



Mathematics: Maths No Problem Calculation Policy 2026

MATHS 
NO PROBLEM!



Maths — No Problem!

Calculation Policy



Introduction

Maths — No Problem! materials use real-world contexts to help pupils understand the importance of mathematics in their everyday lives.

The progression of calculation skills, focusing on addition, subtraction, multiplication and division is developed using a Concrete Pictorial Abstract (CPA) approach and delivered through problem solving.

Key mathematical ideas are reinforced using Bruner's spiral curriculum: a teaching approach in which each subject or skill area is revisited in intervals at a more sophisticated level each time.

The **Maths — No Problem!** Calculation Policy guides practitioners through a clear progression of key skills and representations at each year group.

Number

Addition and Subtraction (Whole number)

Year 1

Count to 100 (first 0 – 10, then to 20, then to 40 then to 100). Read and write numbers from 0 to 100 (first 0 – 10, then to 20, then to 40 then to 100). Compare and order numbers from 0 to 100 (first 0 – 10, then to 20, then to 40 then to 100). Make different number bonds for numbers up to 10. Make number stories Complete number patterns. Use a place-value chart to show numbers in tens and ones. Find how much more. Count in twos, fives and tens to 100. Say a number that is 1 more or 1 less than a 2-digit number.

Add by counting. Add by counting on. Make addition stories. Write addition equations. Subtract by crossing out. Subtract using number bonds. Subtract by counting back. Make subtraction stories. Write subtraction equations. Make a family of addition and subtraction facts. Add by making 10. Add by adding ones. Subtract by subtracting ones. Subtract by subtracting from 10. Solve word problems involving addition or subtraction.

Year 2

Count to 100.
Read and write numbers to 100.
Compare and arrange numbers within 100. Make and complete number patterns.

Add numbers without renaming.
Add numbers with renaming.
Subtract numbers without renaming.
Subtract numbers with renaming.
Add three numbers. Draw models for different situations.

Year 3

Count to 1000.
Count in hundreds, tens and ones.
Count in fifties.
Count in fours and eights. Tell the value of a digit in a number.
Compare and arrange numbers within 1000. Complete number patterns.

Add numbers without renaming.
Add numbers with renaming.
Subtract numbers without renaming.
Subtract numbers with renaming.
Solve word problems involving addition and subtraction.

Year 4

Count to 10 000.
Count in thousands, hundreds, tens and ones. Count in twenty-fives. Count in sixes, sevens and nines.
Tell the number that a digit stands for.
Compare and arrange numbers within 10 000. Describe and complete number patterns.
Round numbers and estimate sum and difference.
Read and write numbers to 1 000 000.

Add numbers without renaming.
Add numbers with renaming.
Add numbers mentally. Subtract numbers without renaming.
Subtract numbers with renaming.
Subtract numbers mentally. Solve word problems involving addition and subtraction.

Year 5

Tell the place value of a digit in a number.
Compare and arrange numbers within 1 000 000. Count forwards or backwards in steps of 1000, 10 000 and 100 000.
Round numbers to the nearest 10, 100, 1000, 10 000 and 100 000.

Add whole numbers with more than 4 digits.
Add numbers mentally. Subtract whole numbers with more than 4 digits. Subtract numbers mentally. Use rounding to check answers.
Solve word problems involving addition, subtraction, multiplication and division, and a combination of these.

Year 6

Read and write numbers to 10 million.
Compare and arrange numbers within 10 million. Tell the place value of a digit in a number.
Round numbers to the nearest 10, 100, 1000, 10 000, 100 000 and 1 000 000.

Perform mental calculations. Use estimation to check answers to calculations. Use the order of operations. Solve problems involving addition and subtraction. multiplication and division.

Multiplication and Division (Whole number)

Year 1

Make equal groups. Add equal groups to find the total number of objects.
Group things equally. Share things equally. Solve word problems about multiplication.

Year 2

Do my 2, 5 and 10 times table. Write multiplication equations.
Divide a number by 2, 5 and 10. Write multiplication and division equations.
Write a family of multiplication and division facts. Recognise odd and even numbers.
Solve word problems using the 2, 5 and 10 times tables. Solve word problems involving multiplication and division.

Year 3

Do my 3, 4 and 8 times table.
Divide a number by 3, 4 and 8.
Solve word problems involving the 3, 4 and 8 times tables.
Solve word problems involving the division of 3, 4 and 8.

Year 4

Multiply by 6, 7, 9, 11 and 12.
Divide by 6, 7, 9, 11 and 12. Divide to find quotient and remainder.
Solve word problems involving multiplication and division.
Multiply without regrouping. Multiply with regrouping. Divide without regrouping. Divide with regrouping. Find the quotient and remainder in division. Solve word problems involving multiplication and division.

Year 5

Find multiples and common multiples. Find factors and common factors.
Identify prime and composite numbers. Recognise square numbers and cube numbers, and use the notation for squares (e.g. 42) and cubes (e.g. 23). Multiply numbers up to 4 digits by a 1-digit number. Multiply numbers up to 3 digits by a 2-digit number. Multiply and divide mentally. Multiply and divide numbers by 10, 100 and 1000. Divide 3-digit and 4-digit numbers. Solve word problems involving addition, subtraction, multiplication and division, and a combination of these.

Year 6

Multiply numbers up to 4 digits by a 2-digit whole number.
Divide numbers up to 4 digits by a 2-digit whole number.
Interpret remainders in division. Identify common factors, common multiples and prime numbers. Solve problems involving multiplication and division. Solve problems involving the calculation and conversion of units of measure.

Fractions

Show a half.
Show a quarter.
Group/share things to get a half or a quarter.
Find a half or a quarter of a group of things.

Make and show halves, quarters and thirds. Name and write a fraction.
Name fractions that make one whole.
Compare and order fractions.
Count wholes with halves, quarters and thirds.
Find part of a set and a quantity.

Count in tenths. Make number pairs that form one whole.
Add and subtract two fractions. Find and list equivalent fractions.
Write a fraction in its simplest form. Compare fractions.
Find part of a set and fraction of a number. Share a number equally.
Write fractions on the number line. Write fractions that are greater than 1.
Solve word problems involving fractions.

Count in hundredths. Write and show mixed numbers on a number line.
Find equivalent fractions. Simplify fractions and mixed numbers.
Add and subtract fractions. Solve word problems involving fractions.

Find equivalent fractions of a given fraction.
Recognise mixed numbers and improper fractions and convert from one form to the other.
Compare and order fractions. Add and subtract fractions.
Multiply proper fractions and mixed numbers by whole numbers.

Find equivalent fractions using common multiples.
Simplify fractions using common factors. Compare and order fractions.
Add and subtract fractions. Multiply proper fractions. Divide proper fractions by whole numbers. Relate division of whole numbers to fractions and decimals.

	Decimals	Percentage
Year 1		
Year 2		
Year 3		
Year 4	Recognise and write tenths. Recognise and write hundredths. Compare numbers with the same number of decimal places. Complete number patterns involving decimals. Round decimals with one decimal place to the nearest whole number. Recognise and write decimal equivalents of $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$. Divide a 1- or 2-digit number by 10 and by 100.. Solve simple measure and money problems involving decimals.	
Year 5	Read and write decimals up to three decimal places. Compare and order decimals up to three decimal places. Write fractions as decimals. Add and subtract decimals. Round decimals with two decimal places to the nearest whole number and to one decimal place. Solve problems involving decimals up to three decimal places.	Recognise the per cent symbol (%). Find percentages of a given number. Interpret a percentage as a fraction of an amount.
Year 6	Relate division of whole numbers to fractions and decimals. Write fractions as decimals. Tell the place value of digits in a decimal number. Multiply and divide decimals with 1-digit and 2-digit whole numbers.	Calculate the percentage of a number and a quantity. Use percentage to describe changes. Use percentage to compare.

Length**Area and Perimeter****Volume****Year 1**

Compare the length of objects.
Measure the length of objects.

Year 2

How to measure length in metres (m).
How to measure length in centimetres (cm).
When to use cm or m to measure length.
How to compare and order length.
How to measure and draw lines.
How to solve word problems on length.

Year 3

Write length in metres (m) and centimetres (cm). Convert length from m and cm to cm. Convert length from cm to m and cm. Write length in kilometres (km) and metres (m). Convert length from km and m to m. Convert length from m to km and m. Compare different lengths. Solve word problems on length.

Measure the total length around a shape.
Find the perimeter of figures using a square grid.
Find the perimeter of figures in centimetres (cm) and metres (m).
Find the perimeter of squares and rectangles

Measure volume in millilitres (ml) and litres (l).
Measure capacity in ml and l. Write volume in ml and l.
Write capacity in ml and l.
Solve word problems on volume and capacity

Year 4

Measure and estimate length.
Convert units of length.

Measure perimeter in different units.

Measure and estimate volume.
Convert units of volume.

Year 5

Convert measurements of length.
Solve problems involving measurements.

Find the perimeter of a figure. Find the area of a figure. Use scale diagrams to find the perimeter and the area of a figure.
Estimate the area of a figure.

Find and compare the volumes of solids.
Find and compare the capacity of rectangular boxes.
Estimate volume and capacity. Convert units of volume.
Solve word problems involving volume.

Year 6

Find the perimeter and the area of rectangles, triangles and parallelograms. Use formulae to find the area of rectangles, triangles and parallelograms. Use the area of rectangles to find the area of other types of polygons.

Find the volume of solids by counting unit cubes. Calculate the volume of cubes and cuboids in standard units (mm^3 , cm^3 , m^3 and km^3). Solve problems involving volume.

