PILGRIMS' WAY
PRIMARY SCHOOL

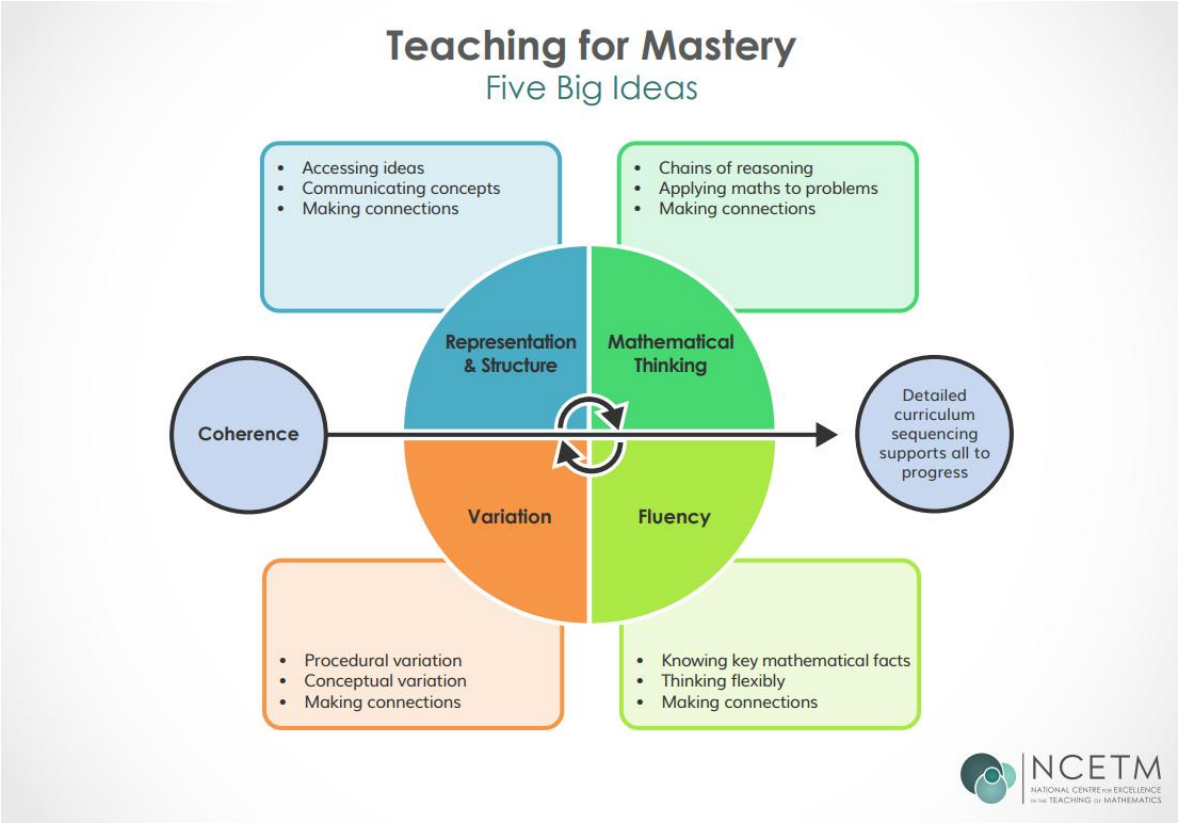
MATHEMATICS
POLICY

Contents

Teaching for Mastery 2
Stem Sentences 2
Maths Curriculum – White Rose 2
White Rose Scheme 3
White Rose Resources 4
Maths Curriculum – Mastering Number 5
Mastering Number Scheme 5
Rekenreks 5
Going for Gold 5
Gesture 6
Further reading 6
Appendix A: White Rose Calculation Policy 8
Appendix B: National Curriculum and 'Ready to Progress' Mapping 107
Appendix C: White Rose Vocabulary Progression Document 179

Teaching for Mastery

We teach maths using a mastery approach, in collaboration with the Kent and Medway Maths Hub and the NCETM. This is built on five key ideas: coherence, variation, fluency, representation and structure, and mathematical thinking.



In practice, this means: whole-class teaching where all children work on the same content at the same pace, with rapid intervention in the form of pre-teaching and flexible grouping for anyone at risk of falling behind; carefully sequenced small steps that build on prior learning; precise mathematical language and representations that expose the structure of concepts; and a balance of procedural fluency and conceptual understanding developed together, with key facts practised to automaticity.

Stem Sentences

Stem sentences give children a consistent sentence structure to articulate their mathematical thinking and reasoning, rather than needing to find the words themselves each time. By reusing the same core structure across a concept, children internalise the underlying mathematical relationship, freeing them up to focus on the maths rather than on how to phrase their answer. This also supports precise mathematical vocabulary and gives less confident children a scaffold to draw on when explaining their reasoning aloud. Stem sentences are used consistently across both White Rose lessons and Mastering Number sessions, giving children a single, shared way of expressing their reasoning throughout the school.

Maths Curriculum – White Rose

White Rose Scheme

From EYFS to Year 6, Maths is taught following the White Rose scheme, which is rooted in a mastery approach to teaching Maths and provides a coherent, sequential progression of small steps within each unit. Central to this approach is the use of concrete, pictorial and abstract (CPA) representations, allowing children to build understanding by moving between physical resources, visual models and formal written methods.

Year group overviews set out the objectives and small-step breakdown, alongside a scheme of learning for each block. These overviews are designed around the DfE's Ready to Progress criteria, identifying the key knowledge and skills children need to secure before moving on to new learning (see Assessment policy for further detail). Teachers use these to plan the week's teaching, adapting the slides where appropriate for the class rather than delivering materials unchanged – for example, some small steps may be covered over several days rather than just one, or a concrete or pictorial activity may be added to support the CPA approach and develop understanding if this is deemed appropriate.

The White Rose calculation policy sets out the methods and models used to teach the four operations, showing how these progress year by year through the CPA approach, moving from concrete resources to pictorial representations and on to abstract methods. It ensures a consistent approach across the school, so that children experience the same language, models and methods as they move through year groups.

Each unit is also supported by the White Rose vocabulary progression document, which sets out the key mathematical language children are expected to learn and use as they move through each block, building cumulatively from EYFS to Year 6. Teachers use this document to identify the vocabulary relevant to their year group and add it to lesson slides using Language through Colour and Widgit visuals, ensuring new terminology is introduced consistently and revisited at the appropriate point. This helps children to build a secure and progressively more precise mathematical vocabulary, which they can draw on and apply confidently in their reasoning and explanations.

White Rose Maths lessons begin with Flashback 4 in Years 1–6, a short retrieval task revisiting previous learning to build long-term recall and fluency. The main lesson is broken down into small, carefully sequenced steps, where appropriate, allowing children to build understanding incrementally before moving on, drawing on concrete or pictorial representations before progressing to abstract methods where this supports the sequence of learning. Slides within the main lesson support this – they say "Your turn – have a go at questions..." – and teachers decide which questions children answer initially before bringing them back together to teach the next step, either within the same lesson or, where necessary, on the following day. This ensures that all children can keep up with the learning.

Most Maths work is completed in the White Rose workbooks, although not every question is answered in every lesson. Teacher judgement is used to select the questions that best meet the needs of the class, and whichever questions are chosen are completed by all children – in line with best practice within the mastery approach. Whiteboards and squared exercise books are also used as appropriate alternative forms of recording, at the teacher's discretion.

White Rose Resources

Throughout the school, resources have been purchased to match exactly the colours used in the White Rose scheme. Using the same colours consistently across year groups means children immediately recognise a resource's purpose from its colour alone, rather than having to process a new colour scheme each time – reducing unnecessary cognitive load and allowing children to focus on the maths itself. These include:

Double sided red and yellow counters



Base 10



Place value counters



Numicon is not part of the White Rose scheme and its colours do not follow the same colour-coding, so it is not included above. It is used as an additional resource in EYFS and KS1, where its distinctive shapes help younger children to see number patterns and relationships at a glance.

Numicon



Maths Curriculum – Mastering Number

Mastering Number Scheme

Mastering Number (NCETM) is taught In Year 1 - 6 as a discrete daily session, 4–5 times weekly, focused on building fluency with number facts, place value and number sense — particularly subitising, number bonds and multiplicative reasoning. In Year R, it forms the main maths lesson for five weeks a term, with White Rose taught for the rest of term. Key elements of delivery include:

Rekenreks

Used in KS1 to support subitising and the development of number bonds and additive/subtractive reasoning through a visual, structured model.

The rekenrek is set up with the 'whites to the right'.

Children are taught to push the whole number they need in one movement, rather than pushing beads across individually while counting – for example, to show 4, a child subitises the amount and pushes all 4 beads across together, rather than pushing one bead at a time while counting "1, 2, 3, 4". This reinforces the idea of number as a whole quantity, rather than a count of separate ones, and builds fluency in recognising and using number bonds within 5 and 10.

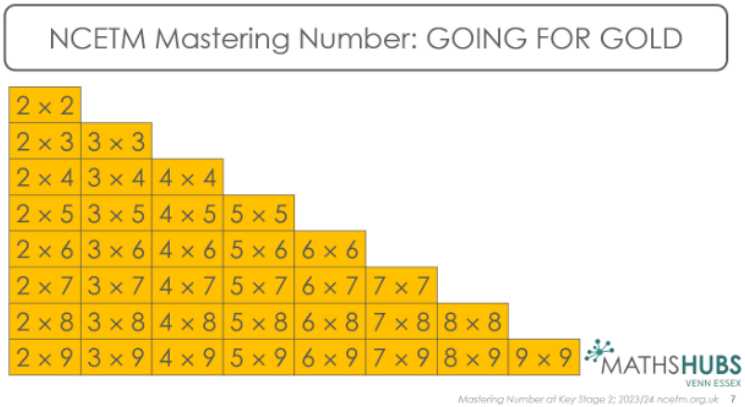


Going for Gold

Going for Gold is used in Year 4 as the main strategy for developing fluency in multiplication facts in preparation for the MTC.

The approach focuses on 36 key facts, covering the multiplication tables from 2 to 9, with each fact always written with the smallest factor first (e.g. 2 × 9 rather than 9 × 2). Facts are only counted once, so once a fact such as 2 × 9 has been learned, the corresponding 9 × 2 does not need to be relearned separately, as children understand this as the same fact through their knowledge of commutativity. This reduces the total number of facts children need to memorise.

The learning of these facts is tracked for all children in Year 4 and into Year 5 and 6 for those children who are not yet secure.



Gesture

Gestures give children a physical, multisensory way to engage with abstract number ideas, helping to embed concepts more securely than words or images alone. Using the same gesture every time a concept is referred to also builds a shared, consistent language between adults and children, making it easier for children to recall and apply their understanding independently. There are four key gestures used within the KS2 Mastering Number Scheme:

- **The stamping gesture** teaches the concept of unitising – representing counting in groups (e.g. "a group of 5" or "a unit of 50") rather than counting individual ones. To perform it, make a fist with one hand and "stamp" it onto the palm of the other hand.



- **The square number gesture** teaches square numbers (e.g. 8 × 8 = 64). To perform it, place both hands parallel to each other in a vertical position while saying the first number, then parallel in a horizontal position while saying the second number, then draw a square in the air with your fingers while saying the resulting square number.





- **The number line gesture** is used when calculating multiplication facts, such as the 9 or 12 times table. Both hands start together on the left-hand side of the body, then the right hand moves along an imaginary number line – for example, to show 9 × 12, the right hand moves right while saying "9 × 10 = 90", followed by a smaller jump of 18 to represent 9 × 2.




- **The multiplication array gesture** is used to visualise an array. The vertical line of the array is drawn first, followed by the horizontal line (with each line drawn in the air at a length relative to the number it represents). The hand is then waved across the 'array' to represent the total amount it contains.




Further reading

Teaching for Mastery: https://www.ncetm.org.uk/teaching-for-mastery/mastery-explained/five-big-ideas-in-teaching-for-mastery/

White Rose Maths learning materials: https://whiteroseeducation.com/

White Rose Calculation Policy:
https://assets.whiteroseeducation.com/new-schemes/WRM%20calculation%20policy%202024%20All%20year%20groups.pdf

White Rose Ready to Progress:
https://assets.whiteroseeducation.com/new-schemes/NEW%20NC%20RTP%202024.pdf

White Rose Vocabulary Progression Document:
https://assets.whiteroseeducation.com/new-schemes/Primary%20maths%20-%20Vocabulary%20progression.pdf

Appendix A: White Rose Calculation Policy

The following 98 pages are reproduced unaltered from: White Rose Education - Calculation Policy (updated September 2024).

Primary maths

Calculation policy

Updated September 2024

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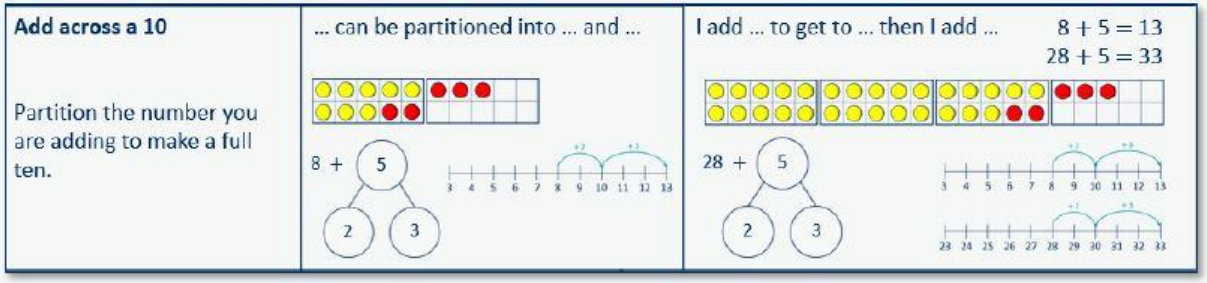
White Rose MATHS

Guidance for teachers

The calculation policy is divided into four sections: addition, subtraction, multiplication and division. At the start of each section, you will find an overview of the progression of skills. Calculations involving decimal numbers and fractions are included.

The calculation policy follows the same concrete, pictorial, abstract approach as our main schemes of learning. Where appropriate, sentence stems and key questions are included alongside the key representations.

Where skills are divided into more than one section across the page, there is a progression in the level of difficulty from left to right.
For example, when adding across a 10, children need to be able to add across 10 itself, before making links with related facts.



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Progression of skills - Addition

Year group	Skill
Nursery	• Subitise to 3 • Count how many • Make numbers to 5 • Add 1 more (through songs and rhymes)
Reception	• Conceptually subitise to 5 • 1 more • Notice the composition of numbers within 10 • Combine 2 groups • Add more
Year 1	• Add together • Add more • Bonds within 10 • Related facts within 20 • Missing numbers

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Progression of skills - Addition

Year group	Skill
Year 2	• Add 1s to any number (related facts) • Add three 1-digit numbers • Add across a 10 • Add multiples of 10 • Add 10s to any number • Add two 2-digit numbers (not across a ten) • Add two 2-digit numbers (across a ten) • Missing numbers
Year 3	• Add 1s, 10s and 100s to a 3-digit number • Add two numbers (no exchange) • Add two numbers across a 10 or 100 • Complements to 100 • Add fractions with the same denominator within 1 whole • Calculate the duration of events

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Progression of skills - Addition

Year group	Skill
Year 4	• Add 1s, 10s and 100s to a 4-digit number • Add up to two 4-digit numbers • Add decimal numbers in the context of money • Add fractions and mixed numbers with the same denominator beyond 1 whole
Year 5	• Add using mental strategies • Add whole numbers with more than 4 digits • Add decimals with up to 2 decimal places • Complements to 1 • Add fractions with denominators that are a multiple of one another
Year 6	• Add integers up to 10 million • Add decimals with up to 3 decimal places • Order of operations • Negative numbers • Add fractions

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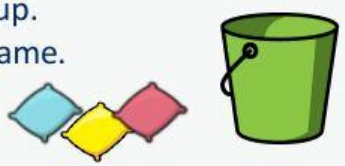
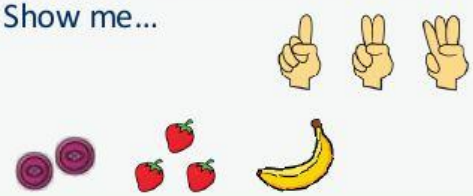
Nursery	• Begin to have an understanding of numbers to 5 • We recommend focusing on noticing and representing small quantities, perceptual subitising and counting.
Progression of skills	**Key representations**
Subitise to 3 Instantly see how many.	How many do you see? 
Count how many Begin to count objects using 1-1 correspondence.	How many are there?  Count out … from a larger group. E.g. Collect 3 beanbags for a game. 
Make numbers to 5 Start by showing 1, 2 and 3 using fingers.	Show me…  Begin to link numerals to quantities. 
Add 1 more Through stories, songs and rhymes.	How many do I have now? 

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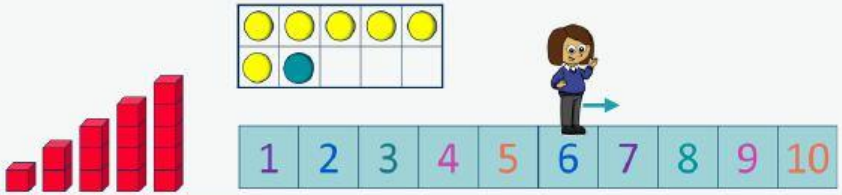
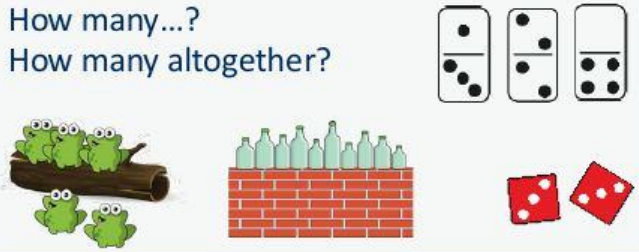
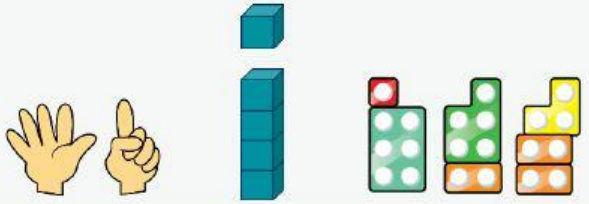
Reception	• Have a deep understanding of numbers to 10, including the composition of each number. • Subitise (recognise quantities without counting) up to 5 • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts.
Progression of skills	**Key representations**
Conceptually subitise to 5 Notice the parts that make up the whole.	What do you see? How do you see it? 
1 more Continue to link to stories, songs and rhymes.	1 more than … is … 
Notice the composition of numbers within 10 Link to stories, songs and rhymes.	How many…? How many…? How many altogether? 
	How many ways can you make…? 

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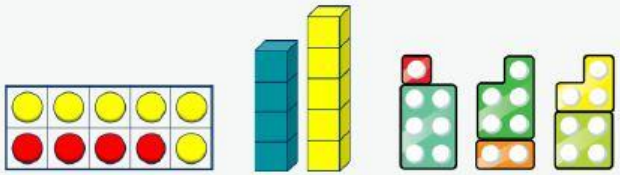
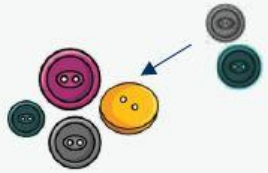
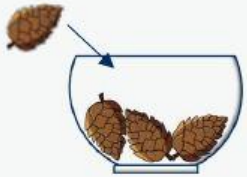
Progression of skills	Key representations	
Combine 2 groups 2 groups are combined to find the total.	There are .... There are .... There are .... altogether.   	.... and .... make .... 
Add more A quantity is increased.	First... Then.... Now....   	I have .... I add .... more. Now I have....   

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Addition

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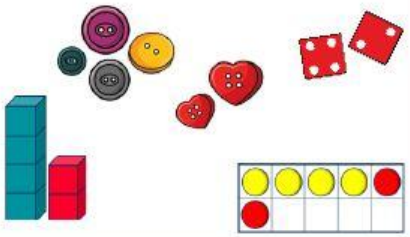
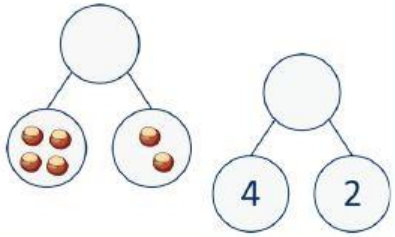
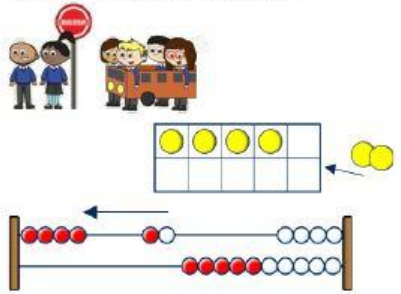
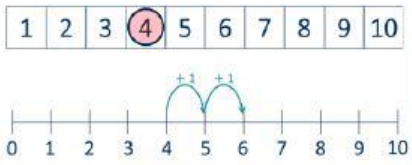
Year 1	• Read, write and interpret mathematical statements involving addition (+) and equals (=) signs. • Represent and use number bonds within 20 • Add 1-digit and 2-digit numbers to 20, including zero. • Solve one-step problems that involve addition, using concrete objects and pictorial representations, and missing number problems such as $7 = \square + 2$		
Progression of skills	**Key representations**		
Add together (aggregation) 2 quantities are combined to find the total.	There are ... There are ... There are ... altogether. 	... is a part. ... is a part. ... is the whole. 	... plus ... is equal to ... ... is equal to .... + ... $4 + 2 = 6$ $2 + 4 = 6$ $6 = 4 + 2$ $6 = 2 + 4$
Add more (augmentation) A quantity is increased.	First... Then... Now... 	I start at ... I jump on ... I land on ... 	... plus ... is equal to ... is equal to ... + ... $4 + 2 = 6$ $2 + 4 = 6$ $6 = 4 + 2$ $6 = 2 + 4$

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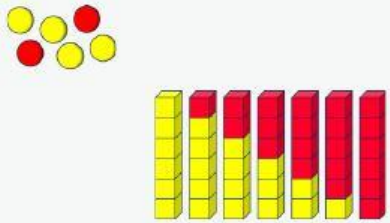
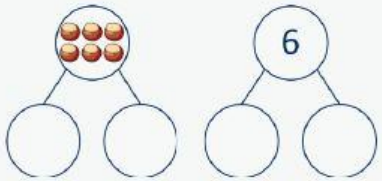
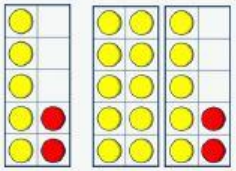
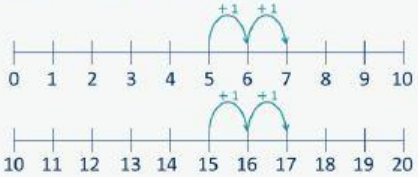
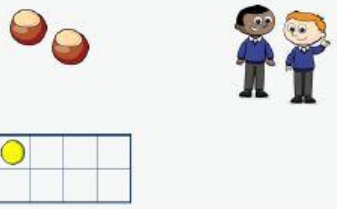
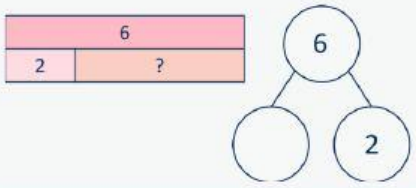
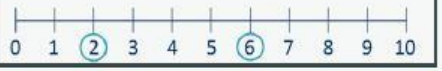
Progression of skills	Key representations		
Bonds within 10 Include bonds for each number within 10 Encourage children to notice patterns.	… is made of … and … … and … make … 	… can be partitioned into … and … 	… plus … is equal to … $6 + 0 = 6$ $5 + 1 = 6$ $4 + 2 = 6$ $3 + 3 = 6$ $2 + 4 = 6$ $1 + 5 = 6$ $0 + 6 = 6$
Related facts within 20 Make links to known facts.	I know that … and … = … so … and … = … 	… more than … is … so … more than … is … 	What patterns do you notice? $5 + 2 = 7$ $15 + 2 = 17$ $7 = 5 + 2$ $17 = 15 + 2$
Missing numbers Make links to known facts.	How many more do you need to make …? 	If … is the whole and … is a part, the other part must be… 	… plus … is equal to … $2 + \square = 6$ $6 = 2 + \square$ 

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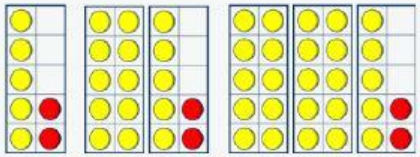
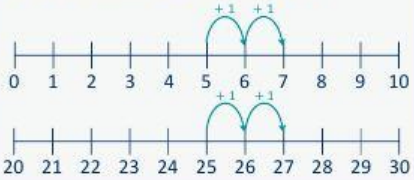
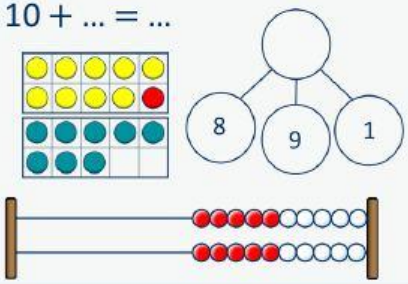
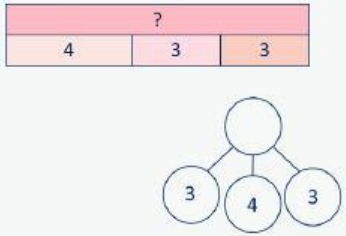
Addition

White Rose MATHS

Year 2	• Recall and use addition facts to 20 fluently, and derive and use related facts up to 100
	• Add numbers using concrete objects, pictorial representations, and mentally, including:
	  • a two-digit number and 1s
	  • a two-digit number and 10s
	  • 2 two-digit numbers
	  • adding 3 one-digit numbers
	• Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.		

