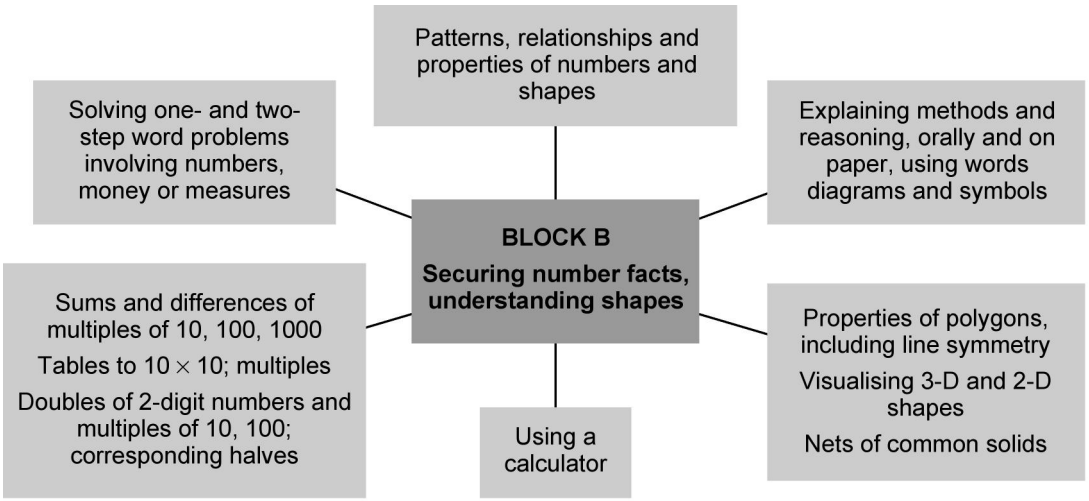
Year 4: Block B — Three 3-week units

Securing number facts, understanding shapes



Objectives End-of-year expectations (key objectives) are highlighted	Units 1	 2	 3
• Identify and use patterns, relationships and properties of numbers or shapes; investigate a statement involving numbers and test it with examples	✓	✓	✓
• Solve one-step and two-step problems involving numbers, money or measures, including time; choose and carry out appropriate calculations, using calculator methods where appropriate	✓		✓
• Use knowledge of rounding, number operations and inverses to estimate and check calculations	✓	✓	✓
• Report solutions to puzzles and problems, giving explanations and reasoning orally and in writing, using diagrams and symbols	✓	✓	✓
• Use knowledge of addition and subtraction facts and place value to derive sums and differences of pairs of multiples of 10, 100 or 1000	✓		✓
• Identify the doubles of two-digit numbers; use these to calculate doubles of multiples of 10 and 100 and derive the corresponding halves		✓	✓
• Derive and recall multiplication facts up to 10 × 10, the corresponding division facts and multiples of numbers to 10 up to the tenth multiple	✓	✓	✓
• Draw polygons and classify them by identifying their properties, including their line symmetry	✓	✓	✓
• Visualise 3-D objects from 2-D drawings; make nets of common solids	✓	✓	✓

Speaking and listening objectives for the block

Objectives	Units 1	 2	 3
• Listen to a speaker and make notes on the talk	✓		
• Investigate how talk varies with age, familiarity, gender and purpose		✓	
• Use time, resources and group members efficiently by distributing tasks, checking progress, making back-up plans			✓

Opportunities to apply mathematics in science

Activities		Units		
		1	2	3
4e	Friction: When investigating streamlining, make Plasticine shapes from drawings. Measure the time for them to drop in a cylinder of water.	✓	✓	
4d	Solids, liquids and how they can be separated: Measure volumes of liquids. Explain conservation when liquids are poured into different containers.			✓

Key aspects of learning: focus for the block

Enquiry	Problem solving	**Reasoning**	**Creative thinking**
Information processing	Evaluation	Self-awareness	**Managing feeling**
Social skills	Communication	Motivation	Empathy

