

Newton International Academy, Barwa

Calculation Policy (EYFS & Primary)

An International Community of Learners, Striving for Excellence and Celebrating Success

NEWTON INTERNATIONAL ACADEMY | BARWA

At Newton International Academy, Barwa City, we believe that a strong foundation in mathematics is essential for academic success and lifelong learning. This Calculation Policy outlines our approach to teaching the four core operations—addition, subtraction, multiplication, and division—across the Early Years Foundation Stage (EYFS) and Primary School. It aims to ensure consistency, progression, and high standards in the development of calculation skills for all pupils.

Rooted in our school vision—An International Community of Learners, Striving for Excellence and Celebrating Success—this policy supports a whole-school approach to mathematical fluency, reasoning, and problem-solving. Drawing on the White Rose Maths scheme as our principal curriculum framework, the policy reflects a commitment to high-quality, inclusive, and evidence-based teaching practices.

This document provides clear expectations for teachers, students, and parents and sets out a structured progression of skills, supported by concrete, pictorial, and abstract (CPA) methods. It also establishes a shared language and consistent strategies for teaching calculations, enabling all learners to gain confidence, competence, and a deep conceptual understanding of mathematics.

Through collaborative implementation of this policy, we aim to foster mathematical thinkers who are resilient, reflective, and ready to apply their skills in real-world contexts.

Responsibilities and expectations:

Input from all stakeholders in the school, including teachers, the parents, and the student leadership team, has informed the following expectations.

Staff Responsibilities

Staff are expected to:

1. Deliver High-Quality Instruction: Teachers are responsible for providing clear, consistent, and effective instruction in calculation methods, ensuring students are taught both conceptual understanding and procedural fluency in addition, subtraction, multiplication, and division.
2. Ensure Progression: Teachers will follow the policy's progression from Year 1 to Year 6, ensuring that each lesson builds on prior knowledge, allowing students to develop skills and confidence in their calculations.
3. Use Varied Teaching Strategies: Teachers will use a range of teaching strategies, including concrete, pictorial, and abstract methods, to cater to diverse learning styles and abilities. This includes using manipulatives, visual aids, and problem-solving activities.
4. Monitor and Assess Student Progress: Teachers will regularly assess students' understanding of calculation methods through both formal and informal assessments, providing timely feedback to address misconceptions and celebrate achievements.
5. Provide Differentiation: Teachers will differentiate instruction to meet the needs of all students, offering additional support or extension tasks as necessary to ensure every student progresses at an appropriate pace.

Students are expected to:

1. Engage with Learning: Students are expected to engage actively in all lessons, participate in class discussions, and apply themselves to learning new calculation methods, showing curiosity and perseverance.
2. Practice Regularly: Students should regularly practice their calculation skills, both in class and at home, to build fluency, confidence, and accuracy in addition, subtraction, multiplication, and division.
3. Ask for Help When Needed: Students are encouraged to seek help from their teachers, peers, or parents when they are struggling with any calculation methods, taking responsibility for their own learning.
4. Use Multiple Strategies: Students are expected to explore and use different methods for solving problems, allowing them to deepen their understanding and develop flexibility in their calculations.
5. Reflect on Progress: Students will take time to reflect on their own learning, identifying areas of strength and areas for improvement, and setting personal goals for further development.

Parents and guardians are expected to:

1. Support Learning at Home: Parents are encouraged to support their children's learning by helping them practice key calculation skills at home, reinforcing what is being taught in the classroom.
2. Encourage Regular Practice: Parents should encourage their children to practice mental and written calculations regularly, particularly times tables, number bonds, and place value, to build fluency and accuracy.
3. Foster a Positive Attitude Towards Math: Parents should promote a positive attitude towards mathematics by celebrating successes, encouraging effort, and helping children develop resilience when they face challenges in calculations.
4. Communicate with Teachers: Parents should maintain regular communication with teachers to stay informed about their child's progress, addressing any concerns or areas where additional support may be needed.
5. Provide a Supportive Learning Environment: Parents are encouraged to create a quiet, distraction- free space for their children to complete homework and practice their math skills, fostering an environment that encourages focus and concentration.

By working collaboratively, teachers, students, and parents will ensure that all children have the skills, confidence, and understanding necessary to succeed in mathematics and meet the expectations set out in this policy.

The effective implementation of the Newton International Academy Primary Maths Calculation Policy is rooted in a systematic approach that ensures the development of addition, subtraction, multiplication, and division skills from Year 1 to Year 6. The White Rose Maths scheme will serve as the primary curriculum framework to deliver this policy, providing a structured and progressive model for instruction. This section outlines how the White Rose scheme will be integrated into teaching practices, resources, and assessment methods, with the goal of fostering a deep and lasting understanding of calculation methods across all year groups.

Curriculum Planning:

1. Adherence to White Rose Maths Progression: Teachers will follow the White Rose Maths progression model, which offers a clear, well-structured pathway for developing students' calculation skills in a logical and cumulative manner. The White Rose framework ensures that the key concepts of addition, subtraction, multiplication, and division are introduced at the appropriate time, with each new skill building upon the previous one. Teachers will ensure that lessons are aligned with this progression, following the sequence outlined in the scheme to ensure continuity and coherence in students' learning.
2. Integration of Key Concepts in Each Year Group: Each year group will focus on the specific skills and strategies outlined in the White Rose curriculum, with a deliberate emphasis on the gradual introduction of more complex operations. For example, in the earlier years, students will work on mental strategies and concrete methods of addition and subtraction, while by the end of Year 6, students will focus on multi-step problem solving and more advanced written methods. Teachers will ensure that these concepts are developed in a scaffolded manner to support student mastery at every stage.
3. Cross-Curricular Links and Problem-Solving: In addition to following the White Rose curriculum, teachers will ensure that students regularly apply their calculation skills in other areas of the curriculum, such as science, geography, and project-based learning. This approach will help students understand the real-world applications of their calculation skills and engage them in meaningful problem-solving tasks. Teachers will use examples from everyday life and different subjects to illustrate how calculations are used in various contexts.

Teaching Strategies:

1. Concrete, Pictorial, and Abstract (CPA) Approach: The White Rose Maths scheme emphasizes the CPA approach, which is a fundamental aspect of our teaching methodology. In the early stages of learning, teachers will use concrete materials, such as counters, base-ten blocks, and number lines, to help students physically manipulate numbers and understand the operations. As students become more confident, they will move to pictorial representations, using diagrams, drawings, and models to represent the calculations. Finally, students will progress to abstract methods, using symbols and numbers in formal written methods. This three-step approach ensures a deep understanding of each calculation method.
2. Explicit Instruction and Modelling: Teachers will provide explicit instruction and modeling of key calculation strategies, using the resources and planning provided by White Rose. This includes the use of step-by-step demonstrations of addition, subtraction, multiplication, and division techniques. Teachers will model how to approach problems systematically, explaining the reasoning behind the chosen method and encouraging students to verbalize their thinking. This ensures that students not only learn how to perform the calculation but also understand the 'why' behind each method.

1. Interactive and Engaging Lessons: White Rose Maths encourages interactive lessons that actively engage students in their learning. Teachers will incorporate a variety of strategies to keep lessons dynamic and student-centered, including group work, pair discussions, interactive whiteboard activities, and games. These activities will help students consolidate their understanding through active participation, while also fostering collaboration and communication skills.

2. Scaffolded Learning: Teachers will implement scaffolding techniques to support all students, gradually increasing the level of complexity as students become more proficient. In line with the White Rose approach, teachers will initially provide high levels of support, such as guided practice and worked examples, and will gradually reduce this support as students gain confidence and competence. This ensures that students are not overwhelmed by new concepts and can progress at their own pace.

3. Use of Differentiation: Teachers will differentiate instruction to meet the diverse needs of learners. For students requiring additional support, teachers will use manipulatives, simplified tasks, and additional guided practice to reinforce basic skills. For advanced learners, teachers will provide challenging extension tasks, such as multi-step problems, word problems that require deeper thinking, or opportunities to explore more complex calculation strategies. This ensures that all students are appropriately challenged and supported in their learning.

