>
<td>column and row headings important in a table? If I am finding the difference what operation do I use? How can I calculate the total in the row/column?</td>
</tr>
</table>

<table>
<tr>
<td>Read and interpret two-way tables</td>
<td>This two-way table shows the staff at Liverpool police station.
<table>
<tr><th></th><th>Male</th><th>Female</th><th>Total</th></tr>
<tr><td>Constable</td><td>55</td><td>24</td><td>79</td></tr>
<tr><td>Sergeant</td><td>8</td><td>5</td><td>13</td></tr>
<tr><td>Inspector</td><td>2</td><td>4</td><td>6</td></tr>
<tr><td>Chief Inspector</td><td>1</td><td>1</td><td>2</td></tr>
<tr><td>Total</td><td>66</td><td>34</td><td>100</td></tr>
</table>

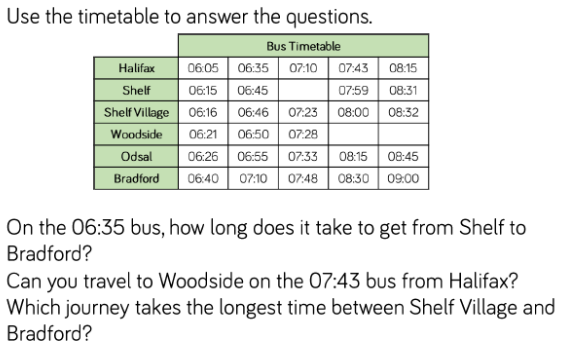
How many female inspectors are there?
How many male sergeants are there?
How many constables are there altogether?
How many people work at Liverpool police station?
How many male inspectors and female constables are there altogether?

</td>
<td></td>
<td>120 people were asked where they went on holiday during the summer months of last year.

Use this information to create a two-way table.

In June, 6 people went to France and 18 went to Spain.
In July, 10 people went to France and 19 went to Italy.
In August,15 people went to Spain.
35 people went to France altogether.
39 people went to Italy altogether.
35 people went away in June.
43 people went on holiday in August.</td>
<td></td>
</tr>
</table>

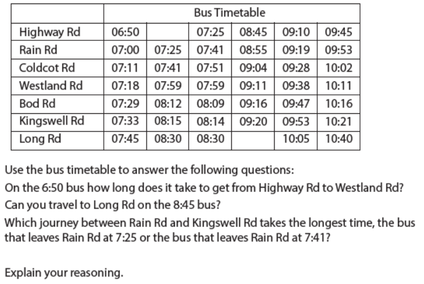
Read and interpret Timetables



Use the timetable to answer the questions.

	Bus Timetable				
Halifax	06:05	06:35	07:10	07:43	08:15
Shelf	06:15	06:45		07:59	08:31
Shelf Village	06:16	06:46	07:23	08:00	08:32
Woodside	06:21	06:50	07:28		
Odsal	06:26	06:55	07:33	08:15	08:45
Bradford	06:40	07:10	07:48	08:30	09:00

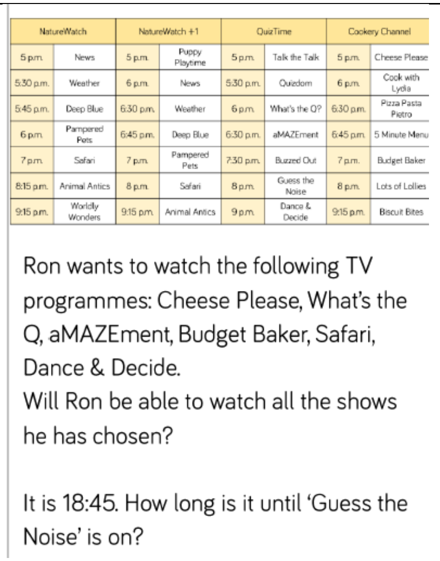
On the 06:35 bus, how long does it take to get from Shelf to Bradford?
Can you travel to Woodside on the 07:43 bus from Halifax?
Which journey takes the longest time between Shelf Village and Bradford?



	Bus Timetable					
Highway Rd	06:50		07:25	08:45	09:10	09:45
Rain Rd	07:00	07:25	07:41	08:55	09:19	09:53
Coldcot Rd	07:11	07:41	07:51	09:04	09:28	10:02
Westland Rd	07:18	07:59	07:59	09:11	09:38	10:11
Bod Rd	07:29	08:12	08:09	09:16	09:47	10:16
Kingswell Rd	07:33	08:15	08:14	09:20	09:53	10:21
Long Rd	07:45	08:30	08:30		10:05	10:40

Use the bus timetable to answer the following questions:
On the 6:50 bus how long does it take to get from Highway Rd to Westland Rd?
Can you travel to Long Rd on the 8:45 bus?
Which journey between Rain Rd and Kingswell Rd takes the longest time, the bus that leaves Rain Rd at 7:25 or the bus that leaves Rain Rd at 7:41?

Explain your reasoning.



NatureWatch		NatureWatch +1		QuizTime		Cookery Channel	
5 p.m.	News	5 p.m.	Puppy Playtime	5 p.m.	Talk the Talk	5 p.m.	Cheese Please
5:30 p.m.	Weather	6 p.m.	News	5:30 p.m.	Quizdom	6 p.m.	Cook with Lydia
5:45 p.m.	Deep Blue	6:30 p.m.	Weather	6 p.m.	What's the Q?	6:30 p.m.	Pizza Pasta Pietro
6 p.m.	Pampered Pets	6:45 p.m.	Deep Blue	6:30 p.m.	aMAZEment	6:45 p.m.	5 Minute Menu
7 p.m.	Safari	7 p.m.	Pampered Pets	7:30 p.m.	Buzzed Out	7 p.m.	Budget Baker
8:15 p.m.	Animal Antics	8 p.m.	Safari	8 p.m.	Guess the Noise	8 p.m.	Lots of Lollies
9:15 p.m.	Worldly Wonders	9:15 p.m.	Animal Antics	9 p.m.	Dance & Decide	9:15 p.m.	Biscuit Bites

Ron wants to watch the following TV programmes: Cheese Please, What's the Q, aMAZEment, Budget Baker, Safari, Dance & Decide.
Will Ron be able to watch all the shows he has chosen?

It is 18:45. How long is it until 'Guess the Noise' is on?

Write your own questions based on the information in the timetable.

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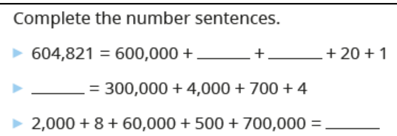
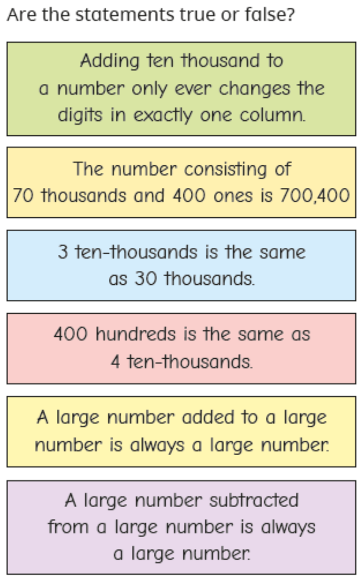
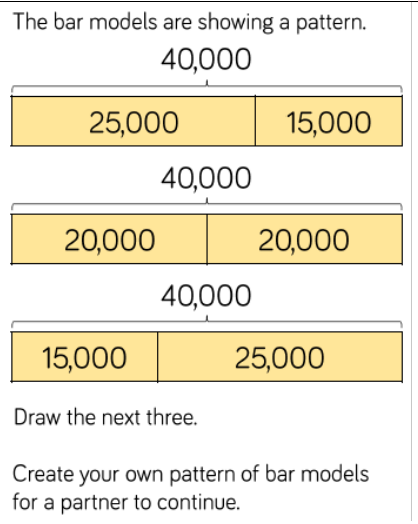
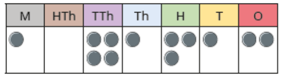
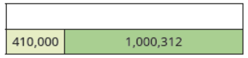
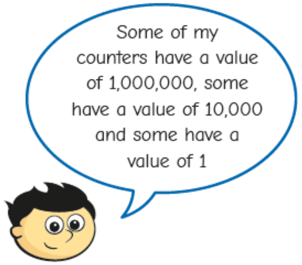
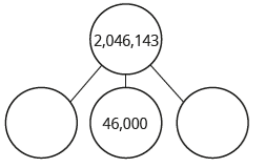
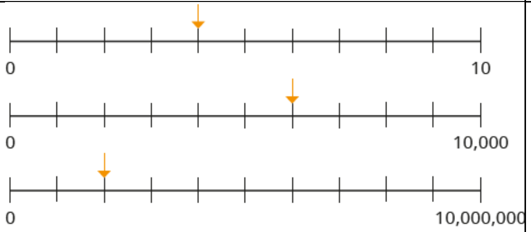
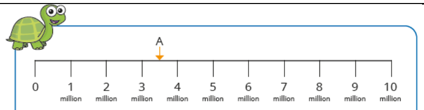
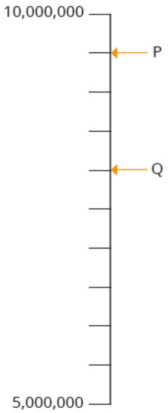
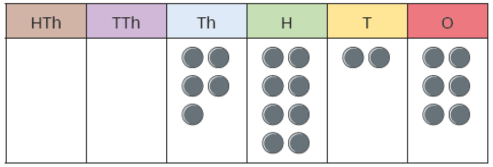
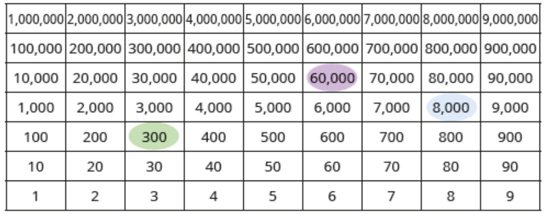
Year 6

Number: Place Value

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Numbers to a million	 Complete the number sentences. ▸ 604,821 = 600,000 + ______ + ______ + 20 + 1 ▸ ______ = 300,000 + 4,000 + 700 + 4 ▸ 2,000 + 8 + 60,000 + 500 + 700,000 = ______	 Are the statements true or false? Adding ten thousand to a number only ever changes the digits in exactly one column. The number consisting of 70 thousands and 400 ones is 700,400 3 ten-thousands is the same as 30 thousands. 400 hundreds is the same as 4 ten-thousands. A large number added to a large number is always a large number. A large number subtracted from a large number is always a large number. Explain your answers.	 The bar models are showing a pattern. 40,000 25,000 | 15,000 40,000 20,000 | 20,000 40,000 15,000 | 25,000 Draw the next three. Create your own pattern of bar models for a partner to continue.	Fewer, more, equal, less than, greater than, number, pair, zero, one, two, three to twenty, and beyond, none, count (on/up/to/from/down), before, after, many, few, fewer, least, fewest, lesser, smallest, greater, same as, odd, even, units, ones, tens, ten more/less, digits, numeral, figure(s), compare, (in) order/ a different order, size, value, between,

Numbers to ten million	Match the numbers to the representations. 1,401,312  1,041,312  1,410,312 	Jack has got some place value counters.  Jack picks four counters. What different numbers greater than 1,000,000 could he make? Jack wants to make a number greater than 5,000,000 What is the fewest number of counters he needs? Explain your answer.	Put a digit in the missing spaces to make the statement correct. 4,62 __ ,645 < 4,623,64 __ Is there more than one option? Can you find them all?	halfway between, above, below. Numbers to one hundred, hundreds, partition, recombine, hundred more/less, numbers to one thousand, numbers to 100,000, numbers to 1million, numbers to 10,000, tenths, hundredths, decimal (places), round (to nearest), thousand more/less than, negative integers, counting through

Read and write numbers to ten million	Complete the part-whole model to show the number 2,046,143  Write the number 2,046,143 in words.	Dora has the number 824,650 She subtracts forty thousand from her number. She thinks her new number is 820,650 Is she correct? Explain how you know.	Use some of the digit cards and the clues to work out the number. 0 3 3 5 5 6 7 • The ten-thousands and hundreds columns have the same digit. • The hundred-thousands digit is double the tens digit. • The number has six digits. • The number is less than six hundred and fifty-five thousand. Find as many possible solutions, giving your answers in words and numerals. Compare answers with a partner.	zero, roman numerals (I to C). Estimate, how do we say this number? What numbers complete the part-whole? How many tens are there? How many ones are there? Do groups of ten help you count? When ordering your numbers do you look at the tens or ones? Are the numbers in the sequence getting larger or smaller? Thousands, 3 digit numbers, 100s, 10s and 1s, place value grid, place holder (0), what is the value of each interval on the number line? How many hundreds are there? 10 more, 10 less, 100 more, 100 less, compare, what strategies did you
Number lines to ten million	 Label each division on the number lines. What numbers are the arrows pointing to? What is the same and what is different about the number lines	 Tiny says A is pointing to 3,050,000 Explain the mistake that Tiny has made.	Find the difference between P and Q.  Compare methods with a partner.	

<table>
<tr>
<td>Powers of 10.
Multiply and divide confidently by powers of 10.</td>
<td>What number is shown in the place value chart?

Multiply the number by 10 and show the answer in a place value chart.
What is the same and what is different?
Multiply the number by 100 and show the answer in a place value chart.
What is the same and what is different?</td>
<td>I have multipled the number by 10. Am I correct? Give reason for your answer.</td>
<td>The Gattegno chart shows the answer to a calculation using powers of 10

<table>
<tr><td>1,000,000</td><td>2,000,000</td><td>3,000,000</td><td>4,000,000</td><td>5,000,000</td><td>6,000,000</td><td>7,000,000</td><td>8,000,000</td><td>9,000,000</td></tr>
<tr><td>100,000</td><td>200,000</td><td>300,000</td><td>400,000</td><td>500,000</td><td>600,000</td><td>700,000</td><td>800,000</td><td>900,000</td></tr>
<tr><td>10,000</td><td>20,000</td><td>30,000</td><td>40,000</td><td>50,000</td><td>60,000</td><td>70,000</td><td>80,000</td><td>90,000</td></tr>
<tr><td>1,000</td><td>2,000</td><td>3,000</td><td>4,000</td><td>5,000</td><td>6,000</td><td>7,000</td><td>8,000</td><td>9,000</td></tr>
<tr><td>100</td><td>200</td><td>300</td><td>400</td><td>500</td><td>600</td><td>700</td><td>800</td><td>900</td></tr>
<tr><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td></tr>
<tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr>
</table>
Find two integer calculations using powers of 10 that give this answer.
Give your answers as calculations, for example:
______ × (or ÷) ______ = ______ and sentences such as "______ is 10 times (or one-tenth) the size of ______".
Compare answers with a partner.</td>
<td rowspan="2">use to compare the numbers? order, ascending, descending, Gattegno, how do you know when you have created the smallest/greatest number? What does each base ten represent? Can you represent the number in another way? Part-whole, what are the values at the start and end point of the number line? Estimate, greater than, less than, equal to, inequality symbols, order, ascending, descending, what patterns do you see in the Roman Numeral system? Negative numbers, what is the value of each digit in the</td>
</tr>
<tr>
<td>Order any number (integers)</td>
<td>Write the numbers in ascending order.
6,503,102 651,300 6,550,021 690,210</td>
<td>I have ordered this numbers in descending order. True or false? Convince me.</td>
<td>Eva has put eight 6-digit numbers in ascending order.
• The first number in her list is 345,900
• The last number in her list is 347,000
• All the other numbers in her list have a digit sum of 20
• None of the numbers in her list have any repeated digits.
Find the other six numbers in Eva's list and write them in ascending order.</td>
</tr>
</table>

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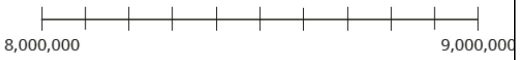
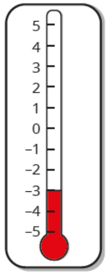
Compare any number (integers)	Write <, > or = to make the statements correct. 62,520 ○ 602,250 3,218,000 ○ 399,875 426,000 ○ forty-four thousand 990,099 ○ one million	 56,700 is greater than 201,000 because 5 is greater than 2 Explain the mistake that Tiny has made.	______ + 80,000 < half a million Complete the sentences. The missing number could be ______ The missing number cannot be ______ The missing number must be ______ Are they the only answers?	number? In order to compare numbers what do you need to know? Numbers to ten million, when do you use place holders in numbers? Where do the commas go in numbers to 1,000,000? How can you represent this rounding on a number line? What is the most appropriate way of rounding this number? How do you find the difference between two negative numbers?
Round any number (integers)	 Draw an arrow to show the approximate position of 8,640,000 on the number line. Round 8,640,000 to the nearest million.	Whitney rounded 2,215,678 to the nearest million and wrote 2,215,000 Can you explain to Whitney what mistake she has made?	My number is 1,350 when rounded to the nearest 10  Mo  My number is 1,400 when rounded to the nearest 100 Rosie Both numbers are whole numbers. What is the greatest possible difference between the two numbers?	
Negative numbers – counting forward and backwards through zero (finding intervals across zero).	What temperature does the thermometer show? If the temperature drops by 1 °C, what temperature will the thermometer show? What temperature is 5 °C warmer than the temperature shown on the thermometer? 	A company has plans to construct a building with floors above and below ground.  If we build from floor −10 to floor 10, we will have 20 floors in total. Do you agree? Explain your answer.	Find different ways of completing the calculation. ______ + ______ = −2	