Vocabulary

problem, solution, calculator, calculate, calculation, equation, operation, inverse, answer, method, explain, predict, reason, reasoning, pattern, relationship, rule, sequence, sort, classify, property

add, subtract, multiply, divide, sum, total, difference, plus, minus, product, quotient, remainder, double, halve, factor, multiple, divisor, round

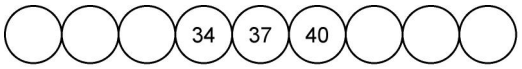
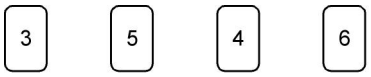
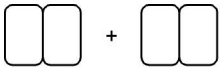
3-D, three-dimensional, 2-D, two-dimensional, net, construct, regular, irregular, concave, convex, symmetrical, line of symmetry, vertex, vertices, face, edge, polygon, equilateral triangle, isosceles triangle, quadrilateral, rectangle, square, oblong, hexagon, heptagon, octagon

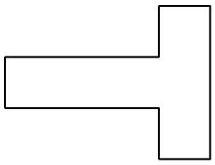
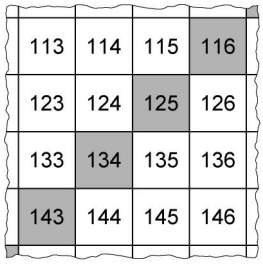
Building on previous learning

Check that children can already:

- recall addition and subtraction facts for each number to 20
- recall multiplication and division facts for the 2, 3, 4, 5, 6 and 10 times-tables
- say a subtraction fact that is the inverse of an addition fact, and a multiplication fact that is the inverse of a division fact, and vice versa
- identify the calculation needed to solve a one-step problem
- name common 2-D and 3-D shapes, and recognise a 3-D shape from a 2-D drawing of it
- draw a line of symmetry in a 2-D shape
- choose their own criterion for sorting a set of shapes

Unit 4B1 — 3 weeks

Objectives *Children's learning outcomes in italic*	**Assessment for learning**
• Identify and use patterns, relationships and properties of numbers or shapes; investigate a statement involving numbers and test it with examples *I can use what I know about polygons to group them into regular and irregular polygons*	Tell me some numbers that will divide exactly by 2, by 5, by 10. How do you know? Tell me a number that will divide exactly by 4. How do you know that a number will divide exactly by 4? Continue this number sequence in both directions. 
• Solve one-step and two-step problems involving numbers, money or measures, including time; choose and carry out appropriate calculations, using calculator methods where appropriate *I can work out how to solve problems with one or two steps* *I can decide what calculation to work out and whether a calculator will help me* *I can think about the numbers in a calculation and choose a good way to do the calculation*	Consider this problem. Jack bought some butter for 87p, some flour for £1.27 and some sugar for £2.15. What did he pay altogether? Explain what you did to get your answer. What made you decide which calculation to do? How would you work out Jack's change from a £10 note? Make up a word problem that would lead to each calculation: 9 × 5 63 ÷ 9 54 − 17 48 + 19 + 27 What are the important things to remember when you solve a word problem?
• Use knowledge of rounding, number operations and inverses to estimate and check calculations *I can round numbers in a calculation to help me estimate the answer to the calculation*	Circle the number that is about the same as the right answer to 49 + 48. 10 50 40 100 70 200
• Use knowledge of addition and subtraction facts and place value to derive sums and differences of pairs of multiples of 10, 100 or 1000 *Because I know sums like* *3 + 7 = 10, I also know* *30 + 70 = 100* *300 + 700 = 1000* *3000 + 7000 = 10 000* *Because I know differences like* *6 – 4 = 2, I also know* *60 – 40 = 20* *600 – 400 = 200* *6000 – 4000 = 2000*	Look at this number sentence: ○ + □ = 15. What could the two missing numbers be? What else? Tell me all the pairs of whole numbers that make 15. How do you know you have got them all? What is 13 – 8? What other pairs of numbers have a difference of 5? Look back at a calculation you have done (choose one that has not been marked right or wrong). Explain how you did it. Think of another way to do it and try it out. Which is the best way to use? Why?
• Derive and recall multiplication facts up to 10 × 10, the corresponding division facts and multiples of numbers to 10 up to the tenth multiple *I can work out division facts for the 1, 2, 3, 4, 5 and 6 times-tables* *I can count in 6s from zero to 60*	Use these four digit cards.  Use each of the digits once to make a total that is a multiple of 5.  If someone has forgotten the 6 times-table, what tips would you give them to help them work it out? If you know 4 × 6 = 24, how does this help you to work out 24 ÷ 6?