	Geometry	Mass	Temperature
Year 1	Name solids and shapes. Look for shapes in solids. Group shapes. Make and complete patterns with shapes.	Compare the mass of objects. Find the mass of objects.	
Year 2	Name triangles, quadrilaterals and polygons. Identify the number of sides and vertices of a shape. Identify the lines of symmetry of a shape or figure. Form different figures with shapes. Name the shapes that make up a figure. Sort shapes. Draw figures on a square grid and a dot grid. Make and complete patterns. Tell how patterns are formed from shapes. Move shapes. Turn shapes. Recognise flat faces and curved surfaces. Name and describe spheres, cuboids, cubes, cylinders, cones, pyramids and prisms. Identify the number of faces, edges and vertices of a shape. Fold two-dimensional shapes into three-dimensional ones. Group shapes in different ways. Form structures with shapes. Make patterns with shapes.	Measure mass in kilograms (kg). Measure mass in grams (g). Compare and order mass. Solve word problems on mass.	Read a thermometer. Measure and write down the temperature.
Year 3	Recognise an angle. Find angles in shapes. Find a right angle, an acute angle and an obtuse angle. Compare the sizes of angles. Make a half turn, a three-quarters turn and a full turn.	Read the scales for mass in kilograms (kg) and grams (g). Solve word problems on mass.	
Year 4	Identify acute and obtuse angles. Compare and order angles. Compare and classify triangles and quadrilaterals. Identify lines of symmetry in 2-D shapes. Complete a simple symmetrical figure with respect to a specific line of symmetry.	Measure and estimate mass. Convert units of mass.	
Year 5	Identify acute angles, right angles, obtuse angles and reflex angles. Draw and measure given angles. Identify angles on a straight line and angles that meet at a point. Find unknown angles in squares and rectangles. Identify regular polygons. Identify 3-D shapes from 2-D drawings.	Convert measurements of mass. Solve problems involving measurements.	Tell the temperature. Solve problems involving measurements.
Year 6	Recognise angles that meet at a point, angles on a straight line, and vertically opposite angles. Find unknown angles in triangles, quadrilaterals and regular polygons. Identify the radius, diameter, circumference and centre of a circle. Draw 2-D shapes using given dimensions and angles. Identify and draw nets of 3-D shapes.		

	Money	Time	Graphs
Year 1	Recognise coins. Recognise notes.	Tell time to the hour. Tell time to the half hour. Compare different times. Recognise dates on a calendar.	
Year 2	Name coins and notes. Count an amount of money. Show amounts of money in different ways. Exchange coins and notes. Compare amounts of money. Calculate change. Solve word problems on money.	Tell and write the time to 5 minutes. Draw hands on a clock face to show time. Find the duration of time. Find the ending or starting time. Compare and sequence intervals of time. Know the number of minutes in an hour. Know the number of hours in a day.	Read information from pictograms, block diagrams, tally charts and tables. Make pictograms, block diagrams, tally charts and tables. Solve problems using information from pictograms, block diagrams, tally charts and tables.
Year 3	Name the amount of money in pounds and pence. Use different ways to show the same amount of money. Add money in pounds and pence. Subtract money in pounds and pence. Calculate change in pounds and pence. Solve word problems on money.	Tell and write time in a.m. and in p.m. Tell and write time using "past" and "to". Tell and write time shown on different types of clocks. Measure time in seconds, hours and minutes. Find starting time, ending time and duration. Change minutes to seconds, and seconds to minutes. Find the number of days using a calendar. Know the number of days in each month, year and leap year.	Draw picture graphs and bar graphs. Read and interpret bar graphs. Solve problems using information from bar graphs.
Year 4	Count an amount of money and write it using decimals. Compare different amounts of money. Round money to the nearest £ and to the nearest £10. Estimate total amounts of money. Solve problems involving money.	Tell time using the 24-hour clock. Change time in minutes to seconds. Change time in hours to minutes. Change time in years to months. Change time in months to years. Find the duration, starting time and finishing time. Solve word problems on time.	Use a table to show information. Draw, read and interpret tables, picture graphs, bar graphs and line graphs. Solve problems using information from tables and graphs.
Year 5		Convert measurements of time. Solve problems involving measurements.	Read and interpret information in a timetable. Read, interpret and complete information in a table. Read and interpret information from a line graph. Solve word problems using information from a line graph.
Year 6			Calculate and interpret the mean as an average. Draw and read pie charts. Draw and read graphs. Solve problems using information provided by graphs.

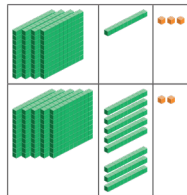
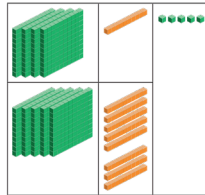
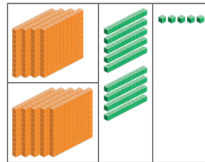
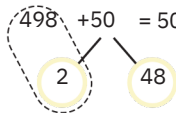
	Position and Movement	Ratio	Negative Numbers	Algebra	Roman Numerals
Year 1	Name positions in a race and in a queue. Name positions from the left and from the right. Use words such as before, after, next to, last and between to name positions. Describe positions. Describe movements. Describe turns.				
Year 2					
Year 3					
Year 4	Describe positions using coordinates. Plot points and form figures on the grid. Describe movement including translation of figures.				Read and write Roman numerals for 1 to 20. Read and write Roman numerals to 100.
Year 5	Write the coordinates of points. Describe translations and reflections. Find the position of a shape after translation or after reflection.				Write Roman numerals up to 1000. Write years in Roman numerals.
Year 6	Use coordinate grids with negative numbers. Describe positions of points with coordinates. Draw, translate and reflect simple shapes on the coordinate plane.	Compare quantities and numbers using ratios. Solve problems involving ratios.	Add and subtract negative numbers. Use negative numbers in context. Solve problems involving negative numbers.	Describe and complete a pattern. Write and evaluate algebraic expressions. Write and use formulae. Solve equations.	

Addition Calculation Policy

Year 3



Year	Topic/Strand	Representation	Key Idea
Year 3	Part – Part – Whole		This is a mathematical structure that underpins all addition situations. Numbers can be understood in terms of their parts; understanding that the parts are part of a larger collection. Pupils develop an understanding of the parts and the whole within an equation.
Year 3	Counting on Using a Number Line		The use of the number line is further developed when counting starts from a given number, relying on pupils' ability to locate and count from a given number, including starting from a 3-digit number. Initially a 1-digit number is added to a 3-digit number, then this progresses to a number line shown with intervals of 1, then 10 and eventually to 100.
Year 3	Base 10 Blocks		The use of base 10 blocks provides a representation of the place value of 3-digit numbers. This representation is related to the formal written method but also encourages pupils to use their understanding of adding the same noun to add 3-digit numbers. For example, 200 + 500 can be understood as 2 hundreds + 5 hundreds. The sum of these numbers is 700 or 7 hundreds. Progression is made by adding ones, then tens and finally hundreds before the addition of all 3 is under taken. An understanding of place value will support addition as well as subtraction, multiplication and division.

Year	Topic/Strand	Representation	Key Idea																																													
Year 3	Formal Written Method	413 + 582 = Step 1 Add the ones. 3 ones + 2 ones = 5 ones  <table><tr><th>h</th><th>t</th><th>o</th></tr><tr><td>4</td><td>1</td><td>3</td></tr><tr><td>5</td><td>8</td><td>2</td></tr><tr><td colspan="3"> </td></tr><tr><td></td><td></td><td>5</td></tr></table> Step 2 Add the tens. 1 ten + 8 tens = 9 tens  <table><tr><th>h</th><th>t</th><th>o</th></tr><tr><td>4</td><td>1</td><td>3</td></tr><tr><td>5</td><td>8</td><td>2</td></tr><tr><td colspan="3"> </td></tr><tr><td></td><td>9</td><td>5</td></tr></table> Step 3 Add the hundreds. 4 hundreds + 5 hundreds = 9 hundreds  <table><tr><th>h</th><th>t</th><th>o</th></tr><tr><td>4</td><td>1</td><td>3</td></tr><tr><td>5</td><td>8</td><td>2</td></tr><tr><td colspan="3"> </td></tr><tr><td>9</td><td>9</td><td>5</td></tr></table> 413 + 582 = 995	h	t	o	4	1	3	5	8	2						5	h	t	o	4	1	3	5	8	2					9	5	h	t	o	4	1	3	5	8	2				9	9	5	This procedural method progresses from the renaming of 10 ones into 1 ten to include the renaming of 10 tens to 1 hundred. The procedure remains unchanged from Year 2. Pupils understand that at this stage, they start with the addition of the ones, then the tens, then finally the hundreds. This method is supported with base 10 block representation. The formal written method is always accompanied by a written equation to ensure that the relationship between the representations is made.
h	t	o																																														
4	1	3																																														
5	8	2																																														
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9	9	5																																														
Year 3	Adding by Making 100	498 + 50 = 498 + 50 = 500 + 48 	Pupils are given the opportunity to further develop their number sense by using a ‘make 100’ strategy with numbers that are ‘near hundreds’. They use their part–whole understanding to rename a given number to make 100. For example, 498 + 50 can be renamed as 498 + 2 + 48. Pupils add 2 to 498 to make 500, then add the remaining 48.																																													

Year	Topic/Strand	Representation	Key Idea
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Year 3

Estimating

Lulu: I had 593 points. 593 is about 600.
 $600 + 50 = 650$

Sam: I had 695 points. 695 is about 700.
 $700 + 70 = 770$

Hannah: I had 498 points. 498 is about 500.
 $500 + 50 = 550$

Pupils use their number sense to recognise numbers close to a hundred and how estimation can help accuracy in completing a precise calculation.

Year 3

Adding Fractions

$\frac{1}{6}$ $\frac{5}{6}$

1 sixth and 5 sixths make 6 sixths.
 $\frac{1}{6} + \frac{5}{6} = \frac{6}{6}$
 $= 1$

Pupils use their understanding of adding the same noun when adding fractions with the same denominator.

The adding of fractions uses equations and is supported through pictorial representation.

Addition Calculation Policy

Year 4



Year	Topic/Strand	Representation	Key Idea
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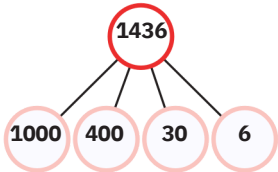
Year 4

Part – Part – Whole



A number can be expressed as a sum of the values of its digits.

$$1436 = 1000 + 400 + 30 + 6$$

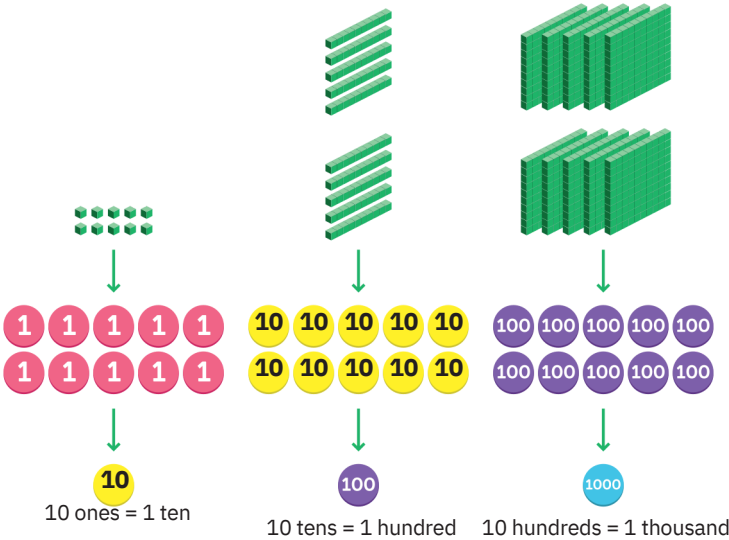


This is a mathematical structure that underpins all addition situations. Numbers can be understood in terms of their parts; understanding that the parts are part of a larger collection. The bar model is used as a representation of a problem that can be related to a part-whole addition situation.