Progression of skills	**Key representations**		
Add ones to any number (related facts) Make links to known facts.	I know that … and … = … so … and … = … 	… more than … is … so … more than … is … 	What do you notice? Can you continue the pattern? 5 + 2 = 7 15 + 2 = 17 25 + 2 = 27…
Add three 1-digit numbers Prompt children to understand that addition can be done in any order and to make links to known facts.	… and … are a bond to 10 10 + … = … 	Double … + … = … 	What do you notice? Which addition is the easiest to calculate? 8 + 9 + 1 = 8 + 1 + 9 = 9 + 1 + 8 =

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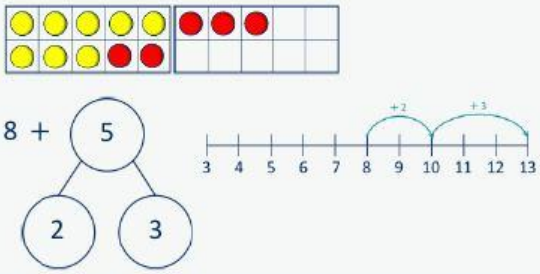
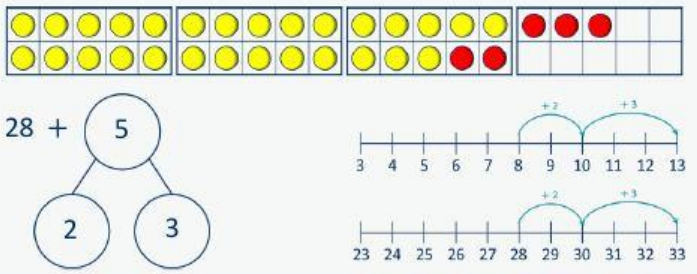
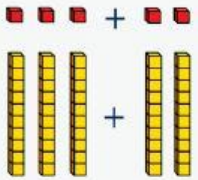
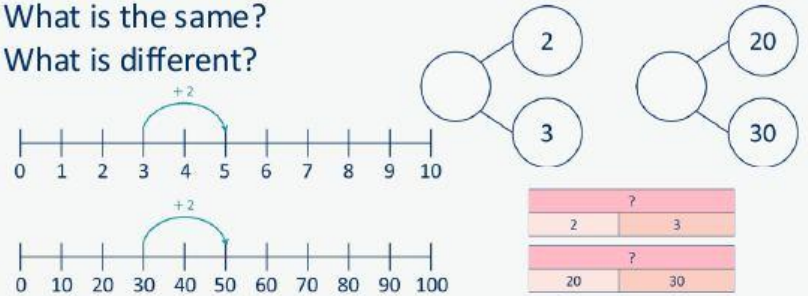
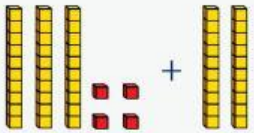
Addition

White Rose MATHS

Progression of skills	Key representations		
Add across a 10 Partition the number being added to make a full ten.	… can be partitioned into … and … 	I add … to get to … then I add … 8 + 5 = 13 28 + 5 = 33 	
Add multiples of 10 Make links to known facts within ten.	… ones + … ones = … ones so … tens + … tens = … tens  3 + 2 = 5 30 + 20 = 50	What is the same? What is different? 	
Add 10s to any number Make links to known facts.	… tens + … tens = … tens … tens and … ones = … 	To add … I need to add 10 … times. 	I know that … and … = … so … and … = … 30 + 20 = 50 34 + 20 = 54

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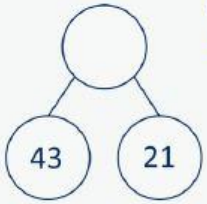
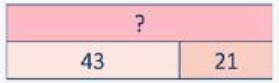
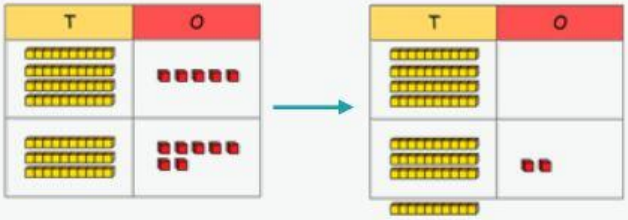
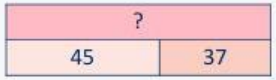
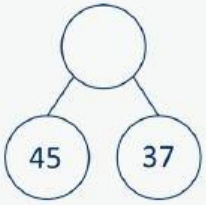
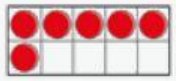
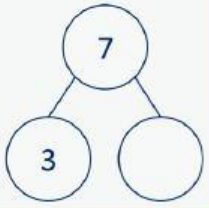
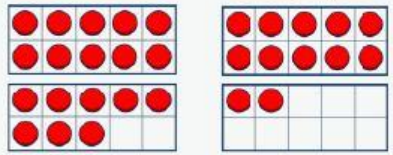
Addition

White Rose MATHS

Progression of skills	Key representations
Add 2-digit numbers (not across a ten) Lining up ones and tens in columns will support with later written methods.	… ones + … ones = … ones … tens + … tens = … tens   3 ones + 1 one = 4 ones 4 tens + 2 tens = 6 tens 6 tens + 4 ones = 64 
Add 2-digit numbers (across a ten) Begin to exchange 10 ones for 1 ten.	There are …. ones, so I do/do not need to make an exchange. … ones = … ten and … ones    5 ones + 7 ones = 12 ones 12 ones = 1 ten and 2 ones 4 tens + 3 tens + 1 ten = 8 tens 8 tens and 2 ones = 82
Missing numbers Solve missing number problems and use the inverse to check.	How many more do you need to make …?  6 + □ = 10 10 − □ = 6 If … is a whole and … is a part, then … is the other part. □ + 3 = 7 7 − 3 = □  … can be partitioned into … and … 10 + 8 = 12 + □ 

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Addition

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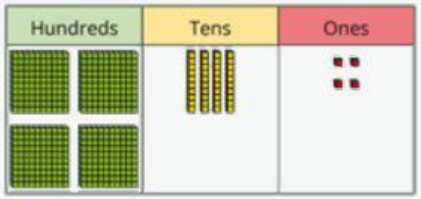
Year 3	• Add numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. • Add numbers with up to three digits, using formal written methods of columnar addition. • Add fractions with the same denominator within 1 whole. • Calculate the time taken by particular events or tasks.
Progression of skills	**Key representations**

Add 1s, 10s or 100s to a 3-digit number

Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.

The ones/tens/hundreds column will increase by …



444 + 5 =
444 + 50 =
444 + 500 =



777 + 2 =
777 + 20 =
777 + 200 =

What patterns do you notice?

235 + 3 =
235 + 30 =
235 + 300 =

604 + 20 =
604 + 50 =
604 + 90 =

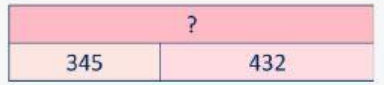
111 + ☐ = 118
111 + ☐ = 181
111 + ☐ = 811

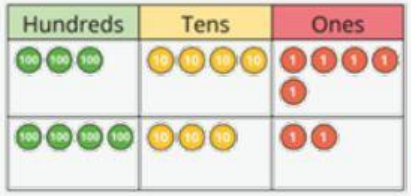
Add two numbers (no exchange)

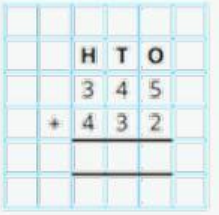
Mental strategies and introduction of formal written method.

… ones + … ones = … ones
… tens + … tens = … tens
… hundreds + … hundreds = … hundreds









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Addition

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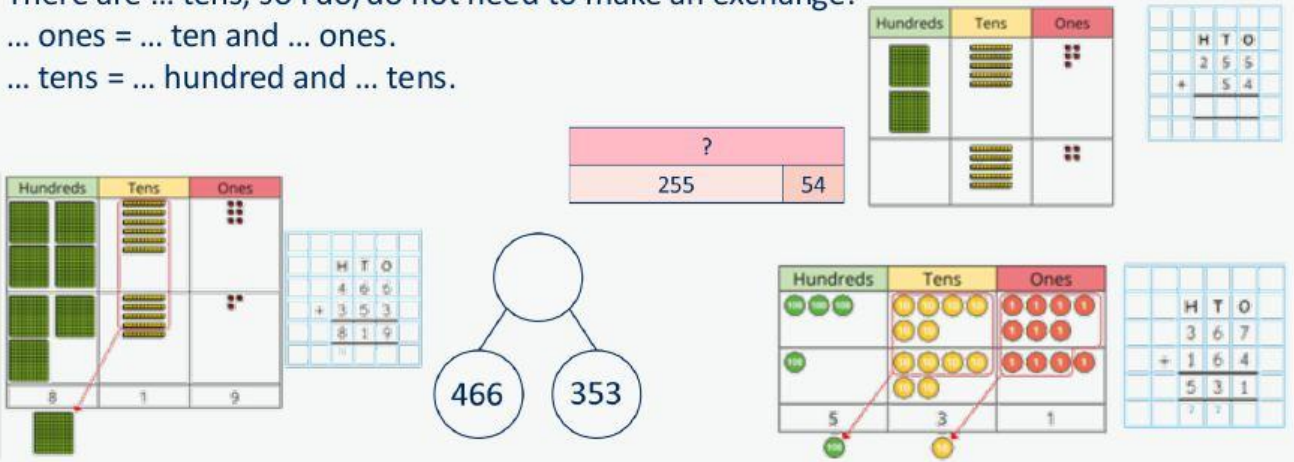
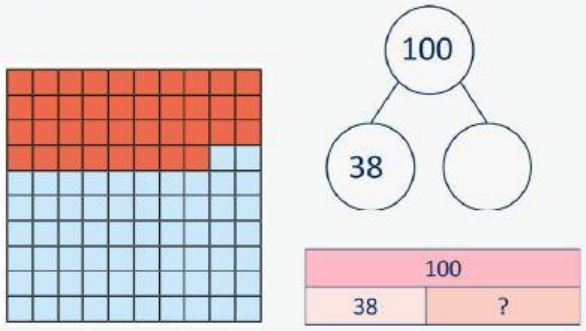
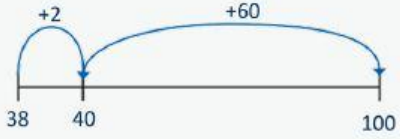
Progression of skills	Key representations
Add two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.	There are … ones, so I do/do not need to make an exchange. There are … tens, so I do/do not need to make an exchange. … ones = … ten and … ones. … tens = … hundred and … tens. 
Complements to 100 Pairs of numbers which total 100	… plus … is equal to 100  I add … to get to the next 10, then … to get to 100  $38 + 62 = 100$ $62 + 38 = 100$ $100 = 38 + 62$ $100 = 62 + 38$

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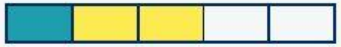
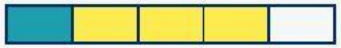
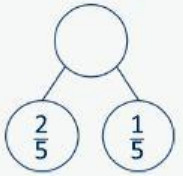
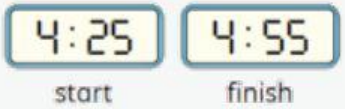
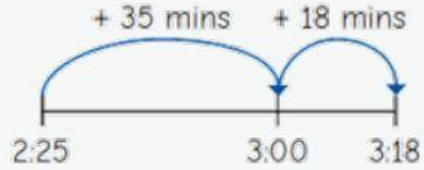
Addition

White Rose MATHS

Progression of skills	Key representations
Add fractions with the same denominator within 1 whole Make links with known facts.	When adding fractions with the same denominator, I only add the numerator. … fifths + … fifths = … fifths  $\frac{1}{5} + \frac{1}{5}$  $\frac{1}{5} + \frac{2}{5}$  $\frac{1}{5} + \frac{3}{5}$  
Calculate the duration of events Find durations of time between a given start and end point. Children will need to calculate complements to 60	From … to … o'clock is … minutes. From … o'clock to … is … minutes. The total time taken is … minutes.   

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Addition

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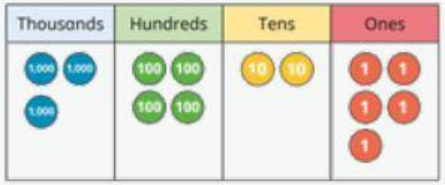
Year 4	• Add numbers with up to 4 digits using a formal written method. • Solve simple measure and money problems involving fractions and decimals to 2 decimal places. • Add fractions with the same denominator.
Progression of skills	**Key representations**

Add 1s, 10s and 100s to a 4-digit number

Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.

The ones/tens/hundreds/thousands column will increase by …



3,425 + 3 =
3,425 + 30 =
3,425 + 300 =
3,425 + 3,000 =

What patterns do you notice?

2,350 + 3 =
2,350 + 30 =
2,350 + 300 =
2,350 + 3,000 =

6,040 + 200 =
6,040 + 500 =
6,040 + 900 =

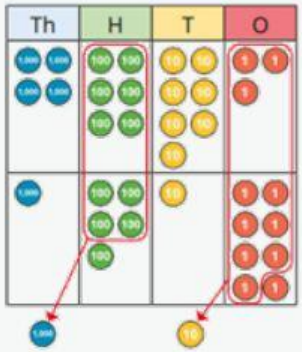
2,211 + ☐ = 2,251
2,211 + ☐ = 2,215
2,211 + ☐ = 2,511

Add up to two 4-digit numbers

Formal written method with up to 3 exchanges. Encourage children to estimate and use inverse operations to check answers to calculations.

There are … ones/tens/hundreds so I do/do not need to make an exchange.

I can exchange 10 … for 1 …



	Th	H	T	O
	4	6	7	3
+	1	5	1	8
	6	1	9	1

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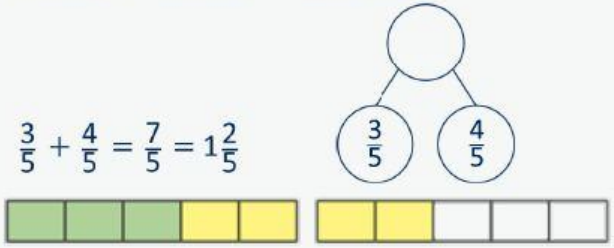
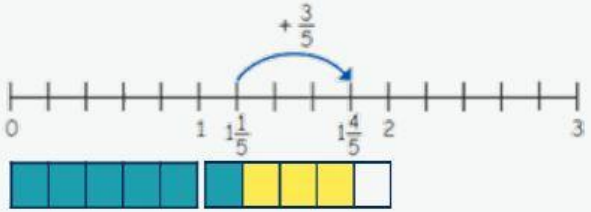
Addition

Progression of skills	Key representations	
Add decimal numbers in the context of money Emphasis on partitioning and use of number lines rather than formal written calculations.	… pence + … pence = … pence … pounds + … pounds = … pounds  45p + 25p = 70p £2 + £3 = £5 £5 + 70p = £5.70	£3.25 can be partitioned into £3 + 20p + 5p 
Add fractions and mixed numbers with the same denominator beyond 1 whole	When adding fractions with the same denominator, I only add the numerator. … fifths + … fifths = … fifths $\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}$  	

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Addition

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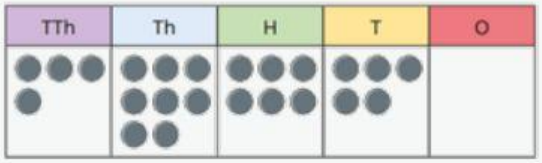
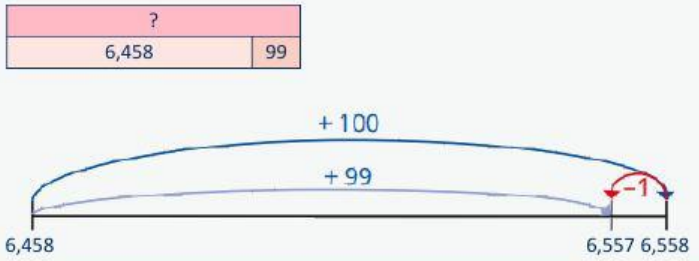
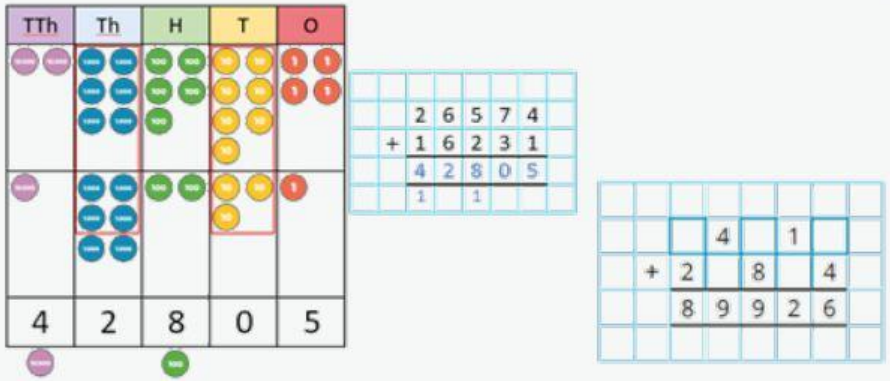
Year 5	• Add whole numbers with more than 4 digits, including using formal written methods. • Add numbers mentally with increasingly large numbers. • Add decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 • Add fractions with the same denominator, and denominators that are multiples of the same number.
Progression of skills	**Key representations**
Add using mental strategies Add 1s, 10s, 100s, etc. to any number. Use number bonds and related facts.	 48,650 + 300 = 48,650 + 30,000 = 48,650 + 30 =
	To add ..., I can add ... then subtract ... 
Add whole numbers with more than 4 digits Encourage children to estimate and use inverse operations to check answers to calculations.	I can exchange 10 ... for 1 ... 

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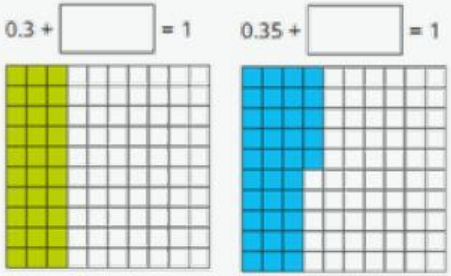
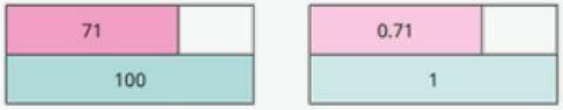
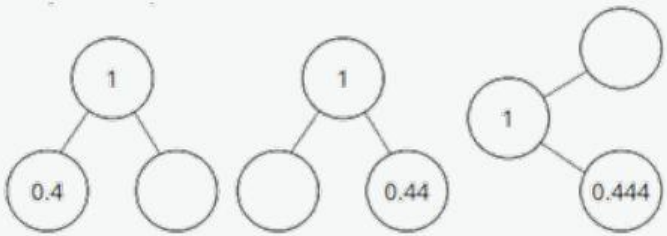
Addition

Progression of skills	Key representations
Add decimals with up to 2 decimal places Progress from the same number of decimal places to a different number of decimal places, and from no exchange to exchange.	I do/do not need to make an exchange because … I can exchange 10 … for 1 …  
Complements to 1 Pairs of numbers with up to 3 decimal places which total 1 Encourage children to make links with bonds to 10 and complements to 100 and 1,000	   $4 + 6 = 10$ $44 + 56 = 100$ $444 + 556 = 1{,}000$ $0.4 + 0.6 = 1$ $0.44 + 0.56 = 1$ $0.444 + 0.556 = 1$

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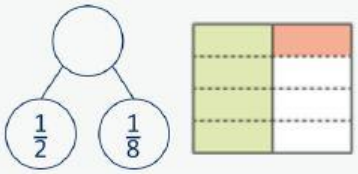
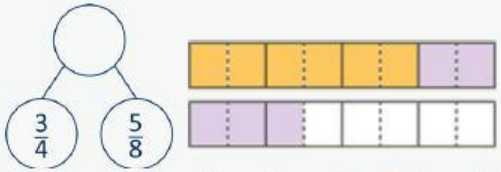
Addition

Progression of skills	Key representations
Add fractions with denominators that are a multiple of one another Encourage children to convert fractions to the same denominator before adding. Progress from adding fractions within 1 whole to adding fractions beyond 1 whole.	The denominator has been multiplied by …, so the numerator needs to be multiplied by… for the fractions to be equivalent.  $\frac{1}{2} + \frac{1}{8} = \frac{4}{8} + \frac{1}{8} = \frac{5}{8}$  $\frac{1}{4} + \frac{3}{8} = \frac{2}{8} + \frac{3}{8} = \frac{5}{8}$  $\frac{3}{4} + \frac{5}{8} = \frac{6}{8} + \frac{5}{8} = \frac{11}{8} = 1\frac{3}{8}$

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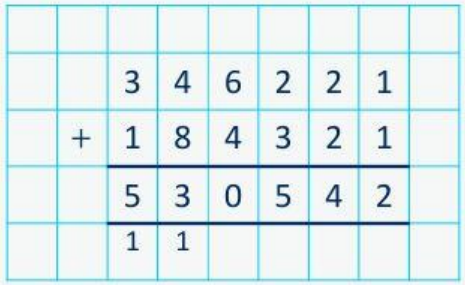
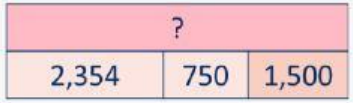
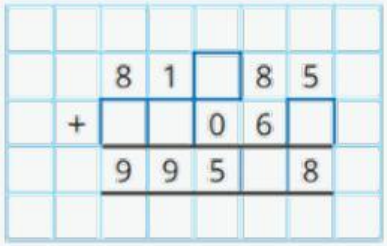
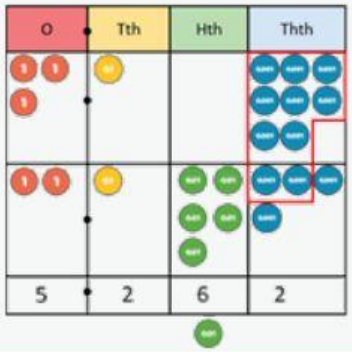
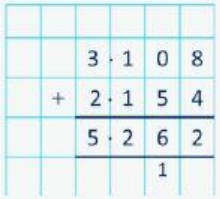
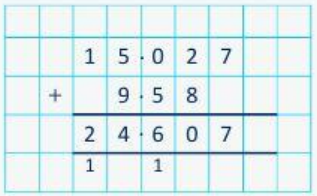
Addition

Year 6	• Add larger numbers, using the formal written method of columnar addition. • Use their knowledge of the order of operations to carry out calculations involving the 4 operations. • Calculate intervals across zero. • Add fractions with different denominators and mixed numbers, using the concept of equivalent fractions.
Progression of skills	**Key representations**
Add integers up to 10 million Encourage children to estimate and use inverse operations to check answers to calculations.	  
Add decimals with up to 3 decimal places Progress to numbers with digits in different place value columns. Encourage children to check that they have lined up the columns correctly.	I do/do not need to make an exchange because …   

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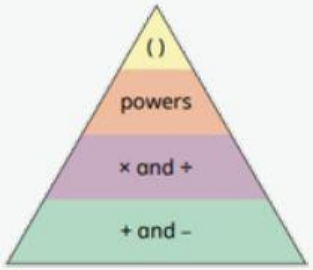
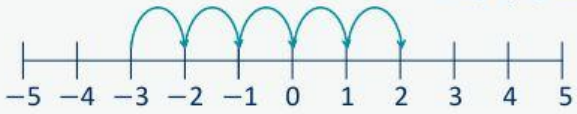
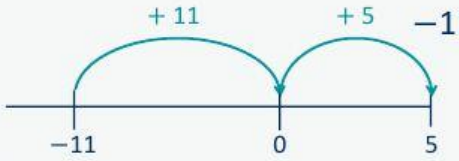
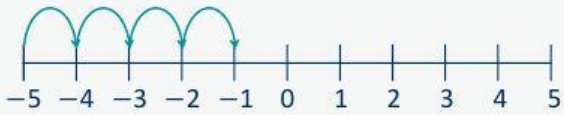
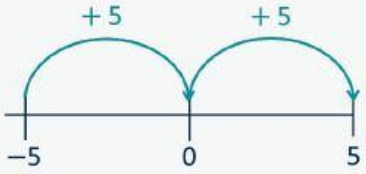
Addition

White Rose MATHS

Progression of skills	Key representations
Order of operations Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction. *When no brackets are shown and the operations have the same priority, work left to right.	… has greater priority than …, so the first part of the calculation I need to do is …   $(3 + 4) \times 2 = 14$  $3 \times 4 + 2 = 14$  $3 + 4 \times 2 = 11$
Negative numbers Children add to negative numbers and carry out calculations which cross 0	… plus … is equal to … $-3 + 5 = 2$   $-11 + 16 = 5$	 The difference between – 5 and −1 is 4  The difference between – 5 and 5 is 10

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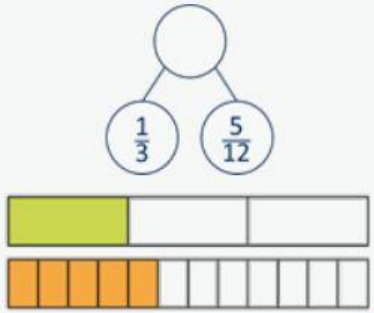
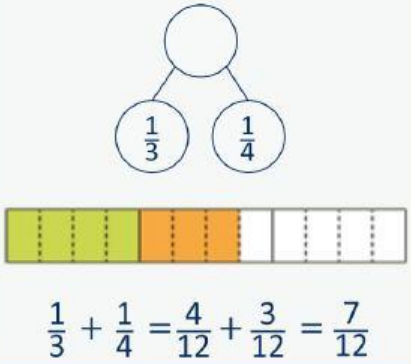
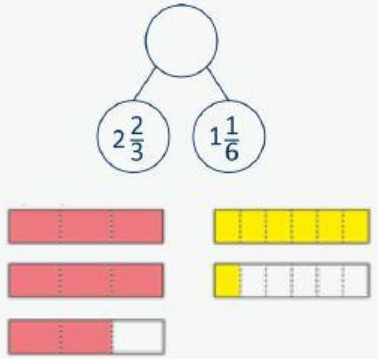
Addition

Progression of skills	Key representations		
Add fractions Convert fractions to the same denominator before adding. Progress from fractions where one denominator is a multiple of the other, to any fractions and then to mixed numbers.	The denominator has been multiplied by … , so the numerator needs to be multiplied by …  	The lowest common multiple of … and … is …  	…is made up of … wholes and … 

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Progression of skills - Subtraction

Year group	Skill
Nursery	• Subitise to 3 • Count how many • Make numbers to 5 • Take 1 away (through songs and rhymes)
Reception	• Conceptually subitise to 5 • 1 less • Notice the composition of numbers within 10 • Partition • Take away
Year 1	• Find a part • Take away • Bonds within 10 • Related facts within 20 • Missing numbers

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Progression of skills - Subtraction

Year group	Skill
Year 2	• Subtract 1s from any number (related facts) • Subtract across a 10 • Subtract multiples of 10 • Subtract 10s from any number • Subtract two 2-digit numbers (not across a ten) • Subtract two 2-digit numbers (across a ten) • Missing numbers
Year 3	• Subtract 1s, 10s and 100s from a 3-digit number • Subtract two numbers (no exchange) • Subtract two numbers across a 10 or 100 • Complements to 100 • Subtract fractions with the same denominator within 1 whole

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Progression of skills - Subtraction

Year group	Skill
Year 4	• Subtract 1s, 10s, 100s and 1,000s from a 4-digit number • Subtract up to two 4-digit numbers • Subtract decimal numbers in the context of money • Subtract fractions and mixed numbers with the same denominator
Year 5	• Subtract whole numbers with more than 4 digits • Subtract using mental strategies • Subtract decimals with up to 2 decimal places • Complements to 1 • Subtract fractions with denominators that are a multiple of one another
Year 6	• Subtract integers up to 10 million • Subtract decimals with up to 3 decimal places • Order of operations • Negative numbers • Subtract fractions

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Subtraction

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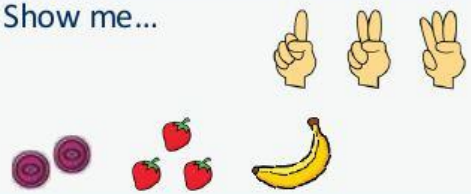
Nursery	• Begin to have an understanding of numbers to 5 • We recommend focusing on noticing and representing small quantities, perceptual subitising and counting.