Assessment and Monitoring:

1. Formative Assessment: Teachers will use ongoing formative assessments to monitor students' understanding and to inform future planning. This may include observational assessments, quick checks for understanding (e.g., mini-whiteboard responses, quizzes), and questioning during lessons. These assessments will allow teachers to identify areas of difficulty and provide targeted interventions when needed. Teachers will use the assessment data to adjust instruction and ensure that all students are progressing according to the White Rose scheme's expectations.
2. Summative Assessment: At the end of each unit or term, teachers will assess students' understanding of calculation methods through both formal and informal summative assessments. These may include tests, project-based assessments, and practical application tasks that require students to use their calculation skills in real-world contexts. The results from these assessments will be compared against White Rose's expected outcomes for each year group to ensure that students are meeting the necessary standards.
3. Feedback and Reflection: Teachers will provide constructive feedback on students' performance in calculations, using both verbal and written comments to highlight strengths and areas for improvement. Feedback will be timely, specific, and focused on improving students' calculation strategies. Additionally, students will be encouraged to reflect on their own learning, setting personal goals for improvement and taking responsibility for their progress.

Parental Involvement:

1. Home Learning and Practice: Parents will be provided with White Rose Maths home learning resources, including worksheets, online tools, and activity suggestions, to reinforce classroom learning at home. These resources will help students practice their calculation skills in a structured manner, ensuring that they continue to develop fluency and confidence outside of school hours. Teachers will offer guidance on how parents can support their child's learning effectively.
2. Regular Communication: Teachers will maintain open lines of communication with parents through parent-teacher meetings, newsletters, and informal conversations. These interactions will keep parents informed about the topics being taught, the progress students are making, and any areas where additional support may be needed. This partnership will help ensure that students receive consistent support at both school and home.

Resources:

1. White Rose Maths Resources: Teachers will use the comprehensive resources provided by White Rose Maths, including lesson plans, worksheets, video tutorials, and interactive tasks. These resources will ensure that lessons are aligned with the White Rose scheme and are engaging and well-structured for students' needs. Additionally, teachers will supplement these resources with other manipulatives, visual aids, and interactive tools to enhance learning.
2. Math Manipulatives: Teachers will continue to use a wide variety of manipulatives such as counters, number lines, base-ten blocks, and place value charts, which will help students visualize the concepts they are learning. These physical tools will be used to reinforce key ideas, particularly in the early stages of learning, ensuring that students gain a strong understanding of mathematical operations before moving on to more abstract methods.

By aligning the implementation of the Newton International Academy Primary Math Calculation Policy with the White Rose Maths scheme, teachers will be able to ensure a high-quality, consistent, and progressive approach to teaching calculation skills. This framework will provide students with the necessary tools and strategies to become confident, capable mathematicians, and will ensure that they are well-prepared for future mathematical challenges.

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 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 10, children need to be able to add across 10 itself, before making links with related facts.

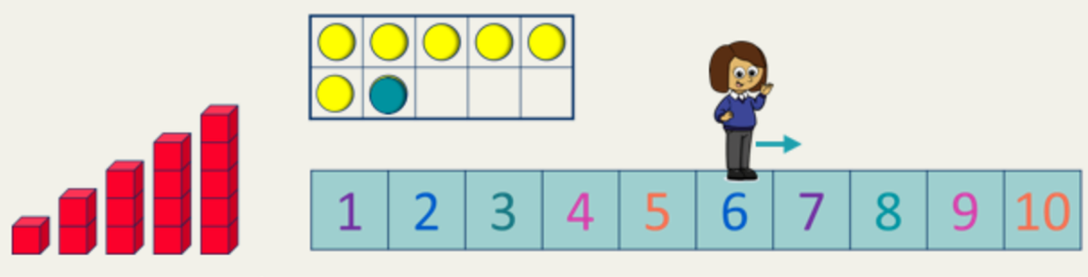
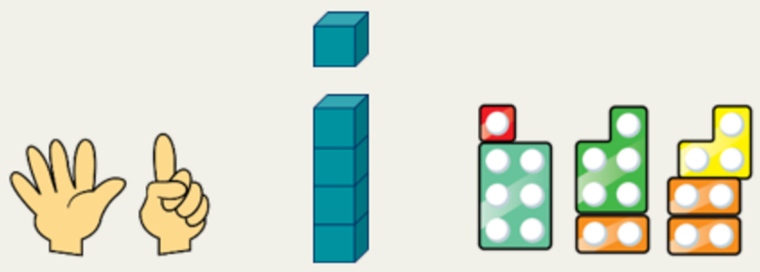
Progression of skills - Addition

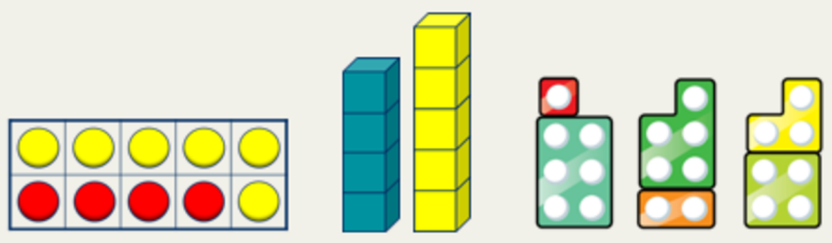
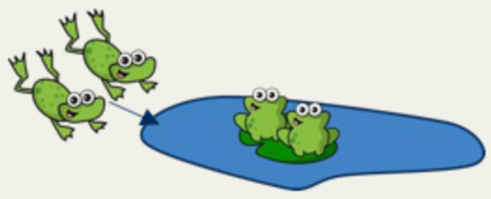
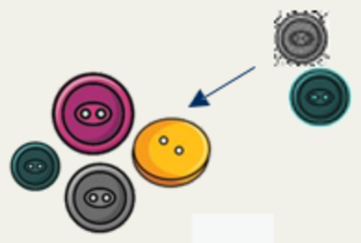
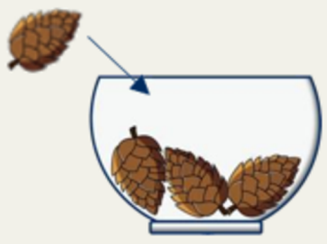
Year group	Skill
Nursery	• Subitise to 3 • Count how many • Make numbers to 5 • Add 1 more (through songs and rhymes)
Reception	• Conceptually subitise to 5 • 1 more • Notice the composition of numbers within 10 • Combine 2 groups • Add more
Year 1	• Add together • Add more • Bonds within 10 • Related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

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

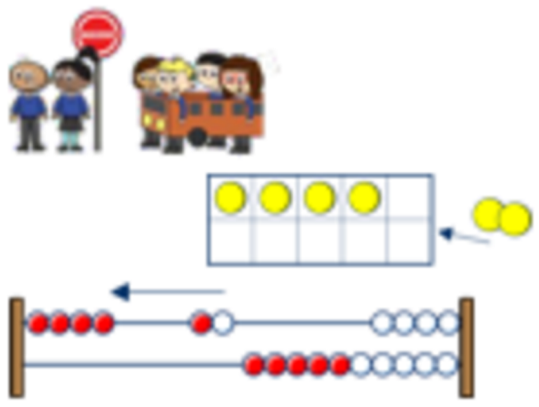
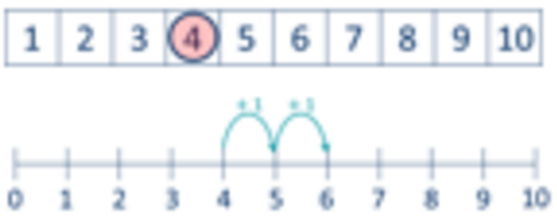
Addition