Objectives *Children's learning outcomes in italic*	**Assessment for learning**
• Draw polygons and classify them by identifying their properties, including their line symmetry *I know facts about regular polygons such as the number of sides and number of angles* *I can pick out irregular polygons that have at least one right angle*	Sort these irregular polygons into those with no right angles, one right angle, two right angles, three right angles. Use these triangular tiles to make a symmetrical shape. Can you take one tile away and keep your shape symmetrical? Can you change one or more tiles so it is no longer symmetrical? This is half a symmetrical shape. Tell me how you would complete it. How did you use the line of symmetry to complete the shape? What do you look for when you try to find a line of symmetry in a shape?
• Visualise 3-D objects from 2-D drawings; make nets of common solids *If I see a drawing of a cube or a pyramid I can visualise the solid shapes* *I can make a net for an open cube and fold it to check that it is correct*	Draw in lines where you would fold this shape to make a cube. Use a ruler to measure where they would go.  I am thinking of a 3-D shape. It has a square base. It has four other faces, which are triangles. What is the name of the 3-D shape?
• Report solutions to puzzles and problems, giving explanations and reasoning orally and in writing, using diagrams and symbols *I can explain to the class how I solved a problem* *I can draw a diagram to show how I solved a problem*	Here is part of a number square. The shaded numbers are part of a sequence. Explain the rule for the sequence.  Explain what you did to get your answer to the problem.
• Listen to a speaker and make notes on the talk *I can listen to and understand how other people solved a problem. I can decide which method I think is the best*	Listen to your partner's explanation of how she recognises a line of symmetry in a shape. What was the most important point that your partner made?

Learning overview

Children rehearse and improve their recall of number facts. They use their understanding of the **inverse relationship** between addition and subtraction to state the addition facts corresponding to any subtraction fact, and vice versa. They know, or can derive quickly, all **addition and subtraction facts for each number to 20**, and continue to play games and solve puzzles to practise recalling these facts. They combine known facts with understanding of place value to **add and subtract multiples of 10, 100 and 1000**. For example, they use the fact that 19 – 5 = 14 to establish that 190 – 50 = 140, 1900 – 500 = 1400, and 19 000 – 5000 = 14 000.

Children round numbers to the nearest 10 and 100 and then round money to the nearest pound. They recognise that **rounding** helps them to estimate the result of a calculation. They also realise that they can use their understanding of **inverses** to **check the accuracy of calculations.**

Children rehearse their knowledge of the 2, 3, 4, 5 and 6 times-tables. They count in steps of 6 from zero and investigate the patterns of multiples in the 100-square. They use the **patterns** to answer questions such as: *Will 72 be in the pattern? How do you know?* They answer questions such as:

How many sixes are in 54? and *What is the missing number in* 6 × □ = 54*?* They compare the multiples of 6 with the multiples of 3 and spot that the former are double the latter.

When they **solve word problems** involving numbers, money or measures, children decide what calculation to do and how to do it: mentally, on paper or using a calculator. They set their solution back in the context of the problem to judge whether it is reasonable. They solve problems such as:

For her party Asmat spent £2.88 on apples, £3.38 on bananas and £3.76 on oranges. Will a £10 note cover the cost? Explain your reasoning.