Progression of skills	Key representations	
Subitise to 3 Instantly see how many.	How many do you see? 	
Count how many Begin to count objects using 1-1 correspondence.	How many are there? 	Count out … from a larger group. E.g. Collect a cup for everyone at the table. 
Make numbers to 5 Start by showing 1, 2 and 3 using fingers.	Show me… 	Begin to link numerals to quantities. 
Take 1 away Through stories, songs and rhymes.	How many do we have now? 	

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Subtraction

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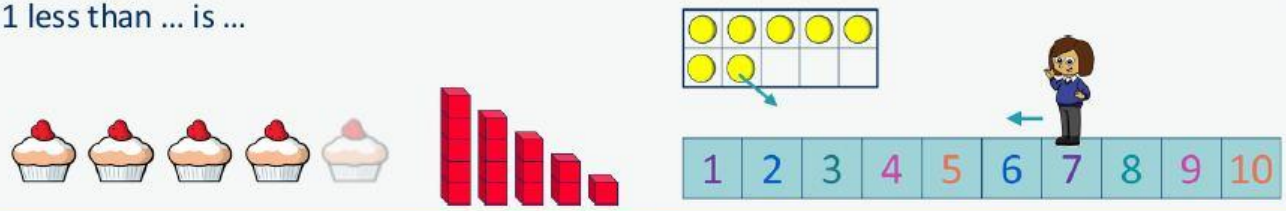
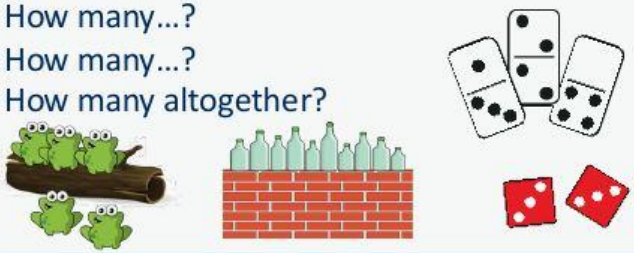
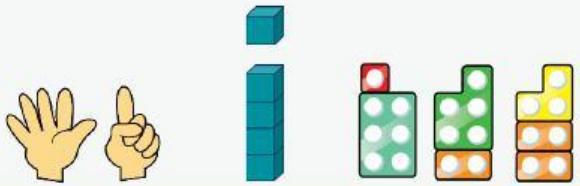
Reception	• Have a deep understanding of number to 10, including the composition of each number. • Subitise (recognise quantities without counting) up to 5 • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (and some subtraction facts) and some number bonds to 10, including double facts.
Progression of skills	**Key representations**
Conceptually subitise to 5 Notice the parts that make up the whole.	What do you see? How do you see it? 
1 less Continue to link to stories, songs and rhymes.	1 less than … is … 
Notice the composition of numbers within 10 Link to stories, songs and rhymes.	How many…? How many…? How many altogether? 
	How many ways can you make…? 

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Subtraction

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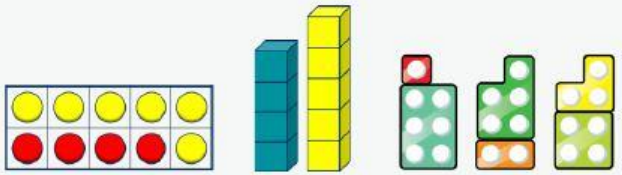
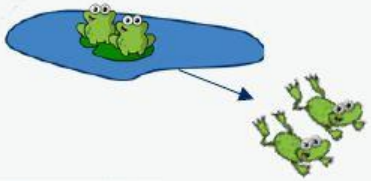
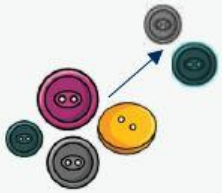
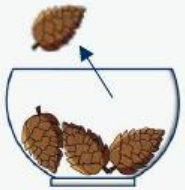
Progression of skills	Key representations	
Partition Using objects, explore different ways to partition a number into 2 or more parts.	There are … altogether. I can see … here and … there.   	… and … make … 
Take away A quantity is reduced.	First… Then… Now…   	I have … I take … away Now I have …   

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Subtraction

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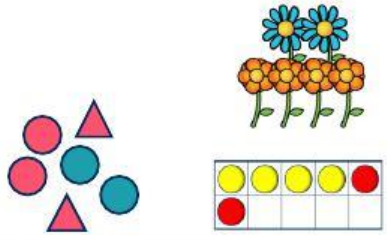
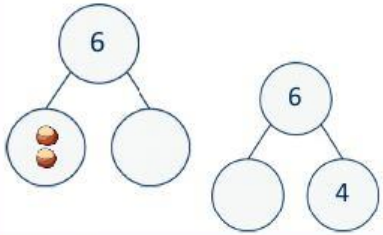
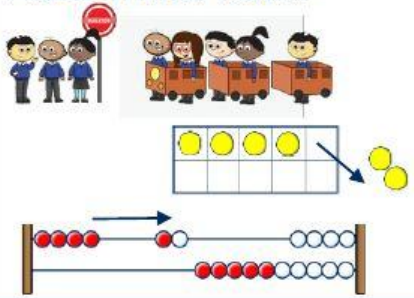
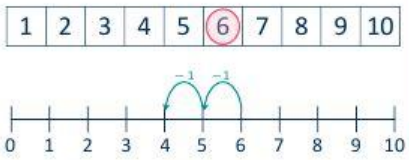
Year 1	• Read, write and interpret mathematical statements involving subtraction (–) and equals (=) signs. • Represent and use number bonds and related subtraction facts within 20 • Subtract one-digit and two-digit numbers to 20, including zero. • Solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$		
Progression of skills	**Key representations**		
Find a part Link to number bonds and known facts. E.g. $2 + 4 = 6$ so if 6 is the whole and 4 is a part, the other part must be 2	There are … in total. … are … How many are **not** …? 	… is the whole. … is a part. … is a part. 	… subtract … is equal to … … is equal to … – … $6 - 2 = 4$ $6 - 4 = 2$ $4 = 6 - 2$ $2 = 6 - 4$
Take away A quantity is decreased.	First… Then… Now… 	I start at … I jump back … I land on … 	… minus … is equal to … … is equal to … – … $6 - 2 = 4$ $6 - 4 = 2$ $4 = 6 - 2$ $2 = 6 - 4$

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Subtraction

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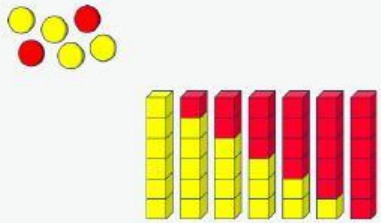
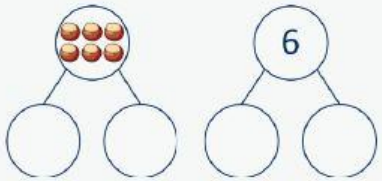
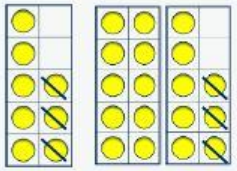
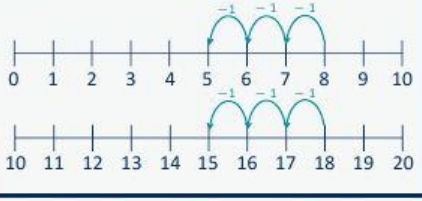
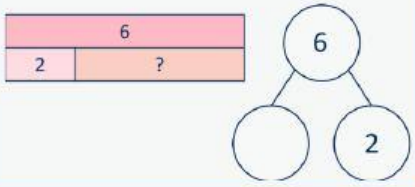
Progression of skills	Key representations		
Bonds within 10 Focus on subtraction facts. Encourage children to notice patterns.	… is made of … and … … and … make … 	… can be partitioned into … and … 	… minus … is equal to … $6 - 0 = 6$ $6 - 1 = 5$ $6 - 2 = 4$ $6 - 3 = 3$ $6 - 4 = 2$ $6 - 5 = 1$ $6 - 6 = 0$
Related facts within 20 Make links to known facts.	I know that … minus … = … so … minus … = … 	… less than … is … so … less than … is … 	What patterns do you notice? $8 - 3 = 5$ $18 - 3 = 15$ $5 = 8 - 3$ $15 = 18 - 3$
Missing numbers Make links to known facts.	How many do you need to subtract to make …?   	If … is the whole and … is a part, the other part must be… 	… minus … is equal to … $6 - \square = 2$ $2 = 6 - \square$ 

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Subtraction

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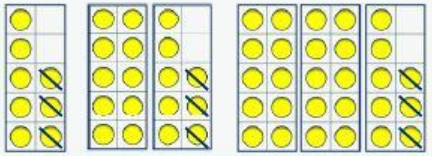
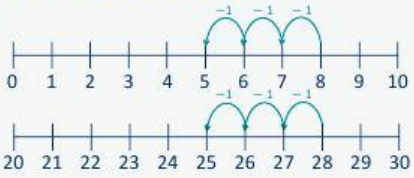
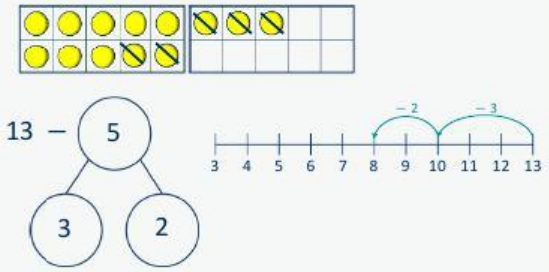
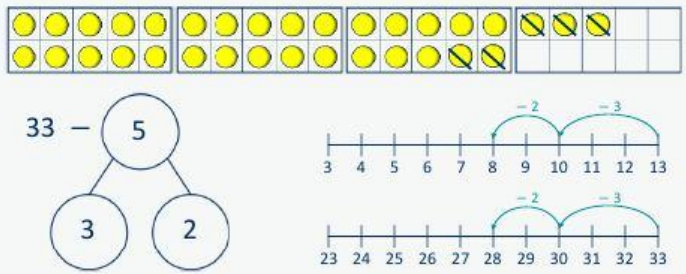
	• Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100
	• Subtract numbers using concrete objects, pictorial representations, and mentally, including:
	  • a two-digit number and 1s
	  • a two-digit number and 10s
	  • 2 two-digit numbers
	• Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Progression of skills	**Key representations**
Subtract ones from any number (related facts) Make links to known facts.	I know that … minus … = … so … minus … = …  … less than … is … so … less than … is …  What do you notice? Can you continue the pattern? $8 - 3 = 5$ $18 - 3 = 15$ $28 - 3 = 25$…
Subtract across a 10 Partition the number being subtracted to bridge through a ten.	… can be partitioned into … and …  Make links with related facts. 

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Subtraction

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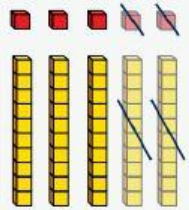
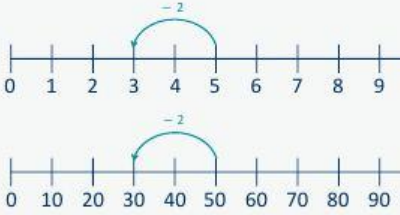
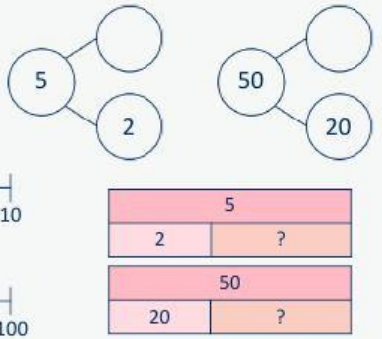
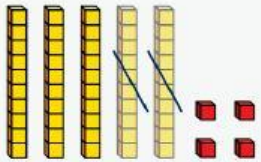
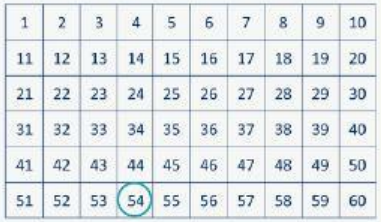
Progression of skills	Key representations		
Subtract multiples of 10 Make links to known facts within ten.	… ones − … ones = … ones so … tens − … tens = … tens  5 − 2 = 3 50 − 20 = 30	What is the same? What is different?   	
Subtract 10s from any number Make links to known facts.	… tens − … tens = … tens … tens and … ones = … 	To subtract … I need to subtract 10 … times.  	I know that … minus … = … so … minus … = … 50 − 20 = 30 54 − 20 = 34

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Subtraction

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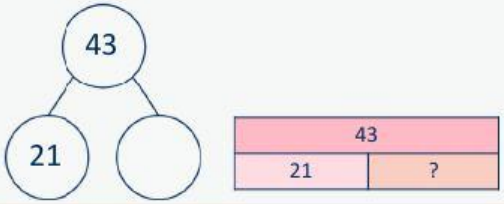
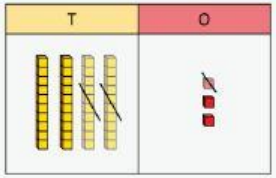
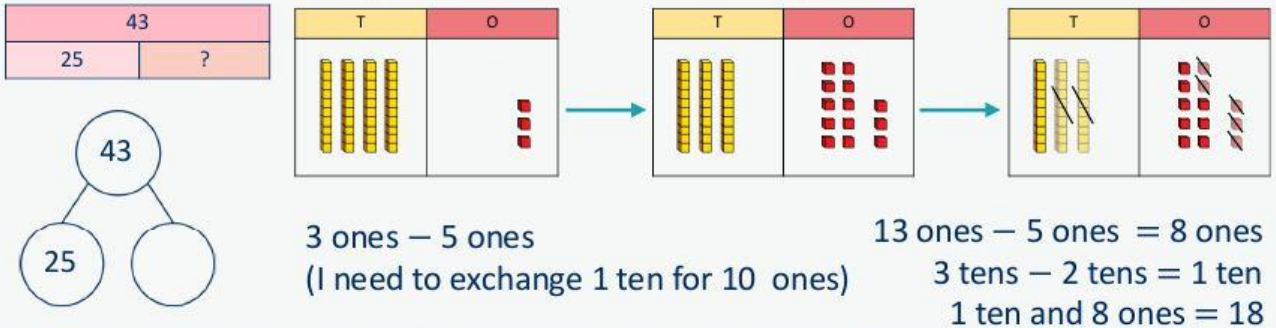
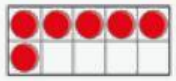
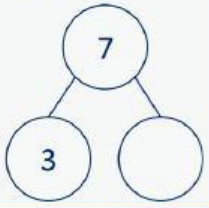
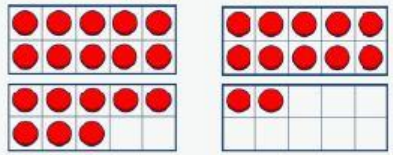
Progression of skills	Key representations
Subtract two 2-digit numbers (not across a ten)	… ones − … ones = … ones … tens − … tens = … tens   3 ones − 1 one = 2 ones 4 tens − 2 tens = 2 tens 2 tens and 2 ones = 22
Subtract two 2-digit numbers (across a ten) Begin to exchange 1 ten for 10 ones.	I need to make an exchange because I do not have enough ones to subtract … ones.  3 ones − 5 ones (I need to exchange 1 ten for 10 ones) 13 ones − 5 ones = 8 ones 3 tens − 2 tens = 1 ten 1 ten and 8 ones = 18
Missing numbers Solve missing number problems and use the inverse to check.	How many do you need to subtract to make …?  10 − □ = 6 6 + □ = 10 If … is a whole and … is a part, then … is the other part. 7 − 3 = □ □ + 3 = 7  … can be partitioned into … and … 18 − □ = 12 + 2 

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Subtraction

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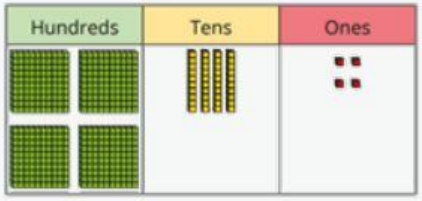
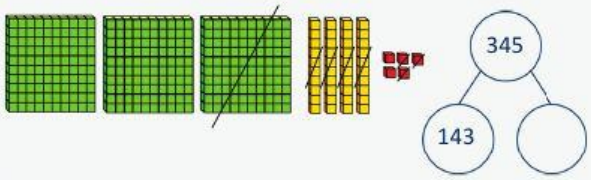
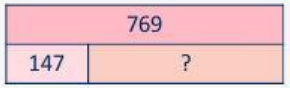
Year 3	• Subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. • Subtract numbers with up to three digits, using formal written methods. • Subtract fractions with the same denominator within 1 whole.

Progression of skills	Key representations	
Subtract 1s, 10s and 100s from a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds column will decrease by …   444 − 2 = 444 − 20 = 444 − 200 = 777 − 4 = 777 − 40 = 777 − 400 =	What patterns do you notice? 235 − 3 = 235 − 30 = 235 − 300 = 624 − 20 = 654 − 50 = 694 − 90 = 118 − ☐ = 111 181 − ☐ = 111 811 − ☐ = 111
Subtract two numbers (no exchange) Mental strategies and introduction of formal written method.	… ones − … ones = … ones … tens − … tens = … tens … hundreds − … hundreds = … hundreds 	  

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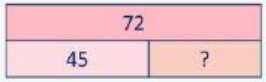
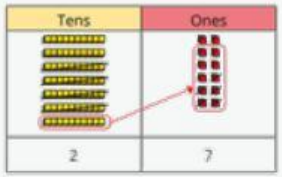
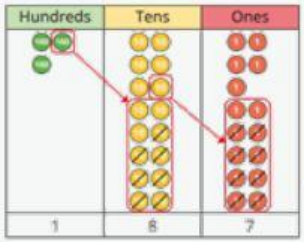
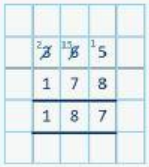
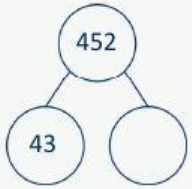
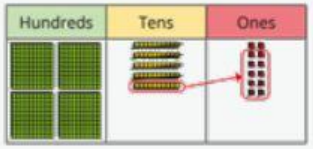
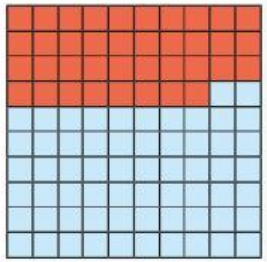
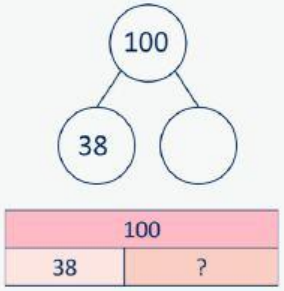
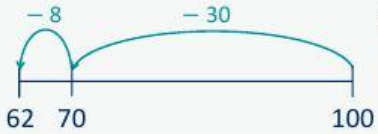
Subtraction

White Rose MATHS

Progression of skills	Key representations
Subtract two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit subtract 2-digit numbers.	I need to subtract … ones. I do/do not need to make an exchange. I need to subtract … tens. I do/do not need to make an exchange. I can exchange 1 … for 10 …        
Complements to 100 Focus on subtraction facts. Encourage children to notice patterns.	100 minus … is equal to …   	I subtract … tens, then I subtract … ones.  $100 - 38 = 62$ $100 - 62 = 38$ $62 = 100 - 38$ $38 = 100 - 62$

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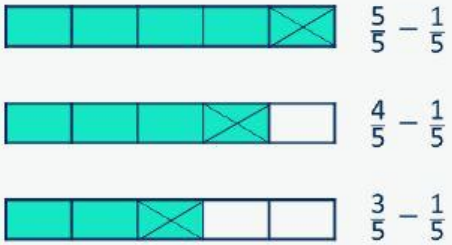
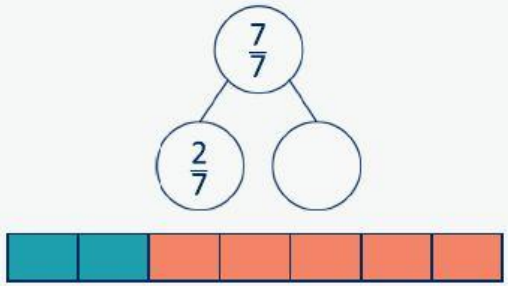
Subtraction

Progression of skills	Key representations
Subtract fractions with the same denominator within 1 whole Make links with known facts.	When subtracting fractions with the same denominator, I only subtract the numerator. ... fifths − ... fifths = ... fifths  $\frac{5}{5} - \frac{1}{5}$ $\frac{4}{5} - \frac{1}{5}$ $\frac{3}{5} - \frac{1}{5}$ 

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Subtraction

White Rose MATHS

Year 4	• Subtract numbers with up to 4 digits using a formal written method. • Solve simple measure and money problems involving fractions and decimals to 2 decimal places. • Subtract fractions with the same denominator.
Progression of skills	**Key representations**

Subtract 1s, 10s, 100s and 1,000s from a 4-digit number

Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.

The ones/tens/hundreds/thousands column will decrease by ...



$3{,}425 - 2 =$
$3{,}425 - 20 =$
$3{,}425 - 200 =$
$3{,}425 - 2{,}000 =$

What patterns do you notice?

$4{,}356 - 3 =$
$4{,}356 - 30 =$
$4{,}356 - 300 =$
$4{,}356 - 3{,}000 =$

$6{,}940 - 200 =$
$6{,}940 - 300 =$
$6{,}940 - 400 =$

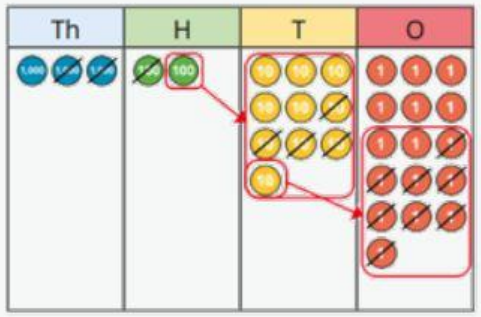
$4{,}433 - \square = 4{,}430$
$4{,}433 - \square = 4{,}033$
$4{,}433 - \square = 4{,}403$

Subtract up to two 4-digit numbers

Formal written method with up to 3 exchanges. Encourage children to estimate and use inverse operations to check answers to calculations.

I need to subtract... ones/tens/hundreds. I do/do not need to make an exchange.

I can exchange 1... for 10...