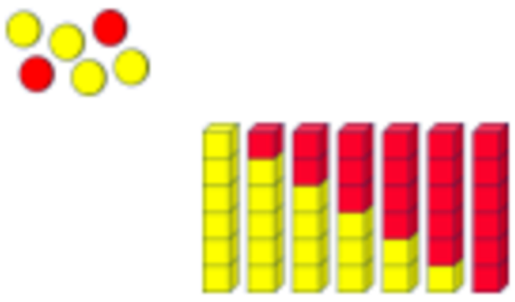
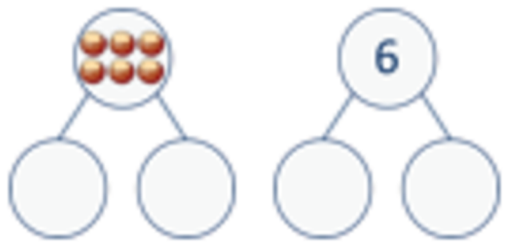
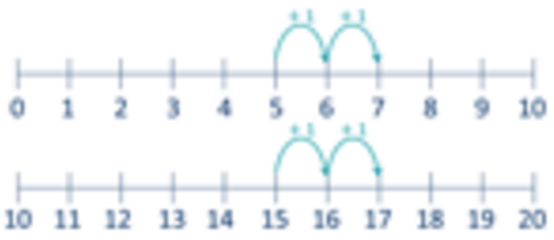
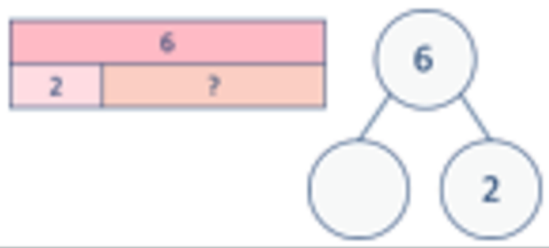
Nursery	• Begin to have an understanding of numbers to 5 • We recommend focusing on noticing and representing small quantities, perceptual subitising and counting.
Progression of skills	**Key representations**
Subitise to 3 Instantly see how many.	How many do you see? 
Count how many Begin to count objects 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? 

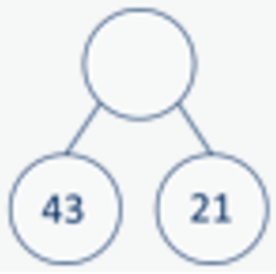
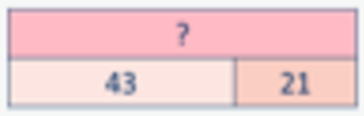
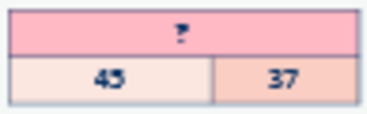
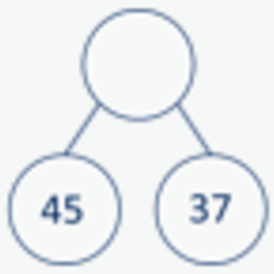
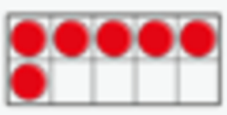
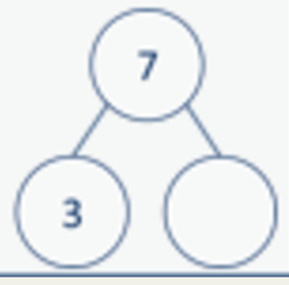
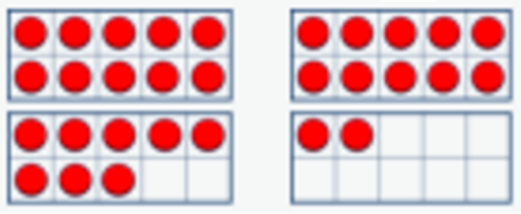
Reception	• Have a deep understanding of numbers to 10, including the composition of each number. • Subitise (recognise quantities without counting) up to 5 • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double 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…? 

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….   

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 = □ + 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.  4 2	… 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 …  1 2 3 4 5 6 7 8 9 10 0 1 2 3 4 5 6 7 8 9 10	… plus … is equal to … is equal to … + … 4 + 2 = 6 2 + 4 = 6 6 = 4 + 2 6 = 2 + 4

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 + □ = 6 6 = 2 + □ 

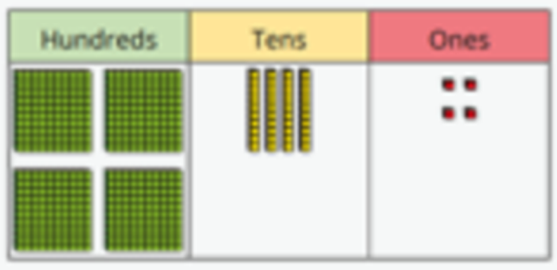
Progression of skills	Key representations		
Add 2-digit numbers (not across a ten) Lining up ones and tens in columns will support with later written methods.	… ones + … ones = … ones … tens + … tens = … tens  	3 ones + 1 one = 4 ones 4 tens + 2 tens = 6 tens 6 tens + 4 ones = 64 	
Add 2-digit numbers (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 + □ 

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

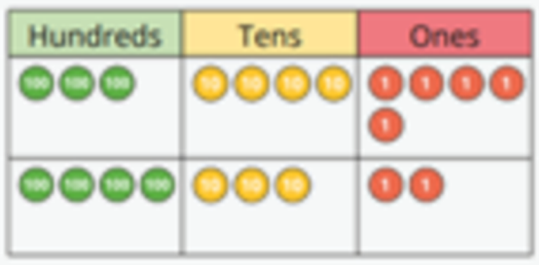
Add two numbers (no exchange)

Mental strategies and introduction of formal written method.

... ones + ... ones = ... ones
... tens + ... tens = ... tens
... hundreds + ... hundreds = ... hundreds









Progression of skills	Key representations

Add two numbers across a 10 or 100

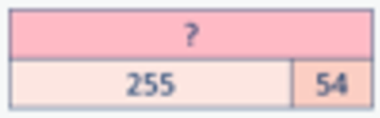
Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.

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.













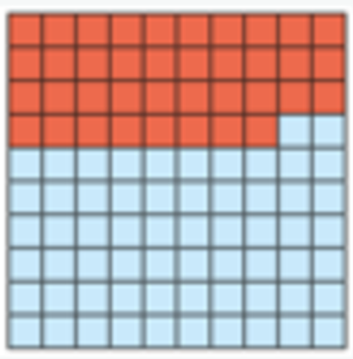


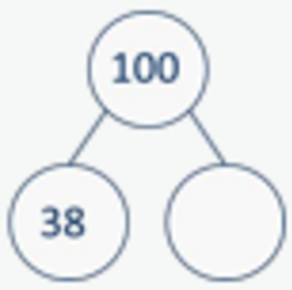


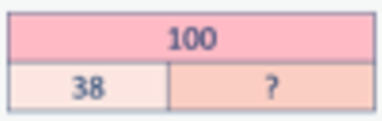
Complements to 100

Pairs of numbers which total 100

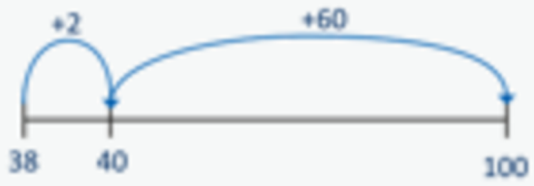
... plus ... is equal to 100



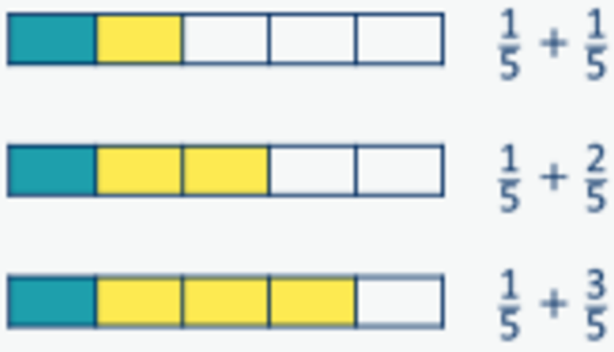
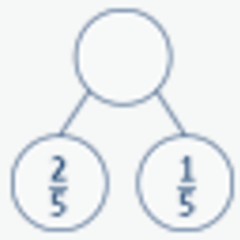
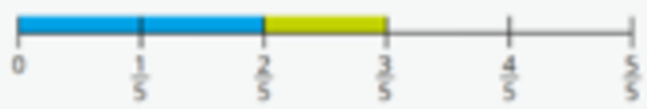
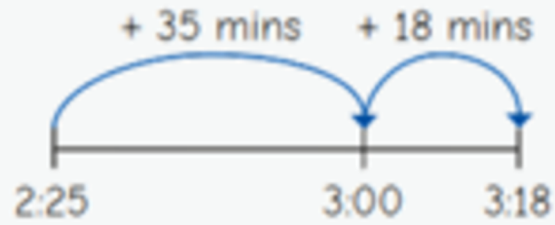