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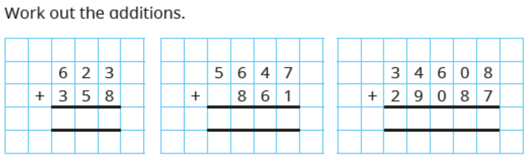
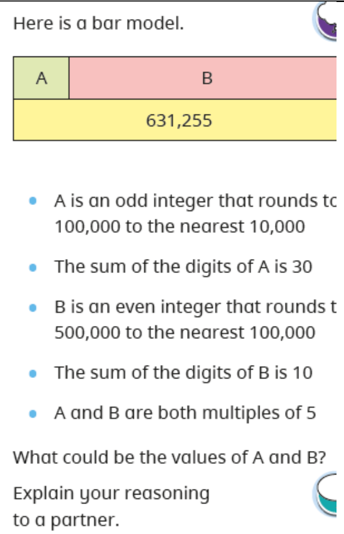
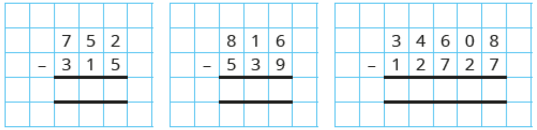
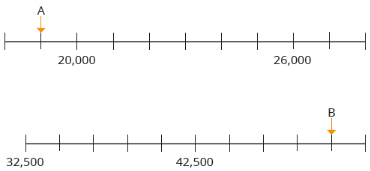
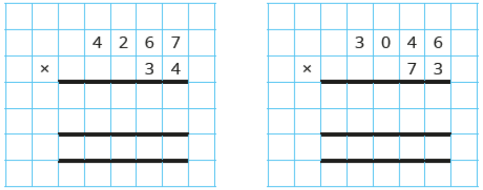
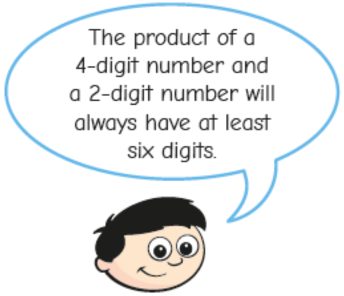
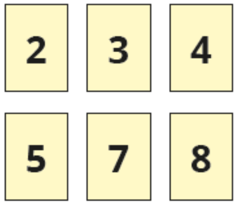
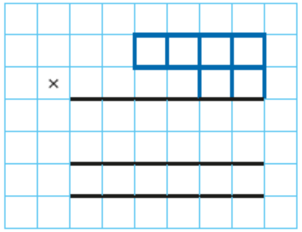
Year 6

Number: Addition, Subtraction, Multiplication and Division

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Add any number (integers)	 Work out the additions. 623 + 358 5647 + 861 34608 + 29087	 Here is a bar model. A | B 631,255 • A is an odd integer that rounds t 100,000 to the nearest 10,000 • The sum of the digits of A is 30 • B is an even integer that rounds t 500,000 to the nearest 100,000 • The sum of the digits of B is 10 • A and B are both multiples of 5 What could be the values of A and B? Explain your reasoning to a partner.	**7a. The answer to an addition calculation using two 6-digit numbers is one million, ninety-eight thousand, three hundred and fifty-four.** **One 6-digit number has only even digits.** **What could the calculation be?**	Which number represents the total? Number bonds, number line, add, more, plus, make, sum, total, altogether, inverse, double, near double, half, halve, equals, is the same as (including equals sign), difference between, how many more to,

Subtract any number (integers)	Work out the subtractions.  	Find the difference between A and B.  Explain your method to a partner.	**7b. The answer to a subtraction calculation using two 6-digit numbers is seven hundred and twenty-four thousand, four hundred and twenty-seven.** **One 6-digit number has only odd digits.** **What could the calculation be?**	how much more is…?, subtract, take away, minus, how many fewer is… than…? How much less is…? Predicting, find, find all, find different, investigate, column addition, column subtraction, multiples, exchange, place holder (zero), how many tens can be added without exchanging? Patterns between calculations, which strategy would you use and why? Near numbers, estimate, reasonable, inverse, partition, exchange, what do you notice? Does it
Multiply up to 4-digit number by 2 digit number	Work out the multiplications.  	 Do you agree with Dexter? Explain your answer.	 Write the digits in the boxes to find the greatest product. You can use each digit once only.  	

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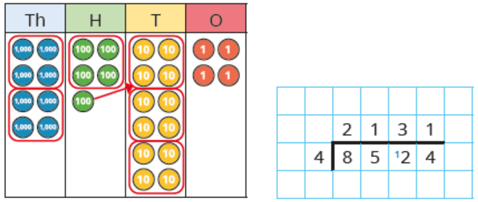
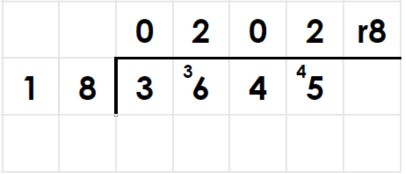
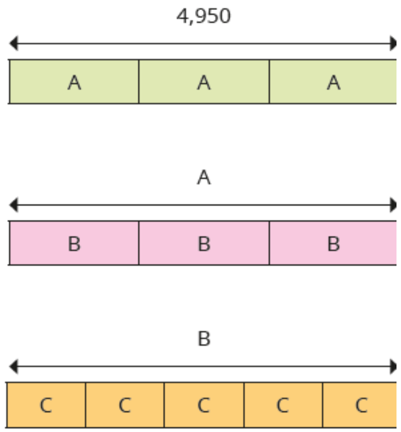
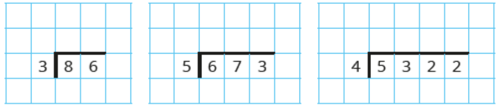
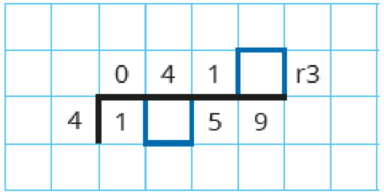
Short division	Here is 8,524 ÷ 4 shown using place value counters and short division.  Use this method to work out the divisions. 5,520 ÷ 4 6,432 ÷ 3 2,665 ÷ 5	**5a. Martha knows she has made a mistake in the calculation below.**  **Find and explain her error. What should the correct answer be?**	Here are three bar models. They are not drawn to scale.  Work out the value of C.	matter which columns you add first? Do you have enough tens/hundreds/ones to make the exchange? Does it matter which column you subtract first? Efficient, estimate, checking strategies, approximate, accuracy, inverse operations, square Squared number cube Cubed numbers Odd, even, count in twos, threes, fives, count in tens (forwards from/ backwards from), how many times, lots of, groups, once, twice, three ties, five times, multiple of, multiply,
Show remainders as fractions	Complete the short divisions. 	Children able to articulate how they can tell if they have made a mistake by using their knowledge of remainders and fractions to support their understanding e.g. Remainder being $\frac{5}{4}$ 'I know this is incorrect because there is a whole within the fraction, which means it is still divisible by 4'.	Work out the missing digits. 	

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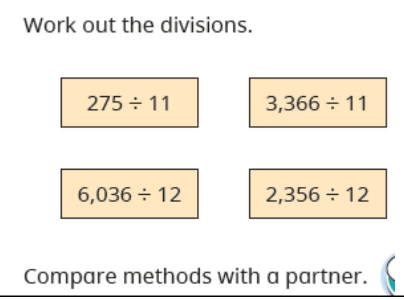
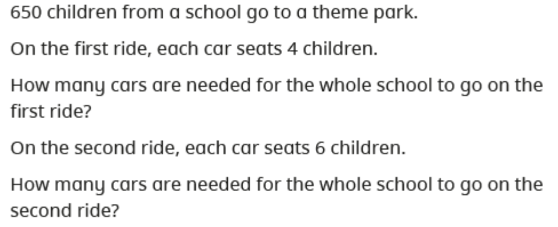
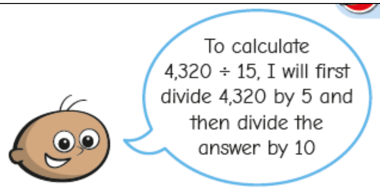
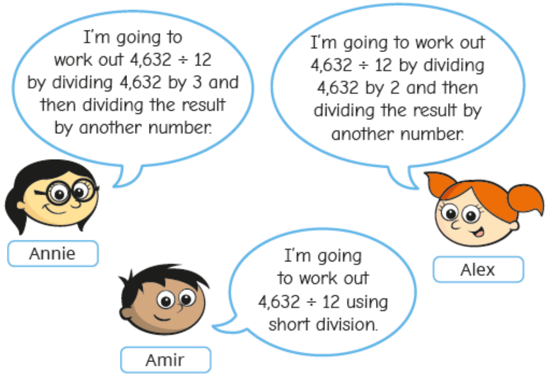
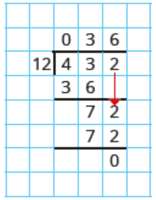
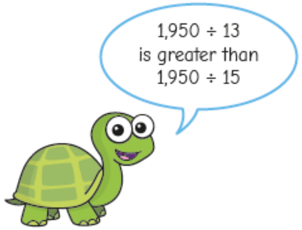
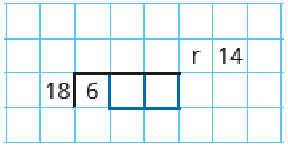
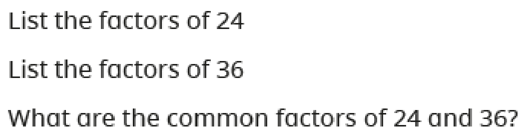
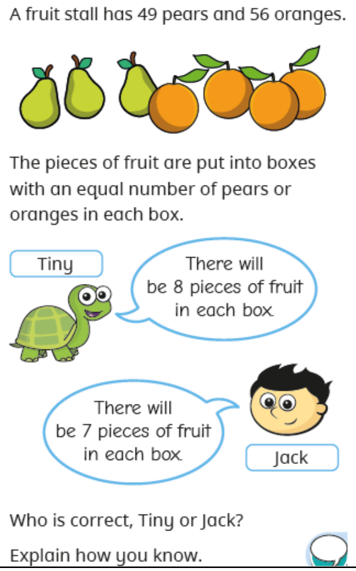
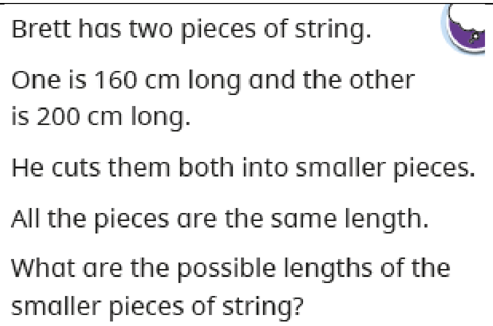
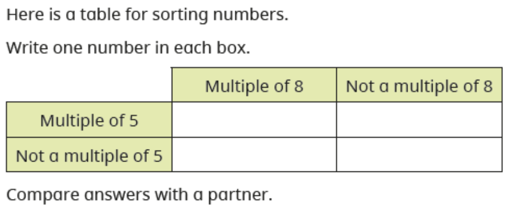
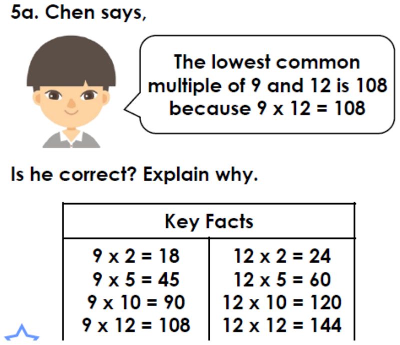
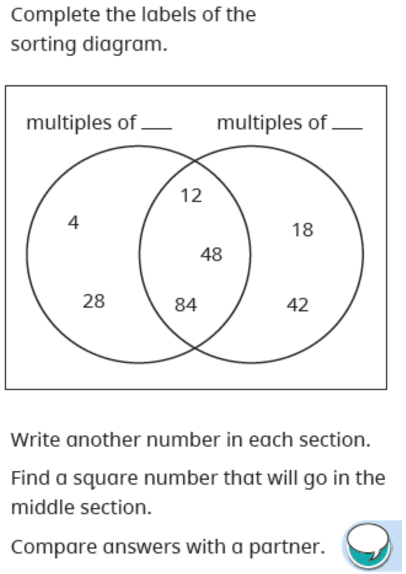
Show remainders as decimals	Children show division with money (pounds and pence). Exchanging onto the decimal when having a remainder.	True or False Convince me Prove the answer	 Work out the divisions. 275 ÷ 11 3,366 ÷ 11 6,036 ÷ 12 2,356 ÷ 12 Compare methods with a partner.	multiply by, repeated addition, array, row, column, double, halve, share, share equally, group in pairs, threes etc., equal groups of, divide, divided by, left, left over, describe the rule, product, multiples of; four, eight, fifty and one hundred, scale up, multiplication facts up to 12 x 12, division facts, inverse, derive,
Short division with remainders – rounding remainders depending on question being asked.	 650 children from a school go to a theme park. On the first ride, each car seats 4 children. How many cars are needed for the whole school to go on the first ride? On the second ride, each car seats 6 children. How many cars are needed for the whole school to go on the second ride?	Explain why you need x number of carts when not all of them will be full?	Children are faced with a range of problems in different situations where they decide whether rounding would be necessary.	

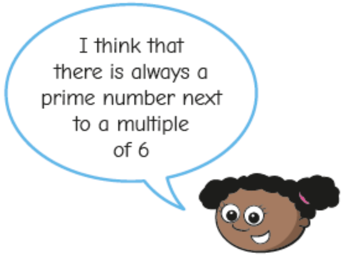
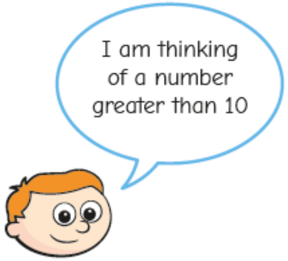
Division using factor knowledge	Find 720 ÷ 15 by firstly dividing 720 by 5 and then dividing the result by 3 Why does dividing a number by 5 and then dividing by 3 give you the same answer as dividing the number by 15? Use this strategy to work out the divisions. 570 ÷ 15 560 ÷ 14 720 ÷ 18 725 ÷ 25 560 ÷ 14 1,176 ÷ 24 Can any of the divisions be done in more than one way?	 Explain why Tommy is wrong.	 Compare the children's methods.	equal, unequal, why are we using the addition symbol? Multiplication, lots of, arrays, commutative, times tables, how many do you have to begin with? Division, what is the same/different about the groups? Common multiples, What do you notice about the pattern? Comparing, inequality symbols, column multiplication, exchange, how do we record the exchange? How
Long division – 3 digit by 2 digit	Here is a different way of setting out a long division.  Use this method to work out the divisions. 836 ÷ 11 798 ÷ 14 608 ÷ 19	 Tiny is correct. Find how much greater 1,950 ÷ 13 is than 1,950 ÷ 15	6,120 ÷ 17 = 360 Use the given calculation to work out the missing number. 6,480 ÷ ______ = 360	

Long division 4 digit by 2 digit	There are 1,989 footballers in a tournament. Each team has 11 players and 2 substitutes. How many teams are there in the tournament?	Which calculation is harder? 1,950 ÷ 13 1,950 ÷ 15 Explain why.	Which numbers up to 20 can 4,236 be divided by without having a remainder? What do you notice about all the numbers?	can we partition our number? Remainder, scaling, times as many, systematically, possibilities, ten times bigger/smaller, hundred times bigger/smaller, how can dividing by 10 help you to divide by 100? What does zero mean? Fact family, multiples, commutativity, associative law, factors, factor pairs, correspondence problems, factors,
Long division with remainders – interpret remainders when needed	Mrs Hall needs 380 cupcakes for a party.  Cupcakes are sold in boxes of 15 How many boxes of cupcakes does she need to buy? Will she have any cupcakes spare? How do you know?	835 ÷ 17 = 48 r19 Explain why the calculation cannot be correct.	Two digits are missing from the division.  The missing digits are equal. What must they be? What could the digits be if they were not equal?	

Recognise common factors of two numbers with increased confidence – can record in Venn diagram and tables	List the factors of 24 List the factors of 36 What are the common factors of 24 and 36?	A fruit stall has 49 pears and 56 oranges. The pieces of fruit are put into boxes with an equal number of pears or oranges in each box. Tiny: There will be 8 pieces of fruit in each box. Jack: There will be 7 pieces of fruit in each box. Who is correct, Tiny or Jack? Explain how you know.	Brett has two pieces of string. One is 160 cm long and the other is 200 cm long. He cuts them both into smaller pieces. All the pieces are the same length. What are the possible lengths of the smaller pieces of string?	how do you find multiples of a number? Can a number be a multiple of more than one number? How do you find the factors of a number? Do factors always come in pairs? Prime number, composite number, why are square numbers called square numbers? Why are

<table>
<tr>
<td>Recognise common multiples</td>
<td>Here is a table for sorting numbers.
Write one number in each box.
<table>
<tr><td></td><td>Multiple of 8</td><td>Not a multiple of 8</td></tr>
<tr><td>Multiple of 5</td><td></td><td></td></tr>
<tr><td>Not a multiple of 5</td><td></td><td></td></tr>
</table>
Compare answers with a partner.</td>
<td>5a. Chen says,
The lowest common multiple of 9 and 12 is 108 because 9 x 12 = 108
Is he correct? Explain why.
<table>
<tr><th colspan="2">Key Facts</th></tr>
<tr><td>9 x 2 = 18
9 x 5 = 45
9 x 10 = 90
9 x 12 = 108</td><td>12 x 2 = 24
12 x 5 = 60
12 x 10 = 120
12 x 12 = 144</td></tr>
</table></td>
<td>Complete the labels of the sorting diagram.