Pupils develop an understanding of the parts and the whole within an equation.

Year 4

Base 10 Blocks



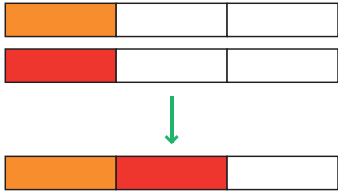
The use of base 10 blocks provides a representation of the place value of 3-digit numbers.

This representation is related to the formal written method but also encourages pupils to use their understanding of adding the same noun.

In Year 4, a transition between base 10 blocks and place-value counters takes place.

Year	Topic/Strand	Representation	Key Idea
Year 4	Place-Value Counters	4506 + 3125 = Step 1 Add the ones. 6 ones and 5 ones = 11 ones Rename the ones. 11 ones = 1 ten and 1 one 4506 + 3125 ----- 7631 4506 + 3125 ----- 7631	Place-value counters are used to represent addition situations. This transition relies on pupils understanding the value of each counter without being able to count its physical attributes. Pupils will have the opportunity to rename 10 counters of the same value to 1 counter with a value 10 times greater and vice versa. The idea of composing and decomposing at a rate of 10 should be well understood at this stage.

Year	Topic/Strand	Representation	Key Idea
Year 4	Formal Written Method	$4188 + 3245 =$ $\begin{array}{r} 4188 \\ + 3245 \\ \hline 13 \\ 120 \\ 300 \\ + 7000 \\ \hline 7433 \end{array}$ $\begin{array}{r} 2612 \\ + 4264 \\ \hline 6876 \end{array}$ Add the ones. Add the tens. Add the hundreds. Add the thousands.	Pupils will have the opportunity to use a long and short version of this procedural method. In the long representation, the sum of adding each place is shown in its entirety before being added to find the final sum. In the short representation, the sum of each place is shown as part of the total sum and as a small number added to an existing place when a ten of one place is made. The procedure remains unchanged from Year 2.
Year 4	Estimating the Sum	Start by estimating. $4188 \approx 4200$ $3245 \approx 3200$ $4200 + 3200 = 7400$	Estimation is introduced as an approach to start a calculation. Estimation is a skill that helps develop number sense. Pupils are expected to be able to decide if an answer is reasonable. Beginning a calculation with estimation is developed during the addition chapter.
Year 4	Making 10 and Making 100	make 10 $4072 + 8 =$ $4072 + 8 = 4070 + 10$ $4072 + 8 = 4080$ make 100 $97 + 5213 =$ $97 + 5213 = 100 + 5210$ $= 5310$	A mental method that involves renaming numbers to make 10 or 100 before finding the sum. Pupils develop their number sense by recognising numbers close to a ten or close to a hundred and renaming a number in the equation to bring a number to the nearest 10 or nearest 100 without having to compensate the sum.

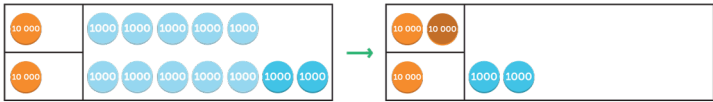
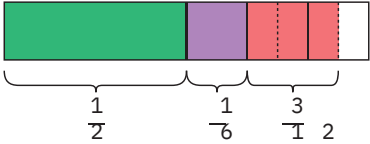
Year	Topic/Strand	Representation	Key Idea
Year 4	Adding Using Compensation	1 Lulu used this method to find the sum of 3067 and 9. $3067 + 10 = 3077$ $3067 + 9 = 3076$ 1 less I know adding 9 is 1 less than adding 10. 	A mental method that uses a similar equation in which a number in the original calculation is shown to the nearest 10 or 100 before carrying out the calculation. This calculation is used to help find the sum of the original equation.
		2 Ravi used this method to find the sum of 98 and 5262. $100 + 5262 = 5362$ $98 + 5262 = 5360$ 2 less I know adding 98 is 2 less than adding 100. 	
Year 4	Adding Fractions	 $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$	Pupils use their understanding of adding the same noun when adding fractions with the same denominator. The adding of fractions uses equations and is supported through pictorial representation. Pupils use their understanding of equivalence to ensure denominators are the same before carrying out the addition.

Addition Calculation Policy

Year 5



Year	Topic/Strand	Representation	Key Idea
Year 5	Counting on Using Place-Value Counters	$32\,541 + 24\,000 =$ Count on 4000 in 1000s.	Pupils use place-value counters to support counting on in thousands to find the sum.
Year 5	Counting on Using Number Lines	Count on 24 000 from 32 541. $32\,541 + 4000 = 36\,541$ $36\,541 + 20\,000 = 56\,541$ $32\,541 + 24\,000 = 56\,541$	Pupils count in thousands and ten thousands, using a number line to show this counting on method.

Year	Topic/Strand	Representation	Key Idea
Year 5	Formal Written Method	 1 5 0 0 0 + 1 0 7 0 0 — 3 2 0 0 0 15 000 + 17 000 = 32 000 5thousands + 7 thousands = 12 thousands 12thousands = 1 ten thousand + 2 thousands	Place-value counters are used to represent the formal written method. The procedure remains unchanged from Year 2.
Year 5	Adding Fractions	Add $\frac{1}{2} + \frac{1}{6}$ and $\frac{3}{12}$.  $\frac{1}{2} + \frac{1}{6} + \frac{3}{12} = \frac{6}{12} + \frac{2}{12} + \frac{3}{12}$ $= \frac{11}{12}$	Pupils use their understanding of adding the same noun when adding fractions with the same denominator. The adding of fractions uses equations and is supported through pictorial representation. Pupils use their understanding of equivalence to ensure denominators are the same before carrying out the addition.

Year	Topic/Strand	Representation	Key Idea
Year 5	Adding Decimals	0.1 kg pancakes 0.1 is 1 tenth. sweetcorn fritters 0.2 kg 0.1 + 0.2 = 0.3 1 tenth and 2 tenths make 3 tenths.	Pupils use their understanding of adding the same nouns when adding tenths. Tenths are represented using bar models, written words and equations.
Year 5	Adding Decimals Using the Formal Written Method	$ \begin{array}{r} \text{£ } 1 \text{ . } 80 \\ + \text{£ } 0.70 \\ \hline \text{£ } 2 \text{ . } 50 \end{array} $	The procedure for adding decimals using a formal written method is the same as when adding whole numbers, but attention needs to be given to the decimal point. The decimal point does not represent a place but separates the whole from the fractional part of a number. Careful alignment is needed when adding decimal numbers using a formal written method.

Addition Calculation Policy

Year 6



Year	Topic/Strand	Representation	Key Idea
Year 6	Addition within Order of Operations	First, carry out all the operations in (). Next, perform all the multiplication and division. Then, calculate all the addition and subtraction. Calculate. (a) $(1 + 3) \times 5 - 7 =$ (b) $1 + (3 \times 5) - 7 =$ (c) $(1 + 3) \times (7 - 5) =$	Pupils utilise the previous addition skills within mixed operation equations. Addition is carried out after multiplication and division. If only addition and subtraction are present in an equation, pupils work from left to right.
Year 6	Adding Fractions	$\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$	Pupils use their understanding of adding the same noun when adding fractions with the same and different denominators. Pupils use their understanding of equivalence to ensure the nouns and the denominators are the same before the calculation is completed.
Year 6	Adding Decimals		Pupils use their understanding of adding the same nouns when adding decimal numbers. They use place-value knowledge and composing and decomposing at a rate of 10 when adding decimals. The procedure remains the same as adding whole numbers.

Year	Topic/Strand	Representation	Key Idea
Year 6	Bar Models	There are 6 + 4 units altogether. 10 units = 240 1 unit = 24	Pupils are expected to utilise previously learned addition skills within increasingly complex situations. The procedure of addition is often at a level previously learned in isolation but the skill being developed is identifying when to use addition within a problem.

Subtraction Calculation Policy

Year 3



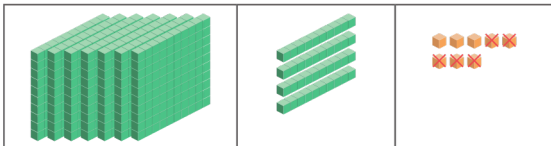
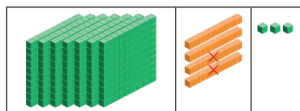
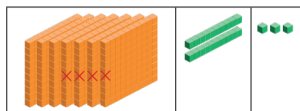
Year	Topic/Strand	Representation	Key Idea
Year 3	Par t-Par t-Whole		This is a mathematical structure that underpins subtraction situations. Numbers can be understood in terms of their parts; understanding that the parts are part of a larger collection. Pupils develop an understanding of the parts and the whole within an equation.
Year 3	Counting Back Using a Number Line	796 – 600 = 196	The use of the number line is further developed when counting back starts from a given number, relying on pupils' ability to locate and count back from a given number, including starting from a 3-digit number. Initially a 1-digit number is subtracted from a 3-digit number, then this progresses to a number line shown with intervals of 1, then 10 and then progressing to 100.
Year 3	Base 10 Blocks	796 – 600 = 196 There were 196 people left at the airport.	The use of base 10 blocks provides a representation of the place value of 3-digit numbers. This representation is related to the formal written method but also encourages pupils to use their understanding of subtracting the same noun to subtract from 3-digit numbers. For example, 700 – 400 can be understood as 7 hundreds – 4 hundreds. The difference between these numbers is 300 or 3 hundreds. Progression is made by subtracting ones, then tens and finally hundreds before the subtraction of all 3 places is undertaken. An understanding of place value will support subtraction as well as addition, multiplication and division.

Year	Topic/Strand	Representation	Key Idea
Year 3	Formal Written Method	507 – 143 = Step 1 Subtract the ones.	