A chocolate bar costs 19p. How many bars can be bought for £5?

How many lengths of 9 cm can I cut from 183 cm of ribbon?

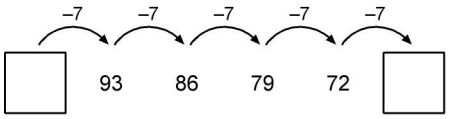
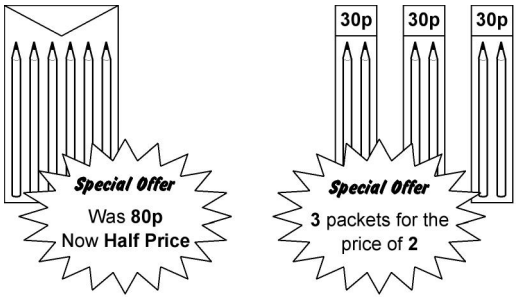
Children extend their knowledge of **2-D shapes**. They name equilateral triangles, isosceles triangles and heptagons, and know that polygons are closed flat shapes with straight sides. They learn that polygons can be regular or irregular and that a regular polygon has equal sides and equal angles. They explore polygons that have equal sides but unequal angles, and those that have equal angles but unequal sides. They describe properties of polygons using correct mathematical vocabulary, such as: has more than one right angle, is regular, has two or more sides of equal length, is a quadrilateral, etc. They classify polygons, using Carroll or Venn diagrams when appropriate. They **justify their reasoning**, **explaining** to others why some shapes may not fit their chosen criteria.

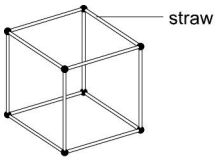
Using their understanding of the properties of 2-D shapes, children **investigate problems** such the maximum number of right angles in a triangle, quadrilateral, pentagon, …

Children extend their knowledge of properties of **3-D shapes.** They identify the shapes of faces of common 3-D shapes, and count the number of faces, edges and vertices (corners) of cubes, cuboids, pyramids and prisms. From their experience of handling 3-D shapes and describing their properties, they visualise mental images of the shapes. They can name a 3-D shape which has been secretly hidden in a drawstring bag. They look at drawings of 3-D shapes and relate them to real shapes. By unfolding packets they begin to understand how a **net folds up to create a 3-D shape**.

Children contribute throughout to class discussions. They listen to the responses of others and **identify the main points of the speaker**. They compare their solutions and suggest alternatives.

Unit 4B2 3 weeks

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Identify and use patterns, relationships and properties of numbers or shapes; investigate a statement involving numbers and test it with examples *I can see number patterns in the answers to the 3 times-table and can explain how the pattern works* *I can spot a rule about the number of lines of symmetry that regular polygons have*	What are the two missing numbers in this sequence?  Look at these coins.  Which of these amounts can you make using only two coins each time? 61p 52p 20p £1.05 80p
• Use knowledge of rounding, number operations and inverses to estimate and check calculations *If I add two numbers I can use subtraction to check whether my answer is correct* *If I divide one number by another I can use multiplication to check whether my answer is correct*	I rounded a number to the nearest 10. The answer is 320. What number could I have started with? The local newspaper says that 1200 people watched a local football match. This was given to the nearest 100. What is the smallest number that could have attended? What is the largest number? If the answer to a subtraction is 59 and I subtracted 45, what number did I start with? How do you know?
• Report solutions to puzzles and problems, giving explanations and reasoning orally and in writing, using diagrams and symbols *I can write an explanation of how I solved a problem. I can include number sentences using the +, – , × or ÷ signs where I need to*	A shop has these special offers.  Joe wants to buy six pencils. Which is the cheaper offer: half price, or 3 packets for the price of 2? Explain how you know.
• Identify the doubles of two-digit numbers; use these to calculate doubles of multiples of 10 and 100 and derive the corresponding halves *Because I know that double 7 is 14, I know that double 70 is 140* *I can work out doubles of numbers with two digits*	I'm thinking of a number. I halve it and get the answer 55. What number was I thinking of? How do you know? Double 13 is 26. What other number facts can you work out from this? Tell me about the connection between halving and doubling. Start with 86 to explain the connection. Ben told me that if you double 16 you get 32. He says that this means that double 160 is 320. Is Ben right? How do you know?
• Derive and recall multiplication facts up to 10 × 10, the corresponding division facts and multiples of numbers to 10 up to the tenth multiple *I can tell you answers to the 8 times-table, even when the questions are not in order*	How can doubling help you work out multiples of 8? Which are the multiples of 8 in this list of numbers? 18 32 56 68 72