Write another number in each section.
Find a square number that will go in the middle section.
Compare answers with a partner.</td>
<td>cube numbers called cube numbers? In which direction do the digits move when you multiply//divide? Area model, integers, what is the greatest digit you can have in a place value column? How do you exchange when adding/subtracting? Which columns are affected by the exchange? How do</td>
</tr>
<tr>
<td>Rules of disability.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</table>

Prime numbers to 100 – use the language of prime number, prime factor and composite numbers.	Which of these numbers are prime and which are composite? 30 31 32 33 34 35 36 37 38 39 Find the prime factors of the numbers. 30 33 39 42 43 49 50	Shade the multiples of 6 on a hundred square. What do you notice about all the numbers either side of the multiples of 6?  Is Whitney correct? Explain your reasoning.	Ron is thinking of a number.  Use the clues to work out Ron's number. • It is a composite number. • It has two prime factors. • It is an odd number. • It is a factor of 60 Can you make your own number with rules?	you set out a multiplication? Short division, long division, what does the arrow represent in the long division? What is the first step when performing long division? What can you work out first? Is this step and addition, subtraction, division or multiplication, how do you know? Does it make a difference if you perform the operations in a

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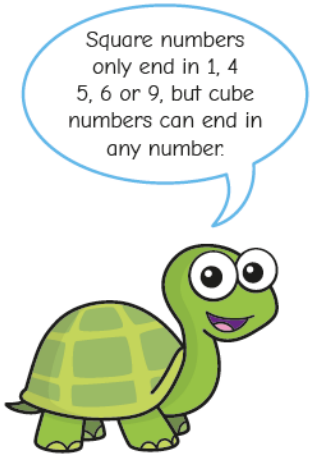
Explore the relationship between squared and cubed numbers and solve problems involving them.

The table shows some square numbers and cube numbers.

Complete the table and describe any patterns and connections you notice. The first row has been done for you.

1^2	1×1	1	1^3	$1 \times 1 \times 1$	1
					8
	3×3		3^3		27
	4×4			$4 \times 4 \times 4$	
		25	5^3		
				$6 \times 6 \times 6$	
8^2					

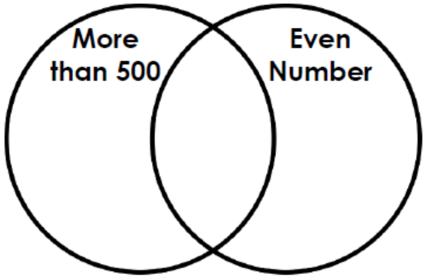


Do you agree with Tiny?

7b. Sort the square and cube numbers into the Venn diagram.

$11^3 + 3^2$ square root of 144

$10^3 - 9^3$ $9^3 + 4^2$



GD

PS

different order? Which operation has greater priority? What is an inverse operation?

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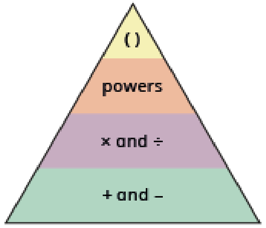
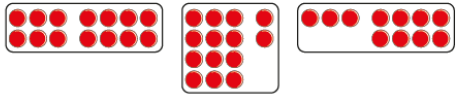
Order of operations (BODMAS)	 Brackets, Order, Division, Multiplication, Addition and Subtraction. Match the counters to the calculations.  3 + 4 × 2 3 × 4 + 2 (3 + 4) × 2	Teddy has completed this calculation and got an answer of 5 14 – 4 × 2 ÷ 4 = 5 Explain and correct his error.	1 2 3 4 + − × ÷ ( ) Use the digits and symbols to write as many calculations as you can that give different answers. Is it possible to make every number from zero to 20?	

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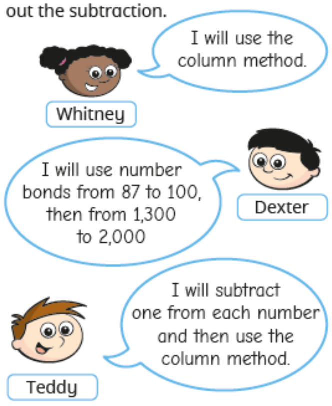
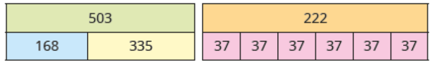
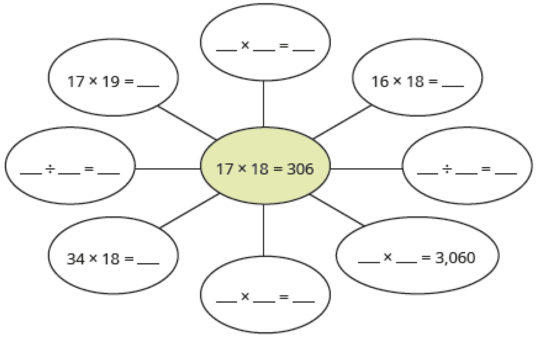
Efficient mental calculations and estimations	Use rounding to estimate the answer to each calculation. 6,941 + 4,099 6,941 – 4,099 6,941 × 18 6,941 ÷ 11 Compare answers with a partner.	2,000 – 1,287 Here are three strategies for working out the subtraction.  Whose strategy is most efficient?	Here is a number line.  Estimate the number shown by arrow B for these values of A and C: • A = 0 and C = 1,000 • A = 30 and C = 230 • A = 7 and C = 33 • A = 1 and C = 2 • A = 1,000 and C = 100,000	
Use known facts from one calculation to determine the answer of another similar calculation	Write four facts shown by each bar model.  	Without working them out, which calculation has the greater answer? 57 × 23 56 × 24 Draw a diagram to explain how you know.	Complete the spider diagram.  Compare methods with a partner.	

Solve multi-step questions involving the four operations	- The total mass of apples in a box is 25 kg. The total mass of oranges in a box is 24 kg.  - There are 32 boxes of apples and 25 boxes of oranges in a supermarket. What is the total mass of apples and oranges? - A customer orders 300 kg of apples and 600 kg of oranges. How many boxes of fruit will the customer receive?	What is the best way to solve this calculation? Explain why you think that. A coach has 55 seats and a minibus has 17 seats. 431 people from a school go on a trip. The school books 6 coaches and 8 minibuses. How many spare seats will there be?	24 bottles of water cost £15  How many bottles of water can you buy for £30? How many bottles of water can you buy for £300? How many bottles of water can you buy for £525? How much will 600 bottles of water cost?	

Year 6

Number: Fractions

Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**

<table>
<tr>
<td>Simplify fractions using previous knowledge of equivalent fractions for support.</td>
<td>Alex is simplifying $\frac{8}{12}$ by dividing the numerator and denominator by their highest common factor.

Factors of 8: 1 , 2 , 4 , 8
Factors of 12: 1 , 2 , 3 , 4 , 6 , 12
4 is the highest common factor.
$\overset{\div 4}{\frac{8}{12} = \frac{2}{3}}$
÷ 4
Use Alex's method to simplify these fractions:
$\frac{6}{9}$ $\frac{6}{18}$ $\frac{10}{18}$ $\frac{10}{15}$ $\frac{15}{50}$</td>
<td>Tommy is simplifying $4\frac{12}{16}$
$4\frac{12}{16} = 1\frac{3}{4}$
Explain Tommy's mistake.</td>
<td>Sort the fractions into the table.
<table><tr><th>Simplifies to $\frac{1}{2}$</th><th>Simplifies to $\frac{1}{3}$</th><th>Simplifies to $\frac{1}{4}$</th></tr><tr><td></td><td></td><td></td></tr></table>$\frac{5}{15}$ $\frac{2}{4}$ $\frac{4}{16}$ $\frac{8}{16}$ $\frac{5}{10}$ $\frac{3}{9}$ $\frac{6}{12}$ $\frac{2}{8}$
Can you see any patterns between the numbers in each column?
What is the relationship between the numerators and denominators?
Can you add three more fractions to each column?
Complete the sentence to describe the patterns:
When a fraction is equivalent to _____, the numerator is _______ the denominator.</td>
<td rowspan="2">tenths, equivalent decimals and fractions, Whole, equal parts, four equal parts, one half, two halves, a quarter, two quarters, fraction, three quarters, one third, a third, equivalence, equivalent, unequal, are the parts equal? How do you know? Splitting a whole into two</td>
</tr>
<tr>
<td>Equivalent fractions on a number line.</td>
<td></td>
<td></td>
<td></td>
</tr>
</table>

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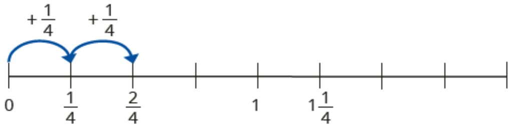
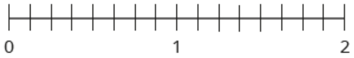
Count forwards and backwards on a number line in fractions.	Jack is counting in quarters. He writes each number on a number line. Complete the number line. 	Plot the sequences on a number line. $3\frac{1}{2}, 4, 4\frac{1}{2}, 5, 5\frac{1}{2}, 6$ $\frac{13}{4}, \frac{15}{4}, \frac{17}{4}, \frac{19}{4}, \frac{21}{4}, \frac{23}{4}$ $5\frac{5}{8}, 5\frac{1}{8}, 4\frac{5}{8}, 4\frac{1}{8}, 3\frac{5}{8}, 3\frac{1}{8}$ $3\frac{1}{8}, 3\frac{3}{8}, 3\frac{5}{8}, 3\frac{7}{8}, 4\frac{1}{8}, 4\frac{3}{8}$ Which sequence is the odd one out? Explain why. Can you think of a reason why each of the sequences could be the odd one out?	How many ways can you show a difference of one quarter on the number line? 	equal parts, 1/2 , 1/3 , what does the 1 represent, what does the 3 represent. How many thirds make a whole? 1/4, unit fraction, non-unit fraction, numerators, denominators, 3/4 , tenths, decimals, is a

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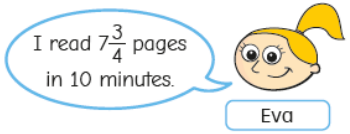
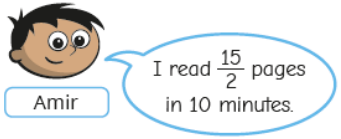
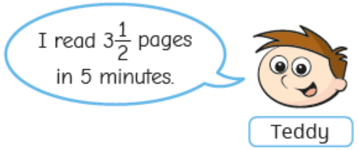
Compare fractions (denominators)	Aisha is comparing $\frac{5}{6}$ and $\frac{3}{4}$ by finding the first common multiple of the denominators. $\frac{5}{6} = \frac{10}{12}$ $\frac{3}{4} = \frac{9}{12}$ $\frac{10}{12} > \frac{9}{12}$ so $\frac{5}{6} > \frac{3}{4}$ Use Aisha's method to compare the fractions. $\frac{4}{5}$ ○ $\frac{3}{4}$ $\frac{3}{5}$ ○ $\frac{4}{7}$ $\frac{3}{4}$ ○ $\frac{7}{10}$ $2\frac{2}{5}$ ○ $2\frac{3}{8}$	Eva, Teddy and Amir are reading the same book.    Who is reading the fastest? How do you know?	Use the digit cards to complete the statements. 5 6 3 4 $\frac{\square}{4} > \frac{\square}{6}$ $\frac{\square}{4} < \frac{6}{\square}$ Find three examples of ways you could complete the statement. $\frac{\square}{\square} < \frac{\square}{\square}$ Can one of your ways include an improper fraction?	fraction always less than one? How many tenths make a whole? What is a tenth? Can you see a pattern between the fractions? How can we use our times tables to help us find equivalent fractions? Compare, order,

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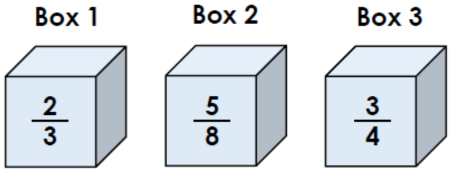
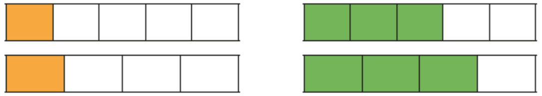
Order fractions (denominators)	Write the fractions in descending order. $\frac{1}{2}$ $\frac{1}{4}$ $\frac{7}{12}$ $\frac{3}{4}$ $\frac{1}{12}$ $\frac{11}{12}$	**5a. Tom is participating in a game show. He needs to order three boxes in ascending order.** **He has ordered the boxes like this:**  **Is he correct? Explain how you know.**	**7a. Use the clues to work out the mystery fraction written in its simplest form.** **Clue 1: It is greater than $\frac{5}{8}$.** **Clue 2: It is smaller than $\frac{9}{10}$.** **Clue 3: The denominator is a number between 3 and 6.** **Write down the possible fraction/s.**	addition and subtraction of fractions, greater than, how many x make a whole? Quantity, what does equivalent mean? What is a unit fraction? What is a non-unit fraction? Improper fractions, mixed numbers, integer, What is an improper
Compare fractions (numerator)	Write <, > or = to compare the fractions.  $\frac{1}{5}$ ○ $\frac{1}{4}$ $\frac{3}{5}$ ○ $\frac{3}{4}$ Complete the sentence. When the numerators are the same, the ______ the denominator, the ______ the fraction.	What could the missing number be, to make the statement true? $\frac{1}{5} > \frac{1}{\square} > \frac{1}{12}$ Is there more than one answer? How do you know?	Brett is comparing $\frac{3}{7}$ and $\frac{6}{11}$ How many different ways can he work this out? Find a pair of fractions where it would be more efficient to find: • a common numerator • a common denominator. Compare answers with a partner.	

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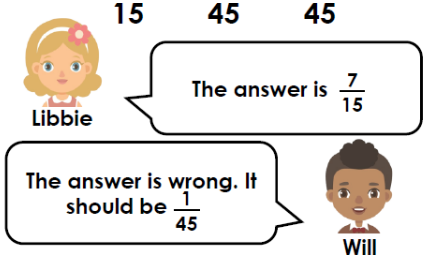
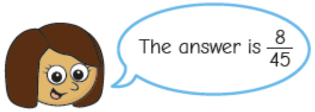
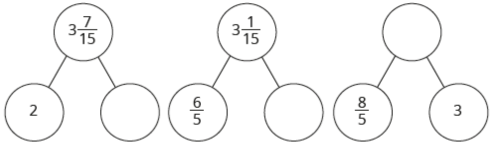
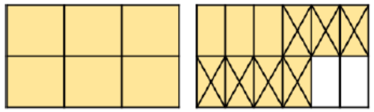
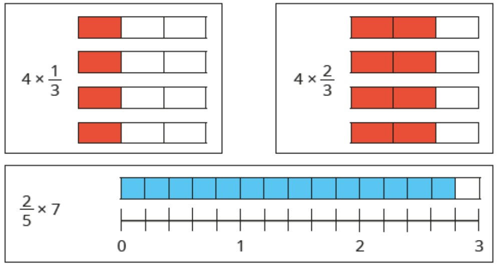
Order fractions (numerator)	Write each set of fractions in ascending order. $\frac{3}{3}, \frac{3}{8}, \frac{3}{11}, \frac{3}{100}, \frac{3}{5}, \frac{3}{2}$ $\frac{2}{8}, \frac{4}{7}, \frac{2}{10}, \frac{8}{12}, \frac{4}{6}$ $2\frac{3}{7}, 2\frac{6}{9}, 2\frac{18}{20}, \frac{20}{7}, 2\frac{3}{10}$	**6b. Adeel ordered a set of fractions from largest to smallest.** $1\frac{20}{24}$ $\frac{5}{7}$ $\frac{15}{30}$ $\frac{45}{81}$ $\frac{10}{24}$ **Explain his mistake and write the fractions in the correct order using their common numerator.**	**7b. Stephan measures three trees.** **Tree A is $3\frac{15}{55}$ metres tall.** **Tree B is $\frac{36}{10}$ metres tall.** **Tree C is $3\frac{21}{49}$ metres tall.**  **Which tree is the tallest?**	fraction? Convert, number sequences, if two fractions have the same denominator/ numerator, how can you decide which one is greater? Why do denominators need to be the same? Multiply, fractions of amount, repeated
Add fractions within 1 (denominators are multiples)	Use the bar model to help add the fractions.  $\frac{1}{3} + \frac{5}{12}$ Work out the additions. ▸ $\frac{1}{3} + \frac{1}{12}$ ▸ $\frac{1}{3} + \frac{7}{12}$ ▸ $\frac{2}{3} + \frac{1}{12}$	 Tiny is adding fractions. Here are Tiny's workings. $\frac{3}{5} + \frac{1}{15} = \frac{4}{20} = \frac{1}{5}$ Explain Tiny's mistake. Find the correct answer.	Use the same digit in both boxes to complete the calculation. $\frac{\square}{20} + \frac{1}{\square} = \frac{9}{20}$ Find all the possible answers.	

<table>
<tr>
<td>Subtract fraction within 1 (denominators are multiples)</td>
<td>Find the difference between each pair of fractions.
$\frac{3}{4}$ and $\frac{5}{8}$
$\frac{7}{12}$ and $\frac{1}{3}$
$\frac{14}{15}$ and $\frac{2}{5}$
$\frac{8}{9}$ and $\frac{1}{3}$</td>
<td>4a. Look at the subtraction below.
$\frac{10}{15} - \frac{9}{45} = \frac{21}{45}$

Who is correct? Prove it.</td>
<td>Kim subtracts $\frac{3}{5}$ from a fraction.