	Th	H	T	O
	3	12	9	6
−	2	1	4	8
	1	0	5	8

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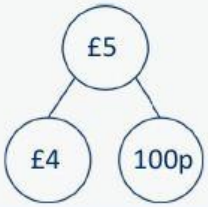
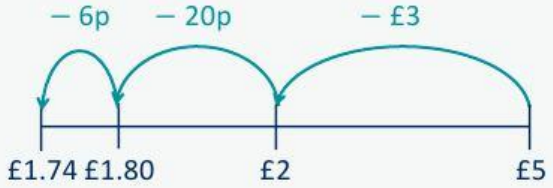
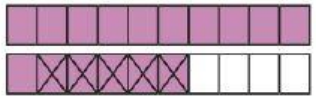
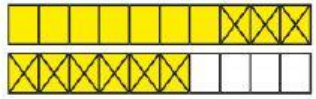
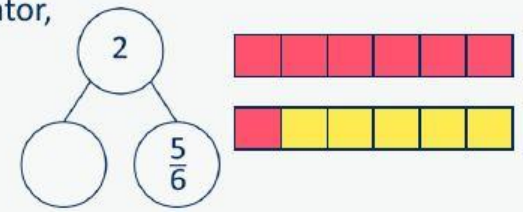
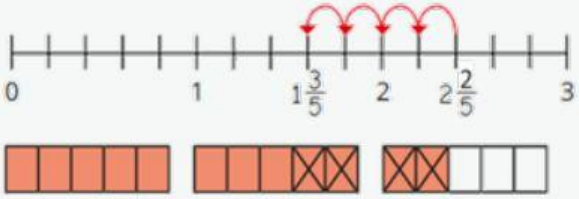
Subtraction

White Rose MATHS

Progression of skills	Key representations	
Subtract decimal numbers in the context of money Emphasis here is on partitioning and use of number lines rather than formal written calculations.	I can partition £... into £... and 100p £... − £... = £... 100p − ...p = ...p **£5 − £3.26** £4 − £3 = £1 100p − 26p = 74p £5 - £3.26 = £1.74 	£3.26 can be partitioned into £3 + 20p + 6p 
Subtract fractions and mixed numbers with the same denominator Include subtracting fractions from wholes.	When subtracting fractions with the same denominator, I only subtract the numerator. ... tenths − ... tenths = ... tenths  $\frac{16}{10} - \frac{5}{10}$  $\frac{16}{10} - \frac{9}{10}$	 

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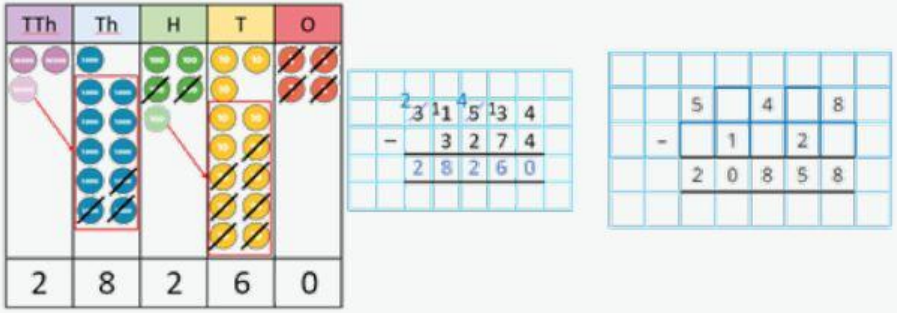
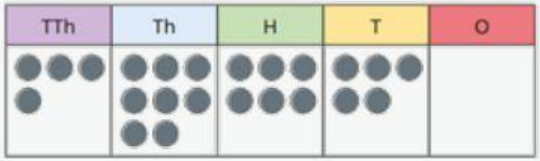
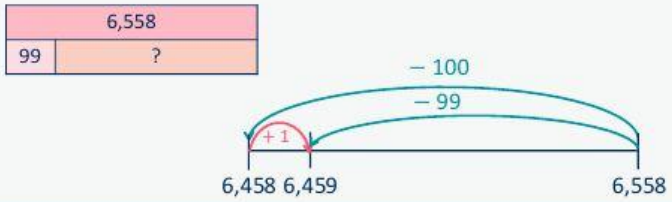
Subtraction

White Rose MATHS

Year 5	• Subtract whole numbers with more than 4 digits. • Subtract numbers mentally with increasingly large numbers. • Subtract decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 • Subtract fractions with the same denominator, and denominators that are multiples of the same number.
Progression of skills	**Key representations**
Subtract whole numbers with more than 4 digits Encourage children to estimate and use inverse operations to check answers to calculations.	I can exchange 1 … for 10 … 
Subtract using mental strategies Subtract 1s, 10s, 100s etc from any number. Use number bonds and related facts.	 48,650 − 300 = 48,650 − 30,000 = 48,650 − 30 =
	To subtract …, I can subtract … then add … 

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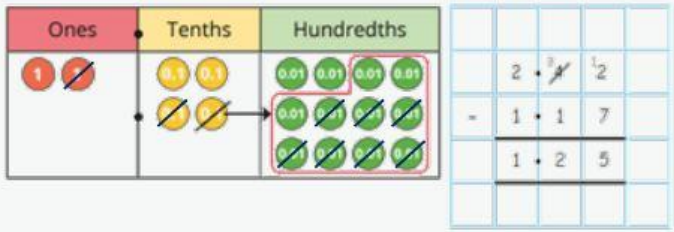
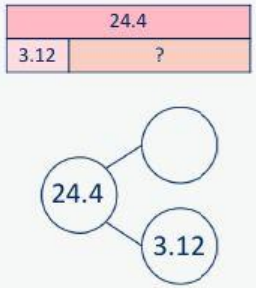
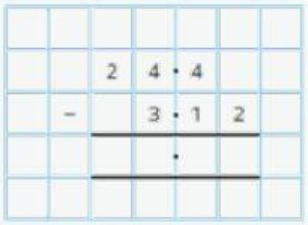
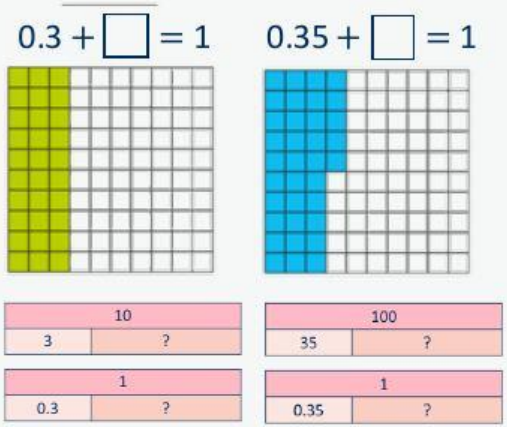
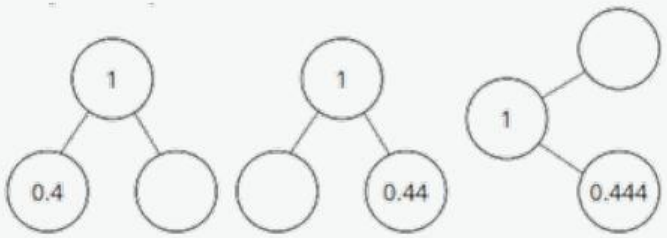
Subtraction

White Rose MATHS

Progression of skills	Key representations
Subtract decimals with up to 2 decimal places Progress from the same number of decimal places to a different number of decimal places and from no exchange to exchange.	
Complements to 1 Encourage children to make links with bonds to 10 and complements to 100 and 1,000 when finding a missing part or subtracting from 1	 $10 - 4 = 6$ $\quad 1 - 0.4 = 0.6$ $100 - 44 = 56$ $\quad 1 - 0.44 = 0.56$ $1{,}000 - 444 = 556$ $\quad 1 - 0.444 = 0.556$

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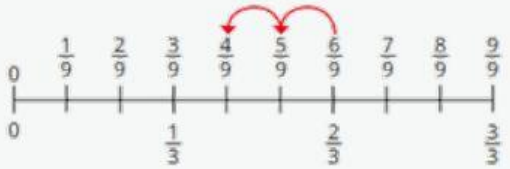
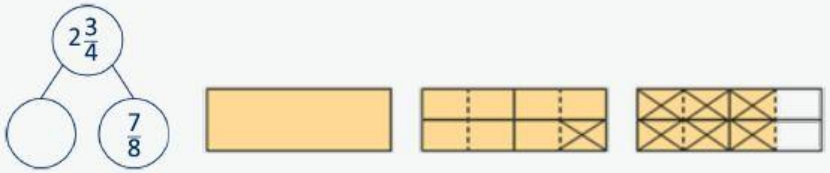
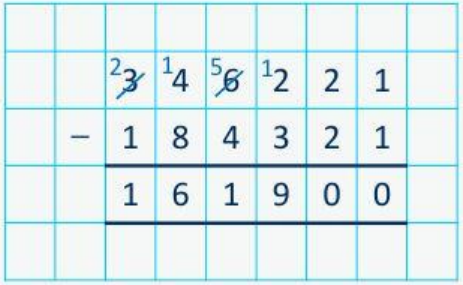
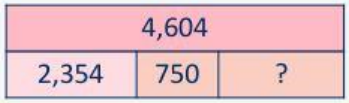
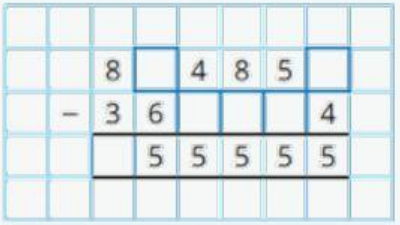
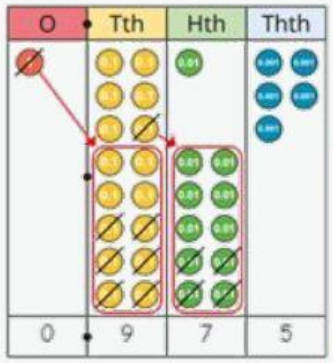
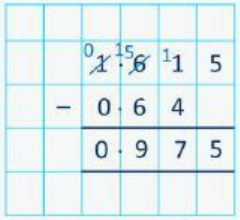
Subtraction

Progression of skills	Key representations
Subtract fractions with denominators that are a multiple of one another Convert fractions to the same denominator before subtracting. Progress from subtracting fractions within 1 whole to subtracting from a mixed number.	The denominator has been multiplied by …, so the numerator needs to be multiplied by… for the fractions to be equivalent.  $\frac{1}{3} - \frac{1}{15} = \frac{5}{15} - \frac{1}{15} = \frac{4}{15}$  $\frac{2}{3} - \frac{2}{9} = \frac{6}{9} - \frac{2}{9} = \frac{4}{9}$ 

Subtraction

White Rose MATHS

Year 6	• Subtract larger numbers, using the formal written methods of columnar subtraction. • Use their knowledge of the order of operations to carry out calculations involving the 4 operations. • Calculate intervals across zero. • Subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.
Progression of skills	**Key representations**
Subtract integers up to 10 million Encourage children to estimate and use inverse operations to check answers to calculations.	  
Subtract decimals with up to 3 decimal places Progress from the same number of decimal and whole number places to a different number of decimal and whole number places.	I do/do not need to make an exchange because …   

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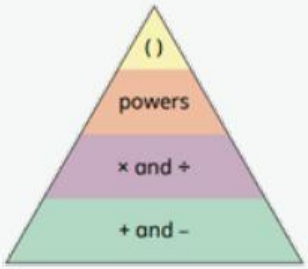
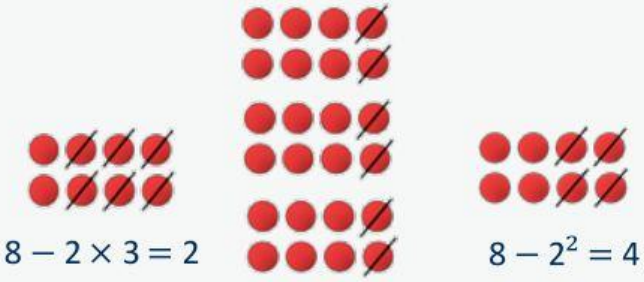
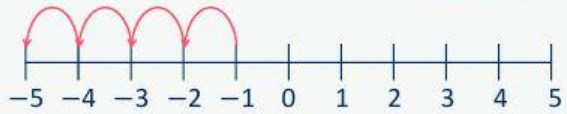
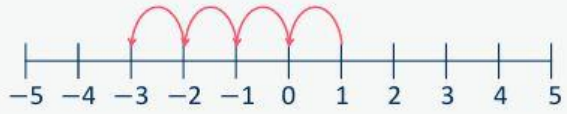
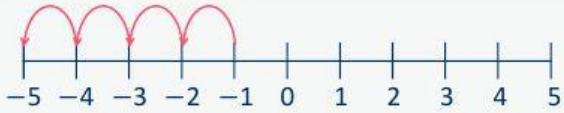
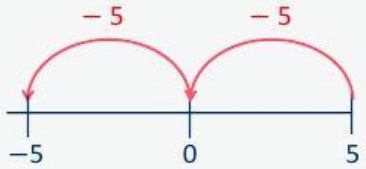
Subtraction

White Rose MATHS

Progression of skills	Key representations
Order of operations Children learn the order of priority for operations in a calculation. Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction.	… has greater priority than … , so the first part of the calculation I need to do is …   $8 - 2 \times 3 = 2$ $(8 - 2) \times 3 = 18$ $8 - 2^2 = 4$
Negative numbers Children subtract from positive and negative numbers and calculate intervals across 0	… minus … is equal to … $-1 - 4 = -5$  $1 - 4 = -3$ 	 The difference between – 5 and –1 is 4  The difference between 5 and –5 is 10

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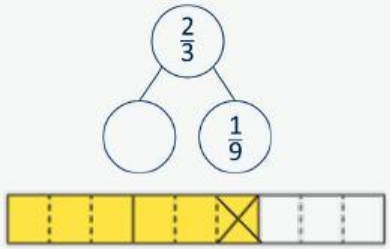
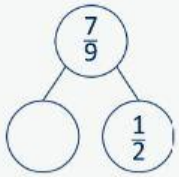
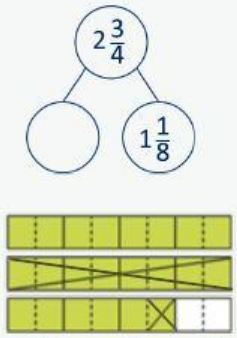
Subtraction

White Rose MATHS

Progression of skills	Key representations		
Subtract fractions Convert fractions to the same denominator before subtracting. Progress from fractions where one denominator is a multiple of the other, to any fractions and then subtracting from a mixed number.	The denominator has been multiplied by …, so the numerator needs to be multiplied by…  $\frac{2}{3} - \frac{1}{9} = \frac{6}{9} - \frac{1}{9} = \frac{5}{9}$	The lowest common multiple of … and … is …  $\frac{7}{9} - \frac{1}{2} = \frac{14}{18} - \frac{9}{18} = \frac{5}{18}$	… is made up of … wholes and …  $2\frac{3}{4} - 1\frac{1}{8} = 1\frac{5}{8}$

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Progression of skills - Multiplication

Year group	Skill
Nursery	• Continue with counting and subitising skills as a foundation for later work on equal groups. (see addition and subtraction sections)
Reception	• Double to 10 • Make equal groups
Year 1	• Count in 2s, 5s and 10s • Add equal groups • Make arrays • Make doubles

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Progression of skills - Multiplication

Year group	Skill
Year 2	• Link repeated addition and multiplication • Use arrays • Double • The 2 times-table • The 10 times-table • The 5 times-table • Missing numbers
Year 3	• The 3 times-table • The 4 times-table • The 8 times-table • Related facts • Multiply a 2-digit number by a 1-digit number - no exchange • Multiply a 2-digit number by a 1-digit number - with exchange • Scaling • Correspondence problems

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Progression of skills - Multiplication

Year group	Skill
Year 4	• Times-table facts to 12 × 12 • Multiply by 1 and 0 • Multiply 3 numbers • Factor pairs • Multiply by 10 and 100 • Related facts • Mental strategies • Multiply a 2 or 3-digit number by a 1-digit number • Scaling • Correspondence problems

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Progression of skills - Multiplication

Year group	Skill
Year 5	• Multiples and factors • Square and cube numbers • Multiply numbers up to 4 digits by a 1-digit number • Multiply numbers up to 4 digits by a 2-digit number • Multiply by 10, 100 and 1,000 • Mental strategies • Multiply fractions by a whole number • Multiply mixed numbers by a whole number • Find the whole

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Progression of skills - Multiplication

Year group	Skill
Year 6	• Multiply numbers up to 4 digits by a 2-digit number • Multiply by 10, 100 and 1,000 • Order of operations • Multiply decimals by integers • Multiply fractions by fractions • Find the whole • Calculations involving ratio

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Multiplication

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Reception	• Have a deep understanding of number to 10, including the composition of each number. • Subitise (recognise quantities without counting) up to 5 • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts. • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.
Progression of skills	**Key representations**
Double to 10 Prompt children to notice that double means twice as many and to notice that there are two equal groups.	Double ... is ... ... is double ... 
Make equal groups Provide opportunities to make equal groups when tidying up or during snack time. Encourage children to check that each group has the same amount.	There are ... groups of ... There are ... altogether. 

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Multiplication

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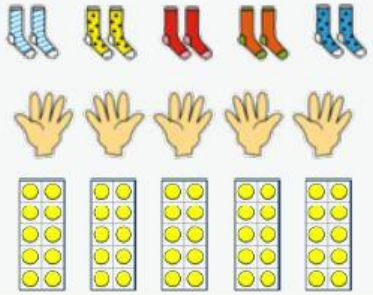
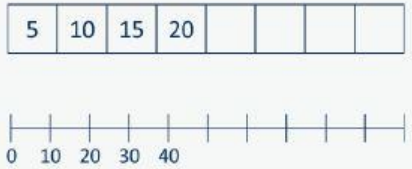
Year 1	• Count in multiples of twos, fives and tens. • Solve one-step problems involving multiplication, using concrete objects, pictorial representations and arrays with the support of the teacher.

Progression of skills	Key representations		
Count in 2s, 5s and 10s Begin by counting objects that naturally come in 2s, 5s and 10s, for example pairs of socks or fingers.	There are ... equal groups of ... There are ... altogether. 	Continue to colour in ...s What do you notice?  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50	Complete the number track/number line by counting in ...s.  5 10 15 20 0 10 20 30 40
Add equal groups (repeated addition) Children should be able to write a repeated addition to represent equal groups and to draw pictures or use objects to represent a repeated addition.	There are ... groups of ... There are ... altogether.  $10 + 10 + 10 = 30$  $5 + 5 + 5 + 5 = 20$	What is the same? What is different? $2 + 2 + 2 =$ $5 + 5 + 5 =$ $10 + 10 + 10 =$ Use objects or a drawing to represent the equal groups and find how many in total.	

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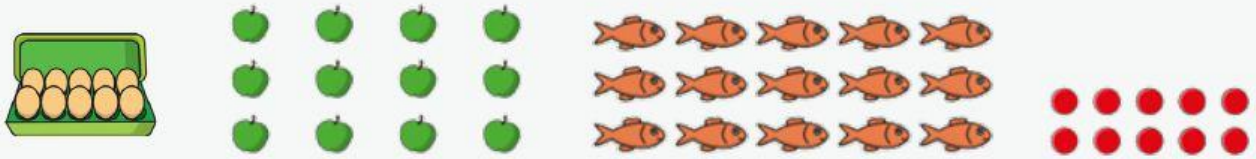
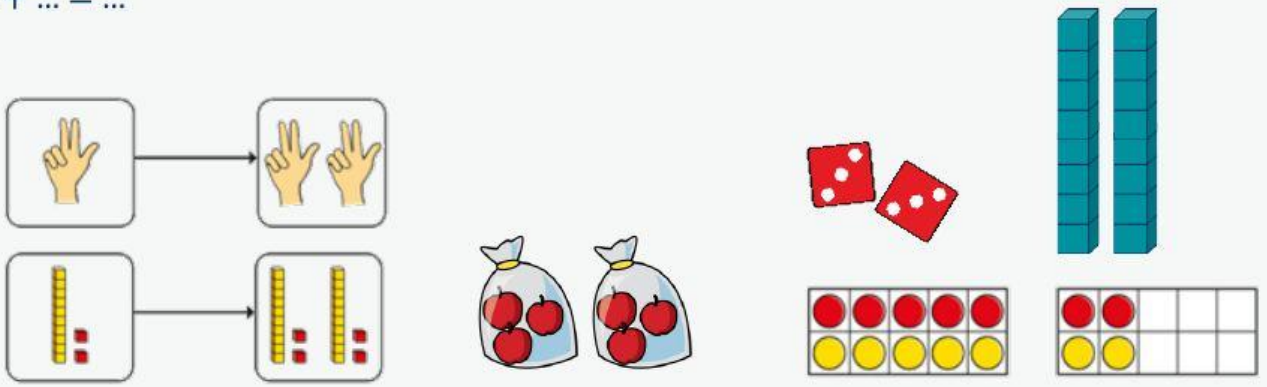
Multiplication

Progression of skills	Key representations
Make arrays Children use their knowledge of adding equal groups to arrange objects in columns and rows.	There are ... rows of ... There are ... altogether. There are ... columns of ... There are ... altogether. 
Make doubles Children understand that doubles are two equal groups. Children may begin to explore doubles beyond 20 using base 10	Double ... is ... ... + ... = ... 

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Multiplication

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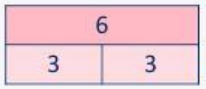
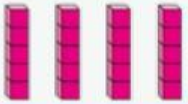
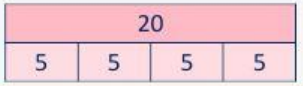
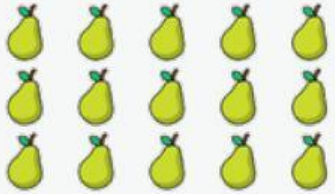
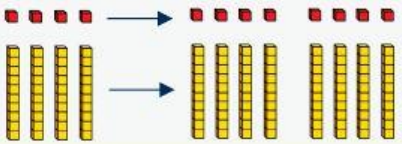
Year 2	• Recall and use multiplication facts for the 2, 5 and 10 multiplication tables. • Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs. • Show that multiplication of two numbers can be done in any order (commutative).
Progression of skills	**Key representations**
Link repeated addition and multiplication Encourage children to make the link between repeated addition and multiplication.	There are … equal groups with … in each group. There are … altogether.   6 / 3 3 3 + 3 = 6 2 × 3 = 6   20 / 5 5 5 5 5 + 5 + 5 + 5 = 20 4 × 5 = 20
Use arrays Encourage children to see that multiplication is commutative.	There are … rows with … in each row. There are … columns with … in each column.  3 lots of 5 = 15 5 + 5 + 5 = 15 5 lots of 3 = 15 3 + 3 + 3 + 3 + 3 = 15
	I can see … × … and … ×… 3 × 5 = 15 5 × 3 = 15 3 × 5 = 5 × 3
Double Encourage children to make links with related facts.	Double … is …  Double 4 = 4 + 4 Double 4 is 8
	Double … is … so double … is …  Double 4 is 8 Double 40 is 80

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Multiplication

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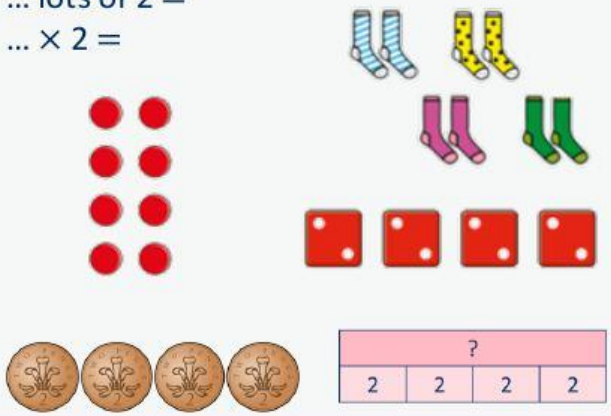
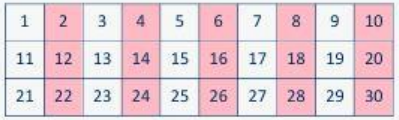
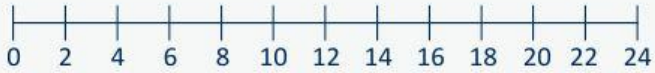
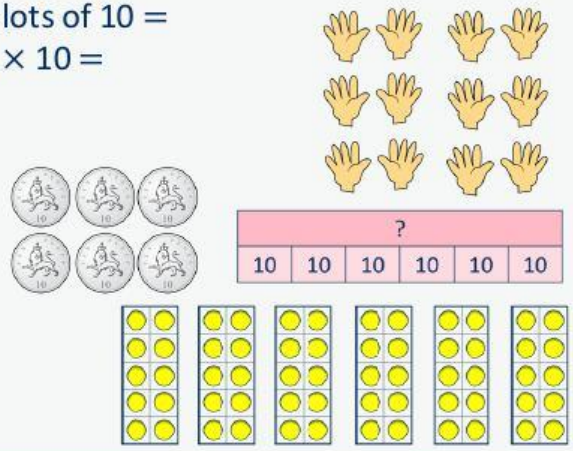
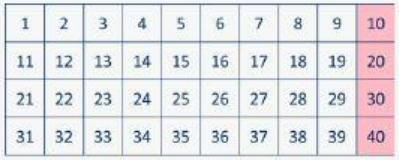
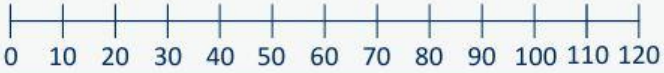
Progression of skills	Key representations	
The 2 times-table Encourage daily counting in multiples both forwards and back. Notice that all multiples of 2 are even numbers.	… lots of 2 = … × 2 =  	… times 2 is equal to …  $1 \times 2 = 2 \quad 2 = 1 \times 2$ $2 \times 2 = 4 \quad 4 = 2 \times 2$ $3 \times 2 = 6 \quad 6 = 3 \times 2$ 
The 10 times-table Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.	… lots of 10 = … × 10 =  	… times 10 is equal to …  $1 \times 10 = 10 \quad 10 = 1 \times 10$ $2 \times 10 = 20 \quad 20 = 2 \times 10$ $3 \times 10 = 30 \quad 30 = 3 \times 10$ 

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Multiplication

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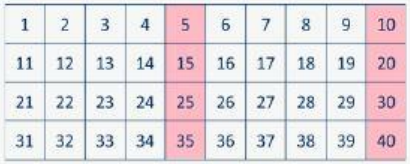
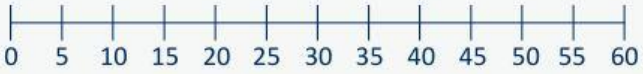
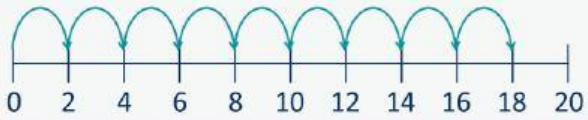
Progression of skills	Key representations	
The 5 times-table Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.	… lots of 5 = … × 5 =  	… times 5 is equal to …  1 × 5 = 5 5 = 1 × 5 2 × 5 = 10 10 = 2 × 5 3 × 5 = 15 15 = 3 × 5 
Missing numbers Make links to known facts.	… is equal to … groups of … 18 socks, how many pairs?   	… times … is equal to … □ × 2 = 18 18 = 2 × □

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Multiplication

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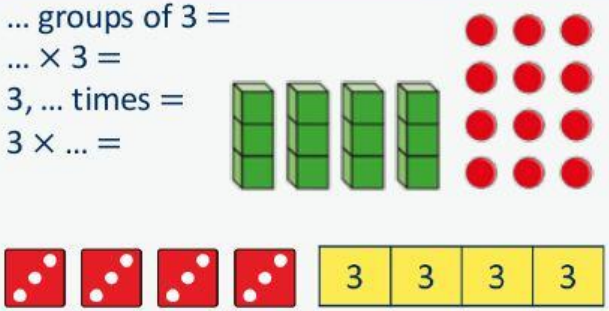
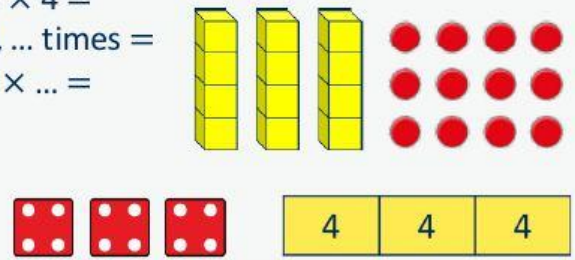
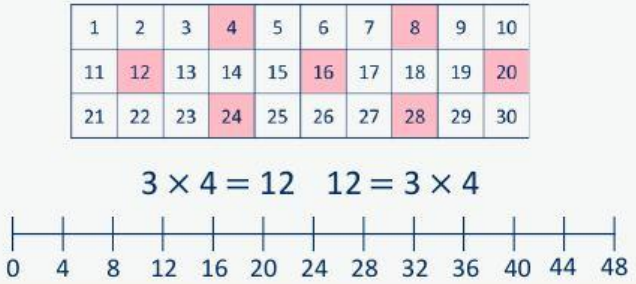
Year 3	• Recall and use multiplication facts for the 3, 4 and 8 multiplication tables. • Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. • Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.

Progression of skills	Key representations	
The 3 times-table Encourage daily counting in multiples both forwards and back.	... groups of 3 = ... × 3 = 3, ... times = 3 × ... = 	... times 3 is equal to ... 
The 4 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2 and 4 times-tables.	... groups of 4 = ... × 4 = 4, ... times = 4 × ... = 	... times 4 is equal to ... 