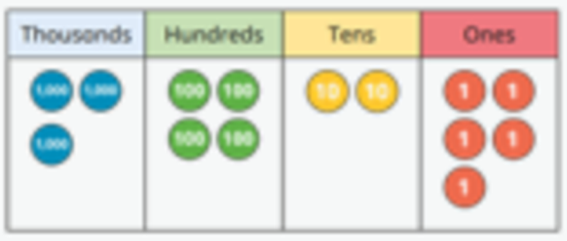
I add ... to get to the next 10, then ... to get to 100

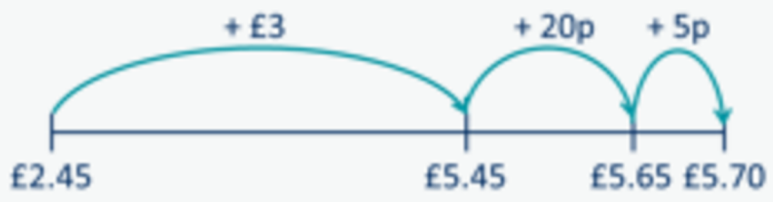
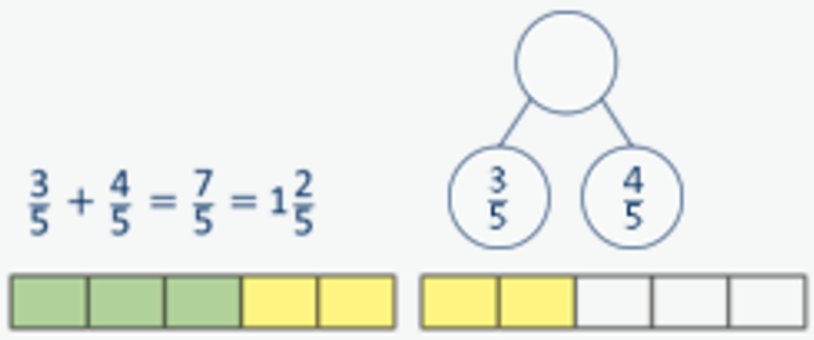


38 + 62 = 100
62 + 38 = 100
100 = 38 + 62
100 = 62 + 38

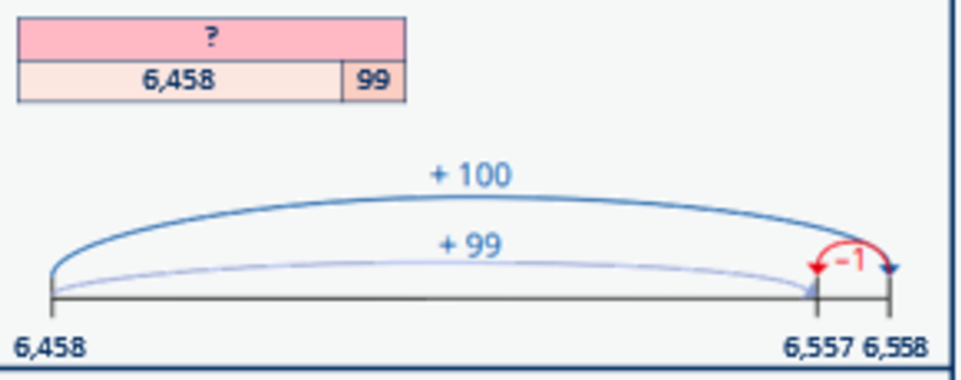
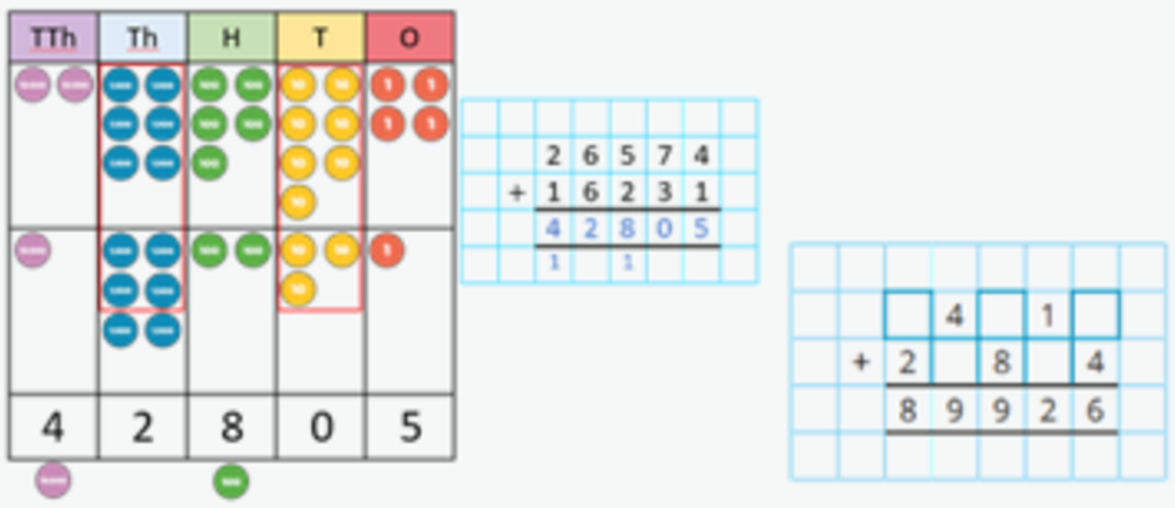
Progression of skills	Key representations
Add fractions with the same denominator within 1 whole Make links with known facts.	When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths  $\frac{1}{5} + \frac{1}{5}$ $\frac{1}{5} + \frac{2}{5}$ $\frac{1}{5} + \frac{3}{5}$  
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.  start finish  start finish 

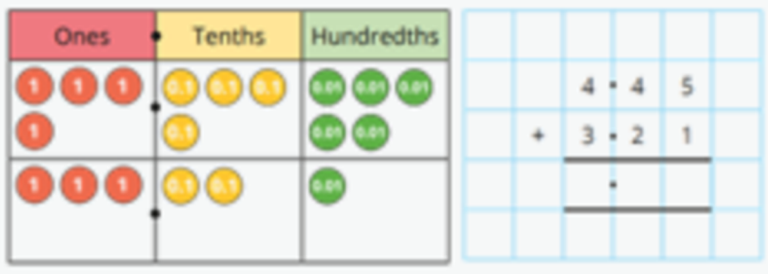
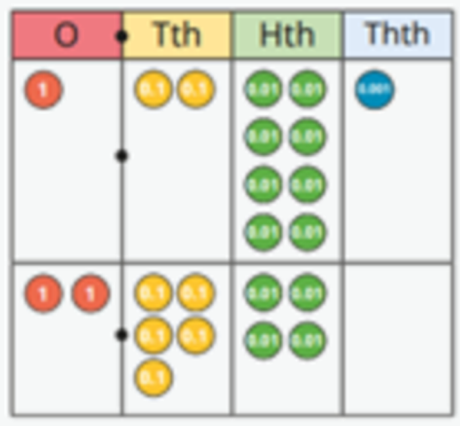
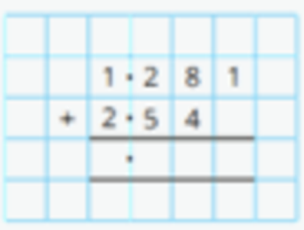
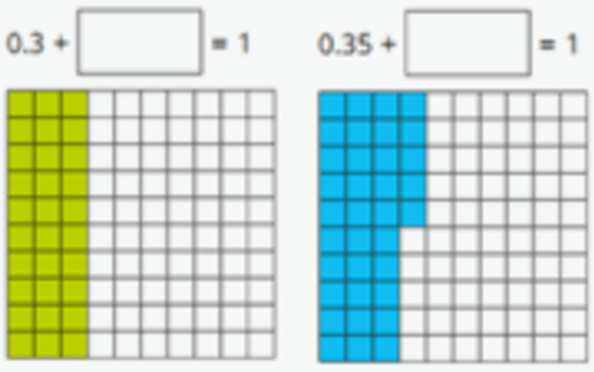
Year 4	▪ Add numbers with up to 4 digits using a formal written method. ▪ Solve simple measure and money problems involving fractions and decimals to 2 decimal places. ▪ Add fractions with the same denominator.