What fraction has Kim subtracted $\frac{3}{5}$ from?
Give your answer in its simplest form.</td>
<td rowspan="2">addition, operators, commutativity, what is the same/what is different? Can you see the link between the numbers? Can you make a list of factors to support your simplifying? How could you use a bar model or number line to support you? How many of the fractions</td>
</tr>
<tr>
<td>Add fractions (denominators not multiples)</td>
<td>What common denominator would you use to add each pair of fractions?
$\frac{2}{4}$ and $\frac{1}{5}$
$\frac{1}{6}$ and $\frac{2}{5}$
$\frac{1}{3}$ and $\frac{5}{7}$
$\frac{3}{8}$ and $\frac{4}{7}$
Find the sum of each pair.</td>
<td>Huan and Dora are working out $\frac{1}{4} + \frac{5}{6}$
Here are their methods.
Huan
$\frac{1}{4} + \frac{5}{6} = \frac{6}{24} + \frac{20}{24} = \frac{26}{24} = 1\frac{2}{24}$
Dora
$\frac{1}{4} + \frac{5}{6} = \frac{3}{12} + \frac{10}{12} = \frac{13}{12} = 1\frac{1}{12}$
Who is correct?
Explain your answer.</td>
<td>Fill in the boxes to make the calculation correct.
$1\frac{\square}{10} = \frac{4}{\square} + \frac{\square}{10}$</td>
</tr>
</table>

Subtract fractions (denominators not multiples)	Annie is calculating $\frac{7}{9} - \frac{1}{2}$ She finds the first common multiple of 9 and 2 first common multiple of 9 and 2 is 18 $\frac{7}{9} - \frac{1}{2} = \frac{14}{18} - \frac{9}{18} = \frac{5}{18}$ Use this method to find the differences. $\frac{2}{3} - \frac{1}{5}$ $\frac{4}{9} - \frac{1}{6}$ $\frac{5}{7} - \frac{1}{3}$ $\frac{11}{12} - \frac{3}{8}$	**5b. Which calculation is the odd one out?** **A.** $\frac{4}{5} - \frac{8}{12}$ **B.** $\frac{2}{3} + \frac{1}{7}$ **C.** $\frac{4}{5} - \frac{2}{3}$ **Explain how you know.**	A car is travelling from Halifax to Brighton. In the morning, it completes $\frac{2}{3}$ of the journey. In the afternoon, it completes $\frac{1}{5}$ of the journey. What fraction of the journey has been travelled altogether? What fraction of the journey is left to travel? If the journey is 270 miles, how far did the car travel in the morning? How far did the car travel in the afternoon? How far does the car have left to travel?	for you need to convert? Multiples, factors, how can you partition the mixed numbers? Multiply, divide, when I multiply is my answer getting greater or smaller than each fraction? How many equal parts are there altogether? What is the value of each equal part?
Add mixed numbers Add Mixed numbers and fractions.	What method would you use to work out the additions? $3\frac{2}{7} + 4$ $3\frac{2}{7} + \frac{4}{7}$ $3\frac{2}{7} + 4\frac{4}{7}$ How are they similar? How are they different?	**8a. Olivia says,**  I think that $\frac{10}{7} + \frac{10}{4} = 3\frac{13}{14}$. **Is Olivia correct? Convince me.**	On Saturday and Sunday, Nijah ran a total of $4\frac{1}{2}$ km. Suggest how far Nijah ran on each day. Find more than one answer.	

Subtract mixed numbers Subtract mixed numbers and fractions.	Complete the part-whole models.  	Jack is calculating $4\frac{2}{7} - 2\frac{6}{7}$ He adds $\frac{1}{7}$ to both numbers. $4\frac{2}{7} - 2\frac{6}{7} = 4\frac{3}{7} - 3$, so the answer is $1\frac{3}{7}$  Explain why Jack is correct.	Here is Rosie's method. What is the calculation?   Can you find more than one answer? Why is there more than one answer?	
Multiply fractions by integers (Inc. mixed numbers)	Use the diagrams to work out the multiplications.  	A classroom desk is $1\frac{1}{3}$ m long. The classroom is 6 m wide. Will 5 desks fit side by side in the classroom? Explain your answer.	$A \times 3\frac{1}{5} = B$ B is an integer. Work out possible values of A and B.	

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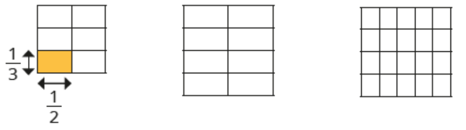
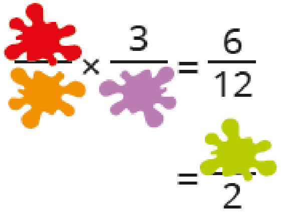
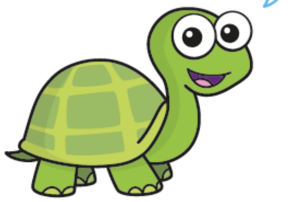
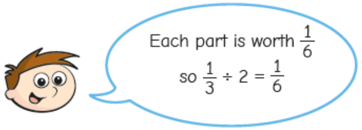
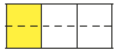
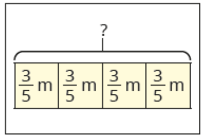
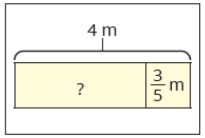
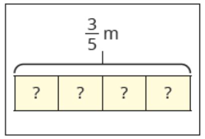
Multiply fractions by fractions	Whitney is using diagrams to represent multiplying fractions. Shade the diagrams to work out the multiplications.  $\frac{1}{3} \times \frac{1}{2} =$ _____ $\frac{1}{4} \times \frac{1}{2} =$ _____ $\frac{1}{5} \times \frac{1}{4} =$ _____ Can any of your answers be simplified?	Alex says,  $\frac{1}{4} \times \frac{1}{2}$ is the same as $\frac{1}{2}$ of a quarter. Do you agree? Explain why.	Find the missing numbers.  $\frac{\square}{\square} \times \frac{3}{\square} = \frac{6}{12} = \frac{\square}{2}$ Is there more than one answer?	
Divide fractions by integers (numerator is a multiple off the whole)	Complete the divisions. ▶ $\frac{6}{11} \div 3$ ▶ $\frac{15}{17} \div 5$ ▶ $\frac{49}{50} \div 7$ ▶ $\frac{96}{101} \div 12$	Dividing by 2 is the same as finding half of a number, so $\frac{4}{11} \div 2$ is the same as $\frac{1}{2} \times \frac{4}{11}$  Do you agree with Tiny? Explain your answer.	What could the missing numbers be? $\frac{\square}{21} \div 4 = \frac{\square}{21}$ Can any of your answers be simplified?	

Divide fractions by integers (numerator is not a multiple of a whole)	Teddy divides one third into 2 equal parts.   Draw diagrams to work out the divisions. $\frac{1}{3} \div 3$ $\frac{2}{3} \div 3$ $\frac{1}{5} \div 3$ $\frac{2}{5} \div 3$	Is the statement true or false? $\frac{3}{5} \div 4 = \frac{3}{4} \div 5$ Explain your answer.	Find the missing fractions and integers. $\_\_\_\_ \div 4 = \frac{7}{36}$ $\frac{3}{20} \div \_\_\_\_ = \frac{3}{80}$ $\_\_\_\_ \div \_\_\_\_ = \frac{2}{5}$ Is there more than one possible answer for each calculation?	

Combine four operations when calculating with fractions including multi step problems.	Match the bar models to the correct problems. A piece of ribbon is 4 m long. Tom cuts $\frac{3}{5}$ off. How much ribbon is left?  Nijah has 4 pieces of ribbon. Each piece is $\frac{3}{5}$ m long. How much ribbon does Nijah have altogether?  A piece of ribbon is $\frac{3}{5}$ m long. Brett cuts it into 4 equal parts. How long is each part?  Work out the answer to each problem.	Add two sets of brackets to make the following calculation correct: $\frac{1}{2} + \frac{1}{4} \times 8 + \frac{1}{6} \div 3 = 6\frac{1}{18}$ Explain where the brackets go and why. Did you find any difficulties?	2 3 4 5 Using each digit once only, find as many solutions to the calculation that are between 1 and 2 as you can. $\frac{1}{\square} + \square \times \frac{\square}{\square}$ Compare answers with a partner.	

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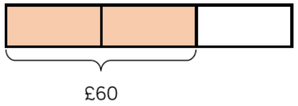
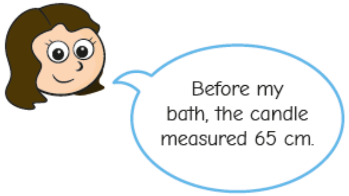
Work out fractions of amount with increased confidence	Work out the fractions of the amounts. $\frac{1}{5}$ of 20 $\frac{1}{4}$ of 40 $\frac{1}{5}$ of 30 $\frac{1}{10}$ of £20 $\frac{1}{8}$ of 40 m $\frac{1}{10}$ of 90 g	Two fashion designers receive $\frac{3}{8}$ of 208 metres of material. One of them says:  Is she correct? Explain your reasoning.	Fill in the missing numbers. $\frac{\square}{6}$ of £300 = £250 420 g = $\frac{\square}{12}$ of 720 g	
Find the whole amount from the known value of a fraction	Jack has spent $\frac{2}{3}$ of his money. He spent £60, how much did he have to start with?  Use a bar model to represent and solve the problems. • Rosie eats $\frac{2}{5}$ of a packet of biscuits. She eats 10 biscuits. How many biscuits were in the original packet? • In an election, $\frac{3}{8}$ of a town voted. If 120 people voted, how many people lived in the town?	Miss Rose lights a candle before she has a bath. After her bath, $\frac{2}{5}$ of the candle is left. This part of the candle measures 13 cm.  Is Miss Rose correct? Explain your reasoning.	Write a problem which this bar model could represent.  What other problems can you come up with?	

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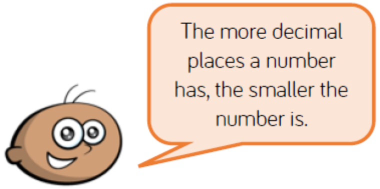
Year 6				
Number: Decimals				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**
Describe value of up to 3 d.p.	Complete the sentences.  There are ____ ones, ____ tenths, ____ hundredths and ____ thousandths. The number in digits is ____________	Tommy says,  Do you agree? Explain why.	Four children are thinking of four different numbers. 3.454 4.445 4.345 3.54 **Teddy**: "My number has four hundredths." **Alex**: "My number has the same amount of ones, tenths and hundredths." **Dora**: "My number has less ones that tenths and hundredths." **Jack**: "My number has 2 decimal places." Match each number to the correct child.	Decimals, tenths, hundredths, thousandths, equivalent decimals and fractions, order, compare, place value, what is a tenth? Where would we use tenths in real life? How many tenths are equivalent to a whole? Number line, relevant scale, divide by 10 – split into 10 equal parts, Gettegno chart, zero as a place holder, part, whole, decimal
Round decimals				
Add and subtract decimals.				

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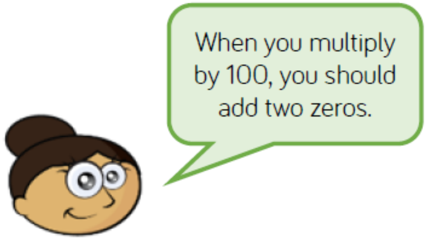
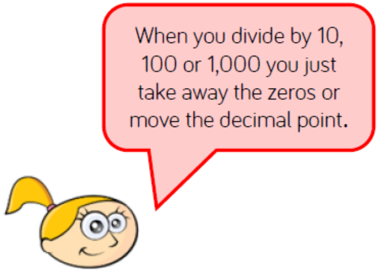
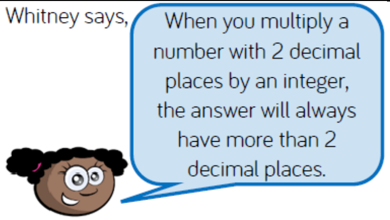
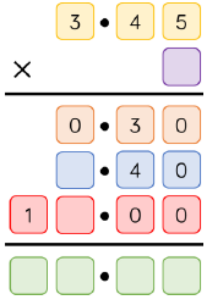
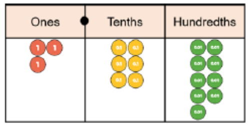
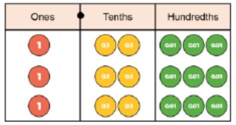
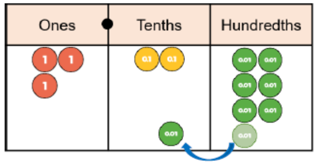
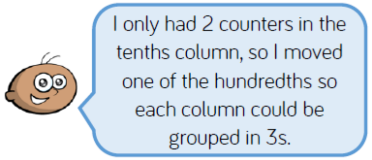
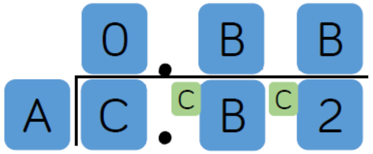
<table>
<tr>
<td>Multiply decimals by 10, 100 and 1000</td>
<td>Identify the number represented on the place value chart.
<table>
<tr><th>Thousands</th><th>Hundreds</th><th>Tens</th><th>Ones</th><th>Tenths</th><th>Hundredths</th></tr>
<tr><td></td><td></td><td></td><td>● ●</td><td>●</td><td></td></tr>
</table>
Multiply it by 10, 100 and 1,000 and complete the sentence stem for each.
When multiplied by ____ the counters move ____ places to the _____.</td>
<td>Dora says,


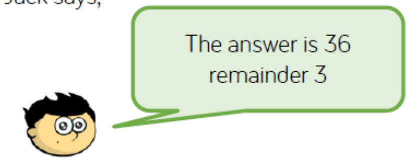
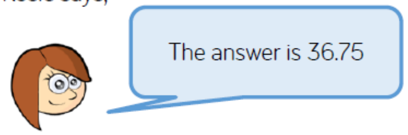
Do you agree?
Explain your thinking.</td>
<td>9b. Create a calculation using the operation and number cards below.
0.375 37.5 375 3,750
x 10 x 1,000 x 100
How many combinations can you make using two operations per calculation? Cards can be used more than once.</td>
<td rowspan="2">place, compare, order, ascending, descending, which digit do we use to compare these decimals? Round up, round down, integers, halves, quarters, part-whole, what is the value of x? When do we need to use zero as a place holder? Complements, number bonds, sequences, rules, multiply, divide, what do you notice about the numbers when you multiply/ divide? When multiplying/dividing what patterns do you notice? Column</td>
</tr>
<tr>
<td>Divide decimal by 10, 100 and 1000</td>
<td>Use the place value chart to divide the following numbers by 10, 100 and 1,000
<table>
<tr><th>Hundreds</th><th>Tens</th><th>Ones</th><th>Tenths</th><th>Hundredths</th><th>Thousandths</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
44 1.36 107 5</td>
<td>Eva says,


Do you agree?
Explain why.</td>
<td>Using the following rules, how many ways can you make 70?

Use a number from column A
Use an operation from column B.
Use number from column C.

<table>
<tr><th>A</th><th colspan="2">B</th><th>C</th></tr>
<tr><td>0.7</td><td rowspan="5">×</td><td rowspan="5">÷</td><td>0.1</td></tr>
<tr><td>7</td><td>1</td></tr>
<tr><td>70</td><td>10</td></tr>
<tr><td>700</td><td>100</td></tr>
<tr><td>7,000</td><td>1,000</td></tr>
</table></td>
</tr>
</table>

Multiply decimals by integers	Use the place value counters to multiply 1.212 by 3 Complete the calculation alongside the concrete representation. 	Whitney says,  Do you agree? Explain why.	Fill in the blanks 	multiplication, division, integers, how would you convert tenths to hundredths? How could you convert a fraction to a decimal?
Use division to solve problems with decimals	Divide 3.69 by 3 Use the diagrams to show the difference between grouping and by sharing?   Use these methods to complete the sentences. 3 ones divided by 3 is _________ ones. 6 tenths divided by 3 is __________ tenths. 9 hundredths divided by 3 is ________ hundredths. Therefore, 3.69 divided by 3 is ______________	When using the counters to answer 3.27 divided by 3, this is what Tommy did:  Tommy says,  Do you agree with what Tommy has done? Explain why.	C is $\frac{1}{4}$ of A $B = C + 2$ Use the clues to complete the division. 	

Division to solve problems.	Mrs Forbes has saved £4,960 She shares the money between her 15 grandchildren. How much do they each receive?	Jack and Rosie are both calculating the answer to 147 ÷ 4 Jack says,  Rosie says,  Who do you agree with?	Each division sentence can be completed using the digits below. 1 2 3 4 5 6 ☐ . 3 ÷ ☐ = 0.26 12 . ☐ ÷ ☐ = 4.2 4 . ☐ 8 ÷ ☐ = 1.07	
Multiply and divide decimals in context.				

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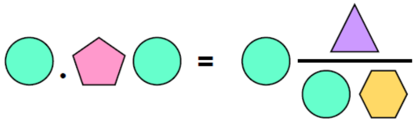
<table>
<tr>
<td>Write decimals as fractions</td>
<td>Complete the table.
<table>
<tr><th>Decimal</th><th>Fraction in tenths or hundredths</th><th>Simplified fraction</th></tr>
<tr><td>0.6</td><td>$\frac{6}{10}$</td><td>$\frac{3}{5}$</td></tr>
<tr><td>0.1 0.1 0.1</td><td></td><td></td></tr>
<tr><td></td><td></td><td>☐☐☐■</td></tr>
<tr><td> </td><td></td><td></td></tr>
<tr><td>0.95</td><td></td><td></td></tr>
</table>
</td>
<td>Alex says,
0.84 is equivalent to $\frac{84}{10}$

Do you agree?
Explain why.</td>
<td>7a. Find the digits represented by the symbols.
Clue: The digit sum of the pentagon and the circle is 3.