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Multiplication

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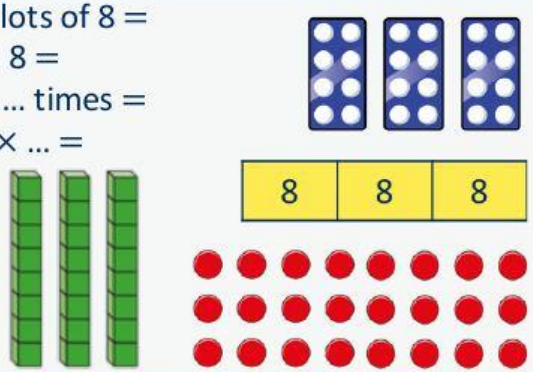
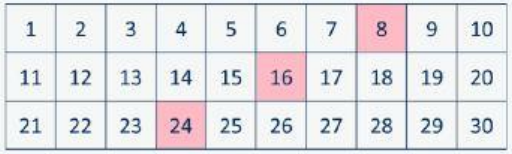
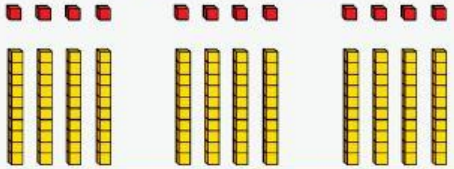
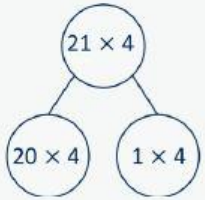
Progression of skills	Key representations
The 8 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2, 4 and 8 times-tables.	… lots of 8 = × 8 = 8, … times = 8 × … =  … times 8 is equal to …  3 × 8 = 24 24 = 3 × 8 
Related facts Use knowledge of multiplying by 10 to scale times-table facts.	… × … ones is equal to … ones so … × … tens is equal to … tens.   3 × 4 = 12 3 × 40 = 120
Multiply a 2-digit number by a 1-digit number - no exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method.	… tens multiplied by … is equal to … tens. …ones multiplied by … is equal to … ones.  30 × 2 = 60 2 × 2 = 4 32 × 2 = 64  

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Multiplication

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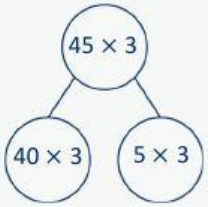
Progression of skills	Key representations	
Multiply a 2-digit number by a 1-digit number - with exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method.	… tens multiplied by … is equal to … tens. … ones multiplied by … is equal to … ones.  $20 \times 4 = 80$ $4 \times 4 = 16$ $24 \times 4 = 96$  	
Scaling Children focus on multiplication as scaling (…. times the size) as opposed to repeated addition.	There are …. times as many … as …  There are 3 times as many triangles as circles.	… is … times the size of … … is … times the length/height of …  Miss Smith is twice the height of Jo.

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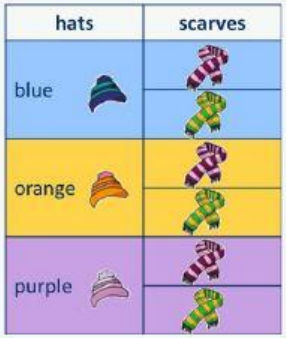
Multiplication

Progression of skills	Key representations
Correspondence problems (How many ways?) Encourage children to work systematically to find all the different possible combinations.	For every … , there are … possible … There are … × … possibilities altogether.   For every hat, there are two possible scarves. $3 \times 2 = 6$ There are 6 possibilities altogether.

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Multiplication

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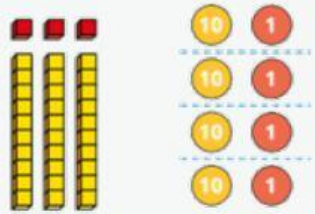
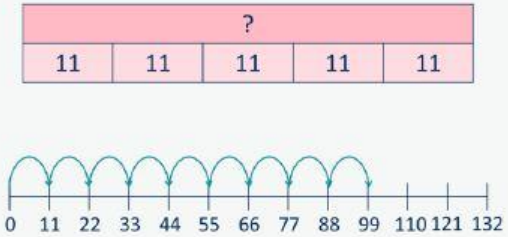
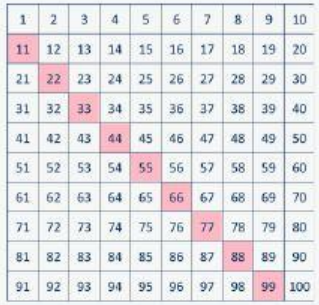
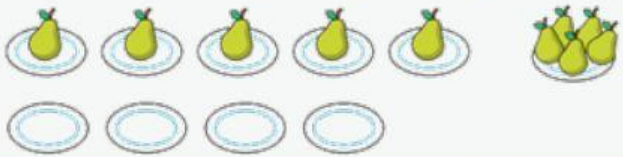
Year 4	• Recall multiplication facts for multiplication tables up to 12 × 12 • Use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1; multiplying together three numbers. • Recognise and use factor pairs and commutativity in mental calculations. • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. • Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.
Progression of skills	**Key representations**
Times-table facts to 12 × 12 Encourage daily counting in multiples both forwards and back. Encourage children to notice links between related times-tables.	... groups of ... = ... times ... is equal to ... ... × ... =   
Multiply by 1 and 0	Any number multiplied by 1 is equal to ... Any number multiplied by 0 is equal to ... 
	... × ... = ... 1 × 1 = 1 1 × 0 = 0 2 × 1 = 2 2 × 0 = 0 3 × 1 = 3 3 × 0 = 0 4 × 1 = 4 4 × 0 = 0

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Multiplication

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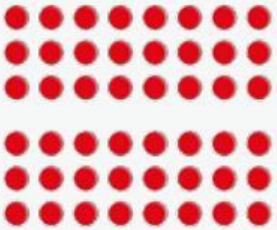
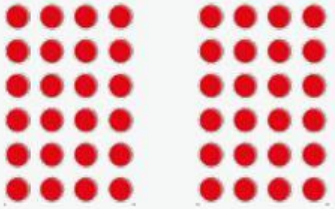
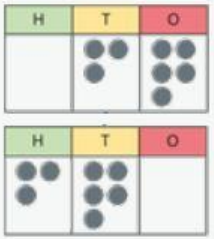
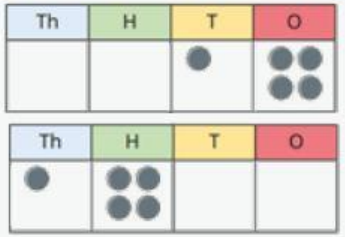
Progression of skills	Key representations
Multiply 3 numbers Children use their understanding of commutativity to multiply more efficiently.	To work out … × … × …, I can first calculate … × … and then multiply the answer by …  $4 \times 2 \times 3 = 8 \times 3 = 24$ $2 \times 3 \times 4 = 6 \times 4 = 24$ $3 \times 4 \times 2 = 12 \times 2 = 24$
Factor pairs Children explore equivalent calculations using different factors pairs.	12 = … × … , so … × 12 = … × … × …  $8 \times 6 = 8 \times 3 \times 2$ $8 \times 6 = 24 \times 2$  $6 \times 8 = 6 \times 4 \times 2$ $6 \times 8 = 24 \times 2$
Multiply by 10 and 100 Some children may over-generalise that multiplying by 10 or 100 always results in adding zeros. This will cause issues later when multiplying decimals.	When I multiply by 10, the digits move … place value column to the left. … is 10 times the size of …  $35 \times 10 = 350$
	When I multiply by 100, the digits move … place value columns to the left. … is 100 times the size of …  $14 \times 100 = 1{,}400$

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Multiplication

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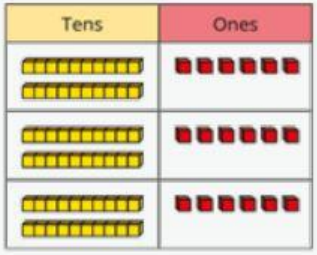
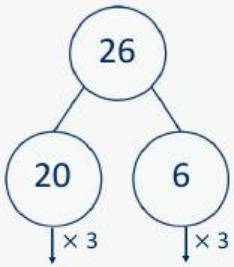
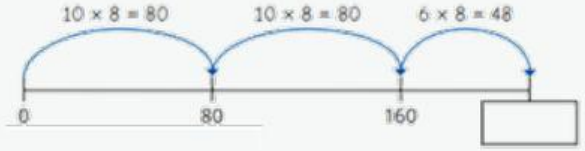
Progression of skills	Key representations
Related facts Use knowledge of multiplying by 10 and 100 to scale times-table facts.	… × … ones is equal to … ones so … × … tens is equal to … tens and … × … hundreds is equal to … hundreds.  $3 \times 7 = 21$ $\quad$ $7 \times 3 = 21$ $3 \times 70 = 210$ $\quad$ $7 \times 30 = 210$ $3 \times 700 = 2{,}100$ $\quad$ $7 \times 300 = 2{,}100$
Mental strategies Partition 2 or 3-digit numbers to multiply using informal methods.	… tens multiplied by … is equal to … tens. …ones multiplied by … is equal to … ones.  $3 \times 26 = 60 + 18 = 78$  60 $\quad$ 18  $26 \times 8 = 80 + 80 + 48 = 208$

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Multiplication

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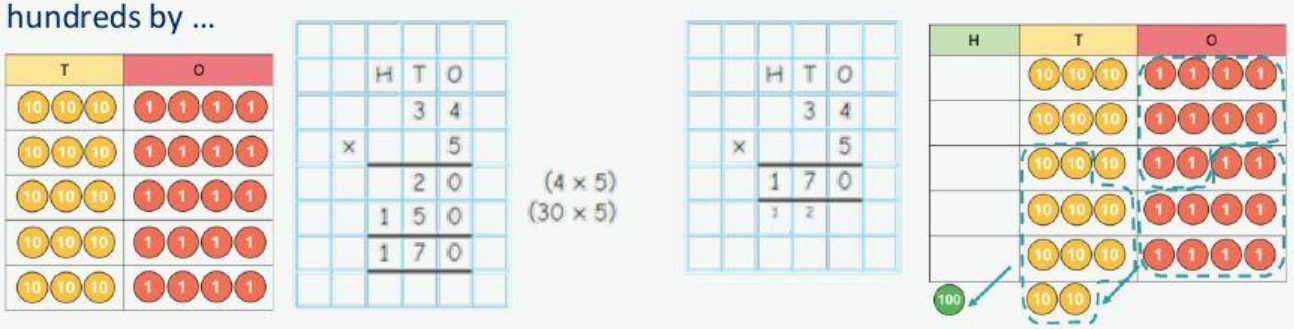
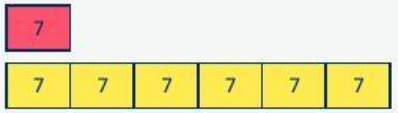
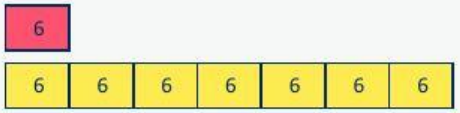
Progression of skills	Key representations
Multiply a 2 or 3-digit number by a 1-digit number The short multiplication method is introduced for the first time, initially in an expanded form.	To multiply a 2-digit number by … , I multiply the ones by … and the tens by … To multiply a 3-digit number by … , I multiply the ones by … , the tens by … and the hundreds by … 
Scaling Children focus on multiplication as scaling (… times the size).	… is … times the size of …  A computer mouse costs £7 A keyboard costs 6 times as much.  A red ribbon is 6 cm. A yellow ribbon is 7 times as long.
Correspondence problems Encourage children to use tables to show all the different possible combinations.	For every … , there are … possibilities. There are … × … possibilities altogether. A pizza company offers a choice of 5 toppings and 3 bases. 5 × 3 = 15

	Deep pan	Italian	Thin
Cheese	C DP	C I	C Th
Mushroom	M DP	M I	M Th
Vegetable	V DP	V I	V Th
Chicken	C DP	C I	C Th
Tuna	T DP	T I	T Th

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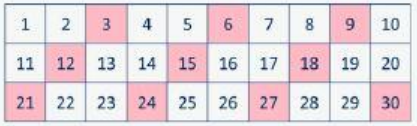
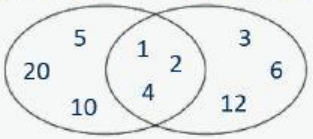
Multiplication

White Rose MATHS

Year 5	• Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) • Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers. • Multiply numbers mentally drawing upon known facts. • Multiply whole numbers and those involving decimals by 10, 100 and 1000 • Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.

Progression of skills	Key representations		
Multiples and factors Encourage children to notice patterns and make links with known facts.	… is a multiple of … because … × … = …   1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	… is a factor of … because … × … = …  1 × 8  2 × 4 1, 2, 4 and 8 are factors of 8	The common factors of … and … are … Factors of 20 Factors of 12  5 1 3 20 2 6 4 10 12
Square and cube numbers	… squared means … × …  1 × 1 $1^2 = 1$ 2 × 2 $2^2 = 4$ 3 × 3 $3^2 = 9$ 4 × 4 $4^2 = 16$	… cubed means … × … × …  1 × 1 × 1 $1^3 = 1$ 2 × 2 × 2 $2^3 = 8$ 3 × 3 × 3 $3^3 = 27$	

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Multiplication

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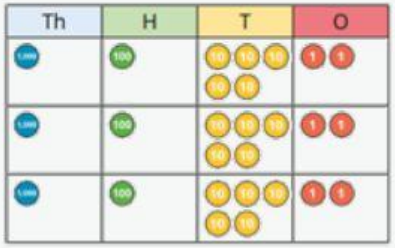
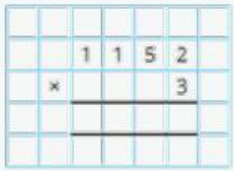
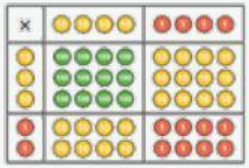
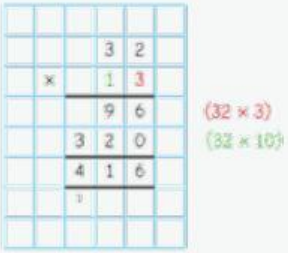
Progression of skills	Key representations	
Multiply numbers up to 4 digits by a 1-digit number This builds on the short multiplication method introduced in Y4	To multiply a 4-digit number by … , I multiply the ones by … , the tens by … , the hundreds by … and the thousands by …   	
Multiply numbers up to 4 digits by a 2-digit number Numbers are first partitioned using an area model then long multiplication is introduced for the first time.	I can partition … into … and …  × 40 4 30 1,200 120 2 80 8 $32 \times 44 = 1{,}200 + 80 + 120 + 8$ $32 \times 44 = 1{,}408$	First, I multiply by the … Then I multiply by the … × 10 3 30 300 90 2 20 6 300 + 90 + 20 + 6 = 416 

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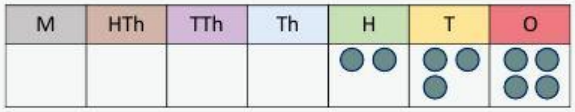
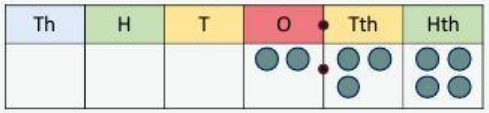
Multiplication

White Rose MATHS

Progression of skills	Key representations
Multiply by 10, 100 and 1,000 Some children may over-generalise that multiplying by a power of 10 always results in adding zeros. This will cause issues later when multiplying decimals.	To multiply by 10/100/1,000, I move all the digits … places to the left. … is 10/100/1,000 times the size of …  234 × 10 = 2,340 234 × 100 = 23,400 234 × 1,000 = 234,000  2.34 × 10 = 23.4 2.34 × 100 = 234 2.34 × 1,000 = 2,340
Mental strategies Children continue to use efficient mental strategies such as partitioning and knowledge of factor pairs and related facts to multiply.	The most efficient strategy to calculate … × … is … To calculate … × 12, I can do … × … × … For example: 121 × 12 I could calculate 100 × 12 plus 20 × 12 plus 1 × 12 I could calculate 121 × 10 plus 121 × 2 I could calculate 121 × 6 × 2 I could calculate 121 × 4 × 3

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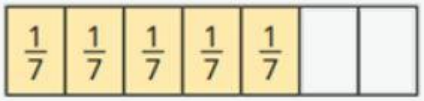
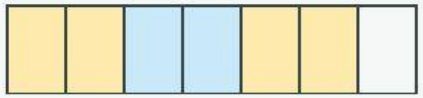
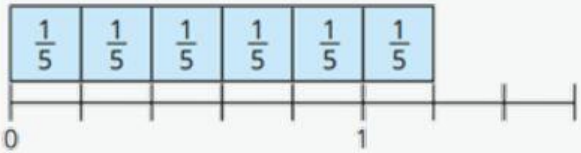
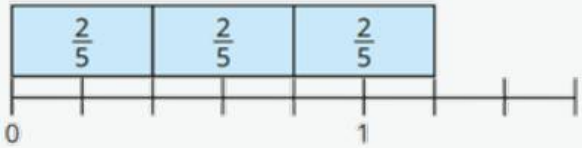
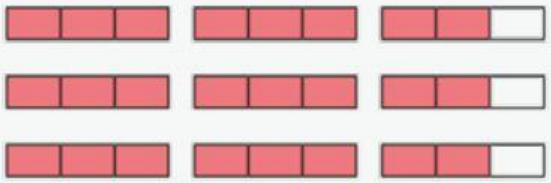
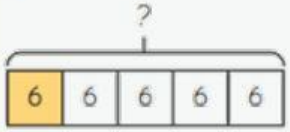
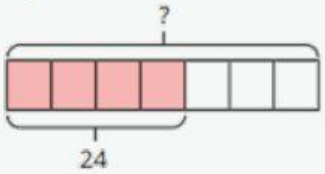
Multiplication

White Rose MATHS

Progression of skills	Key representations
Multiply fractions by a whole number Make links with repeated addition. E.g. $\frac{1}{5} \times 4 = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$	To multiply a fraction by an integer, I multiply the numerator by the integer and the denominator remains the same.  $\frac{1}{7} \times 5 = \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} = \frac{5}{7}$  $\frac{2}{7} \times 3 = \frac{2}{7} + \frac{2}{7} + \frac{2}{7} = \frac{6}{7}$  $\frac{1}{5} \times 6 = \frac{6}{5} = 1\frac{1}{5}$  $\frac{2}{5} \times 3 = \frac{6}{5} = 1\frac{1}{5}$
Multiply mixed numbers by a whole number	I can partition $\square\frac{\square}{\square}$ into $\square$ and $\frac{\square}{\square}$  $2\frac{2}{3} \times 3$ $2 \times 3 = 6$ $\quad \frac{2}{3} \times 3 = \frac{6}{3} = 2$ $2\frac{2}{3} \times 3 = 6 + 2 = 8$

Multiplication

White Rose MATHS

Progression of skills	Key representations	
Find the whole Children multiply to find the whole from a given part.	If $\frac{1}{\square}$ is … , then the whole is … × … $\frac{1}{5}$ of ___ $= 6$  $5 \times 6 = 30$ $\frac{1}{5}$ of **30** $= 6$	If $\frac{\square}{\square}$ is … , then $\frac{1}{\square}$ is … and the whole is … × … $\frac{4}{7}$ of ___ $= 24$  $\frac{1}{7} = 24 \div 4 = 6$ $7 \times 6 = 42$ $\frac{4}{7}$ of **42** $= 24$

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Multiplication

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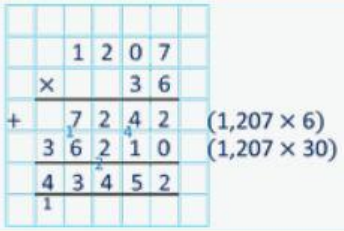
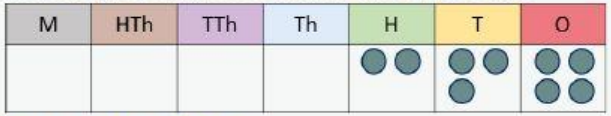
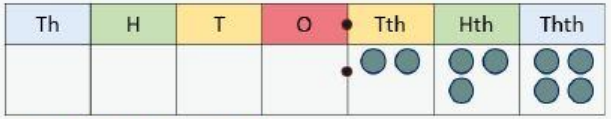
Year 6	• Identify common factors and common multiples. • Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication. • Multiply numbers by 10, 100 and 1,000 • Multiply one-digit numbers with up to two decimal places by whole numbers. • Use their knowledge of the order of operations to carry out calculations involving the 4 operations. • Multiply simple pairs of proper fractions, writing the answer in its simplest form. • Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. • Solve problems involving the calculation of percentages.
Progression of skills	**Key representations**
Multiply numbers up to 4 digits by a 2-digit number	To multiply by a 2-digit number, first multiply by the ones, then multiply by the tens and then find the total.  (1,207 × 6) (1,207 × 30)
Multiply by 10, 100 and 1,000 Some children may over-generalise that multiplying by a power of 10 always results in adding zeros.	To multiply by 10/100/1,000, I move all the digits … places to the left. … is 10/100/1,000 times the size of …   234 × 10 = 2,340 234 × 100 = 23,400 234 × 1,000 = 234,000 0.234 × 10 = 2.34 0.234 × 100 = 23.4 0.234 × 1,000 = 234

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Multiplication

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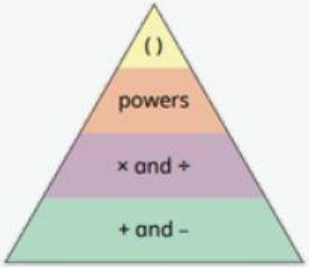
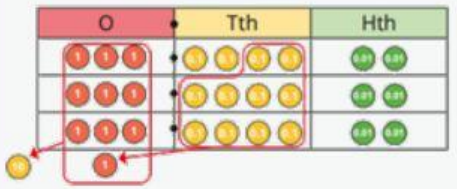
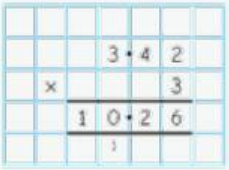
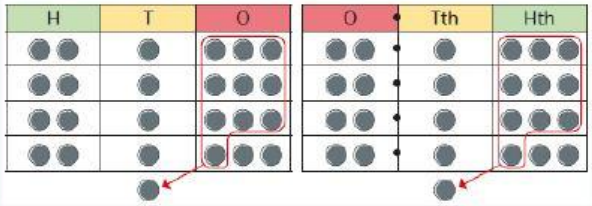
Progression of skills	Key representations
Order of operations Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction.	… has greater priority than …, so the first part of the calculation I need to do is …   $(3 + 4) \times 2 = 14$  $3 + 4^2 = 19$  $3 + 4 \times 2 = 11$
Multiply decimals by integers This is the first time children multiply decimals by numbers other than 10, 100 or 1,000 Encourage them to make links with known facts and whole number multiplication.	I know that … × … = …, so I also know that … × … = …  $6 \times 2 = 12$  $6 \times 0.2 = 1.2$	I need to exchange 10 … for 1 …    $213 \times 4 = 852$ $2.13 \times 4 = 8.52$

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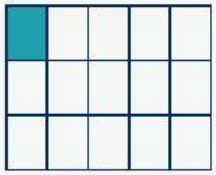
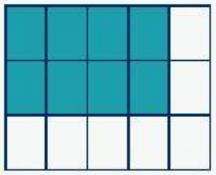
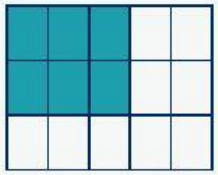
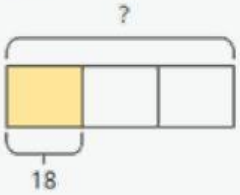
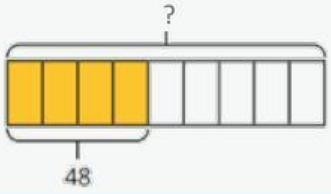
Multiplication

White Rose MATHS

Progression of skills	Key representations
Multiply fractions by fractions Encourage children to give answers in their simplest form.	When multiplying a pair of fractions, I need to multiply the numerator and multiply the denominator.  $\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$  $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$  $\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}$
Find the whole Children multiply to find the whole from a given part.	If $\frac{1}{\square}$ is … , then the whole is … × … $\frac{1}{3}$ of ___ = 18  $18 \times 3 = 54$ $\frac{1}{3}$ of **54** = 18
	If $\frac{\square}{\square}$ is … , then $\frac{1}{\square}$ is … and the whole is … × … $\frac{4}{9}$ of ___ = 48  $\frac{1}{9} = 48 \div 4 = 12$ $9 \times 12 = 108$ $\frac{4}{9}$ of **108** = 48

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Multiplication

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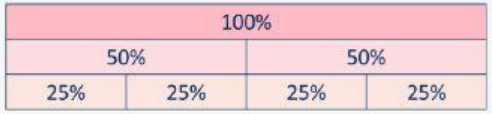
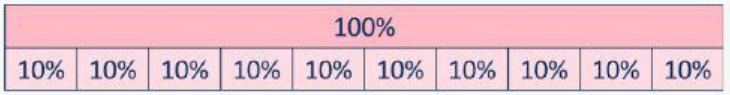
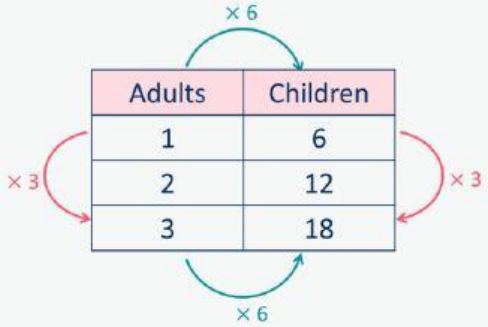
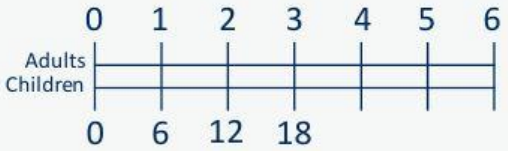
Progression of skills	Key representations	
Calculate percentages Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.	There are … lots of … % in 100% To find … %, I need to divide by … 50% of … = …÷ 2 25% of … = …÷ 4	… % is made up of … %, and … % To find 30%, I can find 10% and then multiply it by 3 To find 23%, I can use 10% × 2 and 1% × 3 To find 99%, I can find 1%, then subtract from 100%
Calculations involving ratio Encourage children to see the multiplicative relationship between ratios. They will need to multiply or divide each value by the same number to keep the ratio equivalent. Double number lines and ratio tables help children to see both horizontal and vertical multiplicative relationships.	For every … , there are … For every 1 adult on a school trip, there are 6 children. The ratio of adults to children is 1 : 6	











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Progression of skills - Division

Year group	Skill
Nursery	• Continue with counting and subitising skills as a foundation for later work on equal groups. (see addition and subtraction sections)
Reception	• Sharing • Grouping
Year 1	• Make equal groups – grouping • Make equal groups – sharing • Find a half • Find a quarter

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Progression of skills - Division

Year group	Skill
Year 2	• Divide by 2 • Divide by 10 • Divide by 5 • Missing numbers • Unit fractions • Non-unit fractions
Year 3	• Divide by 3 • Divide by 4 • Divide by 8 • Related facts • Divide a 2-digit number by a 1-digit number - no exchange • Divide a 2-digit number by a 1-digit number - with remainders • Unit fractions of a set of objects • Non-unit fractions of a set of objects

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Progression of skills - Division

Year group	Skill
Year 4	• Division facts to 12 × 12 • Divide a number by 1 and itself • Related facts • Divide a 2 or 3-digit number by a 1-digit number • Divide by 10 and 100
Year 5	• Mental strategies • Divide numbers up to 4 digits by a 1-digit number • Divide by 10, 100 and 1,000 • Fraction of an amount

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Progression of skills - Division

Year group	Skill
Year 6	• Short division • Mental strategies • Long division • Order of operations • Divide by 10, 100 and 1,000 • Divide decimals by integers • Decimal and fraction equivalents • Divide a fraction by an integer • Fraction of an amount • Calculate percentages • Calculations involving ratio

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Division

Reception	• Have a deep understanding of number to 10, including the composition of each number. • Subitise (recognise quantities without counting) up to 5 • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts. • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.
Progression of skills	**Key representations**
Sharing Provide practical activities such as sharing items during snack time. Encourage children to check whether items have been shared fairly (equally).	There are … altogether. They are shared equally between … groups. 
Grouping Provide opportunities to make equal groups when tidying up or during snack time. Encourage children to check that each group has the same amount.	There are … groups of … There are … altogether. 