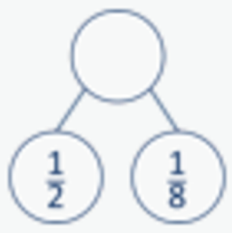
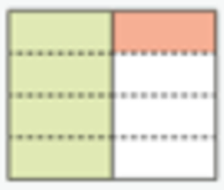
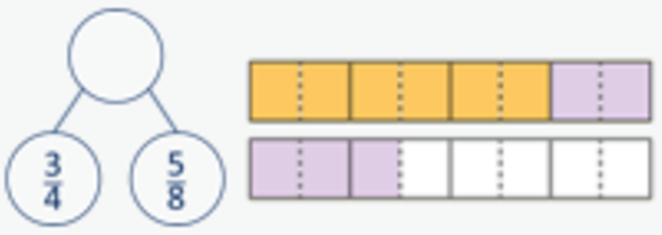
Progression of skills	Key representations	
Add 1s, 10s and 100s to a 4-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds/thousands column will increase by ...  3,425 + 3 = 3,425 + 30 = 3,425 + 300 = 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 ...	 

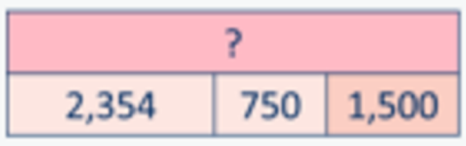
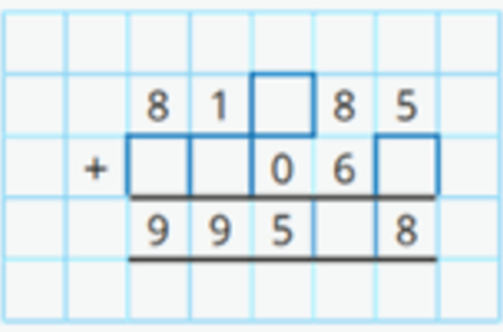
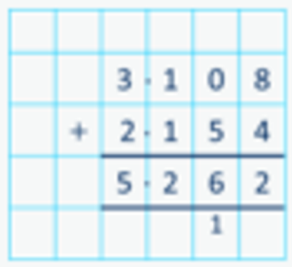
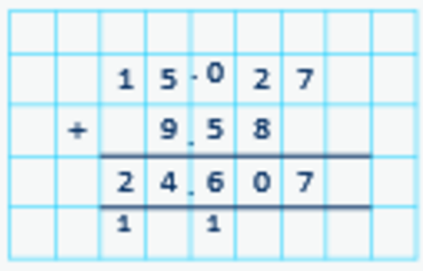
Progression of skills	Key representations	
Add decimal numbers in the context of money Emphasis on partitioning and use of number lines rather than formal written calculations.	… pence + … pence = … pence … pounds + … pounds = … pounds  45p + 25p = 70p £2 + £3 = £5 £5 + 70p = £5.70	£3.25 can be partitioned 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 $\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}$ 	

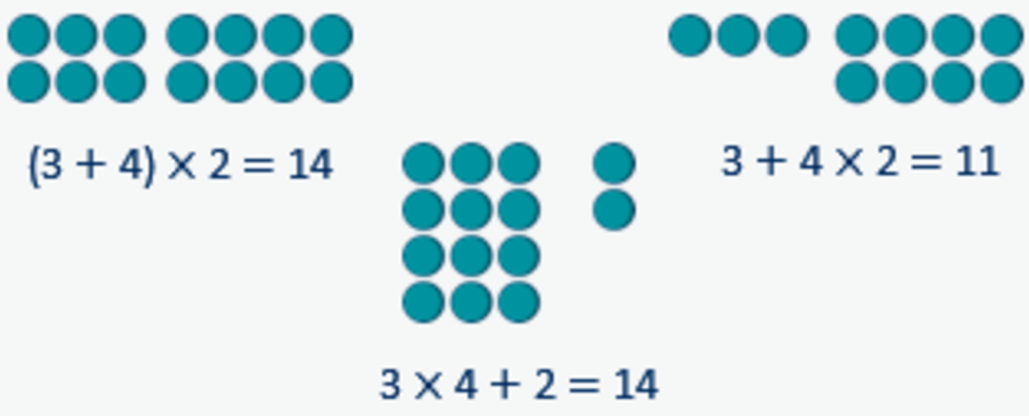
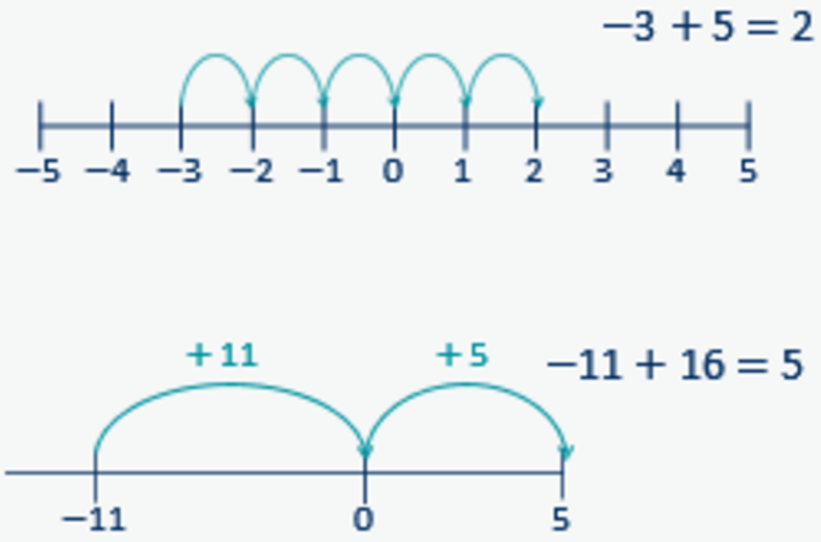
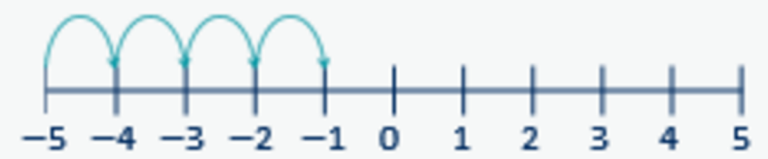
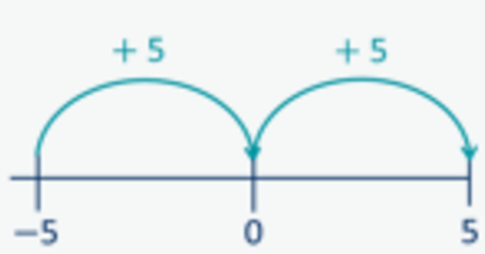
Year 5	
	▪ Add whole numbers with more than 4 digits, including using formal written methods. ▪ Add numbers mentally with increasingly large numbers. ▪ Add decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 ▪ Add fractions with the same denominator, and denominators that are multiples of the same number.