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Draw polygons and classify them by identifying their properties, including their line symmetry *I can use what I know about triangles to group them into equilateral triangles, isosceles triangles and other triangles* *I can pick out triangles that have a right angle from other triangles* *I can recognise symmetrical polygons, including those with more than one line of symmetry*	What is the difference between a regular and an irregular polygon? [Use a set of regular and irregular polygons, and criteria written on cards, such as 'is a regular polygon', 'is an irregular polygon', 'has no lines of symmetry', 'has at least one line of symmetry', 'has no right angles', 'has one right angle', etc. Select a card, e.g. 'is an irregular polygon'.] Show me a polygon in this group? How do you know it is in the group? What do you look for? [Select two cards, such as 'is a regular polygon' and 'has at least one line of symmetry'.] Show me a polygon that fits both of these criteria. What do you look for?
• Visualise 3-D objects from 2-D drawings; make nets of common solids *If I see a drawing of a cube I can imagine the solid shape* *I can make different nets for cubes and fold them to check they are correct*	Name three different 3-D shapes that can have at least one square face. Here is a cereal packet. Describe what you think its net might look like. Anna makes a cube using straws. First she joins four straws to make a square. Then she joins more straws to make a cube.  Altogether, how many straws has she used?
• Investigate how talk varies with age, familiarity, gender and purpose *I can compare the way my teacher describes a shape with the way that my friend describes the same shape*	There is a 3-D shape inside this drawstring bag. Feel it and then describe the shape to me. Now I will feel it and describe it to you. What were the main differences between the way that I described the shape and the way that you described the shape?

Learning overview

Children **count forwards and backwards** in steps of different sizes and rehearse knowledge of **multiplication and division facts** for the 2, 3, 4, 5, 6 and 10 times-tables. They know that multiplication and division are **inverse operations** and they use this to derive the associated division facts for any given multiplication fact. They apply their knowledge of multiplication and division facts to solve equations, such as □ ÷ 6 = 9, and word problems such as:

There are 8 biscuits in a pack. I want 48 biscuits for a party. How many packs do I need to buy?

I bought 72 biscuits for another party. How many packs of biscuits did I buy?

Children show their understanding by creating similar multiplication and division problems for others to solve.

Children begin to learn the **8 times-table**. They know that multiplication can be done in any order and they relate previously learnt multiplication facts to the new facts that they are learning. They **investigate** how **doubling**, doubling and doubling again is equivalent to multiplying by 8. Through listing multiples of 2, 4 and 8 they recognise that multiples of 4 are double multiples of 2 and multiples of 8 are double multiples of 4. They respond to questions such as: *Can you tell me five numbers that are both multiples of 4 and multiples of 8?* They recognise that knowing 4 × 8 = 32 helps them to work out 32 ÷ 8, 8 × 8, 40 × 8, 320 ÷ 8, etc. They **identify patterns** in multiplication facts. For example, they look at the last digit of multiples of 4 and discover that multiples of 4 end in 0, 2, 4, 6 or 8. They use a calculator to test larger numbers and discover that although a multiple of 4 can end in 8, it does not necessarily mean that all numbers that end in 8 are multiples of 4.