This procedural method progresses from the renaming of 10 ones into 1 ten to include the renaming of 10 tens to 1 hundred when necessary. The procedure itself remains unchanged from Year 2.

Pupils understand that at this stage, they start with the subtraction of the ones, then the tens, then finally the hundreds.

This method is supported with base 10 block representation. The formal written method is always accompanied by a written equation to ensure that the relationship between the representations are made.

Year	Topic/Strand	Representation	Key Idea																							
Year 3	Inverse Operation	748 – 425 = Step 1 Subtract the ones. 8 ones – 5 ones = 3 ones  <table><tr><th>h</th><th>t</th><th>o</th></tr><tr><td>7</td><td>4</td><td>8</td></tr><tr><td>– 4</td><td>2</td><td>5</td></tr><tr><td></td><td></td><td>3</td></tr></table> Pupils should understand that subtraction is the inverse operation of addition. They are encouraged to check completed subtraction calculations using addition.	h	t	o	7	4	8	– 4	2	5			3												
h	t	o																								
7	4	8																								
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Year 3	Difference Using a Bar Model	Step 2 Subtract the tens. 4 tens – 2 tens = 2 tens  <table><tr><th>h</th><th>t</th><th>o</th></tr><tr><td>7</td><td>4</td><td>8</td></tr><tr><td>– 4</td><td>2</td><td>5</td></tr><tr><td></td><td>2</td><td>3</td></tr></table> Step 3 Subtract the hundreds. 7 hundreds – 4 hundreds = 3 hundreds  <table><tr><th>h</th><th>t</th><th>o</th></tr><tr><td>7</td><td>4</td><td>8</td></tr><tr><td>– 4</td><td>2</td><td>5</td></tr><tr><td>3</td><td>2</td><td>3</td></tr></table> 748 – 425 = 323 323 tomatoes are left.  Check your answer using addition. 323 + 425 = 748 Pupils are required to find the difference in a comparison problem when represented by a bar model. To find the difference, the known part is subtracted from the quantity it is being compared to. The comparison model reinforces the understanding of difference in subtraction.	h	t	o	7	4	8	– 4	2	5		2	3	h	t	o	7	4	8	– 4	2	5	3	2	3
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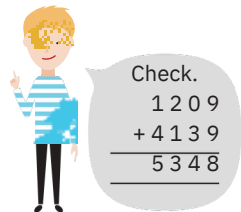
Subtraction Calculation Policy

Year 4



Year	Topic/Strand	Representation	Key Idea
Year 4	Par t-Par t-Whole	$ \begin{array}{r} 432 \\ \begin{array}{r} 400 \quad 20 \quad 12 \\ -100 \quad -10 \quad -9 \\ \hline 300 \quad 10 \quad 3 \end{array} \end{array} $	This is a mathematical structure that underpins subtraction situations. Numbers can be understood in terms of their parts; understanding that the parts are part of a larger collection. Pupils develop an understanding of the parts and the whole within an equation.
Year 4	Place-Value Counters	What is the difference between 432 and 119? There are not enough ones. Rename 1 ten as 10 ones. $ \begin{array}{r} 432 \\ \begin{array}{r} 400 \quad 20 \quad 12 \\ -100 \quad -10 \quad -9 \\ \hline 300 \quad 10 \quad 3 \end{array} \end{array} $	Place-value counters are used to represent subtraction situations. This transition from base 10 blocks relies on pupils understanding the value of each counter without being able to count its physical attributes. Pupils will have the opportunity to rename 1 counter to 10 counters with a value 10 times smaller in order to carry out a formal written method. The idea of decomposing at a rate of 10 should be well understood at this stage.

Year	Topic/Strand	Representation	Key Idea
Year 4	Formal Written Method	Rename 1 ten to 10 ones. $\begin{array}{r} 5 \quad 3 \quad \cancel{4} \quad \overset{3}{18} \\ - 4 \quad 1 \quad 3 \quad 9 \\ \hline \end{array}$ ↓ Now there are enough ones to subtract. $\begin{array}{r} 5 \quad 3 \quad \cancel{4} \quad \overset{3}{18} \\ - 4 \quad 1 \quad 3 \quad 9 \\ \hline 1 \quad 2 \quad 0 \quad 9 \end{array}$	Pupils will use the formal written method initially without renaming, and then move to subtraction that requires renaming. The procedure remains the same as learned in Year 3 but the numbers increase to include 4-digit numbers being subtracted from 4-digit numbers.

Year	Topic/Strand	Representation	Key Idea
Year 4	Using Addition to Check Subtraction	$\begin{array}{c} 5348 \\ \swarrow \quad \downarrow \quad \searrow \\ 5000 \quad 300 \quad 30 \quad 18 \end{array}$ Step 1 Subtract the ones. 18 ones – 9 ones = 9 ones Step 2 Subtract the tens. 3 tens – 3 tens = 0 tens Step 3 Subtract the hundreds. 3 hundreds – 1 hundred = 2 hundreds Step 4 Subtract the thousands. 5 thousands – 4 thousands = 1 thousand 5348 – 4139 = 1209 $\begin{array}{r} 5 \quad 3 \quad 3 \quad 18 \\ - 4 \quad 1 \quad 3 \quad 9 \\ \hline 1 \quad 2 \quad 0 \quad 9 \end{array}$ 	Pupils are encouraged to check subtraction calculations by adding the parts (the subtrahend and the difference) to ensure the sum is equal to the whole (the minuend).
Year 4	Mental Methods	$3002 - 198 = 2804$ $\begin{array}{c} 3002 \\ \swarrow \quad \searrow \\ 2802 \quad 200 \end{array}$ $200 - 198 = 2$ 3002 – 198 = 2802 + 2 	Mental subtraction methods include partitioning the minuend to simplify the subtraction calculation. The approach shown is supported by an understanding of number bonds to 10 and to 100.

Year	Topic/Strand	Representation	Key Idea
Year 4	Subtracting Fractions		Pupils use their understanding of subtracting the same nouns when subtracting fractions with the same denominator. The subtraction of fractions or finding the difference between fractions is supported through pictorial representation. Pupils use their understanding of equivalence to ensure denominators are the same before carrying out the subtractions.

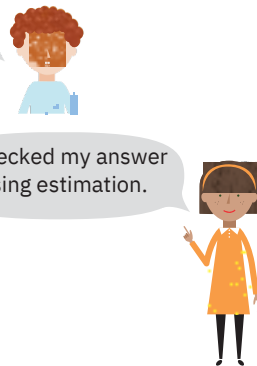
Subtraction Calculation Policy

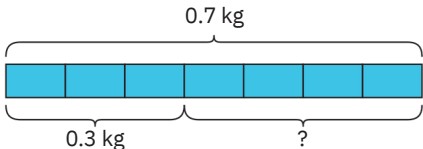
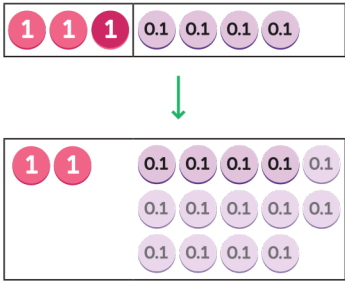
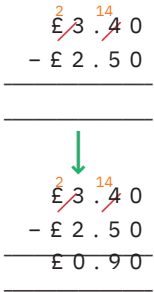
Year 5



Year	Topic/Strand	Representation	Key Idea
Year 5	Counting Back Using Place-Value Counters	Subtract 3000 from 650 452. Start at 650 452. Count back in 1000s. How can I count back from 50000? You could exchange 10 000 for ten 1000. 650 452 650 452 647 452 650 452 - 3000 = []	Pupils use place-value counters to support counting back in thousands to find the difference.
Year 5	Counting Back Using Number Lines	Count back 30 000 from 153 672. 123 672 133 672 143 672 153 672 153 672 - 30 000 = []	Pupils count back in thousands and ten thousands, using a number line to show this counting back method.

Year	Topic/Strand	Representation	Key Idea
Year 5	Formal Written Method	55 400 – 13 700 = 10 00010 00010 000 10 000 100010001000 1000 100100100100 ↓ Rename 1 thousand as 10 hundreds. 10 00010 00010 000 10 000 100010001000 1000 100100100100100 100100100100100 ↓ Subtract 7 hundreds from 14 hundreds. 10 00010 00010 000 10 000 100010001000 1000 100100100100100 100100100100100 Subtract the thousands. 5⁴4¹⁴00 – 1300 1700 Subtract the ten thousands. 5⁴4¹⁴00 – 1300 41700 4¹⁴140 – 130 70 0 70 0	Place–value counters are used to represent the formal written method. The procedure to subtract using numbers up to 6-digits using the formal written method remains the same as when it was first introduced. Pupils begin at the least value place and work to the left through the places to find the difference. Renaming takes place when a calculation in a place cannot be done. Again, this procedure is the same as when this was first learned and requires the renaming of the minuend. The renaming of the minuend is also represented using a number bond, providing the foundation for mental methods that require renaming.

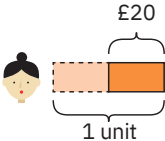
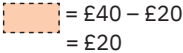
Year	Topic/Strand	Representation	Key Idea
Year 5	Checking by Using Estimation and Addition	$75\,241 - 34\,658 = 40\,583$ $\begin{array}{r} 40\,583 \\ + 34\,658 \\ \hline 75\,241 \end{array}$ I checked my answer using addition. $75\,241 - 34\,658 \approx 75\,000 - 35\,000 = 40\,000$ I checked my answer using estimation. 	Pupils are encouraged to check the reasonableness of their answers by initially finding an estimated difference. When using estimation to check, pupils initially round to the nearest thousand before calculation. When using addition to check the difference, pupils add the difference and the subtrahend to check it is equal to the minuend.
Year 5	Subtracting Fractions	 $1 - \frac{6}{12} = \frac{6}{12} - \frac{6}{12}$ $= \frac{0}{12}$  $\frac{6}{12} - \frac{5}{12} = \frac{1}{12}$ $\frac{6}{12} = \frac{11}{12}$ 	Pupils use their understanding of subtracting the same nouns when subtracting fractions with the same denominator. The subtraction of fractions or finding the difference between fractions is supported through pictorial representation. Pupils use their understanding of equivalence to ensure denominators are the same before carrying out the subtractions.