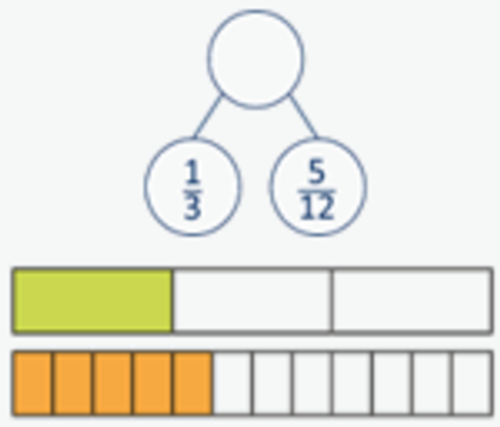
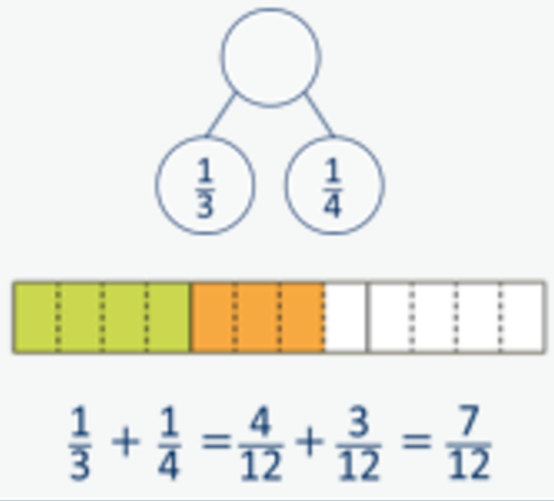
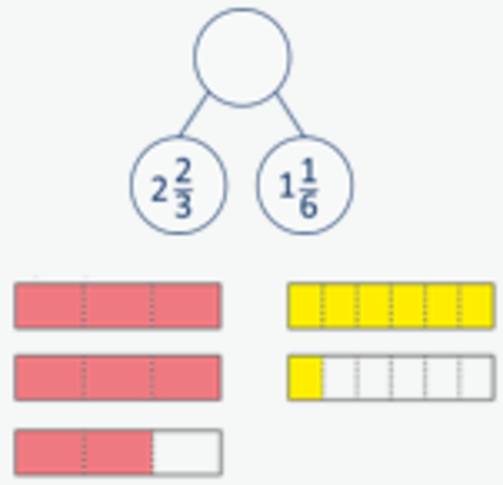
Progression of skills	Key representations	
Add using mental strategies Add 1s, 10s, 100s, etc. to any number. Use number bonds and related facts.	 48,650 + 300 = 48,650 + 30,000 = 48,650 + 30 =	To add …, I can add … then subtract … 
Add whole numbers with more than 4 digits Encourage children to estimate and use inverse operations to check answers to calculations.	I can exchange 10 … for 1 … 	

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	   $4 + 6 = 10$ $44 + 56 = 100$ $444 + 556 = 1{,}000$ $0.4 + 0.6 = 1$ $0.44 + 0.56 = 1$ $0.444 + 0.556 = 1$

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.   $\frac{1}{2} + \frac{1}{8} = \frac{4}{8} + \frac{1}{8} = \frac{5}{8}$  $\frac{1}{4} + \frac{3}{8} = \frac{2}{8} + \frac{3}{8} = \frac{5}{8}$  $\frac{3}{4} + \frac{5}{8} = \frac{6}{8} + \frac{5}{8} = \frac{11}{8} = 1\frac{3}{8}$

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 ...   

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 ...  
Negative numbers Children add to negative numbers and carry out calculations which cross 0	... plus ... is equal to ...   The difference between – 5 and −1 is 4  The difference between – 5 and 5 is 10

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 … 

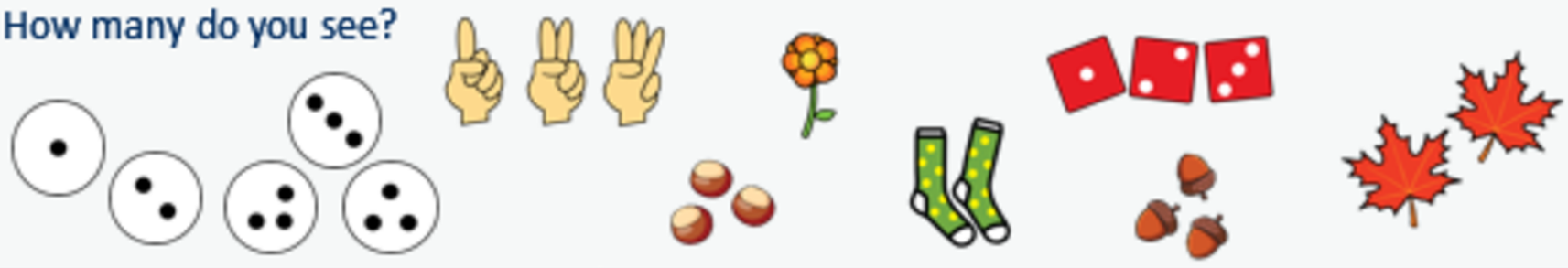
Progression of skills - Subtraction

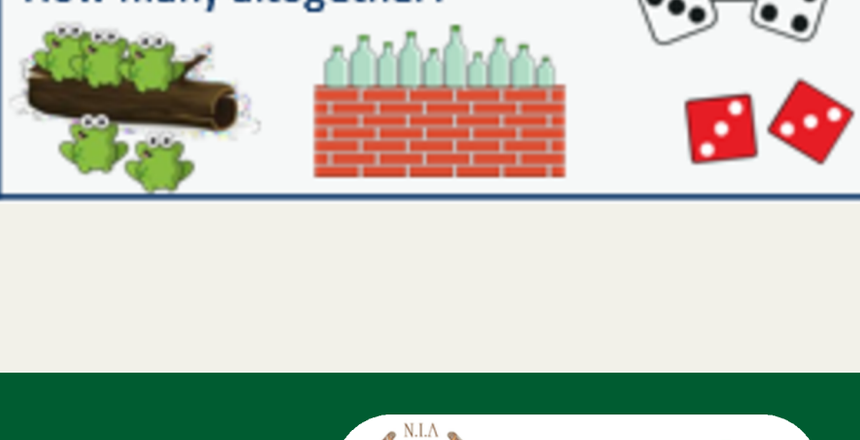
Year group	Skill
Nursery	• Subitise to 3 • Count how many • Make numbers to 5 • Take 1 away (through songs and rhymes)
Reception	• Conceptually subitise to 5 • 1 less • Notice the composition of numbers within 10 • Partition • Take away
Year 1	• Find a part • Take away • Bonds within 10 • Related facts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

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

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

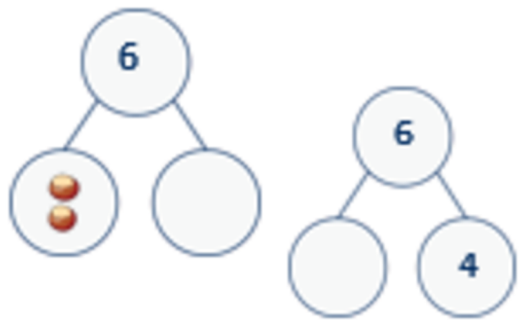
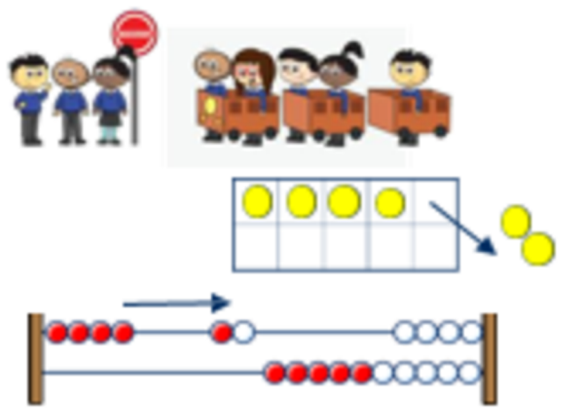
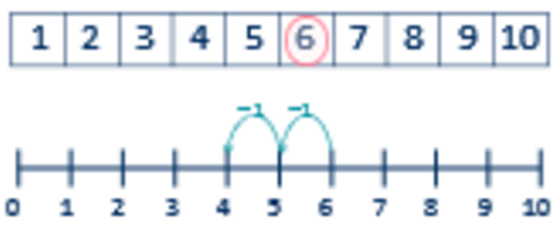
Subtraction