Children relate doubling to both addition and multiplication. They realise that 7 + 7 is equivalent to 7 × 2. They know the doubles of one-digit numbers and learn how to **double two-digit numbers**, first multiples of 10, then numbers 11 to 20, and then numbers beyond 20. They discuss mental strategies such as 'double the tens, double the ones, and add them together'. Using their knowledge of inverses, they relate halving to dividing by 2. They first halve multiples of 10, then numbers in the twenties, forties, sixties and eighties, and then the remaining two-digit numbers. They record their mental strategies in jottings, as in:

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    84                          74
80  +   4                   70  +   4
↓       ↓   + 2             ↓       ↓   + 2
40  +   2   = 42           35  +   2   = 37
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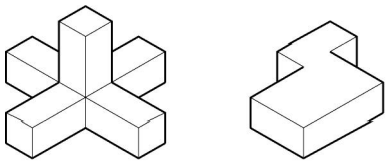
Children extend their knowledge of **properties of 2-D shapes**. They name equilateral, isosceles and right-angled triangles, and identify whether a polygon is concave or convex. They recognise symmetrical polygons, both regular and irregular, and cases where a polygon has no lines of symmetry, or one, two or more lines of symmetry; for example, they try to draw a hexagon with no lines of symmetry, one line of symmetry, two lines of symmetry, etc.

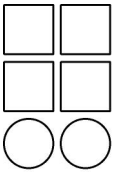
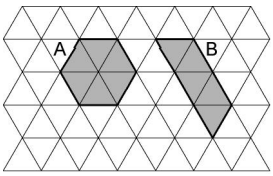
Children apply their understanding of properties of 2-D shapes to solve problems. For example, they **investigate a statement** such as: *'The number of lines of symmetry in a regular polygon is equal to the number of sides of the polygon*' by finding examples that match it.

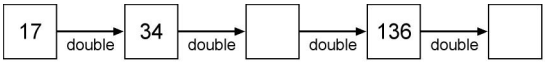
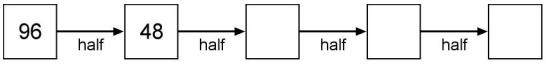
Children continue to develop the skill of **visualising 3-D objects from 2-D drawings**. They look at a picture of a model made from interlocking cubes and predict the least number of cubes needed to build it. They then build the shape to check whether they are correct.

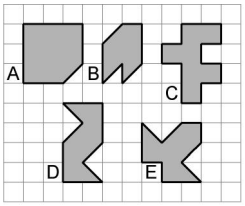


Children describe 2-D and 3-D shapes using mathematical vocabulary. In pairs they sit back to back and pretend to have a telephone conversation during which they describe a shape to each other. They note how **talk varies with purpose** and how precise their language needs to be when they cannot use drawings to convey meaning. They use their knowledge of the faces of 3-D shapes to begin to construct their own **net of a cuboid**. They respond to questions such as: *What 3-D shape has a face that is an equilateral triangle?* They construct the net of an open cube using a set-square and ruler to draw the five squares. They then construct the net of an open cuboid.