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Division

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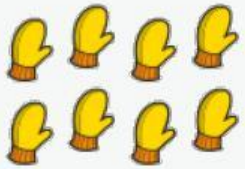
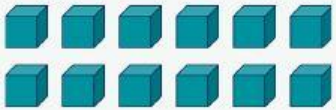
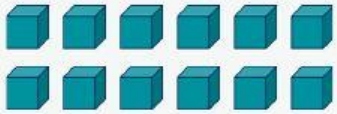
Year 1	• Solve simple one-step problems involving division, using concrete objects, pictorial representations and arrays with the support of the teacher. • Recognise, find and name a half as one of two equal parts of a quantity. • Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.		
Progression of skills	**Key representations**		
Make equal groups - grouping Encourage children to physically move objects into equal groups. They can also circle equal groups when using pictures.	There are … altogether. How many groups of … can you make?  	Circle groups of 2 There are … groups of 2 	Take … cubes. Make equal groups.  There are … groups of …
Make equal groups – sharing Encourage children to check that the objects have been shared fairly and each group is the same.	… have been shared equally between… There are … on/in each …  		Take … cubes. Share them between …  12 shared between … is …

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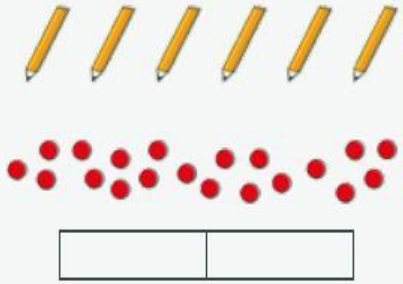
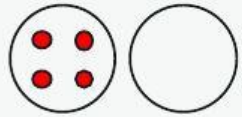
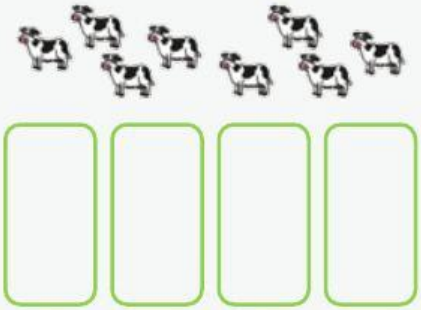
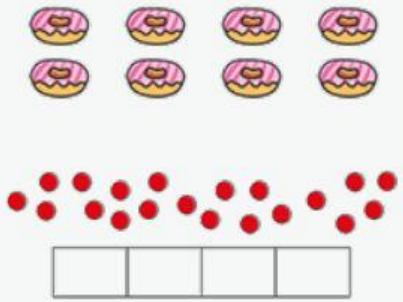
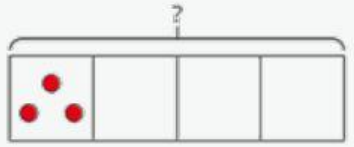
Division

Progression of skills	Key representations		
Find a half Start with practical opportunities to share a quantity into 2 groups. Progress to circling half of the objects in a picture and then to finding the whole from a given half.	To find half, I need to share into 2 equal groups.  There are … in each group.	Half of … is … 	If … is half, what is the whole?  4 is half of …
Find a quarter Start with practical opportunities to share a quantity into 4 groups. Progress to using pictures or bar models to find a quarter and then to finding the whole from a given quarter.	To find a quarter, I need to share into 4 equal groups.  There are … in each group.	A quarter of … is … 	If … is one quarter, what is the whole?  3 is one quarter of …

Division

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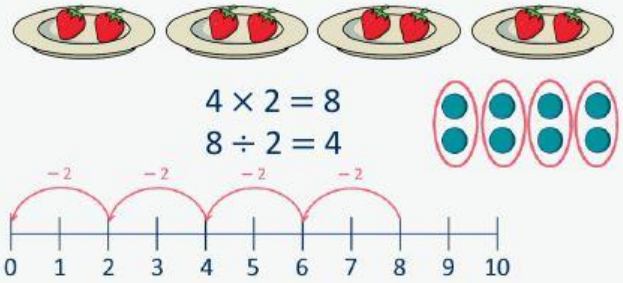
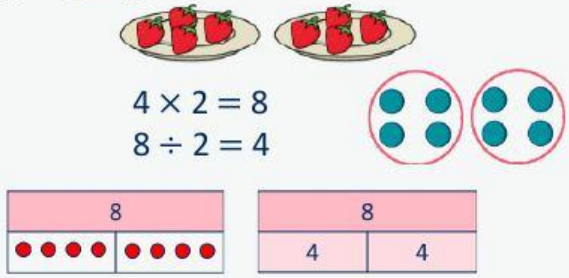
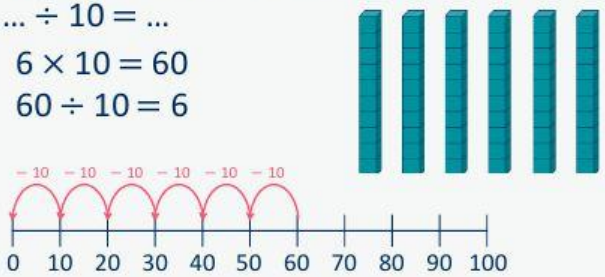
Year 2	• Recall and use division facts for the 2, 5 and 10 multiplication tables. • Calculate mathematical statements for division within the multiplication tables and write them using the division (÷) and equals (=) signs. • Recognise, find, name and write fractions $\frac{1}{3}, \frac{1}{4}, \frac{2}{4}$ and $\frac{3}{4}$ of a quantity.	
Progression of skills	**Key representations**	
Divide by 2 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts and halving.	There are … equal groups of 2 … ÷ 2 = …  	… shared equally between 2 is … Half of … is … … ÷ 2 = … 
Divide by 10 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … equal groups of 10 … ÷ 10 = … 6 × 10 = 60 60 ÷ 10 = 6  	… shared equally between 10 is … … ÷ 10 = … 6 × 10 = 60 60 ÷ 10 = 6 

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Division

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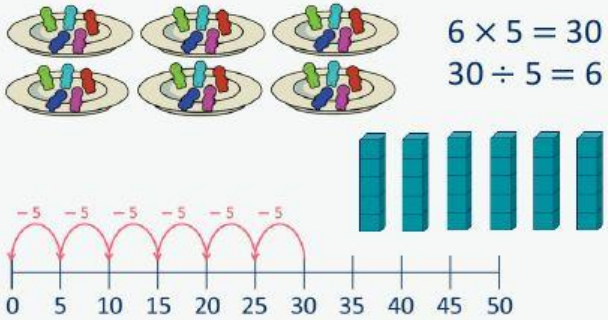
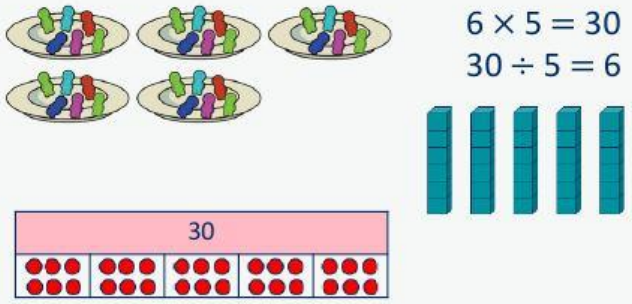
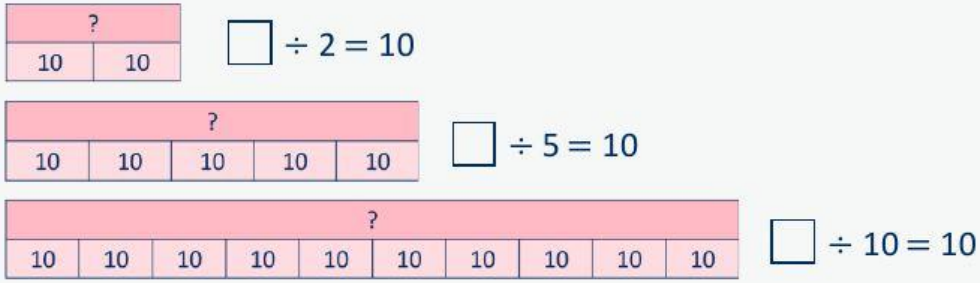
Progression of skills	Key representations	
Divide by 5 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … equal groups of 5 … ÷ 5 = …  	… shared equally between 5 is … … ÷ 5 = … 
Missing numbers Bar models are useful to show the link between multiplication and division.	… divided by 2/5/10 is equal to …  	

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Division

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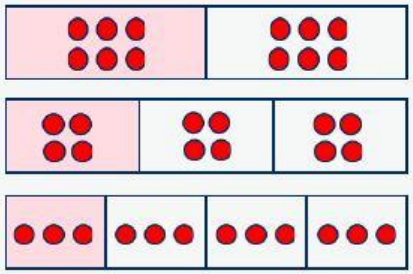
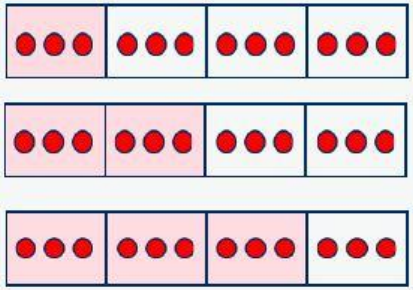
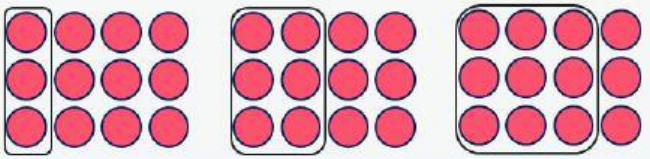
Progression of skills	Key representations	
Unit fractions In Y2 the focus is on finding $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$ Bar models are useful to show the link between division and finding a fraction.	The objects have been shared fairly into … groups. $\frac{1}{\square}$ of … is … 	There are … equal parts. There is … part circled. $\frac{1}{\square}$ is circled. 
Non-unit fractions In Y2 the focus is on finding $\frac{2}{4}$ and $\frac{3}{4}$ Prompt children to notice that $\frac{2}{4}$ is equivalent to $\frac{1}{2}$	The objects have been shared fairly into … groups. $\frac{\square}{\square}$ of … is … 	There are … equal parts. There are … parts circled. $\frac{\square}{\square}$ is circled. 

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Division

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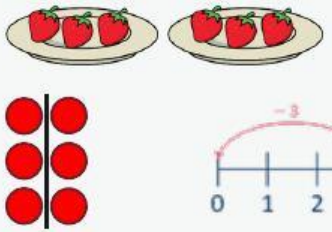
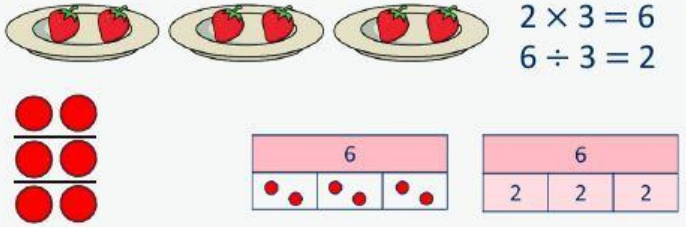
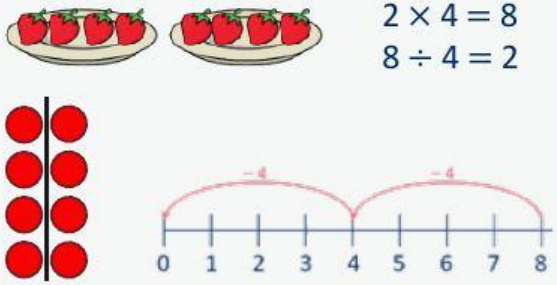
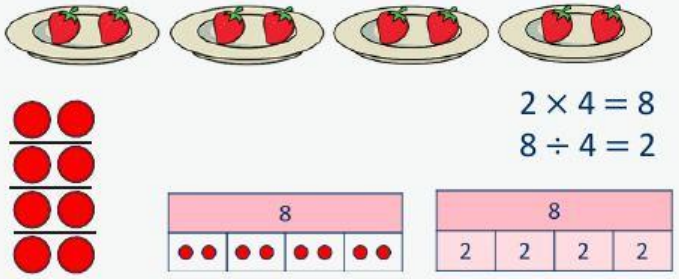
Year 3	• Recall and use division facts for the 3, 4 and 8 multiplication tables. • Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.	
Progression of skills	**Key representations**	
Divide by 3 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … groups of 3 in … … ÷ 3 =  	… has been shared equally into 3 equal groups. … ÷ 3 = 
Divide by 4 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … groups of 4 in … … ÷ 4 =  	… has been shared equally into 4 equal groups. … ÷ 4 = 

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Division

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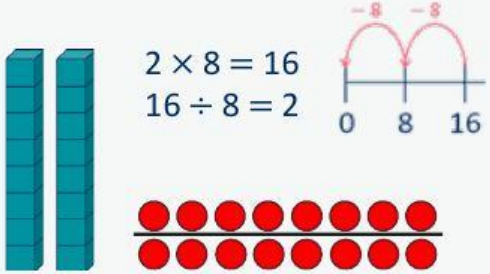
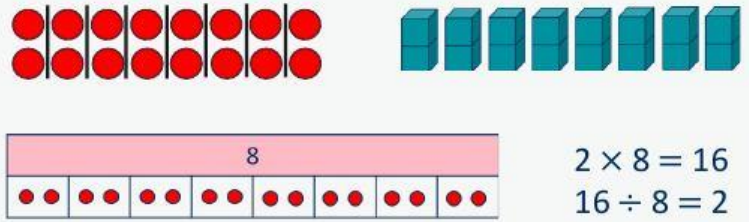
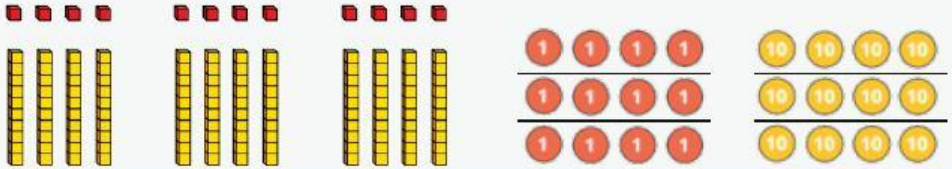
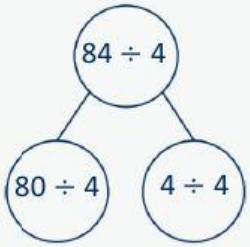
Progression of skills	Key representations
Divide by 8 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … groups of 8 in … … ÷ 8 =  2 × 8 = 16 16 ÷ 8 = 2 … has been shared equally into 8 equal groups. … ÷ 8 =  2 × 8 = 16 16 ÷ 8 = 2
Related facts Link to known times-table facts.	… ÷ … is equal to …, so … tens ÷ … is equal to … tens.  12 ÷ 3 = 4 120 ÷ 3 = 40
Divide a 2-digit number by a 1-digit number - no exchange Partition into tens and ones to divide and then recombine.	… tens divided by … is equal to … tens. … ones divided by … is equal to … ones.  60 ÷ 2 = 30 4 ÷ 2 = 2 64 ÷ 2 = 32  

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Division

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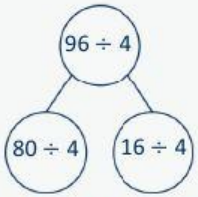
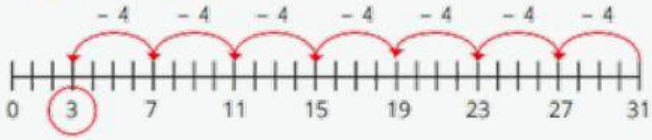
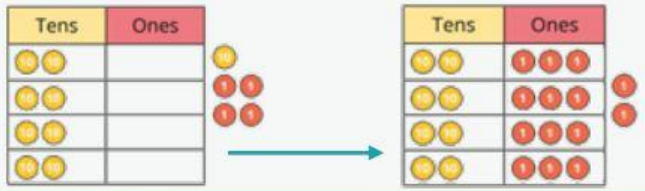
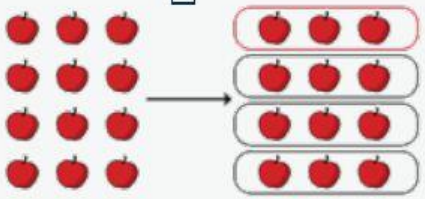
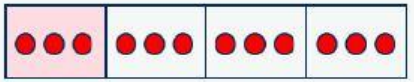
Progression of skills	Key representations	
Divide a 2-digit number by a 1-digit number - with remainders Encourage children to partition numbers flexibly to help them to divide more efficiently.	... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones.   80 ÷ 4 = 20 16 ÷ 4 = 4 96 ÷ 4 = 24	There are ... groups of ... There are ... remaining. 31 ÷ 4 = 7 r3  94 ÷ 4 = 23 r2 
Unit fractions of a set of objects Bar models are useful to show the link between division and fractions, for example, dividing by 3 and finding a third.	The whole is divided into ... equal parts. Each part is $\frac{1}{\square}$ of the whole.  $\frac{1}{4}$ of 12 apples is 3 apples.	One ... of ... is ... $\frac{1}{4}$ of 12 is 3  $\frac{1}{3}$ of 36 is 12 

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Division

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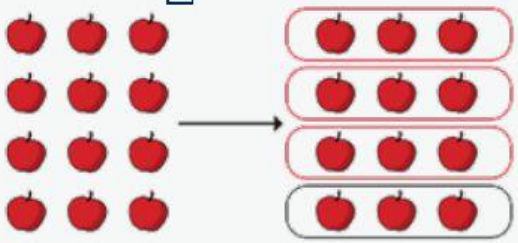
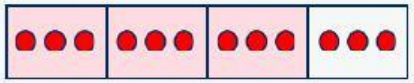
Progression of skills	Key representations	
Non-unit fractions of a set of objects Bar models are a useful representation and show the links with division and multiplication.	The whole is divided into … equal parts. Each part is $\frac{1}{\square}$ of the whole.  $\frac{3}{4}$ of 12 apples is 9 apples.	$\frac{1}{\square}$ of … is …, so $\frac{\square}{\square}$ of … is … $\frac{3}{4}$ of 12 is 9  $\frac{2}{3}$ of 36 is 24 

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Division

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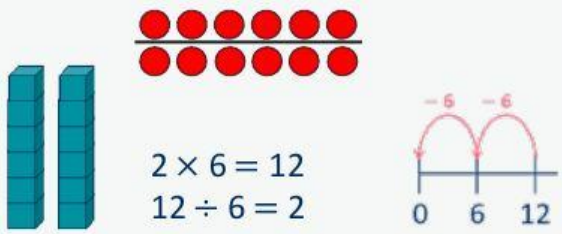
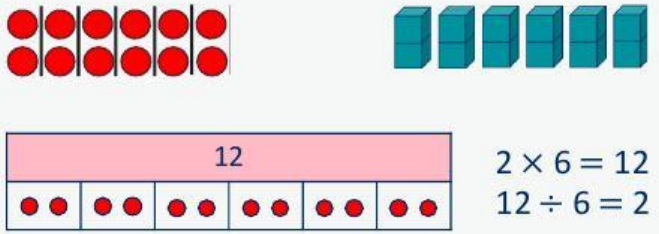
Year 4	• Recall division facts for multiplication tables up to 12 × 12 • Use place value, known and derived facts to divide mentally, including: dividing by 1 • Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.	
Progression of skills	**Key representations**	
Division facts to 12 × 12 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … groups of … in … … ÷ … =  	… has been shared equally into … equal groups. … ÷ … = 
Divide a number by 1 and itself Children may try to divide a number by zero and it should be highlighted that this is not possible.	When I divide a number by 1, the number remains the same. 5 shared between 1 is 5  There are **5** groups of 1 in 5 	When I divide a number by itself, the answer is 1 5 shared between 5 is 1  There is **1** group of 5 in 5 

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Division

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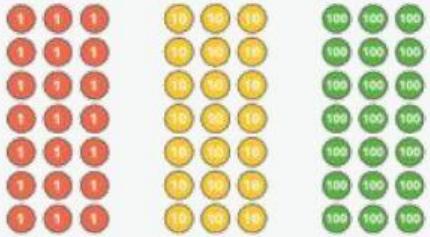
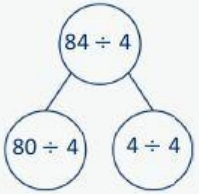
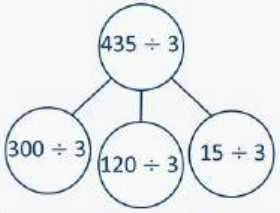
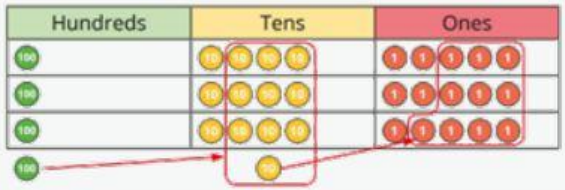
Progression of skills	Key representations	
Related facts Link to known times-table facts.	… ÷ … is equal to … so … tens ÷ … is equal to … tens and … hundreds ÷ … is equal to … hundreds. 	$21 \div 7 = 3$ $210 \div 7 = 30$ $2{,}100 \div 7 = 300$ $21 \div 3 = 7$ $210 \div 3 = 70$ $2{,}100 \div 3 = 700$
Divide a 2 or 3-digit number by a 1-digit number Progress from divisions with no exchange, to divisions with exchange and then divisions with remainders.	I can partition … into … tens and … ones.  $80 \div 4 = 20$ $4 \div 4 = 1$ $84 \div 4 = 21$ 	I cannot share the hundreds/tens equally, so I need to exchange 1 … for 10 …  $300 \div 3 = 100$ $120 \div 3 = 40$ $15 \div 3 = 5$ $435 \div 3 = 145$ 

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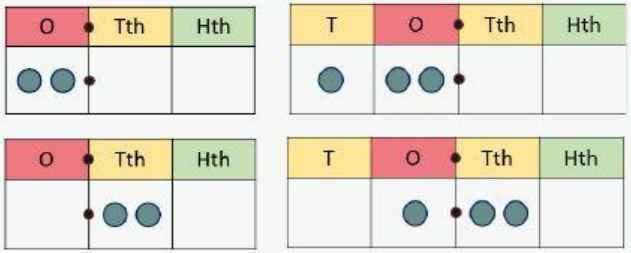
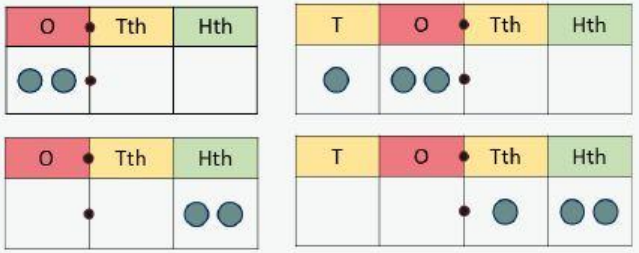
Division

Progression of skills	Key representations	
Divide by 10 and 100 Encourage children to notice that dividing by 100 is the same as dividing by 10 twice.	When I divide by 10, the digits move 1 place value column to the right. ... is one-tenth the size of ...  $2 \div 10 = 0.2$ $12 \div 10 = 1.2$	When I divide by 100, the digits move 2 place value columns to the right. ... is one-hundredth the size of ...  $2 \div 100 = 0.02$ $12 \div 100 = 0.12$

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Division

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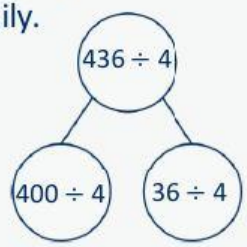
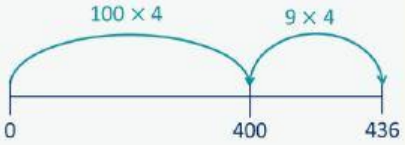
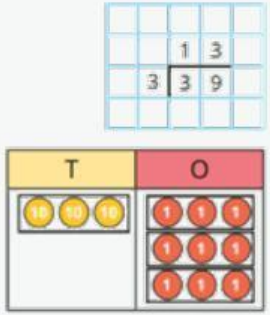
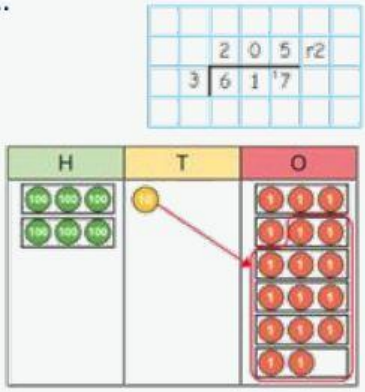
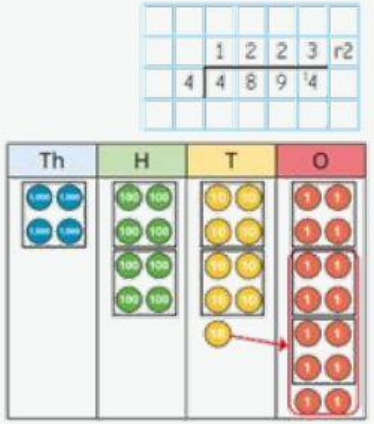
Year 5	• Divide numbers mentally drawing upon known facts. • Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context. • Divide whole numbers and those involving decimals by 10, 100 and 1,000		
Progression of skills	**Key representations**		
Mental strategies	I can partition … into … and … to help me to divide more easily. 	I can show groups of … on a number line. 	To divide by …, I can divide by … and then divide the result by … 436 ÷ 4 = 436 ÷ 2 ÷ 2 436 ÷ 2 = 218 218 ÷ 2 = 109
Divide numbers up to 4 digits by a 1-digit number The short division method is introduced for the first time.	There are … groups of … hundreds/tens/ones/ in … I can exchange 1 … for 10 …   		