Year	Topic/Strand	Representation	Key Idea
Year 5	Subtracting Decimals	Find the difference between 0.7 kg and 0.3 kg.  $0.7 - 0.3 = 0.4$	Pupils use their understanding of subtracting the same nouns when subtracting tenths. Tenths are represented using bar models, written words and equations.
Year 5	Subtracting Decimals Using the Formal Written Method	Find the difference between £3.40 and £2.50.  	The same procedure for subtracting decimals using a formal written method is the same as when subtracting whole numbers but attention needs to be given to the decimal point. The decimal point does not represent a place but separates the whole from the fractional part of a number. Careful alignment is needed when subtracting decimal numbers using a formal written method.
Year 5	Subtracting Decimals Using Equivalence		Pupils use their understanding of equivalence to subtract a decimal from a whole number. For example, when calculating $4 - 0.6$ we can rename 4 as 40 tenths, so the calculation becomes 40 tenths $- 6$ tenths. Once the nouns are the same, the subtraction can be carried out. 40 tenths $- 6$ tenths = 34 tenths = 3.4

Subtraction Calculation Policy

Year 6



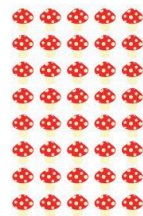
Year	Topic/Strand	Representation	Key Idea
Year 6	Subtraction within Order of Operations	First, carry out all the operations in (). Next, perform all the multiplication and division. Then, calculate all the addition and subtraction. $15 - 4 \times 3 = 15 - 12$ $= 3$ $(15 - 4) \times 3 = 11 \times 3$ $= 33$  Follow the order of operations. Multiply, then subtract.  First, do the subtraction in the (). Then multiply.	Pupils utilise the previous subtraction skills within mixed operation equations. Subtraction is carried out after multiplication and division. If only addition and subtraction are present in an equation, pupils work from left to right.
Year 6	Bar Models	 	Pupils are expected to utilise previously learned subtraction skills within increasingly complex situations. The procedure of subtraction is often at a level previously learned in isolation but the skill being developed is identifying when to use subtraction within a problem.

Multiplication Calculation Policy

Year 3



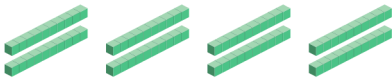
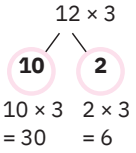
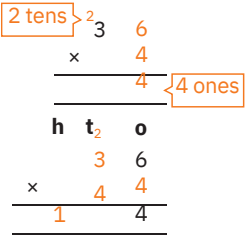
Year	Topic/Strand	Representation	Key Idea
Year 3	Counting in 3s, 4s and 8s		When a pupil knows that the size of a group is 3, 4 and 8 and the group size remains consistent, they can count in multiples of 3, 4 and 8 to find the product. Counting in multiples is supported by representation on a number line.
Year 3	Equal Groups		Multiplication by 3, 4 and 8 is shown initially using equal groups. Specific language is used to support these examples, in this case '4 groups of 3', and this is immediately followed by the equation 4×3 . This forms the basis of using known facts to find unknown facts.
Year 3	Number Line		Counting in multiples is shown on a number line. Multiples of 3, 4 and 8 are used as the intervals on a number line to support skip counting using these multiples.



Year	Topic/Strand	Representation	Key Idea
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Year 3	Fact Families	$12 \div 3 = 4$ $4 \times 3 = 12$	The relationship between multiplication and division is shown using fact families. The product is a result of multiplying factors and dividing the product by a factor will equal the factor used during multiplication.
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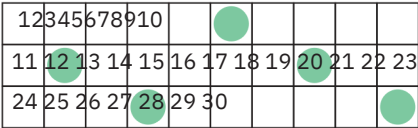
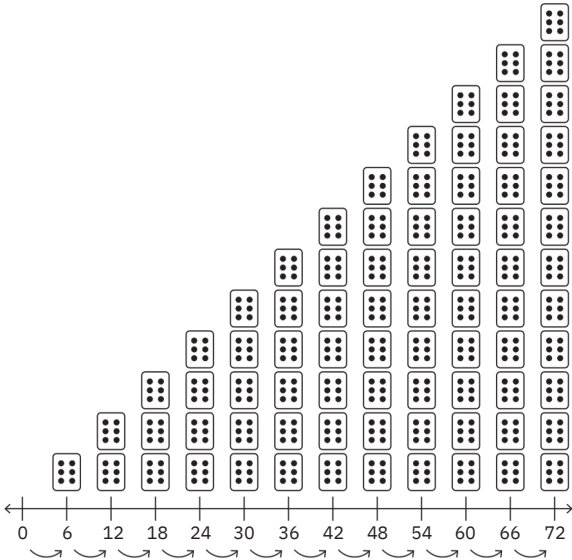
Year 3	Multiplication Using Bar Models	How many hens are in the red hen house? There are 6 hens outside. There are 12 hens in the red hen house. $2 \times 6 = 12$	Bar models are used in multiplicative comparison problems. Pupils use multiplication skills to determine quantities in comparison to another quantity. Language such as 'twice as many', 'three times as many' and so on is developed in relation to multiplicative comparison problems.
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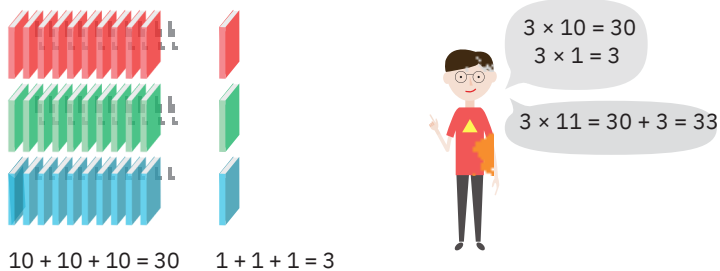
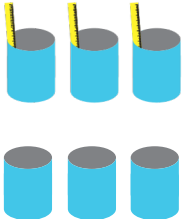
Year	Topic/Strand	Representation	Key Idea
Year 3	Base 10 Blocks	Multiply 2 tens by 4.  $4 \times 2 \text{ tens} = 8 \text{ tens}$ $4 \times 20 = 80$ 	Base 10 blocks are used to support the understanding of multiplication of 2-digit numbers. Language and understanding is developed through the representation of 3×20 as $3 \times 2 \text{ tens} = 6 \text{ tens}$. Pupils use known multiplication tables to 10 together with the place-value names of the digits being used to carry out the multiplication.
Year 3	Number Bonds		Number bonds are used to show numbers partitioned into tens and ones before being multiplied. The examples being used move from a number bond relating to an equation to an equation and the formal written method.
Year 3	Formal Written Method	Step 1 Multiply the ones. $6 \text{ ones} \times 4 = 24 \text{ ones}$ $24 \text{ ones} = 2 \text{ tens} + 4 \text{ ones}$ Step 2 Multiply the tens. $3 \text{ tens} \times 4 = 12 \text{ tens}$ $12 \text{ tens} + 2 \text{ tens} = 14 \text{ tens}$ $36 \times 4 = 144$ 	This method is used to multiply a 2-digit number by a 1-digit number. Initially, the method shows the product of the multiplication of the ones, then the product of the multiplication of the tens, before adding the products to find the total. This method progresses to include renaming and finally moves to a shortened form of the written method. The method is finally shown as a version of the formal written method, in which the product of the multiplication of each place is shown as a single product, with any renaming added above each place in the multiplication.

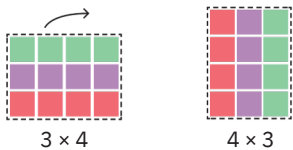
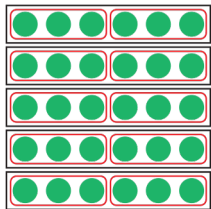
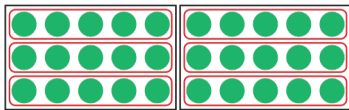
Multiplication Calculation Policy

Year 4



Year	Topic/Strand	Representation	Key Idea
Year 4	Counting in 6s, 7s and 9s	Count on in sixes. 	When pupils know that the size of a group is 6, 7 and 9 and the group size remains consistent, they can count in multiples of 6, 7 and 9 to find the product. Counting in multiples is supported by representation on a number line using intervals of 6, 7 and 9.
Year 4	Equal Groups	 4 boxes of 6 $4 \times 6 = 24$	Multiplication by 6, 7 and 9 is shown initially using equal groups. Specific language is used to support these examples, in this case '4 groups of 6', and this is immediately followed by the equation 4×6. This forms the basis of using known facts to find unknown facts.
Year 4	Number Line		Counting in multiples is shown on a number line. Multiples of 6, 7 and 9 are used as the intervals on a number line to support skip counting using these multiples. A growing pattern in multiples of 6, 7 and 9 is also shown to support pupils' understanding.

Year	Topic/Strand	Representation	Key Idea
Year 4	Multiplying by 11 and 12 Using Associated Facts	 $10 + 10 + 10 = 30$ $1 + 1 + 1 = 3$ $3 \times 10 = 30$ $3 \times 1 = 3$ $3 \times 11 = 30 + 3 = 33$	Learning to multiply by 11 and 12 is supported by partitioning 11 and 12 and using the 10 times table as the basis for initial understanding, building towards immediate recall.
Year 4	Fact Families	 $30 \div 6 = 5$ $6 \times 5 = 30$	Fact families are used in the introduction of division, represented using arrays to show the relationship between factors and a product. Pupils relate $6 \times 11 = 66$ to $66 \div 6 = 11$. They understand that multiplication can be used in division calculations.
Year 4	Multiplying by 0 and 1	 3 pots of 1 ruler $3 \times 1 = 3$ 3 empty pots $3 \times 0 = 0$	Pupils initially use their understanding of 'groups of' to understand multiplying by zero. For example, 0×4 is read as 'There are zero groups of 4'. Pupils' understanding then moves to read 0×4 as zero multiplied 4 times. The language is an extension of what they have already learned about multiplication.