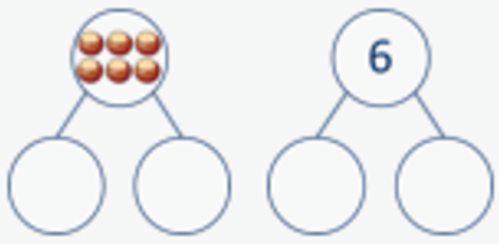
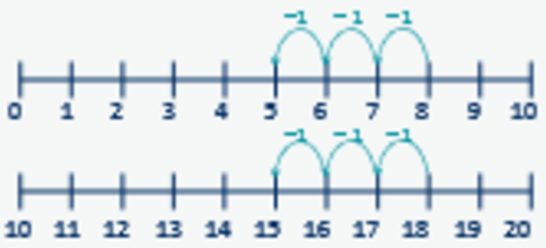
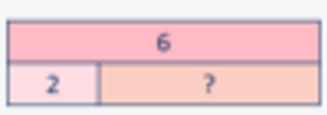
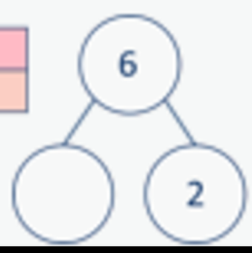
Nursery	• Begin to have an understanding of numbers to 5 • We recommend focusing on noticing and representing small quantities, perceptual subitising and counting.
Progression of skills	**Key representations**
Subitise to 3 Instantly see how many.	How many do you see? 
Count how many Begin to count objects 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? 

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…? 

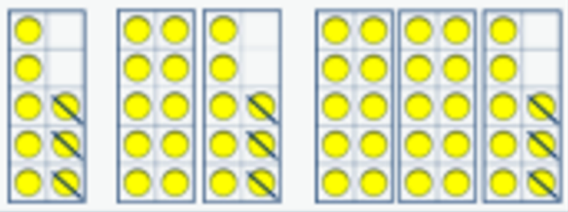
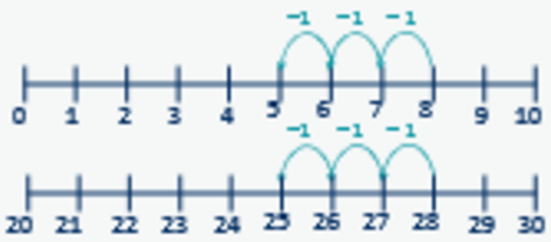
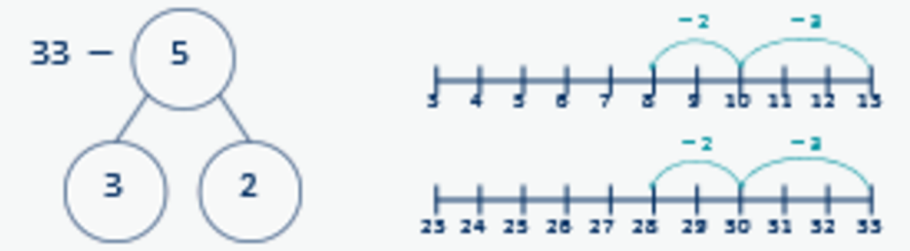
Progression of skills	Key representations		
Partition Using objects, explore different ways to partition a number into 2 or more parts.	There are … altogether. I can see … here and … there.   		… and … make … 
Take away A quantity is reduced.	First… Then… Now…  		I have … I take … away Now I have … 

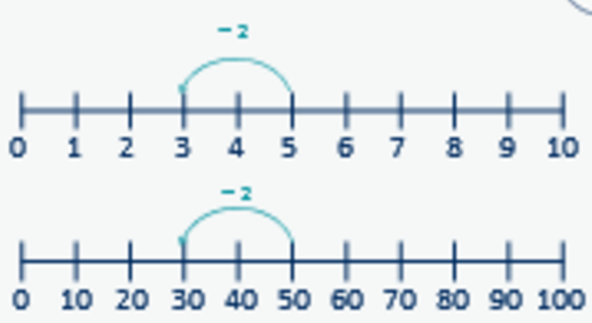
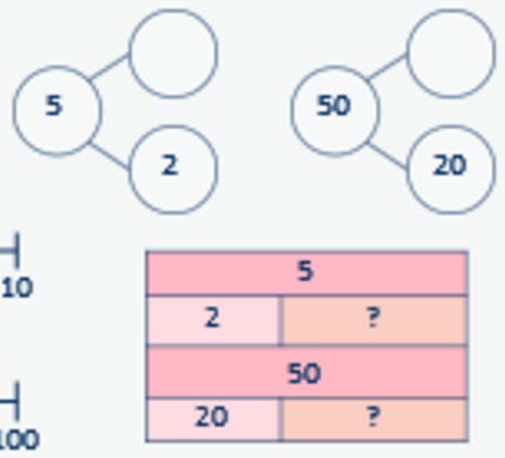
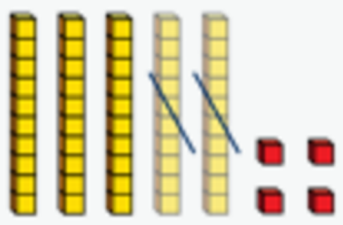
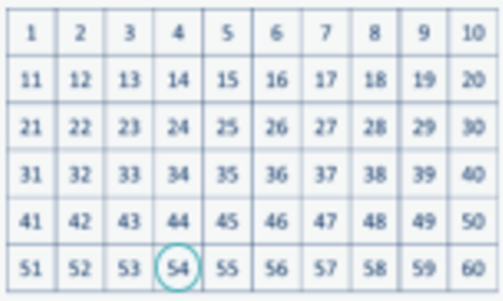
Year 1	
	▪ Read, write and interpret mathematical statements involving subtraction (–) and equals (=) signs. ▪ Represent and use number bonds and related subtraction facts within 20 ▪ Subtract one-digit and two-digit numbers to 20, including zero. ▪ Solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$

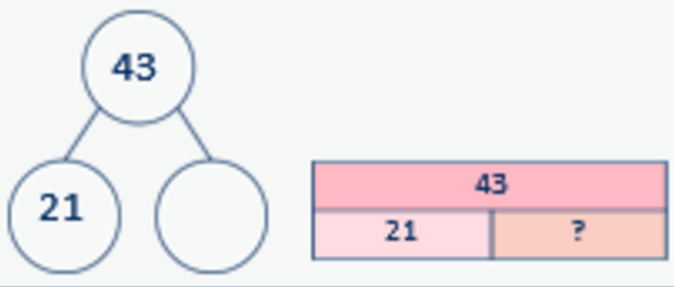
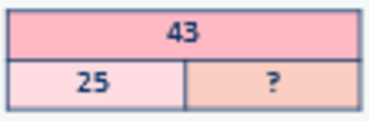
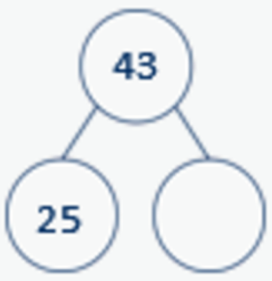
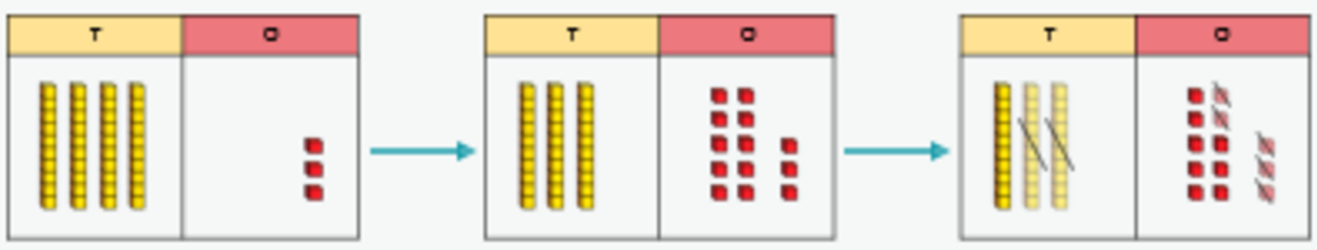
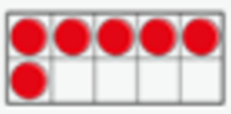
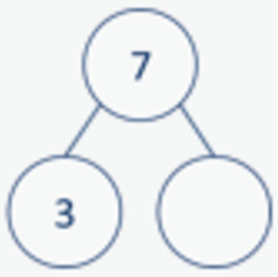
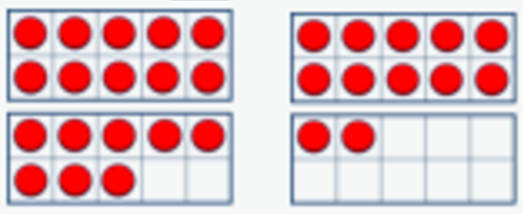
Progression of skills	Key representations		
Find a part Link to number bonds and known facts. E.g. $2 + 4 = 6$ so if 6 is the whole and 4 is a part, the other part must be 2	There are … in total. … are … How many are **not** …? 	… is the whole. … is a part. … is a part. 	… subtract … is equal to … … 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 … − … $6 - 2 = 4$ $6 - 4 = 2$ $4 = 6 - 2$ $2 = 6 - 4$