Unit 4B3 3 weeks

Objectives *Children's learning outcomes in italic*	**Assessment for learning**
• Identify and use patterns, relationships and properties of numbers or shapes; investigate a statement involving numbers and test it with examples *I can start with a calculation such as 18 – 3 = 15 and use number patterns to create a family of calculations with the same answer:* *180 – 30 = 150* *190 – 40 = 150* *200 – 50 = 150* *I can draw polygons on triangular grid paper and pick out some of the properties they have in common*	Name a multiple of 6 that is also a multiple of 9. Using the numbers 6, 8 and 48, create some sentences using the vocabulary *product*, *factor*, *multiplied by* and *multiple of.* Here are some polygons. Decide on a property and classify them according to your property. Explain your decisions to me. What colour is each shape? Write it on the shape.  **Clues** • Red is not next to grey. • Blue is between white and grey. • Green is not a square. • Blue is on the right of pink.
• Solve one-step and two-step problems involving numbers, money or measures, including time; choose and carry out appropriate calculations, using calculator methods where appropriate *I can work out how to solve problems with one or two steps* *I can decide what calculation to work out and whether a calculator will help me* *I can think about the numbers in a calculation and choose a good way to do the calculation*	Sort these problems into those you would do mentally and those you would do with pencil and paper. Explain why. John wanted to use his calculator to add 463 and 319. He entered 263 + 319 by mistake. What could he do to correct his mistake? A Add 200. B Add 2. C Subtract 2. D Subtract 200.
• Report solutions to puzzles and problems, giving explanations and reasoning orally and in writing, using diagrams and symbols *I can describe how I solved a problem about shapes using mathematical vocabulary*	This grid has two shaded shapes.  Leon says: 'Shape A has a larger area than shape B.' Explain how he could have worked this out.
• Use knowledge of rounding, number operations and inverses to estimate and check calculations *I can use inverse operations to help me check calculations* *If you give me a number fact, I can tell you some related facts*	6 + 7 = 13. Write three other facts that you can work out from the addition fact. 48 ÷ 8 = 6. Write three other facts that you can work out from the division fact. Write a calculation that you could do to check that the answer to 53 × 4 is 212.

Objectives *Children's learning outcomes in italic*	**Assessment for learning**
• Use knowledge of addition and subtraction facts and place value to derive sums and differences of pairs of multiples of 10, 100 or 1000 *Because I know number facts such as 8 – 3 = 5, I know that 80 – 30 = 50. I can use this to work out calculations such as 86 – 36 = 50* *I can find differences between numbers such as 2993 and 3000 because I know facts such as 3 + 7 = 10*	Which three numbers in this list have a sum of 190? 10 30 50 70 90 How did you work it out? Which pairs of these numbers have a difference of 60? 190 30 70 130 90 How did you work it out?
• Identify the doubles of two-digit numbers; use to calculate doubles of multiples of 10 and 100 and derive the corresponding halves *I can work out doubles of two-digit numbers* *Because I know that double 9 is 18, I know that double 900 is 1800* *Because I know that double 80 is 160, I know that half of 160 is 80* *I know that doubling and halving are inverse operations*	What are the missing numbers in this sequence?  Complete the number pattern. 
• Derive and recall multiplication facts up to 10 × 10, the corresponding division facts and multiples of numbers to 10 up to the tenth multiple *I can tell you answers to the 9 times-table, even when the questions are not in order* *If you give me a multiplication fact I can give you one or two division facts that go with it* *I know what a factor of a number means. I can find all the factors of 36*	If you count in nines from zero, which digits change? How? Why do they change like this? Show me the pattern on the 100-square. How does the pattern help you to work out, say, six nines? How can you build the 9 times-table from the 3 and 6 times-tables? If you know 4 × 9 = 36, how does this help you to work out 36 ÷ 9? What are the missing numbers in this number sentence? Are there any other possibilities? □ × ○ = 18 What is the missing number in this number sentence? 9 × □ = 54 How do you know?
• Visualise 3-D objects from 2-D drawings; make nets of common solids *When I look at a drawing of a 3-D shape I can work out what shapes I need to make its net, such as four triangles and a square to make a square-based pyramid*	Match these 3-D shapes to these pictures of them. There are three shapes in a row. What order are they in and what colour are they? **Clues** • The cube is in the middle. • The pink shape is not on the right. • The red shape is next to the pyramid. • The cone is not blue.