Are there other possibilities?</td>
<td></td>
</tr>
<tr>
<td>Convert fractions to decimals

To find equivalents</td>
<td>Match the fractions to the equivalent decimals.
$\frac{2}{5}$ 0.04
$\frac{1}{25}$ 0.4
$\frac{1}{4}$ 0.25</td>
<td>True or False?
0.3 is bigger than $\frac{1}{4}$
Explain your reasoning.</td>
<td>Mo shares 6 bananas between some friends.

Each friend gets 0.75 of a banana.

How many friends does he share the bananas with?
Show your method.
Children could then explore alternative methods.</td>
<td></td>
</tr>
</table>

Year 6

Number: Percentages

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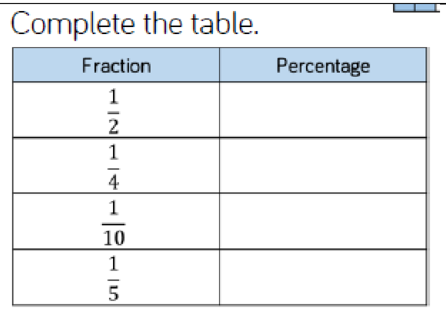
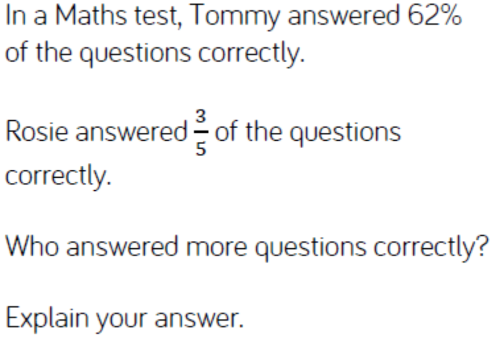
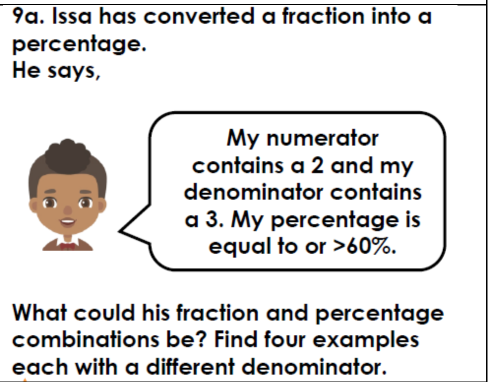
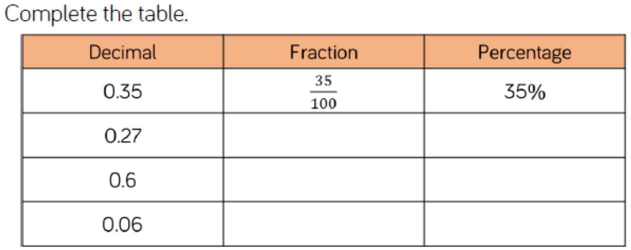
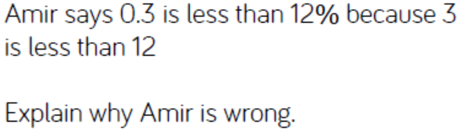
<table>
<tr><th>Objective</th><th>Skill it</th><th>Apply it</th><th>Deepen it</th><th>Mathematical Talk</th></tr>
<tr><td>Understand percentages</td><td></td><td></td><td></td><td rowspan="5">Percent, percentage, what is percentages, per 100, %, per cent = per hundred, fraction, decimal, equivalent, how can you convert tenths to hundredths? What does per cent mean? Equivalent fractions, decimals, percentages, order,</td></tr>
<tr><td>Fractions as division</td><td></td><td></td><td></td></tr>
<tr><td>Fractions to percentages</td><td>
Complete the table.
<table>
<tr><th>Fraction</th><th>Percentage</th></tr>
<tr><td>$\frac{1}{2}$</td><td></td></tr>
<tr><td>$\frac{1}{4}$</td><td></td></tr>
<tr><td>$\frac{1}{10}$</td><td></td></tr>
<tr><td>$\frac{1}{5}$</td><td></td></tr>
</table></td><td>
In a Maths test, Tommy answered 62% of the questions correctly.

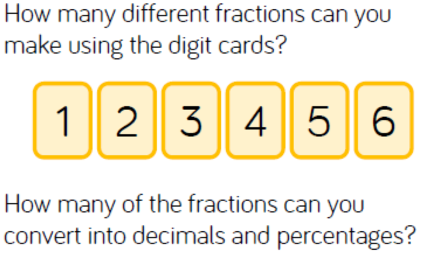
Rosie answered $\frac{3}{5}$ of the questions correctly.

Who answered more questions correctly?

Explain your answer.</td><td>
9a. Issa has converted a fraction into a percentage.
He says,

My numerator contains a 2 and my denominator contains a 3. My percentage is equal to or >60%.

What could his fraction and percentage combinations be? Find four examples each with a different denominator.</td></tr>
<tr><td>Equivalent fractions, decimals and percentages</td><td>
Complete the table.
<table>
<tr><th>Decimal</th><th>Fraction</th><th>Percentage</th></tr>
<tr><td>0.35</td><td>$\frac{35}{100}$</td><td>35%</td></tr>
<tr><td>0.27</td><td></td><td></td></tr>
<tr><td>0.6</td><td></td><td></td></tr>
<tr><td>0.06</td><td></td><td></td></tr>
</table></td><td>
Amir says 0.3 is less than 12% because 3 is less than 12

Explain why Amir is wrong.</td><td>
How many different fractions can you make using the digit cards?

1 2 3 4 5 6

How many of the fractions can you convert into decimals and percentages?</td></tr>
</table>

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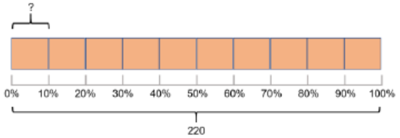
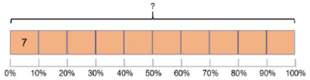
Order fractions, decimals and percentages	Order from smallest to largest: 50% $\frac{2}{5}$ 0.45 $\frac{3}{10}$ 54% 0.05 When ordering children order in given value not the conversion.	In his first Geography test, Mo scored 38% In the next test he scored $\frac{16}{40}$ Did Mo improve his score? Explain your answer.	Which month did Eva save the most money? Estimate your answer using your knowledge of fractions, decimals and percentages. Explain why you have chosen that month. In January, Eva saves $\frac{3}{5}$ of her £20 pocket money.   In February, she saves 0.4 of her £10 pocket money. In March, she saves 45% of her £40 pocket money. 	percentages of amount, missing values, how does converting to a decimal or a fraction help us work out the percentage? If we know a percentage can we work out the whole?
Percentages of amount	Eva says,  50% is equivalent to $\frac{1}{2}$ To find 50% of an amount, I can divide by 2 Complete the sentences. 25% is equivalent to $\frac{1}{\square}$ To find 25% of an amount, divide by ___ 10% is equivalent to $\frac{1}{\square}$ To find 10% of an amount, divide by ___ 1% is equivalent to $\frac{1}{\square}$ To find 1% of an amount, divide by ___	Mo says, To find 10% you divide by 10, so to find 50% you divide by 50 Do you agree? Explain why. 	Complete the missing numbers. 50% of 40 = ____% of 80 ___% of 40 = 1% of 400 10% of 500 = ____% of 100	

	Mo uses a bar model to find 30% of 220  10% of 220 = 22 , so 30% of 220 = 3 × 22 = 66 Use Mo's method to calculate: 40% of 220 20% of 110 30% of 440 90% of 460		How many ways can you find 45% of 60? Use similar strategies to find 60% of 45 What do you notice? Does this always happen? Can you find more examples?	
Use percent to find missing values	Bar model support If 7 is 10% of a number, what is the number? Use the bar model to help you. 	Complete: 10% of 150 = ☐ 30% of ☐ = 45 30% of 300 = ☐ 30% of ☐ = 900 Explain the link between these questions.	Fill in the missing values to make this statement correct. Can you find more than one way? 25% of ☐ = ☐ % of 60	

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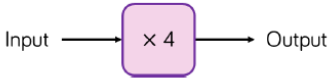
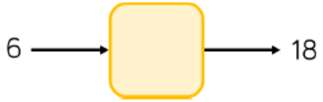
Year 6

Number: Algebra

Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical Talk**
Find a rule – one step function	Here is a function machine.  - What is the output if the input is 2? - What is the output if the input is 7.2? - What is the input if the output was 20? - What is the input if the output was 22?	**5a. If the function for the number of wizards is the number of ninjas x 7, how many wizards are there?**  **Explain your reasoning.**	Eva has a one-step function machine. She puts in the number 6 and the number 18 comes out.  What could the function be? How many different answers can you find?	Function, input, output, algebra, rile, expressions, substitution, values, equations, what do you think one-step function means? What

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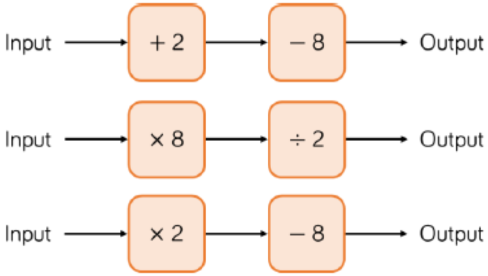
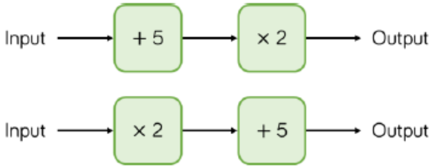
<table>
<tr>
<td>Find a rule – two step function</td>
<td>
Complete the table for the given function machine.

<table>
<tr><td>Input</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr>
<tr><td>Output</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

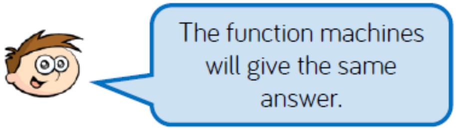
- What patterns do you notice in the outputs?
- What is the input if 20 is the output? How did you work it out?
</td>
<td>
Mo has the following function machines.



Explain which of these can be written as single function machines.
</td>
<td>
Teddy has two function machines.

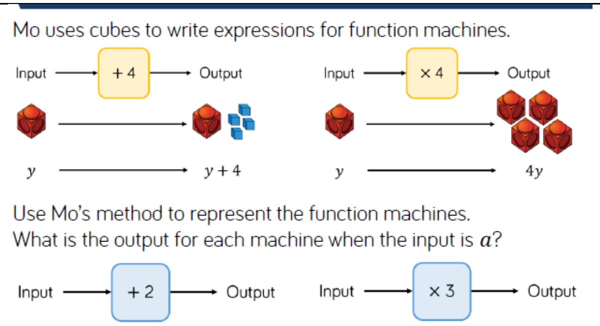
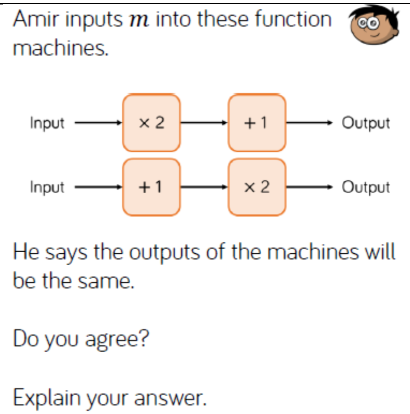
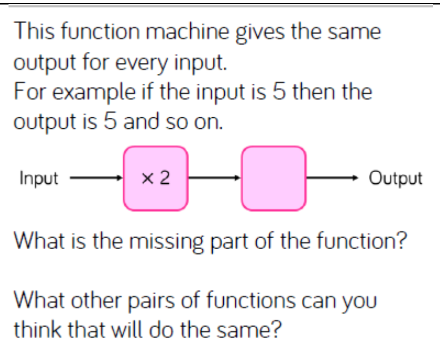
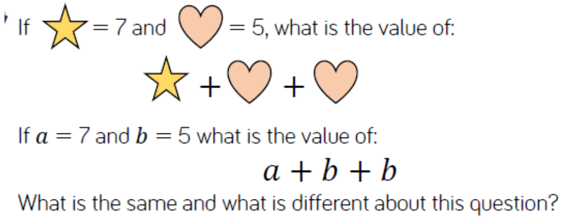
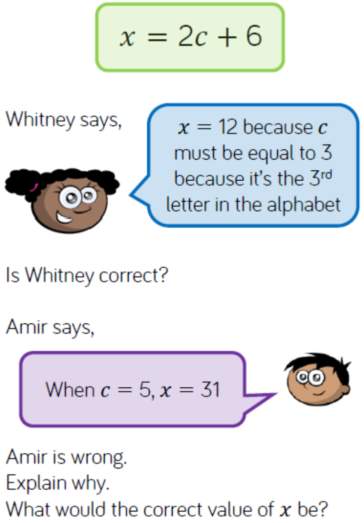
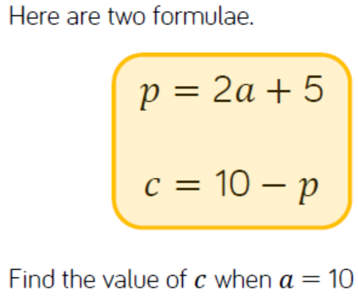


He says,

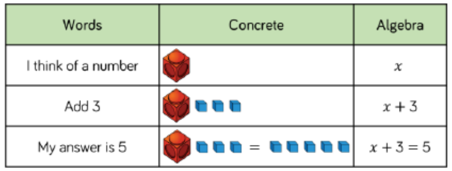
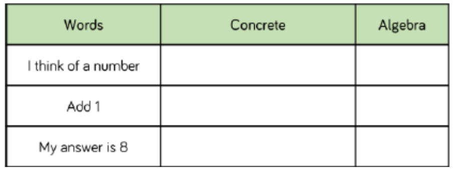
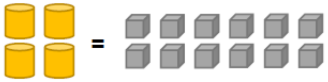
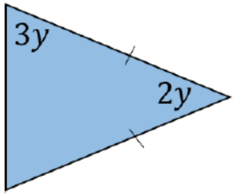


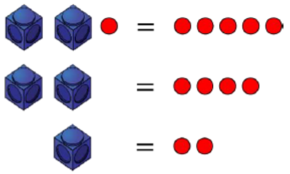
Is Teddy correct?

Is there an input that will give the same output for both machines?
</td>
<td>examples of functions do you know? What is the output if….? What is the input if….? If I change the order of the functions will the answer change? What is the difference between equation and expression? Variables,</td>
</tr>
</table>

Forming expressions	 Mo uses cubes to write expressions for function machines. Use Mo's method to represent the function machines. What is the output for each machine when the input is a?	 Amir inputs m into these function machines. He says the outputs of the machines will be the same. Do you agree? Explain your answer.	 This function machine gives the same output for every input. For example if the input is 5 then the output is 5 and so on. What is the missing part of the function? What other pairs of functions can you think that will do the same?	integer values, trial and improvement, working systematically,
Substitution	 If ☆ = 7 and ♡ = 5, what is the value of: ☆ + ♡ + ♡ If $a = 7$ and $b = 5$ what is the value of: $a + b + b$ What is the same and what is different about this question?	 $x = 2c + 6$ Whitney says, $x = 12$ because c must be equal to 3 because it's the 3rd letter in the alphabet Is Whitney correct? Amir says, When $c = 5$, $x = 31$ Amir is wrong. Explain why. What would the correct value of x be?	 Here are two formulae. $p = 2a + 5$ $c = 10 - p$ Find the value of c when $a = 10$	

Use simple formulae to work out values	Which of the following is a formula? $P = 2l + 2w$ ☐ $3d + 5$ ☐ $20 = 3x - 2$ Link to area and volume.	**6a. The formula for calculating speed (s) is distance (d) divided by time (t).** **Which two formulae represent this?** **A.** $s = d \div t$ **B.** $s = t \div d$ **C.** $s = \frac{d}{t}$ **Explain how you know.**	The rule for making scones is use 4 times as much flour (f) as butter (b). Which is the correct formula to represent this? Ⓐ $f = \frac{b}{4}$ Ⓑ $f = 4b$ Ⓒ $f = b + 4$ Ⓓ $4f = b$ Explain why the others are incorrect.	

<table>
<tr>
<td>Form one step equations</td>
<td>Children need to know the difference between expression (can take different values) and equation (specific unknown value)
Amir represents a word problem using cubes, counters and algebra
<table><tr><th>Words</th><th>Concrete</th><th>Algebra</th></tr><tr><td>I think of a number</td><td></td><td>x</td></tr><tr><td>Add 3</td><td></td><td>$x + 3$</td></tr><tr><td>My answer is 5</td><td>=</td><td>$x + 3 = 5$</td></tr></table>Complete this table using Amir's method.
<table><tr><th>Words</th><th>Concrete</th><th>Algebra</th></tr><tr><td>I think of a number</td><td></td><td></td></tr><tr><td>Add 1</td><td></td><td></td></tr><tr><td>My answer is 8</td><td></td><td></td></tr></table></td>
<td>5b. Which is the odd one out?
A. I think of a number. I multiply it by 6. My answer is 12.
B. 
C. $6n = 12$
Explain your answer.</td>
<td>Rosie thinks of a number. She adds 7 and divides her answer by 2
Teddy thinks of a number. He multiples by 3 and subtracts 4
Rosie and Teddy think of the same number.
Rosie's answer is 9
What is Teddy's answer?
Rosie and Teddy think of the same number again. This time, they both get the same answer.
Use trial and improvement to find the number they were thinking of.</td>
<td></td>
</tr>
<tr>
<td>Solve one step equations using four operations</td>
<td>How many counters is each cup worth?
Write down and solve the equation represented by the diagram.
</td>
<td>What is the size of the smallest angle in this isosceles triangle?