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Division

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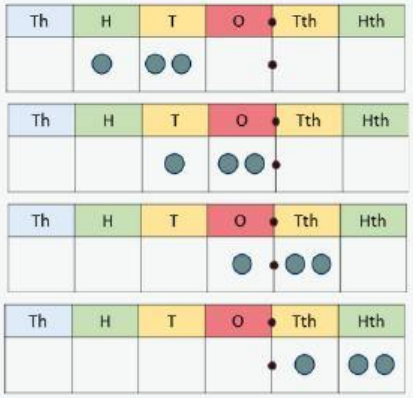
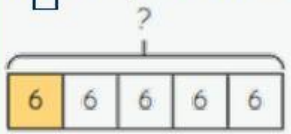
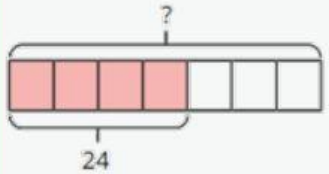
Progression of skills	Key representations
Divide by 10, 100 and 1,000 Encourage children to notice that dividing by 100 is the same as dividing by 10 twice, and that dividing by 1,000 is the same as dividing by 10 three times.	To divide by 10/100/1,000, I move all the digits … places to the right. … is one-tenth/one-hundredth/one-thousandth the size of …  $120 \div 10 = 12$ $120 \div 100 = 1.2$ $120 \div 1{,}000 = 0.12$
Fraction of an amount Bar models support children to understand that to find a fraction of an amount, we divide by the denominator and multiply by the numerator.	To find $\frac{\square}{\square}$ of … , I need to divide by … and multiply by …  $\frac{1}{5}$ of $20 =$ $\quad$ $\frac{1}{4}$ of $84 =$ $\frac{3}{5}$ of $20 =$ $\quad$ $\frac{3}{4}$ of $84 =$
	If $\frac{1}{\square}$ is … , then the whole is … × …  $\frac{1}{5}$ of $__ = 6$  $\frac{4}{7}$ of $__ = 24$

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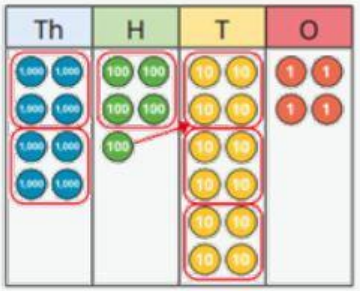
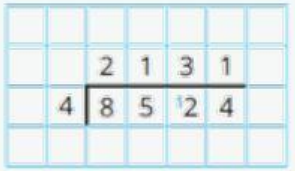
Division

Year 6	• Perform mental calculations, including with mixed operations and large numbers. • Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context. • Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context. • Divide numbers by 10, 100 and 1,000 giving answers up to three decimal places. • Use written division methods in cases where the answer has up to two decimal places. • Associate a fraction with division and calculate decimal fraction equivalents. • Divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$] • Solve problems involving the calculation of percentages.
Progression of skills	**Key representations**
Short division Encourage children to interpret remainders in context, for example knowing that "4 remainder 1" could mean 4 complete boxes with 1 left over so 5 boxes will be needed.	There are … groups of … hundreds/tens/ones/ in … I can exchange 1 … for 10 …  

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Division

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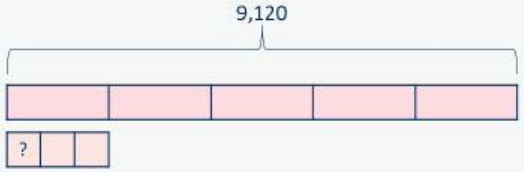
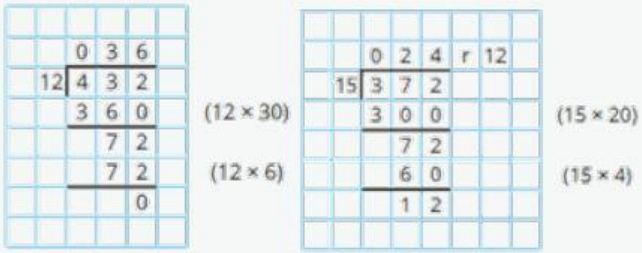
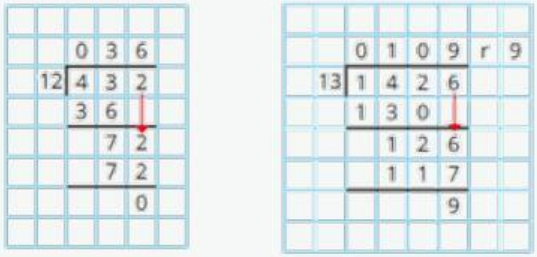
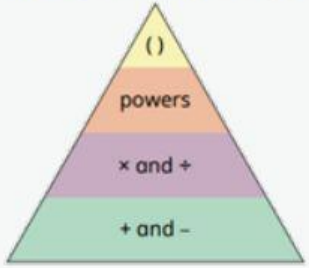
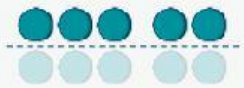
Progression of skills	Key representations
Mental strategies Include partitioning and number line strategies outlined in Y5 as well as division using factors.	To divide by … , I can first divide by … and then divide the answer by … 240 ÷ 60 = 240 ÷ 10 ÷ 6  480 ÷ 24 = 480 ÷ 4 ÷ 6  9,120 ÷ 15 = 9,120 ÷ 5 ÷ 3 
Long division The long division method is introduced for the first time. Two alternative methods are shown.	Method 1  Method 2 
Order of operations Calculations in brackets should be done first, then powers. Multiplication and division should be performed before addition and subtraction.	… has greater priority than …, so the first part of the calculation I need to do is …   (6 + 4) ÷ 2 = 5  6 + 4 ÷ 2 = 8

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Division

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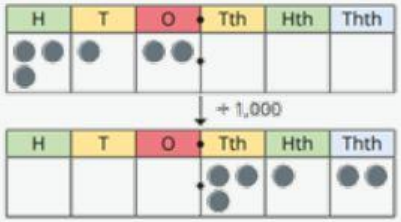
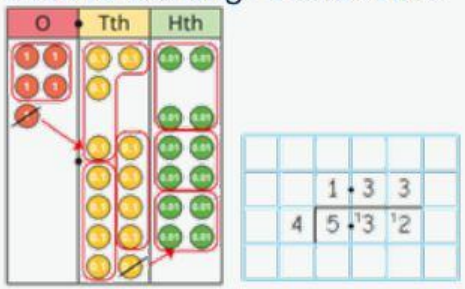
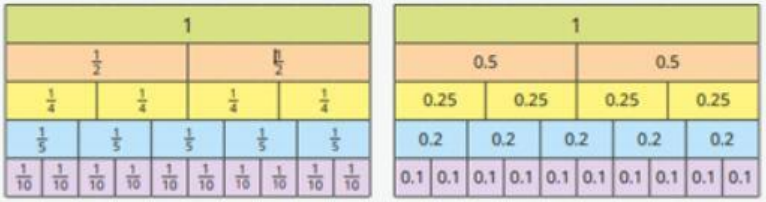
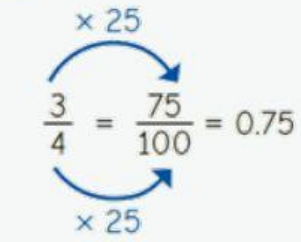
Progression of skills	Key representations	
Divide by 10, 100 and 1,000 Encourage children to notice that dividing by 100 is the same as dividing by 10 twice, and that dividing by 1,000 is the same as dividing by 10 three times.	To divide by … , I move the digits … places to the right.  312 ÷ 10 = 31.2 312 ÷ 100 = 3.12 312 ÷ 1,000 = 0.312 906 ÷ 10 = 90.6 906 ÷ 100 = 9.06 906 ÷ 1,000 = 0.906	
Divide decimals by integers This is the first time children divide decimals by numbers other than 10, 100 or 1,000	I know that … ÷ … = …, so I also know that … ÷ … = …  39 ÷ 3 = 13 3.9 ÷ 3 = 1.3 0.39 ÷ 3 = 0.13	I need to exchange 1 … for 10 … 
Decimal and fraction equivalents	The fraction … is equivalent to the decimal …  $\frac{1}{5} = 0.2$ $\frac{2}{5} = 0.4$ $\frac{3}{5} = 0.6$	$\frac{\square}{\square}$ is equal to $\frac{\square}{100}$ 

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Division

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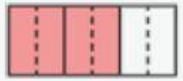
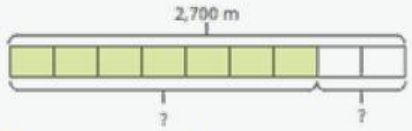
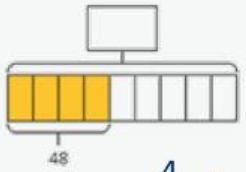
Progression of skills	Key representations		
Divide a fraction by an integer This is the first time children divide fractions by an integer.	... ones divided by 2 is ... ones so ... sevenths divided by 2 is ... sevenths.  $\frac{4}{7} \div 4 = \frac{1}{7}$  $\frac{4}{7} \div 2 = \frac{2}{7}$	I am dividing by ... , so I can split each part into ... equal parts.  $\frac{1}{3} \div 2 = \frac{1}{6}$	... is equivalent to ... so ... ÷ ... = ... ÷ ...  $\frac{2}{3} = \frac{4}{6}$ so $\frac{2}{3} \div 4 = \frac{4}{6} \div 4 = \frac{1}{6}$
Fraction of an amount Children divide and multiply to find fractions of an amount. Bar models can still be used to support understanding where needed.	To find $\frac{1}{\square}$ I divide by ... $\frac{1}{2}$ of $36 = 36 \div 2$ $\frac{1}{12}$ of $36 = 36 \div 12$	If $\frac{1}{\square}$ is equal to ..., then $\frac{\square}{\square}$ are equal to ...  $\frac{7}{9}$ of $2{,}700 = \frac{1}{9}$ of $2{,}700 \times 7$	If $\frac{\square}{\square}$ is equal to ..., then the whole is equal to ...  $\frac{4}{9}$ of $__ = 48$

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Division

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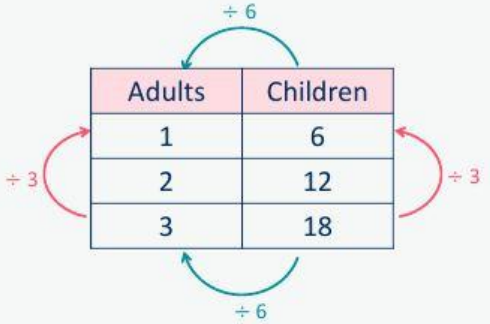
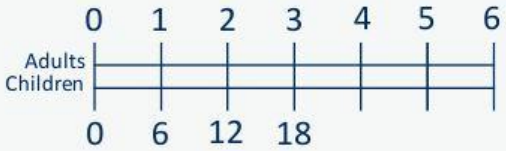
Progression of skills	Key representations	
Calculate percentages Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.	There are … lots of … % in 100% To find … %, I need to divide by … 50% of … = …÷ 2 25% of … = …÷ 4	… % is made up of … %, and … % To find 30%, I can find 10% and then multiply it by 3 To find 23%, I can use 10% × 2 and 1% × 3 To find 99%, I can find 1%, then subtract from 100%
Calculations involving ratio Encourage children to see the multiplicative relationship between ratios. They will need to multiply or divide each value by the same number to keep the ratio equivalent. Double number lines and ratio tables help children to see both horizontal and vertical multiplicative relationships.	For every … , there are … For every 6 children on a school trip, there is 1 adult. The ratio of children to adults is 6 : 1	







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Appendix B: National Curriculum and 'Ready to Progress' Mapping

The following 71 pages are reproduced unaltered from: White Rose Education - National Curriculum and Ready to Progress mapping (updated September 2024).

Primary maths

National curriculum and 'Ready to progress' mapping

Updated September 2024

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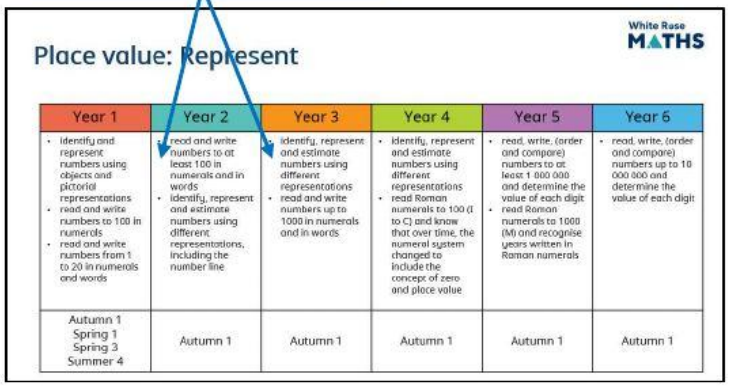
White Rose MATHS

Introduction

The aim of this document is to give an at-a-glance guide to how the White Rose Maths curriculum links to the Key Stage 1 and 2 national curriculum, and how it progresses through topics.

In each of the major topic areas (Number, Measurement, Geometry and Statistics), the curriculum has been broken down into key areas. For each of these areas, you can then see which NC objectives are covered in that year, together with the term and block in which that objective is first met in version 3 of the White Rose Maths schemes.

These are the NC objectives. In our schemes these are broken down into the small steps.



Place value: Represent

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• identify and represent numbers using objects and pictorial representations • read and write numbers to 100 in numerals • read and write numbers from 1 to 20 in numerals and words	• read and write numbers to at least 100 in numerals and in words • identify, represent and estimate numbers using different representations, including the number line	• identify, represent and estimate numbers using different representations • read and write numbers up to 1000 in numerals and in words	• identify, represent and estimate numbers using different representations • read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value	• read, write, (order and compare) numbers to at least 1 000 000 and determine the value of each digit • read Roman numerals to 1000 (M) and recognise years written in Roman numerals	• read, write, (order and compare) numbers up to 10 000 000 and determine the value of each digit
Autumn 1 Spring 1 Spring 3 Summer 4	Autumn 1	Autumn 1	Autumn 1	Autumn 1	Autumn 1

Many schools are using the 'Ready to progress' criteria produced by the DfE as part of their assessments of pupils' learning. This document also lists the key steps in the White Rose Maths schemes of learning that support each of the 'Ready to progress' criteria, in the same sections as the national curriculum objectives. In many cases, the criteria are also addressed in other steps and in other blocks, for example looking at addition and subtraction in the context of measures. We have not listed every single instance as this would become unwieldly.

Year 2 RTP Place value

Ready to progress criteria	Block	Steps
2NPV-1 Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non-standard partitioning.	Autumn 1	3 – Recognise tens and ones 4 – Use a place value chart 5 – Partition numbers to 100 7 – Flexibly partition numbers to 100 8 – Write numbers in expanded form
2NPV-2 Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10	Autumn 1	9 – 10s on the number line to 100 10 – 10s and 1s on the number line to 100 11 – Estimate numbers on the number line

The ready-to-progress criteria are split into strands:

- Number and place value NPV
- Number facts NF
- Addition and subtraction AS
- Multiplication and division MD
- Fractions F
- Geometry G

Most strands are split into separate criteria. For each of these, the key White Rose Maths steps are listed.

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Place value

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Place value: Count

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • Count numbers to 100 in numerals; count in multiples of twos, fives and tens	• count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward	• count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number	• count in multiples of 6, 7, 9, 25 and 1000 • count backwards through zero to include negative numbers	• count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • count forwards and backwards with positive and negative whole numbers, including through zero	
Autumn 1 Spring 1 Spring 3 Summer 4	Autumn 1	Autumn 1 Autumn 3	Autumn 1 Autumn 4	Autumn 1 Summer 4	

In the WRM schemes, negative numbers are introduced in Year 5

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Place value: Represent

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• identify and represent numbers using objects and pictorial representations • read and write numbers to 100 in numerals • read and write numbers from 1 to 20 in numerals and words	• read and write numbers to at least 100 in numerals and in words • identify, represent and estimate numbers using different representations, including the number line	• identify, represent and estimate numbers using different representations • read and write numbers up to 1000 in numerals and in words	• identify, represent and estimate numbers using different representations • read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value	• read, write, (order and compare) numbers to at least 1 000 000 and determine the value of each digit • read Roman numerals to 1000 (M) and recognise years written in Roman numerals	• read, write, (order and compare) numbers up to 10 000 000 and determine the value of each digit
Autumn 1 Spring 1 Spring 3 Summer 4	Autumn 1	Autumn 1	Autumn 1	Autumn 1	Autumn 1

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Place value: Use and compare

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• given a number, identify one more and one less	• recognise the place value of each digit in a two-digit number (tens, ones) • compare and order numbers from 0 up to 100; use <, > and = signs	• recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • compare and order numbers up to 1000	• find 1000 more or less than a given number • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) • order and compare numbers beyond 1000	• (read, write) order and compare numbers to at least 1 000 000 and determine the value of each digit	• (read, write), order and compare numbers up to 10 000 000 and determine the value of each digit
Autumn 1 Spring 1 Spring 3 Summer 4	Autumn 1	Autumn 1	Autumn 1	Autumn 1	Autumn 1

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Place value: Problems/Rounding

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• use place value and number facts to solve problems	• solve number problems and practical problems involving these ideas	• round any number to the nearest 10, 100 or 1000 • solve number and practical problems that involve all of the above and with increasingly large positive numbers	• interpret negative numbers in context • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • solve number problems and practical problems that involve all of the above	• round any whole number to a required degree of accuracy • use negative numbers in context, and calculate intervals across zero • solve number and practical problems that involve all of the above
	Autumn 1	Autumn 1	Autumn 1	Autumn 1	Autumn 1

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Year 1 RTP Place value

Ready to progress criteria	Block	Steps
1NPV-1 Count within 100, forwards and backwards, starting with any number.	Autumn 1	6 – Count on from any number 8 – Count backwards within 10
	Spring 1	1 – Count within 20
	Spring 3	1 – Count from 20 to 50
	Summer 4	1 – Count from 50 to 100
1NPV-2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =	Autumn 1	11 – Fewer, more, same 12 – Less than, greater than, equal to 13 – Compare numbers 14 – Order objects and numbers 15 – The number line
	Spring 1	7 – 1 more and 1 less 8 – The number line to 20 9 – Use a number line to 20 10 – Estimate on a number line to 20 11 – Compare numbers to 20 12 – Order numbers to 20

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Year 2 RTP Place value

Ready to progress criteria	Block	Steps
2NPV-1 Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non-standard partitioning.	Autumn 1	3 – Recognise tens and ones 4 – Use a place value chart 5 – Partition numbers to 100 7 – Flexibly partition numbers to 100 8 – Write numbers in expanded form
2NPV-2 Reason about the location of any two-digit number in the linear number system, including identifying the previous and next multiple of 10	Autumn 1	9 – 10s on the number line to 100 10 – 10s and 1s on the number line to 100 11 – Estimate numbers on the number line

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Year 3 RTP Place value

Ready to progress criteria	Block	Steps
3NPV-1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10	Autumn 1	4 – Hundreds
	Autumn 2	10 – Make connections
	Autumn 3	4 – Multiples of 5 and 10
3NPV-2 Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning.	Autumn 1	5 – Represent numbers to 1,000 6 – Partition numbers to 1,000 7 – Flexible partitioning of numbers to 1,000 8 – Hundreds, tens and ones
3NPV-3 Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10	Autumn 1	9 – Find 1, 10 or 100 more or less 10 – Number line to 1,000 11 – Estimate on a number line to 1,000 12 – Compare numbers to 1,000 13 – Order numbers to 1,000
3NPV-4 Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.	Autumn 1	10 – Number line to 1,000 11 – Estimate on a number line to 1,000 14 – Count in 50s
	Spring 4	1 – Use scales

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Year 4 RTP Place value

Ready to progress criteria	Block	Steps
4NPV-1 Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100	Autumn 1	4 - Thousands
4NPV-2 Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning.	Autumn 1	5 – Represent numbers to 10,000 6 – Partition numbers to 10,000 7 – Flexible partitioning of numbers to 10,000
4NPV-3 Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.	Autumn 1	8 – Find 1, 10, 100, 1,000 more or less 9 – Number line to 10,000 10 – Estimate on a number line to 10,000 11 – Compare numbers to 10,000 12 – Order numbers to 10,000 14 – Round to the nearest 10 15 – Round to the nearest 100 16 – Round to the nearest 1,000 17 – Round to the nearest 10,000
4NPV-4 Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts.	Autumn 1	9 – Number line to 10,000 10 – Estimate on a number line to 10,000

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Year 5 RTP Place value

Ready to progress criteria	Block	Steps
5NPV-1 Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01	Spring 3	1 – Decimals up to 2 decimal places 2 – Equivalent fractions and decimals (tenths) 3 – Equivalent fractions and decimals (hundredths)
5NPV-2 Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning.	Spring 3	1 – Decimals up to 2 decimal places
5NPV-3 Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.	Spring 3	8 – Order and compare decimals (same number of decimal places) 9 – Order and compare any decimals with up to 3 decimal places 10 – Round to the nearest whole number 11 – Round to 1 decimal place
5NPV-4 Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts.	Spring 3	4 – Equivalent fractions and decimals
5NPV-5 Convert between units of measure, including using common decimals and fractions.	Summer 5	1 – Kilograms and kilometres 2 – Millimetres and millilitres 3 – Convert units of length 4 – Convert between metric and imperial 5 – Convert units of time

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Year 6 RTP Place value

Ready to progress criteria	Block	Steps
6NPV-1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).	Autumn 1	4 – Powers of 10
6NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.	Autumn 1	1 – Numbers to 1,000,000 2 – Numbers to 10,000,000 3 – Read and write numbers to 10,000,000
6NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.	Autumn 1	6 – Compare and order any integers 7 – Round any integers
6NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.	Autumn 1	5 – Number line to 10,000,000
	Autumn 5	2 – Convert metric measures
	Spring 3	1 – Place value within 1 2 – Integers and decimals

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Addition and subtraction

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Addition & subtraction: Calculations

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• add and subtract one-digit and two-digit numbers to 20, including zero	• add and subtract numbers using concrete objects, pictorial representations, and mentally, including: ➢ a two-digit number and ones ➢ a two-digit number and tens ➢ two two-digit numbers ➢ adding three one-digit numbers	• add and subtract numbers mentally, including: ➢ a three-digit number and ones ➢ a three-digit number and tens ➢ a three-digit number and hundreds • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	• add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	• add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers	• perform mental calculations, including with mixed operations and large numbers • use their knowledge of the order of operations to carry out calculations involving the four operations
Autumn 2 Spring 2	Autumn 2	Autumn 2	Autumn 2	Autumn 2	Autumn 2

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Addition & subtraction: Problems

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9	• solve problems with addition and subtraction: ➢ using concrete objects and pictorial representations, including those involving numbers, quantities and measures ➢ applying their increasing knowledge of mental and written methods	• solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	• solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	• solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	• solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
Autumn 2 Spring 2	Autumn 2	Autumn 2	Autumn 2	Autumn 2	Autumn 2

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Year 1 RTP Number facts

Ready to progress criteria	Block	Steps
1NF-1 Develop fluency in addition and subtraction facts within 10	Autumn 2	5 – Number bonds within 10 6 – Systematic number bonds within 10 7 – Number bonds to 10
1NF-2 Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers.	See under Multiplication & division	

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Year 2 RTP Number facts

Ready to progress criteria	Block	Steps
2NF-1 Secure fluency in addition and subtraction facts within 10, through continued practice.	Autumn Block 2	1 – Bonds to 10 6 – Add by making 10 8 – Add to the next 10 11 – Subtract from a 10

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Year 3 RTP Number facts

Ready to progress criteria	Block	Steps
3NF-1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.	Autumn Block 2	6 – Add 1s across a 10 7 – Add 10s across a 100 8 – Subtract 1s across a 10 9 – Subtract 1s across a 100 13 – Add two numbers (across a 10) 14 – Add two numbers (across a 100) 15 – Subtract two numbers (across a 10) 16 – Subtract two numbers (across a 100)
3NF-2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.	See under Multiplication & division	
3NF-3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).	See under Multiplication & division	

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Year 1 RTP Addition & subtraction

Ready to progress criteria	Block	Steps
1AS-1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.	Autumn Block 2	5 – Number bonds within 10 6 – Systematic number bonds within 10 7 – Number bonds to 10
1AS-2 Read, write and interpret equations containing addition (+), subtraction (–) and equals (=) symbols, and relate additive expressions and equations to real-life contexts.	Autumn Block 2	4 – Fact families – addition facts 8 – Addition – add together 9 – Addition – add more 10 – Addition problems 11 – Find a part 12 – Subtraction – find a part 13 – Fact families – the eight facts 14 – Subtraction – take away/cross out (How many left?) 15 – Subtraction – take away (How many left?) 16 – Subtraction on a number line
	Spring Block 2	2 – Add ones using number bonds 3 – Find and make number bonds to 20 6 – Subtract ones using number bonds 9 – Related facts 10 – Missing number problems

Note – In the WRM schemes, odd and even numbers are explored both in Reception and Y2 but there is no explicit step in Y1

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Year 2 RTP Addition & subtraction

Ready to progress criteria	Block	Steps
2AS-1 Add and subtract across 10	Autumn 2	9 – Add across a 10 10 – Subtract across a 10 11 – Subtract from a 10 12 – Subtract 1-digit number from a 2-digit number (across a 10)
2AS-2 Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more...?".	Autumn 2	4 – Bonds to 100 (tens) 8 – Add to the next 10
2AS-3 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number.	Autumn 2	9 – Add across a 10 10 – Subtract across a 10 11 – Subtract from a 10 12 – Subtract 1-digit number from a 2-digit number (across a 10) 13 – 10 more, 10 less 14 – Add and subtract 10s
2AS-4 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 two-digit numbers.	Autumn 2	15 – Add two 2-digit numbers (not across a 10) 16 – Add two 2-digit numbers (across a 10) 17 – Subtract two 2-digit numbers (not across a 10) 18 – Subtract two 2-digit numbers (across a 10) 19 – Mixed addition and subtraction
	Spring 1	7 – Calculate with money 9 – Find change
	Spring 3	5 – Four operations with lengths and heights

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Year 3 RTP Addition & subtraction

Ready to progress criteria	Block	Steps
3AS-1 Calculate complements to 100	Autumn Block 2	19 – Complements to 100
	Summer 2	5 – Find change
3AS-2 Add and subtract up to three-digit numbers using columnar methods.	Autumn Block 2	11 – Add two numbers (no exchange) 12 – Subtract two numbers (no exchange) 13 – Add two numbers (across a 10) 14 – Add two numbers (across a 100) 15 – Subtract two numbers (across a 10) 16 – Subtract two numbers (across a 100) 17 – Add 2-digit and 3-digit numbers 18 – Subtract a 2-digit number from a 3-digit number
3AS-3 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part–part–whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction.	Autumn Block 2	21 – Inverse operations 22 – Make decisions
	Summer 2	4 – Subtract money 5 – Find change