Year	Topic/Strand	Representation	Key Idea
Year 4	Commutativity	 3×4 4×3 $3 \times 4 = 4 \times 3$ 3×4 is equal to 4×3.	Arrays are used to support the understanding of commutativity. Pupils learn the pattern of $a \times b = b \times a$. Regardless of the order in which the factors are multiplied, the product remains the same. The commutative property is further developed through the multiplication of 3 numbers. 3 factors are multiplied in different orders and the product remains the same.
		$5 \times 2 \times 3 =$  $2 \times 3 \times 5 =$ 	

Year	Topic/Strand	Representation	Key Idea
Year 4	Multiplying Multiples of 10	30 is equal to 3 tens. $5 \times 3 = 15$ $5 \times 3 \text{ tens} = 15 \text{ tens}$ $= 150$ 10 10 10 10 10 10 10 10 10 $5 \times 30 = 150$	Pupils learn to scale a product by a factor of 10 when multiplying a multiple of 10. For example, we know $3 \times 4 = 12$, therefore the product of 30×4 is 10 times greater: $30 \times 4 = 120$. Naming the place value of the digit supports this approach and pupils relate a known fact to multiplying multiples of 10. For example, we can read 30×4 as 3 tens $\times$ 4. So, 3 tens $\times$ 4 = 12 tens or 120. We would expect pupils to generalise and see that $30 \times 4 = 3 \times 4 \times 10$. While this isn't formalised, this forms the basis of the distributive property of multiplication.
Year 4	Formal Written Method	$\begin{array}{r} 218 \\ \times 4 \\ \hline 32 \\ 40 \\ + 800 \\ \hline 872 \end{array}$ $8 \times 4 = 32$ $10 \times 4 = 40$ $200 \times 4 = 800$ $218 \times 4 = 872$	Pupils use formal written methods, short and long, to multiply a 2-digit number by a 1-digit number. Initially the long method is used, showing the product of the multiplication of the ones, tens and hundreds, before adding the products to find the total. Pupils are shown the corresponding short formal written method so can make the links between the two procedures. Multiplication then moves from a 2-digit number by a 1-digit number to a 3-digit number by a 1-digit number. Pupils should be aware that even though the number of digits in one number increases, the procedure remains the same.

Multiplication Calculation Policy

Year 5



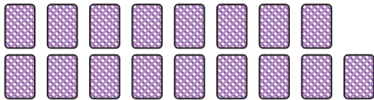
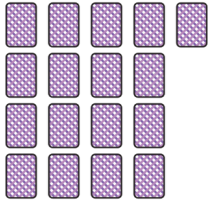
Year	Topic/Strand	Representation	Key Idea
Year 5	Multiples	 1 row of 8 stamps. $1 \times 8 = 8$	Finding multiples is initially related to skip counting. Pupils develop an understanding that counting in 2s produces a series of multiples that are also a product when 2 is a factor. They develop an understanding that the product is the multiple of two numbers.
		 2 rows of 8 stamps. $2 \times 8 = 16$	
		 3 rows of 8 stamps. $3 \times 8 = 24$	
		 4 rows of 8 stamps. $4 \times 8 = 32$	
		 5 rows of 8 stamps. $5 \times 8 = 40$ Sam has 40 stamps altogether.	

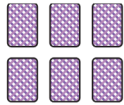
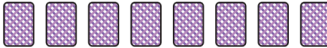
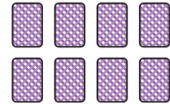
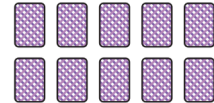
A multiple is a number you get when you multiply one number by another number.

8, 16, 24, 32 and 40 are multiples of 8.

The product of 5 and 8 is 40.

40 is a multiple of 5.
40 is also a multiple of 8.

Year	Topic/Strand	Representation	Key Idea
Year 5	Finding Factors	 2 rows of 12 tiles $2 \times 12 = 24$ 2 and 12 are factors of 24. Factors are the numbers we multiply together to make another number. 2 and 12 are factors of 24 because $2 \times 12 = 24$. 	Pupils have already been working with factors for a significant amount of time but the term 'factors' is introduced in Year 5. The structure for introducing factors uses rectangular arrangements and identifies the number of rows and number of items in each row. Pupils' understanding of factors is further developed when looking at common factors. They learn that different numbers can share some of the same factors. Pupils may go on to generalise about common factors. For example, all integers that end in 0 or 5 have 5 as a common factor.
Year 5	Prime Numbers	 This is a rectangle.   These are not rectangles. There is only one way to arrange 17 cards. $17 = 1 \times 17$ 17 only has two factors, 1 and itself. 17 is a prime number.	Following on from finding factors, pupils use rectangular arrangements to identify a pattern presented by prime numbers. Pupils find that prime numbers can only be arranged in a single rectangular pattern. This leads them to see that certain numbers only have two factors. These numbers, integers greater than 1, are called prime numbers.

Year	Topic/Strand	Representation	Key Idea
Year 5	Composite Numbers	 $6 = 1 \times 6$  $6 = 2 \times 3$  $8 = 1 \times 8$  $8 = 2 \times 4$  $10 = 1 \times 10$  $10 = 2 \times 5$ 2 is the only even prime number. All other multiples of 2 have more than two factors.	Once pupils have a sound understanding of multiples, factors and prime numbers, the term 'composite numbers' is used to describe integers, greater than 1, that have more than two factors.

Year	Topic/Strand	Representation	Key Idea
Year 5	Square and Cube Numbers	Holly would need 9 square tiles to make a larger square. 1 row of 1 $1 \times 1 = 1^2$ $= 1$ 2 rows of 2 $2 \times 2 = 2^2$ $= 4$ 3 rows of 3 $3 \times 3 = 3^2$ $= 9$	Pupils are introduced to both square and cube numbers by the physical representation described by their names. These representations lead to abstraction, with pupils understanding that square numbers are the product of a number multiplied by itself and a cube number is the product made by multiplying a number twice by itself.
		Sam would need 27 cubes to make a larger cube. 1 $1 \times 1 \times 1 = 1^3$ $= 1$ 2 $2 \times 2 \times 2 = 2^3$ $= 8$ 3 $3 \times 3 \times 3 = 3^3$ $= 27$	
Year 5	Multiplying by 10, 100 and 1000	$5 \times 1000 =$ $5 \times 1 \text{ thousand} = 5 \text{ thousands}$ $5 \times 1000 = 5000$	Pupils build on their understanding of multiplication by factors of 10. They see that when a factor is made 10 times greater, the product is 10 times greater. Pupils use their knowledge of times tables to underpin multiplying by 10, 100 and 1000, so 5×1000 is equal to $5 \times 1 \text{ thousand} = 5 \text{ thousands}$ or 5000. This follows a pattern that has been introduced in previous years.

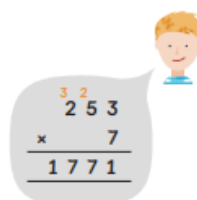
Year	Topic/Strand	Representation	Key Idea
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Year 5

**Formal
Written
Method**

Multiply 253 by 17.

$$\begin{array}{r}
 253 \\
 \times 17 \\
 \hline
 1771 \\
 + 2530 \\
 \hline
 4301
 \end{array}$$

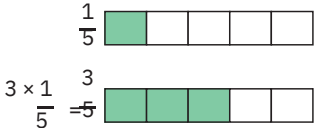


Pupils use formal written methods, short and long, to multiply a 3-digit number by a 1-digit number; then move on to multiply a 4-digit number by a 1-digit number.

Initially the long method is used, showing the product as a result of multiplying each place. Pupils then progress to the short formal written method making a link between the two procedures.

Next, pupils learn to multiply a 2-digit number by a 2-digit number, then a 3-digit number by a 2-digit number.

Links are made to the formal written procedure that they know. Pupils work systematically through the procedure progressing from multiplying by ones to multiplying by tens and ones.

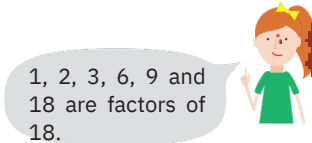
Year	Topic/Strand	Representation	Key Idea
Year 5	Multiplying Fractions	 The representation shows two horizontal bar models, each divided into five equal squares. The top bar is labeled $\frac{1}{5}$ and has its first square shaded green. The bottom bar is labeled $3 \times \frac{1}{5}$ and has its first three squares shaded green.	Multiplying a fraction by a whole number is underpinned by the early idea of adding equal groups. Pupils understand that we need to add and multiply items that have the same noun. We read $1 \times \frac{1}{5}$ as 1 fifth $\times 3 = 3$ fifths, in the same way we would read $1 \text{ kg} \times 3 = 3 \text{ kg}$. Bar models are used as pictorial support to show the multiplication of fractions with the same denominator. Pupils progress to multiplying mixed numbers by whole numbers. The approach remains the same but uses partitioning, so pupils multiply the fraction and whole number separately and add the products.

Multiplication Calculation Policy

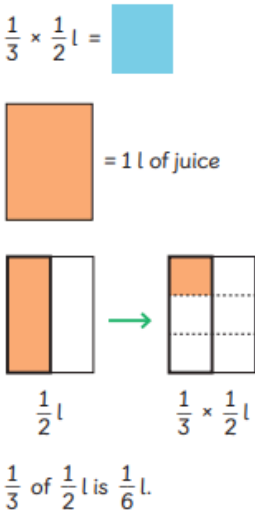
Year 6



Year	Topic/Strand	Representation	Key Idea
Year 6	Order of Operations	First, carry out all the operations in (). Next, perform all the multiplication and division. Then, calculate all the addition and subtraction. $15 - 4 \times 3 = 15 - 12 = 3$ $(15 - 4) \times 3 = 11 \times 3 = 33$  Follow the order of operations. Multiply, then subtract.  First, do the subtraction in the (). Then multiply.	Pupils use the multiplication skills they have learned in previous years within expressions and equations that use multiple operations. Pupils learn to multiply within brackets first, then left to right in expressions and equations that use multiplication. The procedures to multiply remain the same throughout.
Year 6	Multiplying by 2-Digit Numbers	$£1229 \times 28 = $ $\begin{array}{r} ^1 ^2 ^{\frac{1}{7}} \\ 1229 \\ \times 28 \\ \hline 9832 \\ + 24580 \\ \hline 34412 \end{array}$ → $1229 \times 8 = 9832$ → $1229 \times 20 = 24580$ → $580 1229 \times 28 = 34412$	Pupils revisit the formal written method, multiplying up to 4-digit numbers by 2-digit numbers.