How can you check your answer?</td>
<td>• Hannah is 8 years old
• Jack is 13 years old
• Grandma is $x + 12$ years old.
• The sum of their ages is 100
Form and solve an equation to work out how old Grandma is.</td>
<td></td>
</tr>
</table>

<table>
<tr>
<td>Solve two step equations using four operations</td>
<td>Here is each step of an equation represented with concrete resources.

$2x + 1 = 5$
-1 -1
$2x = 4$
$\div 2$ $\div 2$
$x = 2$
Use this method to solve:
$4y + 2 = 6$ $9 = 2x + 5$ $1 + 5a = 16$</td>
<td>6a. James and Lily are solving the following algebraic equation.
$0.5x - 9 = 5$

James
This equation is impossible because 9 is smaller than 0.5.
x must be 28 for this equation to be balanced.

Lily
Who is correct? Prove it.</td>
<td>Alex has some algebra expression cards.

$y + 4$
$2y$
$3y - 1$
The mean of the cards is 19
Work out the value of each card.</td>
<td></td>
</tr>
<tr>
<td>Find pairs of values</td>
<td>a and b are variables:
$a + b = 6$
There are lots of possible solutions to This equation.
Find 5 different possible integer values for a and b.
<table><tr><th>a</th><th>b</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td>
<td>x and y are both positive whole numbers.
$\frac{x}{y} = 4$
Dora says,

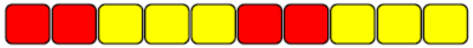
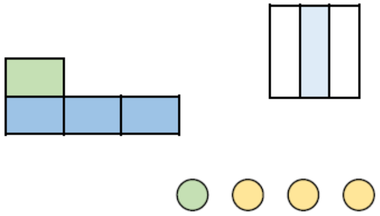
x will always be a multiple of 4
Jack says,

y will always be a factor of 4
Only one is correct – who is it?
Explain your answer.</td>
<td>a, b and c are integers between 0 and 5
$a + b = 6$
$b + c = 4$
Find the values of a, b and c
How many different possibilities can you find?</td>
<td></td>
</tr>
<tr>
<td>Solve problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</table>

with two unknowns.				

Year 6

Number: Ratio

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Understand that a ratio shows the relationship between two values – using ratio language	Complete the sentences.  For every two blue flowers there are ____ pink flowers. For every blue flower there are _____ pink flowers.	Whitney lays tiles in the following pattern  If she has 16 red tiles and 20 yellow tiles remaining, can she continue her pattern without there being any tiles left over? Explain why.	**8a. Euan has some red, blue and yellow counters.** **There are 4 blue counters for every red counter, and 16 counters altogether.** **Write all the possible sentences to show how many of each counter Euan may have.**	Ratio, relationship, value, fractions, symbol, scale, scale factors, enlarge, proportion, calculate, relationship between values, comparison, quantities, ratio symbol, what does the : symbol mean in the context
See the link between ratio and fractions	The ratio of red counters to blue counters is 1 : 2  What fraction of the counters is blue? $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$ What fraction of the counters is red? $\frac{1}{2}$ $\frac{1}{3}$ $\frac{2}{3}$	Which is the odd one out? Explain your answer. 	**7b. Spencer is baking biscuits using oats, sugar and butter.** **The ingredients weigh 1,200g in total.** **Write 5 pairs of fractions to show the possible ratio of oats to sugar to butter.** **Show the fractions in their simplest form.**	

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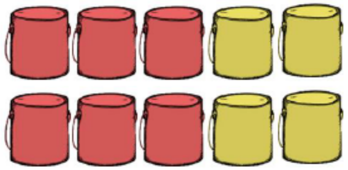
Know the ratio symbol	Complete:  The ratio of red counters to blue counters is ☐ : ☐ The ratio of blue counters to red counters is ☐ : ☐	Tick the correct statements.  • There are two yellow tins for every three red tins. • There are two red tins for every three yellow tins. • The ratio of red tins to yellow tins is 2 : 3 • The ratio of yellow tins to red tins is 2 : 3 Explain which statements are incorrect and why.	In a box there are some red, blue and green pens. The ratio of red pens to green pens is 3 : 5 For every 1 red pen there are two blue pens. Write down the ratio of red pens to blue pens to green pens.	of ration? How can we represent the ratio using a bar model? For every… there are… what does similar mean?

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Calculate ratio	A farmer plants some crops in a field. For every 4 carrots he plants 2 leeks. He plants 48 carrots in total. How many leeks did he plant? How many vegetables did he plant in total? 	**5a. A florist is arranging flowers. She wants to arrange the flowers using the ratio 3 yellow flowers to every 1 red flower.** **Have the flowers been arranged correctly?**  **Explain your answer.**	Annie is making some necklaces to sell. For every one pink bead, she uses three purple beads.  Each necklace has 32 beads in total. The cost of the string is £2.80 The cost of a pink bead is 72p. The cost of a purple bead is 65p. How much does it cost to make one necklace?	

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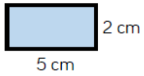
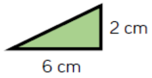
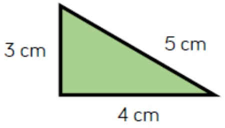
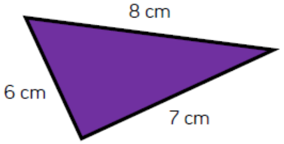
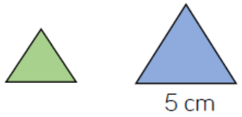
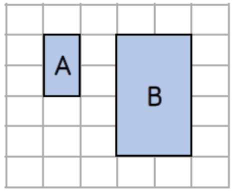
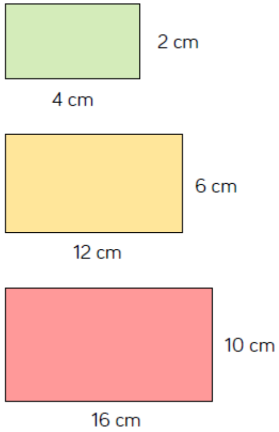
Use scale factors to enlarge Recognise scale drawings.	Enlarge these shapes by: • Scale factor 2 • Scale factor 3 • Scale factor 4   	Jack says:  The purple triangle is green triangle enlarged by scale factor 3   Do you agree? Explain why.	Here are two equilateral triangles. The blue triangle is three times larger than the green triangle.  (Not drawn to scale) Find the perimeter of both triangles.	

Calculate scale factors	Complete the sentences.  Shape B is __________ as big as shape A. Shape A has been enlarged by scale factor ______ to make shape B.	Ron says that these three rectangles are similar.  Do you agree? Explain your answer.	A rectangle has a perimeter of 16 cm. An enlargement of this rectangle has a perimeter of 24 cm. The length of the smaller rectangle is 6 cm. Draw both rectangles.	
Similar shapes				

Able to apply ratio and proportion skills to solve problems.	How much of each ingredient is needed to make soup for: • 3 people • 9 people • 1 person What else could you work out? Recipe for 6 people • 1 onion • 60 g butter • 180 g lentils • 1.2 litres stock • 480 ml tomato juice	**5a. A smoothie recipe serves 2 people. It says to use 3 cherries, 5 grapes and 2 bananas.** **Jaxon says,**  **To serve 8 people I will need 44 pieces of fruit in total.** **Harry says,** **To serve 8 people I will need to use 20 grapes.**  **Who is correct? Explain your answer.**	This recipe makes 10 flapjacks. Flapjacks 120 g butter 100 g brown sugar 4 tablespoons golden syrup 250 g oats 40 g sultanas Amir has 180 g butter. What is the largest number of flapjacks he can make? How much of the other ingredients will he need?	
Proportion problems				
Recipes				

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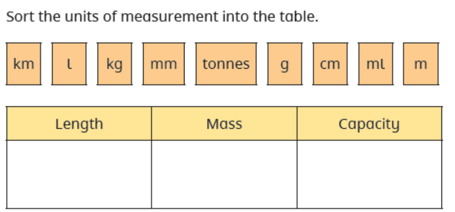
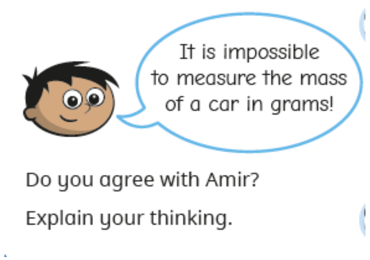
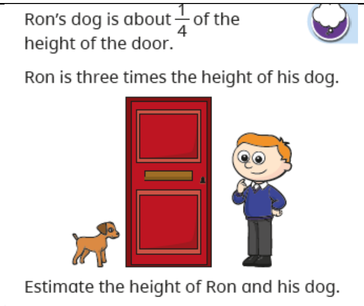
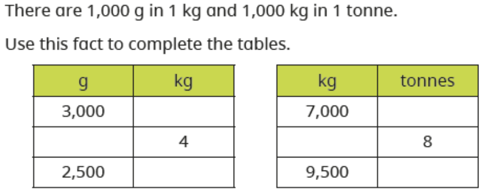
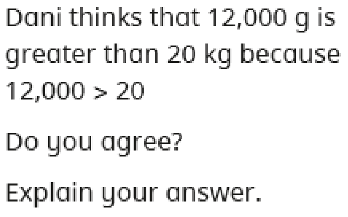
<table>
<tr><th colspan="5">Year 6</th></tr>
<tr><th colspan="5">Measurement: Converting units</th></tr>
<tr><th>Objective</th><th>Skill it</th><th>Apply it</th><th>Deepen it</th><th>Mathematical Talk</th></tr>
<tr>
<td>Read, write and recognise all metric measures for length, mass and capacity.</td>
<td>
Sort the units of measurement into the table.
km l kg mm tonnes g cm ml m
<table><tr><th>Length</th><th>Mass</th><th>Capacity</th></tr><tr><td></td><td></td><td></td></tr></table></td>
<td>

Do you agree with Amir?
Explain your thinking.</td>
<td>
Ron's dog is about $\frac{1}{4}$ of the height of the door.
Ron is three times the height of his dog.
Estimate the height of Ron and his dog.</td>
<td rowspan="2">Height, length, compare, measure, long, short, longer, shorter, narrow, wide, centimetre, metre, kilometre, taller, millimetre, nearest cm, measuring from 0, how</td>
</tr>
<tr>
<td>Convert metric measures</td>
<td>
There are 1,000 g in 1 kg and 1,000 kg in 1 tonne.
Use this fact to complete the tables.
<table><tr><th>g</th><th>kg</th></tr><tr><td>3,000</td><td></td></tr><tr><td></td><td>4</td></tr><tr><td>2,500</td><td></td></tr></table>
<table><tr><th>kg</th><th>tonnes</th></tr><tr><td>7,000</td><td></td></tr><tr><td></td><td>8</td></tr><tr><td>9,500</td><td></td></tr></table></td>
<td>
Dani thinks that 12,000 g is greater than 20 kg because 12,000 > 20
Do you agree?
Explain your answer.</td>
<td>A shop sells one-litre bottles of water for 99p each.
300 ml bottles of water are on offer at 8 bottles for £2
Whitney wants to buy 12 litres of water. Find the cheapest way she can do this.</td>
</tr>
</table>

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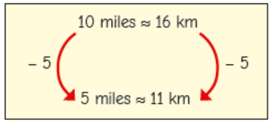
Calculate metric measures	Esther drinks 250 ml of juice. Kim drinks 3 times as much.  - How much does Kim drink? Give your answer in litres. - How much do Esther and Kim drink in total?	**6a. A piece a ribbon wrapped around a jar measures 10cm. Diana buys a length of ribbon and says,**  **This length is 2.75m and will be long enough to wrap 30 jars.** **Is she correct? Explain your answer.**	Teddy, Annie and Jack cycle as far as they can in one hour.  - Teddy cycles $\frac{5}{6}$ of the distance that Jack cycles. - Annie cycles 1,350 m less than Teddy. - Jack cycles 5.4 km. How far does Teddy cycle? How far does Annie cycle? How far do the three children cycle in total?	long is? How tall is? When would we measure in metres? When would we measure in cm? estimating prior to measuring, convert, 100cm=1m 10mm=1cm 1000M = 1km Kilograms, kilo = 1000 Milligrams, metric units, imperial units, pounds, pints, inches, what does approximately mean? Units of time, days, years, months,
Miles and kilometres – approximate conversions	Use the fact 5 miles ≈ 8 km to complete the conversions. - 10 miles ≈ ______ km - 15 miles ≈ ______ km - 25 miles ≈ ______ km - 32 km ≈ ______ miles - 40 km ≈ ______ miles - 64 km ≈ ______ miles	Here are Tiny's workings to convert 5 miles to kilometres.  Explain Tiny's mistake.	Mo cycles 45 miles over the course of 3 days. On day 1, he cycles 16 km. On day 2, he cycles 10 miles further than he did on day 1 How far does he cycle on day 3? Give your answer in miles and in kilometres.	

Imperial measures Children need to know and use the following facts:

- 1 foot is equal to 12 inches
- 1 pound is equal to 16 ounces
- 1 stone is equal to 14 pounds
- 1 gallon is equal to 8 pints
- 1 inch is approximately 2.5 cm

Sort the units of measurement into the table.

millilitre	centimetre	mile	gram	litre
stone	inch	metre	millimetre	tonne
gallon	ounce	pound	foot	kilometre

	Length	Mass	Capacity
Metric			
Imperial			

Amir wants to make a cake.

Here are some of the ingredients he needs:

- 8 ounces caster sugar
- 6 ounces flour
- 6 ounces butter

This is what he has in his cupboards:

- 0.5 lb caster sugar
- 0.25 lb flour
- $\frac{3}{8}$ lb butter

Does Amir have enough ingredients to bake the cake?

If not, how much more does he need to buy?

Convince me.

9b. Felix is ordering food for his party; each food item costs £10 per 100oz.

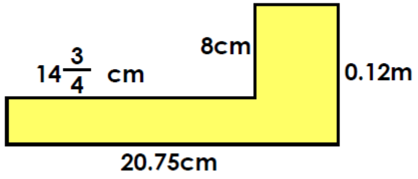
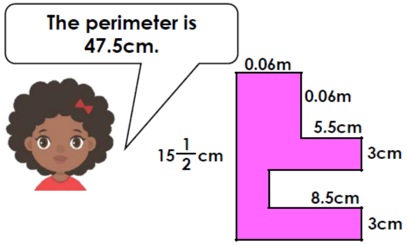
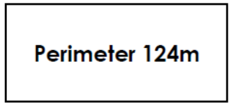
Amount Needed
2 pounds sausages
0.5 pounds bread rolls
1 pound ketchup

What is the total cost of the food?

hours, minutes, seconds, timetables, when do we use timetables in everyday life? Mass, capacity, miles, kilometres, approximate conversions, when do we use imperial units instead of metric units?

Year 6

Measurement: Perimeter, Area and Volume

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Calculate the perimeter of rectilinear/compound shapes – including those with missing lengths	**10b. Calculate the perimeter.**  	9b. Connie says,  Is Connie correct? Explain your answer.	8a. A farmer is building a new barn. It needs to be the following shape and size:  All four sides need to include half metres. What could the length of each side be in metres? 	perimeter, rectilinear, Orientation, Convert, what is perimeter? What are rectilinear shapes? Composite,

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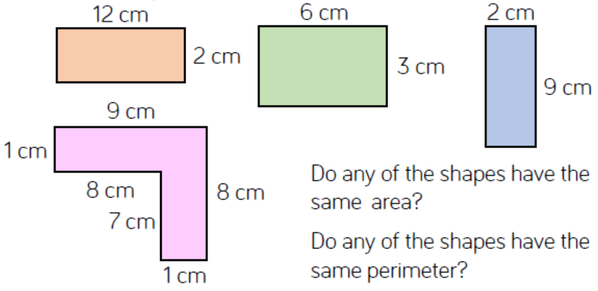
<table>
<tr>
<td>Explore that shapes can have a different perimeter to area.</td>
<td>Look at the shapes below.