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Draw polygons and classify them by identifying their properties, including their line symmetry *I can pick out 2-D shapes that have more than one line of symmetry* *I can draw lots of different polygons on squared paper and tell you their mathematical names* *I can draw all the shapes made from squares placed edge to edge and tell you what sort of polygon each one is*	A shape has four right angles. It has four sides which are not all the same length. What is the name of this shape? Sort a set of polygons using this sorting diagram. <table><tr><th>shapes</th><th>no sides equal</th><th>only 2 sides equal</th><th>more than 2 sides equal</th></tr><tr><td>3 sides</td><td></td><td></td><td></td></tr><tr><td>more than 3 sides</td><td></td><td></td><td></td></tr></table> Here are five shapes on a square grid.  Which two shapes have a line of symmetry?
• Use time, resources and group members efficiently by distributing tasks, checking progress, making back-up plans *I can work with a group of other children to discuss and plan how we will solve a problem*	I want you to work in a group to solve this problem. You have 45 minutes. Decide how you will work together and share the tasks. Make sure you ask someone to be the timekeeper to keep a check on your progress.

Learning overview

Children extend their knowledge of multiplication facts to the **9 times-table**. They recognise how multiplication facts previously learned, such as multiples of 3 and 6, can help to derive multiples of 9. They use a range of vocabulary associated with multiplication and division including *multiple*, *factor* and *product*. They use arrays to recognise connections between multiplication facts and division facts and identify factors of a number by creating arrays for that number. They extend their knowledge of **number properties** to **solve problems and puzzles**. They find a pair of numbers with a sum of 15 and a product of 54. They use knowledge of **inverses** to solve problems such as: *I think of a number, add 2 and multiply by 3. The answer is 15. What was my number?*

Children continue to **double** one- and two-digit numbers and find the **corresponding halves**. This is extended to calculating **doubles and halves of multiples of 10 and 100**; for example, if double 9 is 18, then double 90 is 180, and half of 180 is 90. Children discuss their work and **explain patterns and rules** using **mathematical language and symbols**. They explore a **number sequence** arising from a given rule, for example 'double the last number and subtract 1' (2, 3, 5, 9, …). They discuss the resulting sequence by asking and answering questions such as: *What are the gaps between the numbers?* and *What if the rule were double and add 1?*

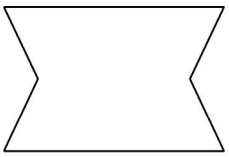
Children continue to improve their **knowledge of number facts**, recalling them quickly and applying them accurately. They know all addition and subtraction facts to 20 and use these facts to **add and subtract multiples of 10, 100 and 1000**. They work out mentally calculations such as 387 – 50 or 3000 – 2993. Given one number statement, they use number patterns and their knowledge of place value to record related statements. For example, they start with 18 – 3 = 15 and use number patterns to create a family of equations each with the same answer, such as 180 – 30, 190 – 40, 200 – 50, etc. They explain the connection between the original and related calculations.

Children **solve one- and two-step problems**, choosing and carrying out appropriate calculations. They identify stages in a problem. They decide what calculations to do and how best to do them: mentally, on paper or using a calculator. They identify how the result of the calculation fits with the context of the original problem. They continue to use their knowledge of **rounding, number operations and inverses** to **check calculations**.

Children extend their knowledge of **properties of shapes**. They draw polygons on triangular grid paper. They identify properties such as number of sides, types of angle, lines of symmetry. They draw closed straight-sided shapes with their vertices on the intersections of a squared grid. They recognise these shapes as polygons. They assign the correct mathematical names to each one.

They apply their knowledge of properties of shapes to **solve mathematical problems or puzzles**. They **collaborate in groups** to investigate the different shapes that can be made by fitting two identical right-angled triangles together edge to edge. They **distribute tasks between themselves**, **think creatively**, and regularly check progress to see what new shapes have been discovered.

They continue to **visualise** shapes. Starting with a rectangular sheet of paper they try to fold it and then make one straight cut to make this hexagon.



Children continue to use their experience of **3-D shapes** to enable them to visualise solids. They construct a model using cubes, take a digital photograph of it, then challenge others to recreate it. They put 72 interlocking cubes together to make a 2 by 3 by 12 cuboid, and then work out what other cuboids they can make using 72 cubes. They create **nets** of a closed cube, a square-based pyramid and a triangular prism.