Year	Topic/Strand	Representation	Key Idea																																					
Year 6	Common Factors	 1 row of 18 bags $1 \times 18 = 18$  2 rows of 9 bags $2 \times 9 = 18$  3 rows of 6 bags $3 \times 6 = 18$  1, 2, 3, 6, 9 and 18 are factors of 18.	Prior learning is expanded on by finding common factors within more challenging word problems. Pupils are encouraged to partition larger numbers into known multiples to determine if the given number is a factor.																																					
		<table><tr><td>Multiples of 4</td><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td><td>24</td><td>28</td><td>32</td><td>36</td><td>40</td><td>44</td><td>48</td></tr><tr><td>Multiples of 6</td><td>6</td><td>12</td><td>18</td><td>24</td><td>30</td><td>36</td><td>42</td><td>48</td><td>54</td><td>60</td><td>66</td><td>72</td></tr><tr><td>Multiples of 8</td><td>8</td><td>16</td><td>24</td><td>32</td><td>40</td><td>48</td><td>56</td><td>64</td><td>72</td><td>80</td><td>88</td><td>96</td></tr></table> 24 and 48 are common multiples of 4, 6 and 8.	Multiples of 4	4	8	12	16	20	24	28	32	36	40	44	48	Multiples of 6	6	12	18	24	30	36	42	48	54	60	66	72	Multiples of 8	8	16	24	32	40	48	56	64	72	80	88
Multiples of 4	4	8	12	16	20	24	28	32	36	40	44	48																												
Multiples of 6	6	12	18	24	30	36	42	48	54	60	66	72																												
Multiples of 8	8	16	24	32	40	48	56	64	72	80	88	96																												

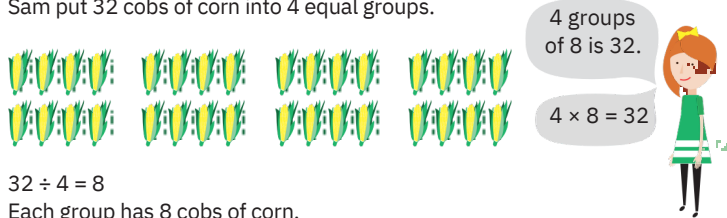
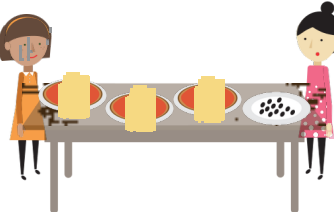
Year	Topic/Strand	Representation	Key Idea
Year 6	Prime Numbers	 8 = 5 + 3  10 = 7 + 3  16 = 11 + 5  8 is a composite number. 5 and 3 are prime numbers.  Can all even numbers be written as the sum of two prime numbers?	Pupils' understanding of prime numbers is expanded through the use of Goldbach's conjecture, that all even numbers greater than 2 can be expressed as the sum of two prime numbers.

Year	Topic/Strand	Representation	Key Idea
Year 6	Multiplying Fractions	$\frac{1}{3} \times \frac{1}{2} \text{ l} = \text{■}$  $\frac{1}{2} \text{ l}$ $\frac{1}{3} \times \frac{1}{2} \text{ l}$ $\frac{1}{3}$ of $\frac{1}{2} \text{ l}$ is $\frac{1}{6} \text{ l}$.	Pupils learn to multiply proper fractions by proper fractions. They read fractions to support multiplication, so $\frac{1}{3} \times \frac{1}{5}$ is read as 'What is $\frac{1}{3}$ of $\frac{1}{5}$?' Bar models are used to represent these problems pictorially. Pupils progress to realise that the numerators can be multiplied and the denominators can be multiplied, but before this procedure can be embedded, pupils must have a deep understanding of what the equation means.
Year 6	Multiplying Decimals	$\begin{array}{r} \textcolor{brown}{1}7 \text{ . } \textcolor{brown}{1}2 \text{ } 3 \\ \times \qquad \qquad \textcolor{brown}{6} \\ \hline \textcolor{brown}{4} \text{ } 3 \text{ . } 3 \text{ } 8 \end{array}$	Pupils use the same formal written method procedure as they have previously. Pupils need to pay special attention to the places of the digits in the multiplication. It is important that they do not see the decimal point as a place but rather as a symbol used to separate the whole parts from the decimal parts of a mixed number.

Division Calculation Policy

Year 3

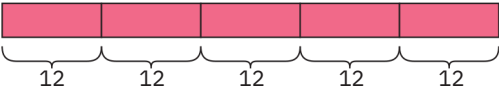


Year	Topic/Strand	Representation	Key Idea
Year 3	Dividing by 3, 4 and 8	Sam put 32 cobs of corn into 4 equal groups.  4 groups of 8 is 32. $4 \times 8 = 32$ $32 \div 4 = 8$ Each group has 8 cobs of corn.	Pupils are introduced to the division of numbers by 3, 4 and 8 using grouping initially. They make groups of 3, 4 and 8 and then move on to sharing a total.
Year 3	Division within Word Problems	Amira and Ruby are making pizzas. They have 12 olives. They want to put 3 or 4 olives on each pizza. Can we make a family of multiplication and division equations to help them?  12  4 times 3 is 12, so 12 divided by 3 is 4. 12 divided into groups of 4 is equal to 3. 12  3 times 4 is 12, so 12 divided by 4 is 3. 12 shared between 4 is equal to 3.	Pupils extend their understanding of division by relating the division facts to multiplication facts, creating a multiplication and division fact family. Word problems get increasingly more complex and bar models are used to represent problems involving division.

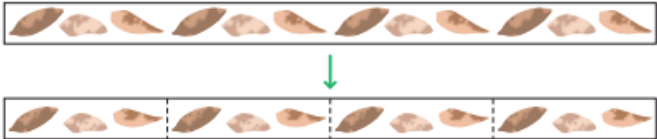
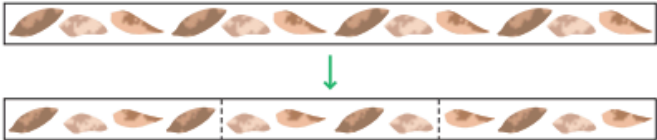
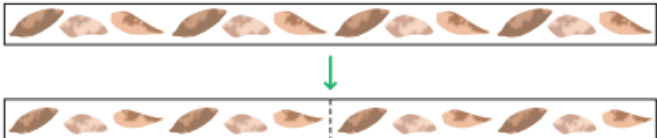
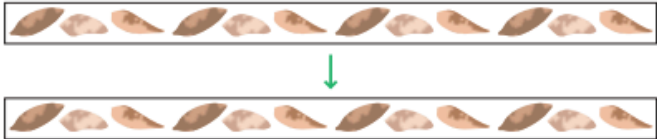
Division Calculation Policy

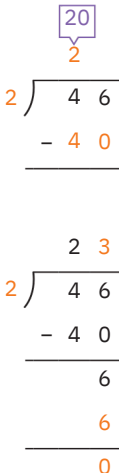
Year 4



Year	Topic/Strand	Representation	Key Idea
Year 4	Dividing by 6, 7 and 9	 $30 \div 6 = 5$ $6 \times 5 = 30$ Each packet can hold 5 pencils. When 30 is divided by 6, the quotient is 5. 	Pupils are given division word problems and immediately relate the division used to solve the problem to the multiplication fact they have previously learned. The language associated with division is given, with pupils understanding that when the number is divided, the outcome is called the quotient.
Year 4	Dividing by 11 and 12	 $5 \times 12 = \square$ $12 \times 5 = \square$ $\square \div 12 = \square$ $\square \div 5 = \square$	Arrays and bar models are used to show the relationship between multiplication and division when learning to multiply and divide by 11 and 12, building on the relationship already learned when dividing by 6, 7 and 9.

Year	Topic/Strand	Representation	Key Idea
Year 4	Dividing with Remainders	There are 13 flowers.  $13 \div 3 = 4$ with 1 left over The quotient is 4. The remainder is 1.	Pupils learn that when dividing into equal groups, we can be left with a number of items less than the group size. This is introduced as the remainder. Initially, the remainder is shown as a whole number.
Year 4	Word Problems Involving Division	hat  tennis racket  6 units $\rightarrow$ £54 1 unit $\rightarrow$ £54 $\div$ 6 = £9 £54	Division word problems are supported by the use of arrays and bar models, reinforcing the idea of equal groups. Pupils relate the representations of the problems to the equations given. Comparison division models are also used to determine amounts when two separate amounts are compared.

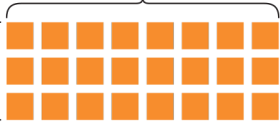
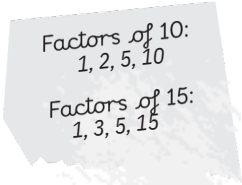
Year	Topic/Strand	Representation	Key Idea
Year 4	Dividing by 1	 $12 \div 4 = 3$ 	Pupils look for a pattern and generalise about dividing by 1. They systematically work through dividing a single amount by 4, 3, 2 and finally 1 to make observations about the number of groups and the size of each group.
		 $12 \div 3 = 4$ 	
		 $12 \div 2 = 6$ 	
		 $12 \div 1 = 12$ 	

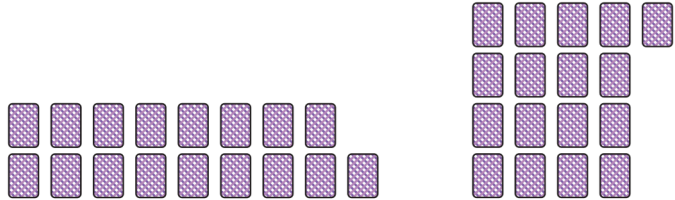
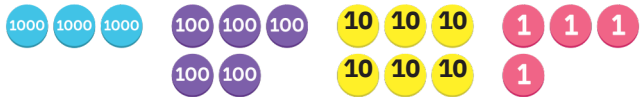
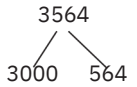
Year	Topic/Strand	Representation	Key Idea
Year 4	Dividing 2-Digit Numbers	Step 1 Divide 4 tens by 2.  4 tens $\div$ 2 = 2 tens $40 \div 2 = 20$ Step 2 Divide 6 ones by 2.  6 ones $\div$ 2 = 3 ones $6 \div 2 = 3$ $46 \div 2 = 23$ 	Pupils initially use place-value counters to support the division of 2-digit numbers, then move on to use a long formal written method. The long written method shows the systematic division of parts of the dividend resulting in the quotient.
Year 4	Dividing 3-Digit Numbers	$306 \div 3 =$  	The same procedure used for dividing 2-digit numbers is used for dividing 3-digit numbers. Place-value counters are used to represent the problem before moving on to use the long formal written method.