Do any of the shapes have the same area?
Do any of the shapes have the same perimeter?</td>
<td>True or false?
Two rectangles with the same perimeter can have different areas.
Explain your answer.</td>
<td>Tommy has a 8 cm × 2 cm rectangle. He increases the length and width by 1 cm.
<table>
<tr><th>Length</th><th>Width</th><th>Area</th></tr>
<tr><td>8</td><td>2</td><td></td></tr>
<tr><td>9</td><td>3</td><td></td></tr>
</table>
He repeats with a 4 cm × 6 cm rectangle.
<table>
<tr><th>Length</th><th>Width</th><th>Area</th></tr>
<tr><td>4</td><td>6</td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>
What do you notice happens to the areas?
Can you find any other examples that follow this pattern?
Are there any examples that do not follow the pattern?</td>
<td>Area, squared (cm^2)
How can you measure area? The amount of space taken up by a two-dimensional shape. Working systematically, compare, greater than, less than, equal to,</td>
</tr>
</table>

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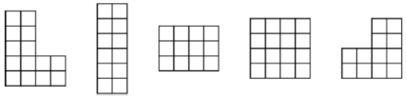
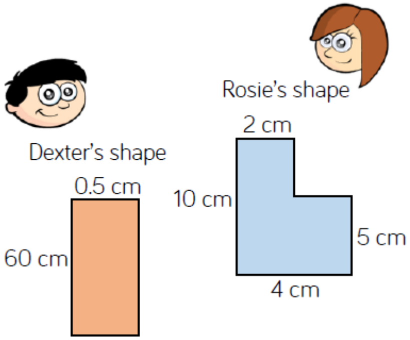
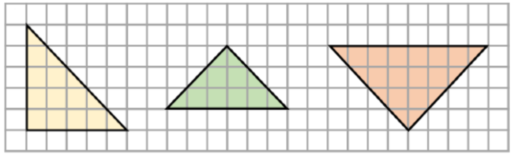
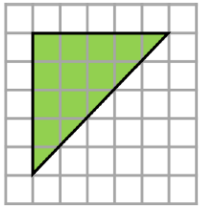
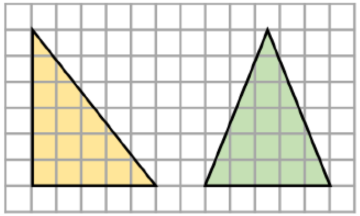
<table>
<tr>
<td>Find and draw rectilinear shapes that have the same area</td>
<td>Sort the shapes into the Carroll diagram.
<table>
<tr><th></th><th>Quadrilateral</th><th>Not a quadrilateral</th></tr>
<tr><td>Area of 12 cm²</td><td></td><td></td></tr>
<tr><td>Area of 16 cm²</td><td></td><td></td></tr>
</table>

Now draw another shape in each section of the diagram.</td>
<td>Rosie and Dexter are drawing shapes with an area of 30cm²


Who is correct?
Explain your reasoning.</td>
<td>Three children are given the same rectilinear shape to draw.
Amir says, "The smallest length is 2 cm."
Alex says, "The area is less than 30 cm²."
Annie says, "The perimeter is 22 cm."
What could the shape be?
How many possibilities can you find?</td>
<td rowspan="3">height x length, what properties of the shape do you need to know work out the area? Compound shapes, irregular shapes, estimate, Volume, cubed, cm3, same, difference, compare, estimate, capacity, how is capacity different to volume? Greatest, smallest, how can we find the volume of this shape? What is the difference</td>
</tr>
<tr>
<td>Area of a right angled-triangle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area of triangles through counting squares (approximation)</td>
<td>Count squares to calculate the area of each triangle.
</td>
<td>
Mo says the area of this triangle is 15cm²
Is Mo correct? If not, explain his mistake.</td>
<td>What is the same about these two triangles?
What is different?

Can you create a different right angled triangle with the same area?</td>
</tr>
</table>

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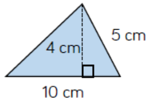
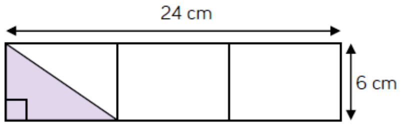
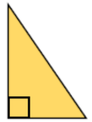
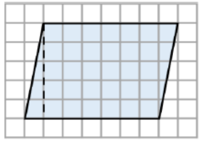
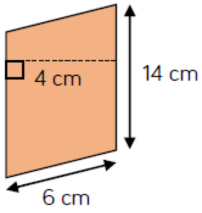
Find the area of a triangle using formula l x h 2	Use knowledge of finding area of a rectangle If l represents length and h represents height: Area of a rectangle = $l \times h$ Use this to calculate the area of the rectangle.  What do you need to do to your answer to work out the area of the triangle? Therefore, what is the formula for the area of a triangle? To calculate the height of a triangle, you can use the formula: base × height ÷ 2 Choose the correct calculation to find the area of the triangle.  - 10 × 5 ÷ 2 - 10 × 4 ÷ 2 - 5 × 4 ÷ 2	Calculate the area of the shaded triangle.  Mo says,  I got an answer of 72 cm^2 Do you agree with Mo? If not, can you spot his mistake?	 Area = 54 cm^2 What could the length and the height of the triangle be? How many different integer possibilities can you find?	between volume and capacity? Carroll diagram, is the perimeter and area the same? How many squares can you see? Can you explain how you worked out the volume? What did you visualise?
Find the area of a parallelogram	Use knowledge of finding area of rectangle Approximate the area of the parallelogram by counting squares. Now cut along the dotted line. Can you move the triangle to make a rectangle? Calculate the area of the rectangle. 	 Dexter thinks the area of the parallelogram is 84 cm^2. What mistake has Dexter made? What is the correct area?	Teddy has drawn a parallelogram. The area is greater than 44 m^2 but less than 48 m^2. What could the base length and the perpendicular height of Teddy's parallelogram be?	

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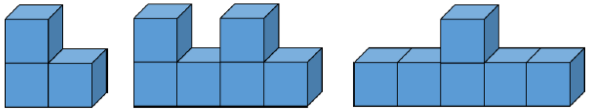
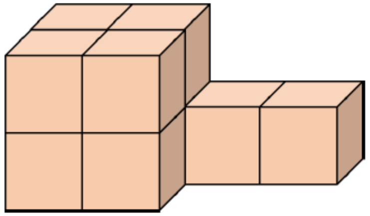
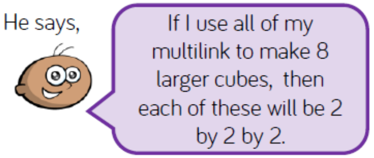
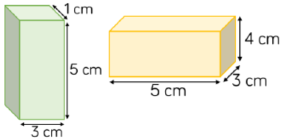
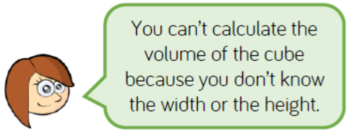
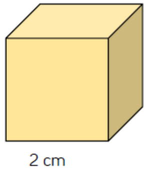
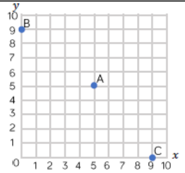
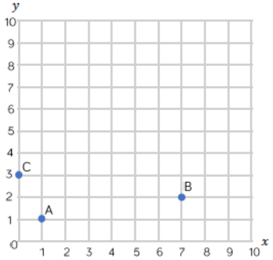
Find volume – counting cubes	If each cube has a volume of 1 cm^3, find the volume of each solid. 	Amir says he will need 8 cm^3 to build this shape. Dora says she will need 10 cm^3.  Who do you agree with? Explain why.	Tommy is making cubes using multilink. He has 64 multilink cubes altogether. How many different sized cubes could he make? He says,  How many other combinations can Tommy make where he uses all the cubes?	
Find volume of a cuboid using formula h x l x w	Complete the sentences for each cuboid.  The length is: __________ The width is: __________ The height is: __________ The area of the base is: ____ × ____ = ____ Volume = The area of the base × ____ = ____	Rosie says,   Do you agree? Explain why.	How many different ways can you make a cuboid with the volume of 36cm^3?	

Year 6

Geometry: Position and direction

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Read and plot coordinates on the first quadrant	Whitney plots three coordinates. Write down the coordinates of points A, B and C. 	Mo has written the coordinates of points A, B and C. A (1, 1) B (2, 7) C (3, 0) Mark Mo's work and correct his mistakes.  Explain why Mo could not make the same mistake for point A as he made for points B and C.	Eva is drawing a trapezium. She wants her final shape to look like this:  Eva uses the coordinates (2, 4), (4, 5), (1, 6) and (5, 6). Will she draw the shape that she wants to? If not, can you correct her coordinates?	underneath, above, below, top, bottom, side, on, in, outside, inside, around, in front, behind, front, back, below, after, beside, next to, opposite, apart, between, middle, edge, centre,

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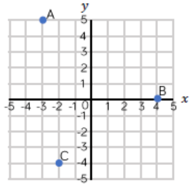
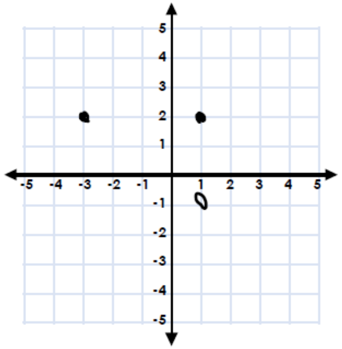
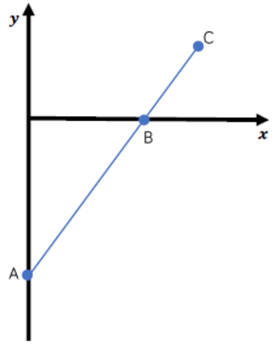
Read and plot coordinates on the four quadrants	Dora plotted three coordinates. Write down the coordinates of points A, B and C.  	**4b. Max thinks that the coordinates below make a square.** **(-3, 2)** **(1, 2)** **(1, -1)** **(-3, -1)**  **Is he correct? Explain why.**	A is the point (0, – 10) B is the point (8, 0) The distance from A to B is two thirds of the distance from A to C. Find the coordinates of C.  	corner, direction, journey, left, right, up, down, forwards, backwards, sideways, across, close, far, near, along, through, to from, towards, away from, movement, side, roll, turn,

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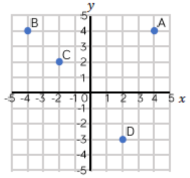
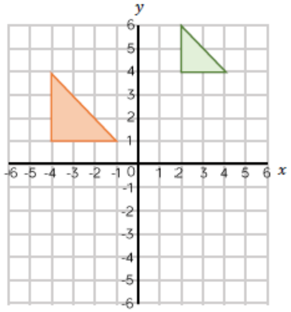
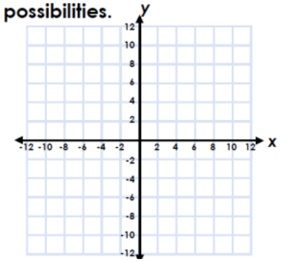
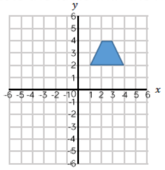
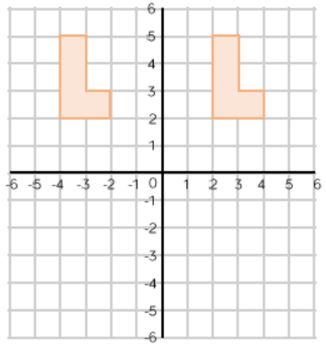
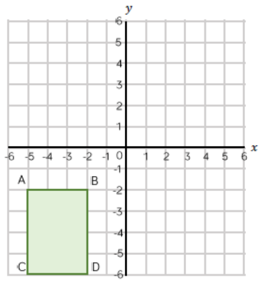
Translate shapes and points in all four quadrants	Use the graph to describe the translations. One has been done for you. From A to B translate 8 units to the **left**. From C to D translate __ units to the **right** and __ units **down**. From D to B translate 6 units to the _____ and 7 units _____. From A to C translate __ units to the ____ and __ units ____. 	Spot the Mistake. The green triangle has been translated 6 units to the left and 3 units down. 	**8a. Here are the coordinates of a shape: (4, 2), (4, 10), (10, 10), (10, 6), (12, 6), (12, 2). If one coordinate translates to (-3, -3), what could the other coordinates be? Find 2 possibilities.**  GD PS	whole turn, half turn, stretch, bend, rotation, clockwise, coordinates, translation, quadrant, x axis, y axis, Over, under, three-quarter turn, quarter turn, stretch, bend, rotation,

<table>
<tr>
<td>Reflect shapes in all four quadrants in both the x and the y axis.</td>
<td>Reflect the trapezium in the x-axis and then the y –axis.
Complete the table with the new coordinates of the shape.

<table>
<tr><th></th><th>Reflected in the x-axis</th><th>Reflected in the y-axis</th></tr>
<tr><td>(1, 2)</td><td></td><td></td></tr>
<tr><td>(4, 2)</td><td></td><td></td></tr>
<tr><td>(2, 4)</td><td></td><td></td></tr>
<tr><td>(3, 4)</td><td></td><td></td></tr>
</table>
</td>
<td>Annie has reflected the shape in the y-axis.
Is her drawing correct?
If not explain why.
 </td>
<td>Rectangle ABCD is the result of a rectangle being reflected in either the x-or the y-axis.
Where could the original rectangle have been? Draw the possible original rectangles on the coordinate grid, and label the coordinates of each vertex.
 </td>
<td>clockwise, anticlockwise, straight line, ninety degree turn, what direction was the turn, plot, describe the translation, position, reflect, parallel, what does translate mean? Mirror line, four quadrant, positive, negative, what axis do we look at first? Centre of the axis (origin), how is reflecting different to translation?</td>
</tr>
</table>

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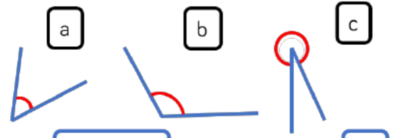
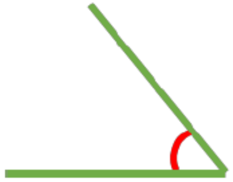
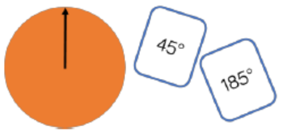
Year 6

Geometry: Properties of shape

Objective	Skill it	Apply it	Deepen it	Mathematical Talk
Measure angles with a protractor	Identify the type of angle, and measure the angle using a protractor.  Angle ☐ is an ☐ angle. It measures ☐	Alex measures this angle:   She says it is 130° Explain what she has done wrong.	Cut out a circle and draw a line from the centre to the edge. Add a spinner in the centre.  Put the arrow in the starting position as shown above. Turn over a flash card with an angle on. Estimate the given angle by moving the spinner. Check how close you are using a protractor.	Group, sort, cube, cuboid, pyramid, sphere, cone, cylinder, circle, triangle, square, rectangle, shape, flat, curved, straight, round, corner (point, pointed)

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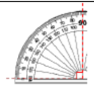
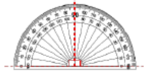
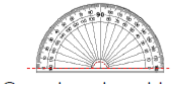
Introduce angles and their link to right angles	 There are ☐ degrees in a right angle.  There are ☐ right angles on a straight line.  There are ☐ degrees on a straight line.	Dora and Eva are asked how many degrees there are between North-West and South-West. Dora says,  There are 90 degrees between NW and SW. Eva says,  There are 270° between NW and SW. Who do you agree with? Explain why.	If it takes 60 minutes for the minute hand to travel all the way around the clock, how many degrees does the minute hand travel in: • 7 minutes • 12 minutes How many minutes have passed if the minute hand has moved 162°?	hollow, solid, face, side, edge, make, build, draw, direction, journey, left, right, up down, forwards, backwards, sideways, across, close, far, near, along, though, to, from, towards, away from, movement, side, roll, turn, full turn, whole turn, half turn,

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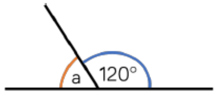
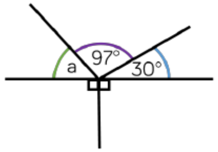
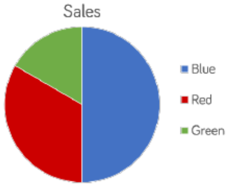
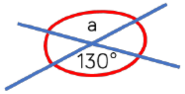
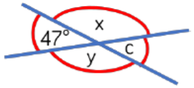
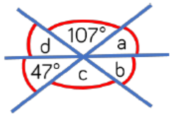
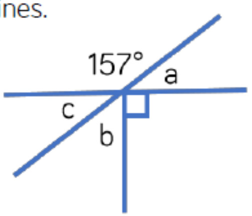
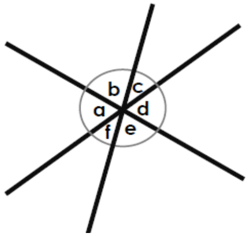
Calculate angles on a straight line and around a point	Calculate the missing angles.   	There are five equal angles around a point. What is the size of each angle? Explain how you know.	Here is a pie chart showing the colour of cars sold by a car dealer.  The number of blue cars sold is equal to the total number of red and green cars sold. The number of red cars sold is twice the number of green cars sold. Work out the size of the angle for each section of the pie chart.	stretch, bend, size, bigger, larger, protractor, smaller, symmetrical, right angle, horizontal, vertical, perpendicular, parallel, greater/ less than ninety degrees, ninety degrees, orientation, straight lines, prism, quarter turn, three quarter turn, pentagon, hexagon, octagon, vertices, 2d, 3d, quadrilateral, dimensional, vertically
Vertically opposite angles	Find the size of the missing angles.    	The diagram below is drawn using three straight lines.  Whitney says that it's not possible to calculate all of the missing angles. Do you agree? Explain why.	**7a. If angle b measures 79° and angle c measures 48°, what is the size of angle d?**  	

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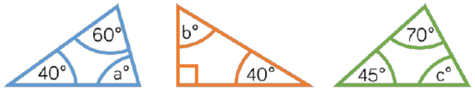
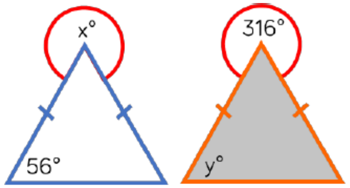
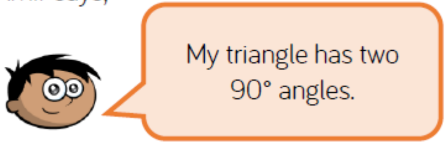
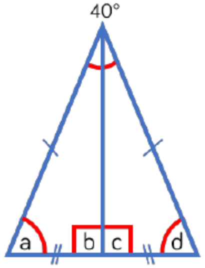
Calculate angles in a triangle using known information	Calculate the missing angles.  Work out the value of x and y. Explain each step of your working.  	Amir says,  Can Amir be correct? Can you demonstrate this?	How many sentences can you write to express the relationships between the angles in the triangles? One has been done for you.  40° + a + d = 180°	opposite angles, flat, acute, obtuse, curved faces, what is the difference between 2d and 3d shapes? Regular and irregular shapes, show me a vertex, vertical, horizontal, how have these shapes
Know hatch marks show equal lengths	Link learning into exploration of properties of shape.			