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Year 6 RTP 4 operations

Ready to progress criteria	Block	Steps
6AS/MD-1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).	Spring 1	1 – Add or multiply? 2 – Use ratio language 3 – Introduction to the ratio symbol
6AS/MD-2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.	Autumn 2	8 – Solve problems with multiplication 10 – Division using factors 13 – Solve problems with division 14 – Solve multi-step problems 17 – Reason from known facts
6AS/MD-3 Solve problems involving ratio relationships.	See under Ratio and proportion	
6AS/MD-4 Solve problems with 2 unknowns.	See under Algebra	

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Multiplication and division

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Multiplication & division: Recall/Use

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot	• recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	• recall multiplication and division facts for multiplication tables up to 12 × 12 • use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • recognise and use factor pairs and commutativity in mental calculations	• identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19 • recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})	• identify common factors, common multiples and prime numbers • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
	Spring 2	Autumn 3 Spring 1	Autumn 4 Spring 1	Autumn 3	Autumn 2

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Multiplication & division: Calculations

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	• write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods	• multiply two-digit and three-digit numbers by a one-digit number using formal written layout	• multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers • multiply and divide numbers mentally drawing upon known facts • divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	• multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • perform mental calculations, including with mixed operations and large numbers
	Spring 2	Autumn 3 Spring 1	Spring 1	Autumn 3 Spring 1	Autumn 2

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Multiplication & division: Problems

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	• solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	• solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	• solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	• solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	• solve problems involving addition, subtraction, multiplication and division
Summer 1	Spring 2	Spring 1	Spring 1	Autumn 3 Spring 1	Autumn 2

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Multiplication & division: Combined

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				• solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	• use their knowledge of the order of operations to carry out calculations involving the four operations
				Spring 1	Autumn 2

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Year 1 RTP Number facts

Ready to progress criteria	Block	Steps
1NF-1 Develop fluency in addition and subtraction facts within 10	See under Addition & subtraction	
1NF-2 Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers.	Summer 1	1 – Count in 2s 2 – Count in 10s 3 – Count in 5s
	Summer 4	4 – The number line to 100
	Summer 5	1 – Unitising 4 – Count in coins

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Year 3 RTP Number facts

Ready to progress criteria	Block	Steps
3NF-1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice.	See under Addition & subtraction	
3NF-2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.	Autumn Block 3	3 – Multiples of 2 4 – Multiples of 5 and 10 5 – Sharing and grouping 9 – Multiply by 4 10 – Divide by 4 11 – The 4 times-table
3NF-3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).	Spring 1	2 – Related calculations

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Year 4 RTP Number facts

Ready to progress criteria	Block	Steps
4NF-1 Recall multiplication and division facts up to 12 × 12 and recognise products in multiplication tables as multiples of the corresponding number.	Autumn 4	All 13 steps in this block relate to this criterion
	Spring 1	1 – Factor pairs
4NF-2 Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context.	Autumn 4	All 13 steps in this block relate to this criterion
	Spring 1	11 – Divide a 2-digit number by a 1-digit number (1) 12 – Divide a 2-digit number by a 1-digit number (2)
4NF-3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100).	Autumn 2	1 – Add and subtract 1s, 10s, 100s and 1,000s
	Spring 1	7 – Related facts – multiplication and division

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Year 5 RTP Number facts

Ready to progress criteria	Block	Steps
5NF-1 Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.	Autumn 3	1 – Multiples 2 – Common multiples 3 – Factors 4 – Common factors 6 – Square numbers
	Spring 2	4 – Calculate a fraction of a quantity 5 – Fraction of an amount 6 – Find the whole
5NF-2 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).	Autumn 3	10 – Divide by 10, 100 and 1,000
	Summer 3	1 – Use known facts to add and subtract decimals within 1 2 – Complements to 1 3 – Add and subtract decimals across 1

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Year 2 RTP Multiplication & division

Ready to progress criteria	Block	Steps
2MD-1 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables.	Spring 2	1 – Recognise equal groups 2 – Make equal groups 3 – Add equal groups 4 – Introduce the multiplication symbol 5 – Multiplication sentences
	Spring 4	2 – Measure in grams 4 – Four operations with mass 8 – Four operations with volume and capacity
	Summer 3	6 – Draw pictograms (2, 5 and 10) 7 – Interpret pictograms (2, 5 and 10)
2MD-2 Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division).	Spring 2	7 – Make equal groups – grouping 10 – Divide by 2 14 – Divide by 10 16 – Divide by 5

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Year 3 RTP Multiplication & division

Ready to progress criteria	Block	Steps
3MD-1 Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division.	Autumn 3	All 15 steps in this block relate to this criterion
	Spring 1	3 – Reasoning about multiplication 10 - Scaling

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Year 4 RTP Multiplication & division

Ready to progress criteria	Block	Steps
4MD-1 Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size.	Spring 1	3 - Multiply by 10 4 – Multiply by 100 5 – Divide by 10 6 – Divide by 100
4MD-2 Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication.	Autumn 4	All 13 steps in this block relate to this criterion
4MD-3 Understand and apply the distributive property of multiplication.	Autumn 4	3 – 6 times-table and division facts 8 – 7 times-table and division facts 9 – 11 times-table and division facts 10 – 12 times-table and division facts
	Spring 1	8 – Informal written methods for multiplication 15 – Efficient multiplication

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Year 5 RTP Multiplication & division

Ready to progress criteria	Block	Steps
5MD-1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size.	Autumn 3	8 – Multiply by 10, 100 and 1,000 9 – Divide by 10, 100 and 1,000 10 – Multiples of 10, 100 and 1,000
	Summer 3	10 – Multiply by 10, 100 and 1,000 11 – Divide by 10, 100 and 1,000 12 – Multiply and divide decimals – missing value
5MD-2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.	Autumn 3	1 – Multiples 2 – Common multiples 3 – Factors 4 – Common factors 6 – Square numbers
5MD-3 Multiply any whole number with up to 4 digits by any one-digit number using a formal written method.	Spring 1	1 – Multiply up to a 4-digit number by a 1-digit number
5MD-4 Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context.	Spring 1	7 – Short division 8 – Divide a 4-digit number by a 1-digit number 9 – Divide with remainders

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Year 6 RTP 4 operations

Ready to progress criteria	Block	Steps
6AS/MD-1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).	Spring 1	1 – Add or multiply? 2 – Use ratio language 3 – Introduction to the ratio symbol
6AS/MD-2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.	Autumn 2	8 – Solve problems with multiplication 10 – Division using factors 13 – Solve problems with division 14 – Solve multi-step problems 17 – Reason form known facts
6AS/MD-3 Solve problems involving ratio relationships.	See under Ratio and proportion	
6AS/MD-4 Solve problems with 2 unknowns.	See under Algebra	

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Fractions, decimals, percentages

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Fractions: Recognise and write

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• recognise, find and name a half as one of two equal parts of an object, shape or quantity • recognise, find and name a quarter as one of four equal parts of an object, shape or quantity	• recognise, find, name and write fractions $\frac{1}{3}, \frac{1}{4}, \frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity	• count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	• count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.	• identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$]	
Summer 2	Summer 1	Spring 3	Spring 4 Summer 1	Autumn 4	

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Fractions: Compare

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$	• recognise and show, using diagrams, equivalent fractions with small denominators • compare and order unit fractions, and fractions with the same denominators	• recognise and show, using diagrams, families of common equivalent fractions	• compare and order fractions whose denominators are all multiples of the same number	• use common factors to simplify fractions; use common multiples to express fractions in the same denomination • compare and order fractions, including fractions > 1
	Summer 1	Spring 3	Spring 3	Autumn 4	Autumn 3

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Fractions: Calculations

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• write simple fractions for example, $\frac{1}{2}$ of 6 = 3	• add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]	• add and subtract fractions with the same denominator	• add and subtract fractions with the same denominator and denominators that are multiples of the same number • multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	• add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] • divide proper fractions by whole numbers [for example $\frac{1}{3} \div 2 = \frac{1}{6}$]
	Summer 1	Summer 1	Spring 3	Autumn 4 Spring 2	Autumn 3 Autumn 4

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Fractions: Solve problems

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		• solve problems that involve all of the above		• solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number	
		Spring 3 Summer 1		Spring 2	

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Decimals: Recognise, write, compare

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			• recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$ • round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places	• read and write decimal numbers as fractions [for example, 0.71 = $\frac{71}{100}$] • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • round decimals with two decimal places to the nearest whole number and to one decimal place • read, write, order and compare numbers with up to three decimal places	• identify the value of each digit in numbers given to three decimal places
			Spring 4 Summer 1	Spring 3 Summer 3	Spring 3

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Fractions, decimals and percentages

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			• solve simple measure and money problems involving fractions and decimals to two decimal places	• recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal • solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25	• associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$] • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
			Spring 3 Spring 4 Summer1	Spring 3	Spring 3 Spring 4

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Year 3 RTP Fractions

Ready to progress criteria	Block	Steps
3F-1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.	Spring 3	1 – Understand the denominators of unit fractions 2 – Compare and order unit fractions 3 – Understand the numerators of non-unit fractions 4 – Understand the whole 5 – Compare and order non-unit fractions
3F-2 Find unit fractions of quantities using known division facts (multiplication tables fluency).	Summer 1	4 – Unit fractions of a set of objects
3F-3 Reason about the location of any fraction within 1 in the linear number system.	Spring 3	6 – Fractions and scales 7 – Fractions on a number line 8 – Count in fractions on a number line 9 – Equivalent fractions on a number line
3F-4 Add and subtract fractions with the same denominator, within 1	Summer 1	1 – Add fractions 2 – Subtract fractions 3 – Partition the whole

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Year 4 RTP Fractions

Ready to progress criteria	Block	Steps
4F-1 Reason about the location of mixed numbers in the linear number system.	Spring 3	4 – Number lines and mixed numbers 5 – Compare and order mixed numbers 9 – Equivalent fractions on a number line
4F-2 Convert mixed numbers to improper fractions and vice versa.	Spring 3	6 – Understand improper fractions 7 – Convert mixed numbers to improper fractions 8 – Convert improper fractions to mixed numbers
4F-3 Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers.	Spring 3	11 – Add two or more fractions 12 – Add fractions and mixed numbers 13 – Subtract two fractions 14 – Subtract from whole amounts 15 – Subtract from mixed numbers

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Year 5 RTP Fractions

Ready to progress criteria	Block	Steps
5F-1 Find non-unit fractions of quantities.	Spring 2	4 – Calculate a fraction of a quantity 5 – Fraction of an amount 6 – Find the whole
5F-2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system.	Autumn 4	1 – Find fractions equivalent to a unit fraction 2 – Find fractions equivalent to a non-unit fraction 3 – Recognise equivalent fractions
5F-3 Recall decimal fraction equivalents for $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{5}$ and $\frac{1}{10}$ and for multiples of these proper fractions.	Spring 3	2 – Equivalent fractions and decimals (tenths) 4 – Equivalent fractions and decimals

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Year 6 RTP Fractions

Ready to progress criteria	Block	Steps
6F-1 Recognise when fractions can be simplified, and use common factors to simplify fractions.	Autumn 3	1 – Equivalent fractions and simplifying 2 – Equivalent fractions on a number line
6F-2 Express fractions in a common denomination and use this to compare fractions that are similar in value.	Autumn 3	3 – Compare and order (denominator)
6F-3 Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.	Autumn 3	3 – Compare and order (denominator) 4 – Compare and order (numerator)

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Ratio and proportion, algebra

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Ratio and proportion

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					• solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • solve problems involving the calculation/use of percentages for comparison • solve problems involving similar shapes where the scale factor is known or can be found • solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
					Spring 1

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Algebra

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• *solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9*	• *recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems*	• *solve problems, including missing number problems*			• use simple formulae • generate and describe linear number sequences • express missing number problems algebraically • find pairs of numbers that satisfy an equation with two unknowns • enumerate possibilities of combinations of two variables
					Spring 2

Note – although formal algebraic notation is not introduced until Y6, algebraic thinking starts much earlier as exemplified by the 'missing number' objectives from Y1/2/3

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Year 6 RTP 4 operations

Ready to progress criteria	Block	Steps
6AS/MD-1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).	See under Addition and subtraction, multiplication and division	
6AS/MD-2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.	See under Addition and subtraction, multiplication and division	
6AS/MD-3 Solve problems involving ratio relationships.	Spring 1	4 – Ratio and fractions 5 – Scale drawing 6 – Use scale factors 7 – Similar shapes 8 – Ratio problems 9 – Proportion problems 10 – Recipes
6AS/MD-4 Solve problems with 2 unknowns.	Spring 2	9 – Find pairs of values 10 – Solve problems with two unknowns

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Measurement

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Using measures

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• compare, describe and solve practical problems for: ➢ lengths and heights ➢ mass/weight ➢ capacity and volume ➢ time • measure and begin to record the following: ➢ lengths and heights ➢ mass/weight ➢ capacity and volume ➢ time (hours, minutes, seconds)	• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • compare and order lengths, mass, volume/capacity and record the results using >, < and =	• measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	• Convert between different units of measure [for example, kilometre to metre; hour to minute] • estimate, compare and calculate different measures	• convert between different units of metric measure • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints • use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling	• solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 d.p. where appropriate • use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 d.p. • convert between miles and kilometres
Spring 4 Spring 5 Summer 6	Spring 3 Spring 4	Spring 2 Spring 4	Spring 2 Summer 3	Spring 4 Summer 5 Summer 6	Autumn 5

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Money

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• recognise and know the value of different denominations of coins and notes	• recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value • find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change	• add and subtract amounts of money to give change, using both £ and p in practical contexts	• estimate, compare and calculate different measures, including money in pounds and pence	• use all four operations to solve problems involving measure [for example, money]	
Summer 5	Spring 1	Summer 2	Summer 2	Summer 3	

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Time

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] • recognise and use language relating to dates, including days of the week, weeks, months and years • tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	• compare and sequence intervals of time • tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • know the number of minutes in an hour and the number of hours in a day	• tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks • estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight • know the number of seconds in a minute and the number of days in each month, year and leap year • compare durations of events [for example to calculate the time taken by particular events or tasks]	• read, write and convert time between analogue and digital 12- and 24-hour clocks • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	• solve problems involving converting between units of time	• use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit, and vice versa Note – In the WRM schemes, time conversions are covered in Y5; the Y6 block concentrates on metric units.
Summer 6	Summer 2	Summer 3	Summer 3	Summer 5	Autumn 5

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Perimeter, area, volume

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		• measure the perimeter of simple 2-D shapes	• measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares	• measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • calculate and compare the area of rectangles (including squares) and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes • estimate volume [for example, using blocks to build cuboids] and capacity [for example, using water]	• recognise that shapes with the same areas can have different perimeters and vice versa • recognise when it is possible to use formulae for area and volume of shapes • calculate the area of parallelograms and triangles • calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units
		Spring 2	Autumn 3 Spring 2	Spring 4 Summer 6	Spring 5

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Geometry

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2-D shapes

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• recognise and name common 2-D shapes [for example, rectangles (including squares), circles and triangles]	• identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line • identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] • compare and sort common 2-D shapes and everyday objects	• draw 2-D shapes	• compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify lines of symmetry in 2-D shapes presented in different orientations	• distinguish between regular and irregular polygons based on reasoning about equal sides and angles. • use the properties of rectangles to deduce related facts and find missing lengths and angles	• draw 2-D shapes using given dimensions and angles • compare and classify geometric shapes based on their properties and sizes • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
Autumn 3	Autumn 3	Summer 4	Summer 4	Summer 1	Summer 1

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3-D shapes

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• recognise and name common 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]	• recognise and name common 3-D shapes [for example, cuboids (including cubes), pyramids and spheres] • compare and sort common 3-D shapes and everyday objects	• make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them		• identify 3-D shapes, including cubes and other cuboids, from 2-D representations	• recognise, describe and build simple 3-D shapes, including making nets
Autumn 3	Autumn 3	Summer 4		Summer 1	Summer 1

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Angles and lines

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		• recognise angles as a property of shape or a description of a turn • identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle • identify horizontal and vertical lines and pairs of perpendicular and parallel lines	• identify acute and obtuse angles and compare and order angles up to two right angles by size • identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry	• know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees • identify: ➢ angles at a point and one whole turn (total 360°) ➢ angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°) ➢ other multiples of 90°	• find unknown angles in any triangles, quadrilaterals, and regular polygons • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
		Summer 4	Summer 4	Summer 2	Summer 1

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Position and direction

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• describe position, direction and movement, including whole, half, quarter and three-quarter turns	• order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)		• describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon	• identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed	• describe positions on the full coordinate grid (all four quadrants) • draw and translate simple shapes on the coordinate plane, and reflect them in the axes
Summer 3	Summer 4		Summer 6	Summer 2	Summer 2

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Year 1 RTP Geometry

Ready to progress criteria	Block	Steps
1G-1 Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another.	Autumn 3	1 – Recognise and name 3-D shapes 2 – Sort 3-D shapes 3 – Recognise and name 2-D shapes 4 – Sort 2-D shapes 5 – Patterns with 2-D and 3-D shapes
1G-2 Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.	Autumn 3	1 – Recognise and name 3-D shapes 2 – Sort 3-D shapes 3 – Recognise and name 2-D shapes 4 – Sort 2-D shapes 5 – Patterns with 2-D and 3-D shapes

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Year 2 RTP Geometry

Ready to progress criteria	Block	Steps
2G-1 Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another.	Autumn 3	1 – Recognise 2-D and 3-D shapes 2 – Count sides on 2-D shapes 3 – Count vertices on 2-D shapes 7 – Sort 2-D shapes 8 – Count faces on 3-D shapes 9 – Count edges on 3-D shapes 10 – Count vertices on 3-D shapes 11 – Sort 3-D shapes

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Year 3 RTP Geometry

Ready to progress criteria	Block	Steps
3G-1 Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.	Summer 4	1 – Turns and angles 2 – Right angles 6 – Parallel and perpendicular 7 – Recognise and describe 2-D shapes
3G-2 Draw polygons by joining marked points, and identify parallel and perpendicular sides.	Summer 4	6 – Parallel and perpendicular 8 – Draw polygons

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Year 4 RTP Geometry

Ready to progress criteria	Block	Steps
4G-1 Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.	Summer 6	1 – Describe position using coordinates 2 – Plot coordinates 3 – Draw 2-D shapes on a grid 4 – Translate on a grid 5 – Describe translations on a grid
4G-2 Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons.	Spring 2	3 – Perimeter on a grid 4 – Perimeter of a rectangle 5 – Perimeter of rectilinear shapes 6 – Find missing lengths in rectilinear shapes 7 – Calculate the perimeter of rectilinear shapes 8 – Perimeter of regular polygons 9 – Perimeter of polygons
	Summer 4	6 - Polygons
4G-3 Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.	Summer 4	7 – Lines of symmetry 8 – Complete a symmetrical figure

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Year 5 RTP Geometry

Ready to progress criteria	Block	Steps
5G-1 Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.	Summer 1	1 – Understand and use degrees 2 – Classify angles 3 – Estimate angles 4 – Measure angles up to 180° 5 – Draw lines and angles accurately
5G-2 Compare areas and calculate the area of rectangles (including squares) using standard units.	Spring 4	4 – Area of rectangles

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Year 6 RTP Geometry

Ready to progress criteria	Block	Steps
6G-1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.	Spring 5	1 – Shapes – same area 2 – Area and perimeter 3 – Area of a triangle 4 – Area of a right-angled triangle 5 – Area of any triangle 6 – Area of a parallelogram
	Summer 1	2 – Calculate angles 3 – vertically opposite angles 4 – Angles in a triangle 5 – Angles in a triangle - special cases 6 – Angles in a triangle – missing angles 7 – Angles in quadrilaterals 8 – Angles in polygons 9 – Circles 10 – Draw shapes accurately

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Statistics

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Present and interpret data

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• interpret and construct simple pictograms, tally charts, block diagrams and simple tables	• interpret and present data using bar charts, pictograms and tables	• interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	• complete, read and interpret information in tables, including timetables	• interpret and construct pie charts and line graphs and use these to solve problems
	Summer 3	Summer 5	Summer 5	Spring 5	Spring 6

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Solve statistical problems

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • ask and answer questions about totalling and comparing categorical data	• solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables	• solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	• solve comparison, sum and difference problems using information presented in a line graph	• calculate and interpret the mean as an average
	Summer 3	Summer 5	Summer 5	Spring 5	Spring 6

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Appendix C: White Rose Vocabulary Progression Document

The following 14 pages are reproduced unaltered from: White Rose Education - Vocabulary Progression Document (September 2025).

Primary maths

Vocabulary progression document

September 2025

White Rose MATHS

Introduction

The use of accurate mathematical vocabulary is essential for children's understanding and communication of mathematical concepts.

This progression document provides an outline of where key mathematical vocabulary is introduced and developed in the White Rose Maths schemes of learning.

Measure (length and height)

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
big bigger large little small smaller	height length long longer longest measure short shorter shortest tall taller tallest	centimetres	metres	convert millimetres perimeter	area kilometres rectilinear width	imperial inches metric	formula

To save repetition of vocabulary, words are listed only where they are first introduced. For example, although the word 'sharing' is used throughout school, it is listed in Reception. Key vocabulary is revisited frequently as students progress through the curriculum.

Teachers can use this document to ensure that children are supported in using the correct mathematical vocabulary at each stage of their learning. By developing confidence with key terms, pupils can better articulate their thinking, reason effectively, and build a strong foundation for future learning in mathematics.

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Place value

White Rose MATHS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
amount, backwards, collection, count, few, fewer (than), forwards, how many, largest, lot(s), more (than), number, numeral, same, smallest, subitise	after, before, different, represent, zero	compare, count on, digit, fewest, greater than, greatest, less than, most, one(s), order, partition, represent, ten(s), ordinal numbers (first, second, third, etc)	exchange, interval, least, multiple, value,	ascending, descending, hundred(s), part, whole	place holder, Roman, numeral, round, thousands	hundred, thousand(s), integer, negative number, millions, power of 10, ten thousand	ten million

Addition and subtraction

White Rose MATHS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	1 less, 1 more, add, add more, altogether, first, left, now, part, take away, whole	addition, add together, subtraction/ subtract, difference, double, efficient, equal to, fact family, greater, group, inverse, less, minus, near double, number bond, plus, symbol, systematic, total	calculation, exchange, method, multiple, one(s), operation, partition, related facts, ten(s), value, increase, decrease, sum	column, addition, column, subtraction, digit, estimate, exchange, hundred(s), inverse, crossing the 10, crossing the 100,	efficient, inverse, round, thousand(s)	accurate, approximate, constant difference, strategy	order of operations

Multiplication and division

White Rose MATHS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	double, equal groups, even, fair, grouping, groups, odd, pair, sharing, unequal, groups	array, divide, repeated, addition	divide, even, half, lots of, multiply, odd, twice, times times-table,	commutative, inverse, multiple, product, remainder, scaling	factor, factor pair, inverse, triple, efficient	common multiple, common factor, cube number, prime number, square number	composite number, order of operations, powers of

Fraction, decimals and percentages

White Rose MATHS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		equal parts, half, quarter, whole	numerator, denominator, equivalent, unit fraction, non-unit fraction, third, two-quarters, three-quarters	scale, compare, convert	decimal equivalent, decimal place, decimal point, hundredths, improper, fractions, mixed, numbers, proper fractions, round, tenths	common denominator, fractional part, percentage, thousandth	simplify, simplest form, recurring

Measure (money)

White Rose MATHS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		amount, coin, note, money, pence (p), pound (£), unitise, value	change, cost, worth	convert	decimal		

Measure (length and height)

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
big, bigger, large, little, small, smaller	height, length, long, longer, longest, measure, short, shorter, shortest, tall, taller, tallest	centimetres, ruler	metres	convert, millimetres, perimeter	area, kilometres, rectilinear, width	imperial, inches, metric, volume	formula

Measure (mass, capacity and temperature)

White Rose MATHS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
big, bigger, large, little, small, smaller	balanced, balancing scales, empty, float, full, heavier, heaviest, heavy, least, less, light, lighter, lightest, mass, more, most, narrow, sink, tall, thin, weight, wide,	capacity, container, non-standard, volume	celsius, circular scales, degrees, grams, kilograms, litres, millilitres, temperature, thermometer	convert		cubic, centimetres, imperial metric, pints, pounds,	formula, gallon, ounces, tonnes

Measure (time)

White Rose MATHS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
first, next, now, then	after, afternoon, before, clock, day, evening, later, lunchtime, minute, morning, night, night-time, today, tomorrow, week, weekend, yesterday,	half past, hour, month, o'clock, second, watch, week,	five-minute intervals midnight, noon, quarter past, quarter to,	analogue clock, 12-hour clock, 24-hour clock, digital clock duration, leap year, am, pm, Roman numerals,			

Shape

White Rose MATHS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
build, curved, curvy, different, flat, match, pointy, round, same, sharp, stack	2-d shape, 3-d shape, circle, cone, corner, cube, cuboid, curved, cylinder, face, flat, pyramid, rectangle, rotate, set, sides, solid, sort, sphere, square, straight, surface, triangle	properties	edge, line of symmetry, symmetrical, vertex, vertices	acute, obtuse, angle, vertical horizontal, parallel, perpendicular, polygon, right angle	equilateral, regular, irregular, isosceles, parallelogram, quadrilateral, rhombus, scalene, trapezium	adjacent, degrees, reflex angle	base, circumference, diameter, dimensions, interior angles, intersect, net, opposite angles, radius,

Statistics

White Rose MATHS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			block diagram, key, pictogram, table, tally chart, collect, record	axis, bar chart, cell, horizontal axis, label, scale, two-way table, title, vertical axis,	data, estimate, line graph	timetable, variable	average, dual bar chart, mean, pie chart

Position and direction

White Rose MATHS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
behind, between, down in, in front, inside, move, on, out, outside, over, through, under, up,	above, around, backwards, below, beside, bottom, forwards, map, next to, position, route, top	far, full turn, half turn, left, near, quarter turn, right, three-quarter turn, direction	anti-clockwise, between, clockwise		coordinates, grid, reflection, translation,	quadrant,	x-axis y-axis

Ratio and proportion

White Rose MATHS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
							additive, enlargement, multiplicative, proportion, ratio, scale factor, scaling, simplest form

Algebra

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
							algebra, equation, expression, function, input, linear output, rule, solve, substitution, value,

Pattern

White Rose MATHS

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
after, line, next, pattern, spot, star, stripe, swirl, zigzag	continue, copy, mistake, repeat, repeating, pattern, same, unit of repeat,		decreasing, increasing, sequence				