Division Calculation Policy

Year 5



Year	Topic/Strand	Representation	Key Idea
Year 5	Finding Multiples	 4 rows of 8 stamps. $4 \times 8 = 32$ A multiple is a number you get when you multiply one number by another number. 8, 16, 24, 32 and 40 are multiples of 8. 	Pupils use arrays to recognise multiples as the total number once a number is multiplied by another number. Skip counting is related to multiples as it is shown on a number line. Pupils also look for patterns when identifying multiples on number squares.
Year 5	Finding Factors	 3 rows of 8 tiles $3 \times 8 = 24$ 3 and 8 are factors of 24. 	The same rectangular arrangement that was used to find multiples is used to identify factors. The pictorial representation leads to an understanding that factors are the numbers we multiply to produce a product.
Year 5	Find Common Factors		Pupils learn that when multiple numbers share the same factors, we can describe those factors as common factors. Pupils will begin to generalise about common factors. For example, all whole numbers ending in zero will have 5 as a multiple.

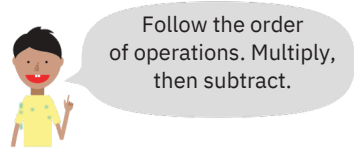
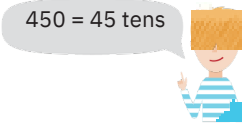
Year	Topic/Strand	Representation	Key Idea
Year 5	Prime and Composite Numbers	 This is a rectangle.  These are not rectangles. There is only one way to arrange 17 cards. $17 = 1 \times 17$ 17 only has two factors, 1 and itself. 17 is a prime number.	Pupils use their understanding of rectangular arrays to look for prime numbers. They learn that any number that can only be made into a single rectangular array is a prime number. In describing this array, they make the connection that prime numbers only ever have two factors, itself and 1. They also learn that numbers with two or more factors can be described as composite numbers.
Year 5	Dividing by 10, 100 and 1000	How many groups of 1000 can we make from 3564?   Look at the digit in the thousands place. 	Place-value counters and numbers bonds are initially used to represent division problems involving dividing by 10, 100 and 1000. Pupils use their understanding of place value to support the division calculations. For example, 35 hundreds $\div$ 1 hundred = 35.

Year	Topic/Strand	Representation	Key Idea
Year 5	Dividing without Remainder	640 100 100 100 10 10 100 100 100 10 10 640 600 40	Pupils use place-value counters and number bond diagrams to support their understanding of the long formal written method for division. Pupils are shown how numbers can be partitioned into known multiples before carrying out the division.
Year 5	Dividing with Remainder	7 8 remainder 1 6 4 6 9 - 4 2 0 4 9 4 8 1 420 ÷ 6 = 70 48 ÷ 6 = 8 1 1 6 1 ÷ 6 = 0.1 469 ÷ 6 = 78.1	The same procedure used for dividing without a remainder is used for dividing with a remainder but once pupils have made the maximum possible number of equal groups, they have a quantity remaining that is less than the equal group size. This is the remainder. Initially, the remainder is shown as a whole number. This progresses to showing the remainder as a fraction. This progression is supported pictorially with a bar model. Pupils should also start to become aware that the representation of the remainder will be determined by the context of the problem.

Division Calculation Policy

Year 6



Year	Topic/Strand	Representation	Key Idea
Year 6	Order of Operations	$15 - 4 \times 3 = 15 - 12$ $= 3$ 	Pupils understand the order to calculate expressions and equations that have multiple operations.
Year 6	Dividing by a 2-Digit Number without Remainder	$450 \div 15 = \text{■}$ $45 \text{ tens} \div 15 = 3 \text{ tens}$ $450 \div 15 = 30$ 	Pupils use simple division to help them calculate more complex division. Initially, pupils understand that if the dividend increases by a factor of 10 and the divisor remains the same, the quotient will also increase by a factor of 10. So, if $45 \div 15 = 3$, then $450 \div 15 = 30$. Pupils also use their understanding of factors to divide. They progress to show division using a long formal written method. Once the long method is understood, pupils move on to divide using a short formal written method. While the process remains the same, the notation changes to keep it within the short division structure.

Year	Topic/Strand	Representation	Key Idea																																	
Year 6	Dividing by a 2-Digit Number with Remainder	3 2 remainder 5 18 581 Which division method do you prefer? 581 540 41 30 × 18 2 × 18 36 remainder	The process used when dividing by a 2-digit number without a remainder stays the same when dividing with remainders. The process results in remainders that cannot be put into the equal group size as whole numbers. The context of the problem suggests the form that the remainder will take and pupils decide on the best representation for the remainder depending on the context. Pupils also use a unitary method of division to solve more complex word problems. Within these problems, they also use brackets to show the partitioning of numbers and how this can be used to support calculation in division problems.																																	
Year 6	Common Multiples	<table><tr><td>Multiples of 4</td><td>4</td><td>8</td><td>1</td><td>1</td><td>2024</td><td>2</td><td>32</td><td>3</td><td>4044</td><td>48</td></tr><tr><td>Multiples of 6</td><td>6</td><td>12</td><td>2</td><td>6</td><td>3036</td><td>8</td><td>48</td><td>6</td><td>6066</td><td>72</td></tr><tr><td>Multiples of 8</td><td>8</td><td>16</td><td>1</td><td>2</td><td>4048</td><td>4</td><td>64</td><td>5</td><td>8088</td><td>96</td></tr></table> 8 4 2 4 2 3 5 7 4 2 6 2	Multiples of 4	4	8	1	1	2024	2	32	3	4044	48	Multiples of 6	6	12	2	6	3036	8	48	6	6066	72	Multiples of 8	8	16	1	2	4048	4	64	5	8088	96	Pupils work systematically through problems looking for common multiples of given numbers.
Multiples of 4	4	8	1	1	2024	2	32	3	4044	48																										
Multiples of 6	6	12	2	6	3036	8	48	6	6066	72																										
Multiples of 8	8	16	1	2	4048	4	64	5	8088	96																										

Year	Topic/Strand	Representation	Key Idea
Year 6	Common Factors	1 row of 18 bags $1 \times 18 = 18$ 2 rows of 9 bags $2 \times 9 = 18$ 3 rows of 6 bags $3 \times 6 = 18$ 1, 2, 3, 6, 9 and 18 are factors of 18.	Pupils use long division to find common factors of given numbers. The method used to find common factors progresses to arrays and using tables to systematically find possible common factors.
Year 6	Prime Numbers	Elliott has 7 square tiles. Elliott can only make 1 rectangular arrangement. 1 row of 7 $1 \times 7 = 7$ The factors of 7 are 1 and 7. 7 is a prime number.	Arrays are used as they have been previously, looking for rectangular patterns. Pupils see that numbers that can only be made into 1 rectangular arrangement are prime numbers with factors of itself and 1.

Year	Topic/Strand	Representation	Key Idea
Year 6	Dividing Fractions by Whole Numbers	$\frac{3}{4} \div 4 =$  $\frac{3}{4} \div 4 = \frac{1}{4} \times \frac{3}{16} = \frac{3}{64}$	Pupils relate dividing fractions by a whole number to multiplying by its reciprocal. So, dividing by 4 is related to multiplying by $\frac{1}{4}$. We also read this as '$\frac{1}{4}$ of'. The procedure of dividing fractions by whole numbers is supported by the use of bar models and pictorial representation.
Year 6	Dividing Decimals without Renaming	 $\begin{array}{r} 2 \overline{) 0.82} \\ \underline{- 8} \\ 0.4 \\ \underline{- 0.4} \\ 0.02 \\ \underline{- 0.02} \\ 0 \end{array}$ → 2×4 → 2×0.2 → 2×0.01	Initially, place-value counters are used to show the division procedure that should be well known by pupils at this stage. The long formal written method is then used to divide decimal numbers without renaming the dividend. The procedure for long division does not change. Pupils need to be mindful of the placement of the digits and remember that the decimal point does not represent a place. Simply, the decimal point separates the whole and fractional parts of a number.

Year	Topic/Strand	Representation	Key Idea
Year 6	Dividing Decimals with Renaming	$ \begin{array}{ccccc} & 6.15 & & & \\ & \swarrow \quad \downarrow \quad \searrow & & & \\ 6 \text{ ones} & & 1 \text{ tenth} & & 5 \text{ hundredths} \\ \downarrow & & \downarrow & & \downarrow \\ 5 \text{ ones} & & 11 \text{ tenths} & & 5 \text{ hundredths} \\ \downarrow & & \downarrow & & \downarrow \\ 5 \text{ ones} & & 10 \text{ tenths} & & 15 \text{ hundredths} \\ \downarrow \div 5 & & \downarrow \div 5 & & \downarrow \div 5 \\ 1 \text{ one} & & 2 \text{ tenths} & & 3 \text{ hundredths} \\ \\ 6.15 \div 5 = 1.23 \end{array} $	Initially, place-value counters are used to show the division procedure that should be well known by pupils at this stage. The long formal written method is then used to divide decimal numbers without a remainder. The procedure for long division with renaming does not change from what pupils have experienced previously. Pupils need to be mindful of the placement of the digits and remember that the decimal point does not represent a place. Simply, the decimal point separates the whole and fractional parts of a number.
Year 6	Dividing Decimals by a 2-Digit Whole Number	$ \begin{array}{c} 4.65 \text{ kg} \div 15 = \boxed{} \\ \\ \begin{array}{cc} 4.5 & 0.15 \\ = 45 \text{ tenths} & = 15 \text{ hundredths} \\ \downarrow \div 15 & \downarrow \div 15 \\ = 3 \text{ tenths} & = 1 \text{ hundredth} \\ \\ 3 \text{ tenths} + 1 \text{ hundredth} = 0.3 + 0.01 \\ = 0.31 \\ \\ 4.65 \div 15 = 0.31 \end{array} \end{array} $	Pupils initially divide decimal numbers by 2-digit whole numbers where the dividend is easily broken into multiples of the divisor. Number bonds demonstrate the partitioning in order to divide using long and short formal written methods of division.

Year	Topic/Strand	Representation	Key Idea								
Year 6	Ratio	London plane sweet chestnut common lime 1890 trees There are 9 parts in total. Divide 1890 by 9. 	Pupils use a unitary method involving division to determine quantities in ratio problems. This approach is supported by the use of bar models.								
Year 6	Algebra	<table> <tr> <td>x</td><td>18</td><td>3</td><td>90</td></tr> <tr> <td>$\frac{x}{3}$</td><td></td><td></td><td></td></tr> </table>	x	18	3	90	$\frac{x}{3}$				Pupils use their understanding of division to determine unknown values with algebraic expressions and equations.
x	18	3	90								
$\frac{x}{3}$											