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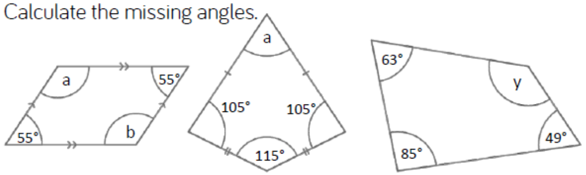
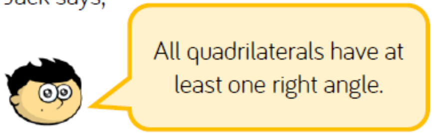
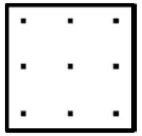
Calculate angles in a quadrilateral using known information	Calculate the missing angles.  	Jack says,  All quadrilaterals have at least one right angle. Draw two different shapes to prove Jack wrong. Measure and mark on the angles.	How many quadrilaterals can you make on the geoboard?  Identify the names of the different quadrilaterals. What do you notice about the angles in certain quadrilaterals? If your geoboard was 4 × 4, would you be able to make any different quadrilaterals?	been sorted? Repeating pattern, where would you position the ruler when measuring a line? Link to horizon, acute, obtuse, reflex, polygon, isosceles, scalene,

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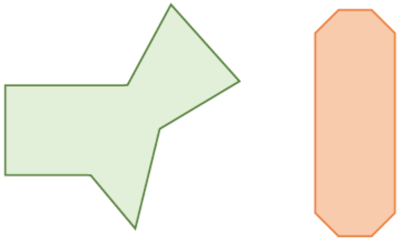
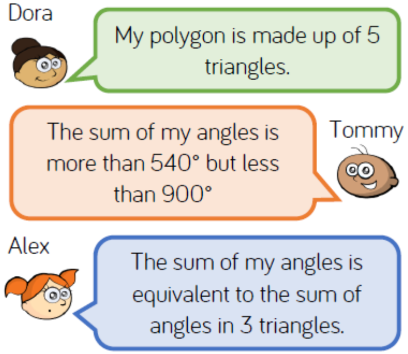
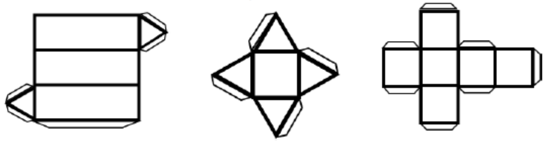
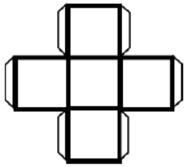
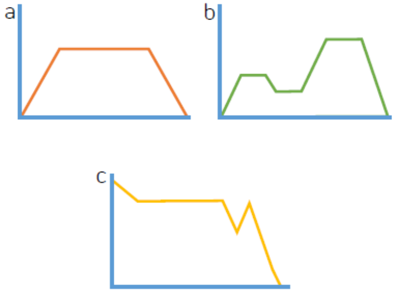
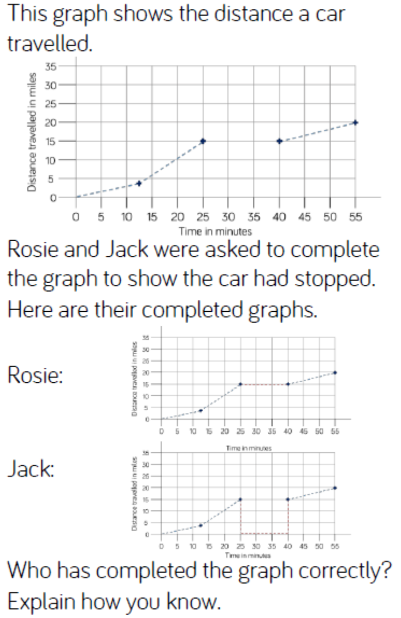
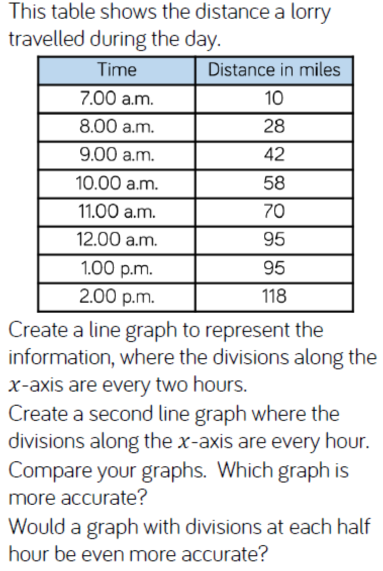
<table>
<tr>
<td>Calculate interior angles in polygons using known information</td>
<td>Use the same method to complete the table.
<table>
<tr><th>Shape</th><th>No. of sides</th><th>No. of triangles</th><th>180 × no. of triangles</th><th>Sum of internal angles</th></tr>
<tr><td>Quadrilateral</td><td>4</td><td>2</td><td>180 × 2</td><td>360°</td></tr>
<tr><td>Pentagon</td><td>5</td><td>3</td><td></td><td></td></tr>
<tr><td>Hexagon</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Heptagon</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table>
What do you notice?
Can you predict the angle sum of any other polygons?</td>
<td>6b. The sum of the interior angles of any octagon will always equal 1080˚.

Convince me that it is true.</td>
<td>Use the clues to work out what shape each person has.

Dora
My polygon is made up of 5 triangles.
Tommy
The sum of my angles is more than 540° but less than 900°
Alex
The sum of my angles is equivalent to the sum of angles in 3 triangles.
What is the sum of the interior angles of each shape?</td>
<td rowspan="2">equilateral, quadrilaterals, rhombus, parallelogram, trapezium, orientation, mirror line, 90 degrees, 180 degrees, 360 degrees, what is an angle? What is the size of the angle? What unit do we measure angles in? Angles around a point, how many right angles are there in a full turn? What is a polygon? Protractor, interior, exterior, what</td>
</tr>
<tr>
<td>Draw shapes accurately</td>
<td>On a piece of squared paper, accurately draw the shapes.
• A square with perimeter 16 cm.
• A rectangle with an area of 20 cm².
• A right-angled triangle with a height of 8 cm and a base of 6 cm.
• A parallelogram with sides 3 cm and 5 cm.</td>
<td>5a. Asha says,

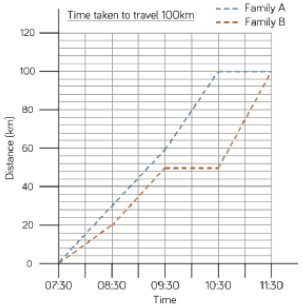
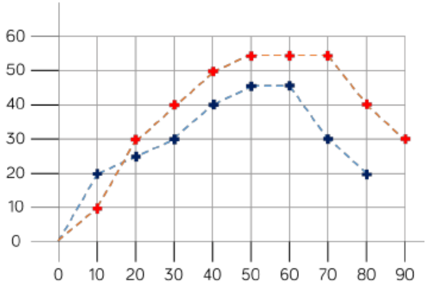
I know that the interior angles of a regular pentagon total 540°, so I think that one angle will measure 110°.
Is Asha correct? Explain why.
Draw a regular pentagon with sides of 5cm. Check the size of each interior angle.</td>
<td>Eva has drawn a scalene triangle.
Angle A is the biggest angle.
Angle B is 20° larger than angle C.
Angle C is the smallest angle, and it is 70° smaller than angle A.
Use a bar model to help you calculate the size of each angle, then construct Eva's triangle.
Is there more than one way to construct the triangle?</td>
</tr>
</table>

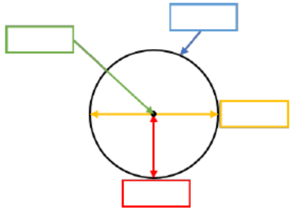
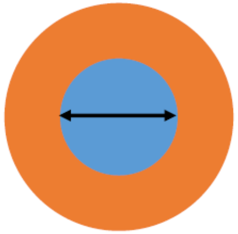
Identify 3 dimensional shapes in nets	What three-dimensional shape can be made from these nets?  Identify and describe the faces of each shape.	Dora thinks that this net will fold to create a cube.  Do you agree with Dora? Explain your answer.	Use Polydron to investigate how many different nets can be made for a cube.  Is there a rule you need to follow? Can you spot an arrangement that won't work before you build it? How do you know why it will or won't work? Can you record your investigation systematically?	do the interior angles of a triangle total? Does the size of the triangle matter? Hatch marks, angles in a triangle = 180 degrees, angles in a quadrilateral = 360 degrees, nets,

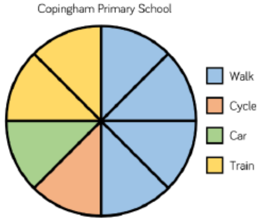
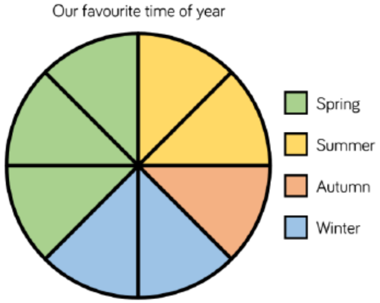
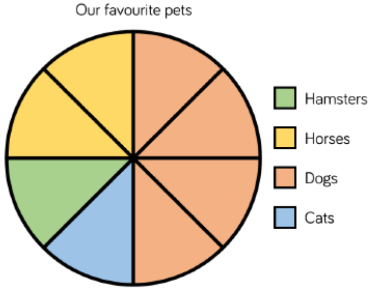
Year 6				
Statistics (can link across curriculum e.g. COMPUTING/Topic/P.E)				
Objective	**Skill it**	**Apply it**	**Deepen it**	**Mathematical talk**
Read and interpret line graphs	Provide questions where children have to retrieve information from a line graph. - What is the same/different about the two line graphs? - At what time of the day was the most rainfall recorded?	Explain the mistake made on the line graph. e.g. through miss labelling or a miss reading of information.	Write a story and 3 questions for each of the 3 graphs below. 	Where might you see a line graph in real life? How can you make sure you rea the graph accurately? Line graphs, circle, pie charts, radius, diameter, circumference, compass, x and y axis, intervals,

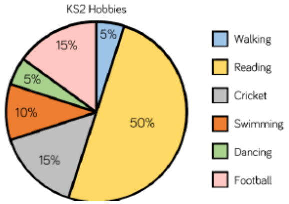
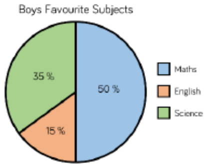
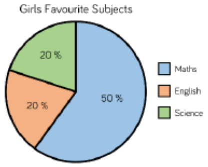
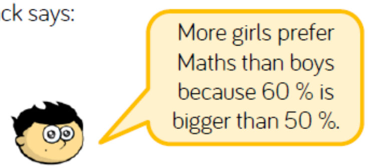
<table>
<tr>
<td>Draw line graphs accurately</td>
<td>Using a set of data, children then draw their own line graph. This could be from data gathered during science, measuring distances thrown in P.E. over a period of time.</td>
<td>This graph shows the distance a car travelled.

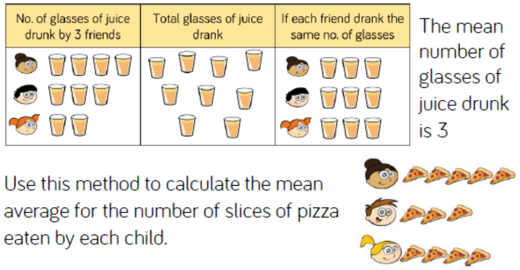
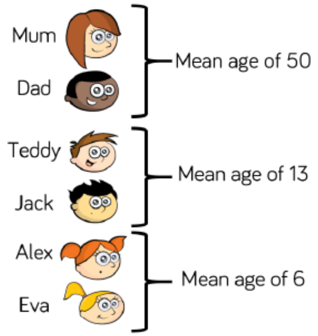
Rosie and Jack were asked to complete the graph to show the car had stopped. Here are their completed graphs.
Rosie:
Jack:
Who has completed the graph correctly? Explain how you know.</td>
<td>This table shows the distance a lorry travelled during the day.
<table>
<tr><th>Time</th><th>Distance in miles</th></tr>
<tr><td>7.00 a.m.</td><td>10</td></tr>
<tr><td>8.00 a.m.</td><td>28</td></tr>
<tr><td>9.00 a.m.</td><td>42</td></tr>
<tr><td>10.00 a.m.</td><td>58</td></tr>
<tr><td>11.00 a.m.</td><td>70</td></tr>
<tr><td>12.00 a.m.</td><td>95</td></tr>
<tr><td>1.00 p.m.</td><td>95</td></tr>
<tr><td>2.00 p.m.</td><td>118</td></tr>
</table>
Create a line graph to represent the information, where the divisions along the x-axis are every two hours.
Create a second line graph where the divisions along the x-axis are every hour.
Compare your graphs. Which graph is more accurate?
Would a graph with divisions at each half hour be even more accurate?</td>
<td>scale, frequency, data, centre, mean, Chart, bar chart, frequency table, Carroll diagram, Venn diagram, axis, axes, diagram pictograms, continuous data, line graphs, table, block diagrams, tally chart, quantity, diagram, one to one correspondence, what will each</td>
</tr>
</table>

Use line graphs to solve problems	 Two families were travelling to Bridlington for their holidays. They set off at the same time but arrived at different times. What time did family A arrive? How many km had each family travelled at 08:45? Which family stopped midway through their journey? How much further had they left to travel?	Explain the mistake made on the line graph. e.g. through miss labelling or a miss reading of information.	What could this graph be showing?  Label the horizontal and vertical axes to show this. Is there more than one way to label the axes?	symbol be worth? What will each block be worth? read and interpret, construct, tables, one and two step problems, what are the different ways to present data? Scale, sum, comparison, difference, how are line graphs different to bar charts? Discrete data, two-way
Dual bar charts				

Illustrate and name parts of a circle	Using the labels complete the diagram:  Radius Diameter Centre Circumference	Alex says:  The bigger the radius of a circle, the bigger the diameter. Do you agree? Explain your reasoning.	Here are 2 circles. Circle A is blue; Circle B is orange. The diameter of Circle A is $\frac{3}{4}$ the diameter of Circle B.  If the diameter of Circle B is 12 cm, what is the diameter of Circle A? If the diameter of Circle A is 12 cm, what is the radius of Circle B? If the diameter of Circle B is 6 cm, what is the diameter of Circle A? If the diameter of Circle A is 6 cm, what is the radius of Circle B?	tables, timetables, how can we use a ruler to support us in reading line graphs? How do the vertical and horizontal lines support you in reading the line graphs, why are column and row headings important in a table? If I am finding the difference what operation do I

Read and interpret pie charts Use fractions of amount to support their understanding of interpreting pie charts.	There are 600 pupils at Copingham Primary school. Work out how many pupils travel to school by: a) Train b) Car c) Cycling d) Walking 	In a survey people were asked what their favourite season of the year was. The results are shown in the pie chart below. If 48 people voted summer, how many people took part in the survey?  Explain your method.	96 people took part in this survey.  How many people voted for cats? $\frac{3}{8}$ of the people who voted for dogs were male. How many females voted for dogs? What other information can you gather from the pie chart? Write some questions about the pie chart for your partner to solve.	use? How can I calculate the total in the row/column?

Apply their understanding of calculating percentages of amounts to interpret pie charts.	Children show recognition that a pie chart represents 100%. There are 200 pupils in Key Stage 2 who chose their favourite hobbies. How many pupils chose each hobby? 	120 boys and 100 girls were asked which was their favourite subject. Here are the results:   Jack says:  Do you agree? Explain why.	Children could represent information provided in a pie chart in different ways e.g. line graph, table.	
Draw pie charts	Children build around the point of 360 degrees and recognise that this complete turn is 100%. They then go on to use a protractor to be able to accurately construct the rest of the pie chart.	Recongise any errors or misconceptions whilst drawing a pie chart. Able to explain the mistake that has been made and give examples on how to correct.	Children collect their own data to then convert into percentages – degrees- and into pie chart.	

Work out the mean	Here is a method to find the mean.  The mean number of glasses of juice drunk is 3 Use this method to calculate the mean average for the number of slices of pizza eaten by each child. Mean = Total ÷ number of items.	Children provided with an answer whereby an error has been made. They find the mistake and are able to correct successfully explain the misconception made.	Work out the age of each member of the family if: Mum is 48 years old. Teddy is 4 years older than Jack and 7 years older than Alex.  Calculate the mean age of the whole family.	

Year 6

Enterprise

Objective	Mathematical talk
What is meant by enterprise?	Enterprise, money, profit, loss, market, advertisement, critical consumer, loan, debt, tax, economic, sustainable, percentages, decimals, statistics, marketing.
Develop enterprising skills	
Recognise the role money	

plays in their own and others' lives	
Manage money	
Recognise how to be a critical consumer	
Develop initial understanding of; loan, interest, debt, tax	
Recognise how resources can be allocated in different ways and how these economic choices affect individuals and sustainability of the environment.	
Solve problems using measure (money), percentages (profits),	

decimals, statistics	
Listen and respond to others appropriately	
Use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas.	
Participate in discussions/ presentations/ debates	
Gain, maintain and monitor the interest of the listener.	