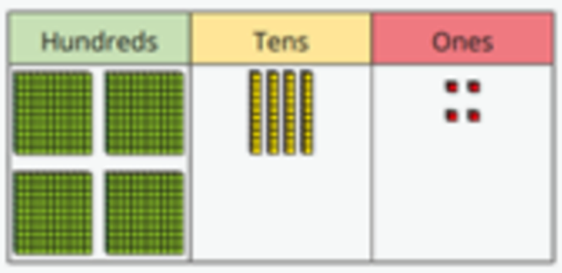
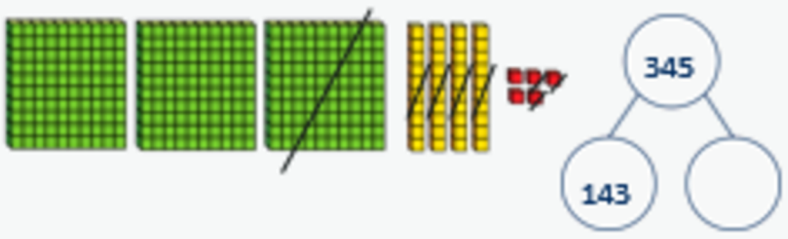
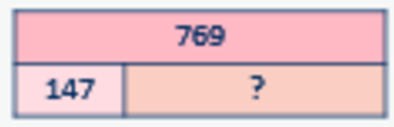
Progression of skills	Key representations		
Bonds within 10 Focus on subtraction facts. Encourage children to notice patterns.	… is made of … and … … and … make … 	… can be partitioned into … and … 	… minus … is equal to … 6 − 0 = 6 6 − 1 = 5 6 − 2 = 4 6 − 3 = 3 6 − 4 = 2 6 − 5 = 1 6 − 6 = 0
Related 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 − □ = 2 2 = 6 − □ 

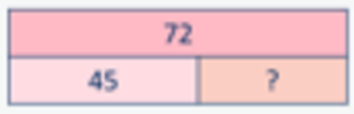
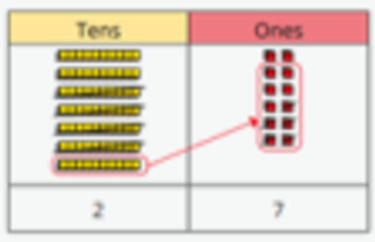
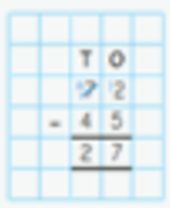
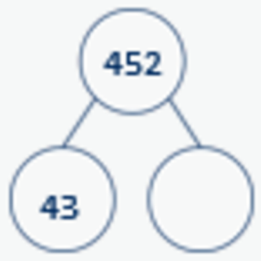
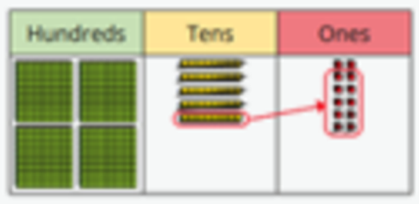
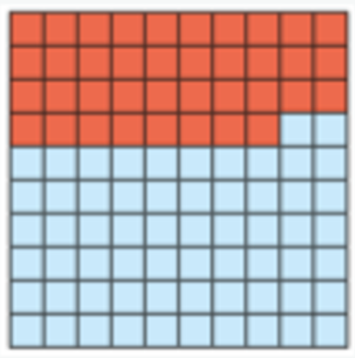
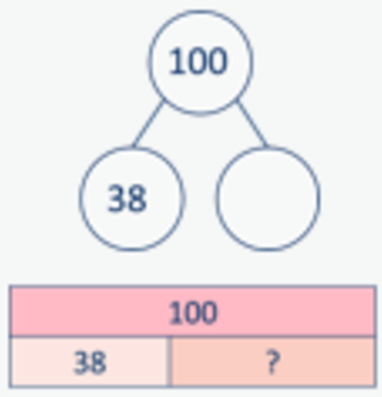
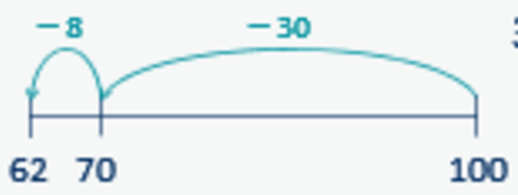
	▪ Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100
	▪ Subtract numbers using concrete objects, pictorial representations, and mentally, including:
	  ▪ a two-digit number and 1s
	  ▪ a two-digit number and 10s
	  ▪ 2 two-digit numbers
	▪ Recognise and use the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

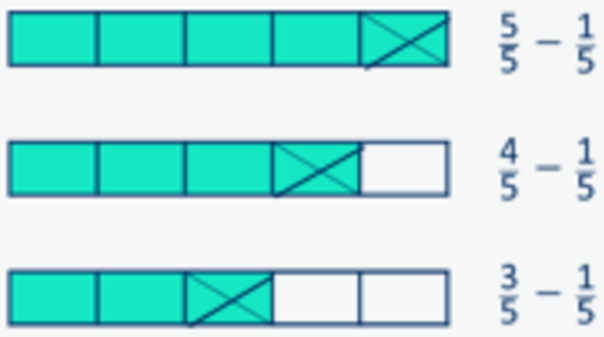
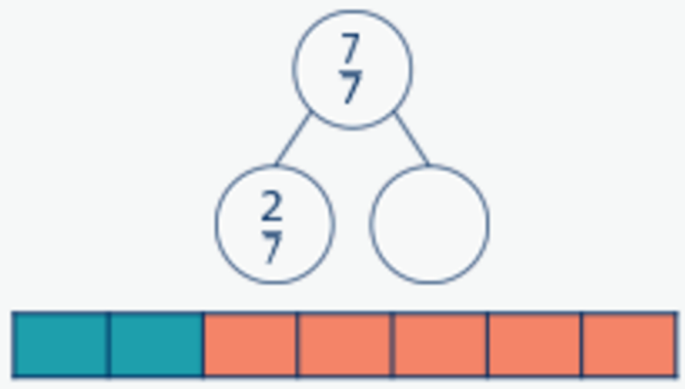
Progression of skills	Key representations		
Subtract ones from any number (related facts) Make links to known facts.	I know that … minus … = … so … minus … = … 	… less than … is … so … less than … is … 	What do you notice? Can you continue the pattern? 8 − 3 = 5 18 − 3 = 15 28 − 3 = 25…
Subtract across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

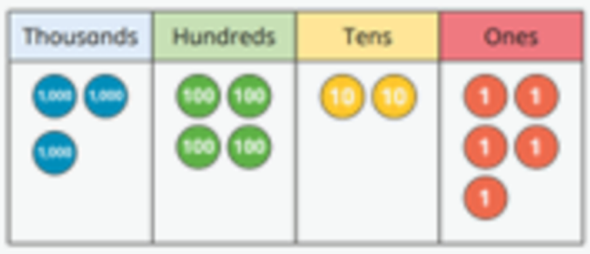
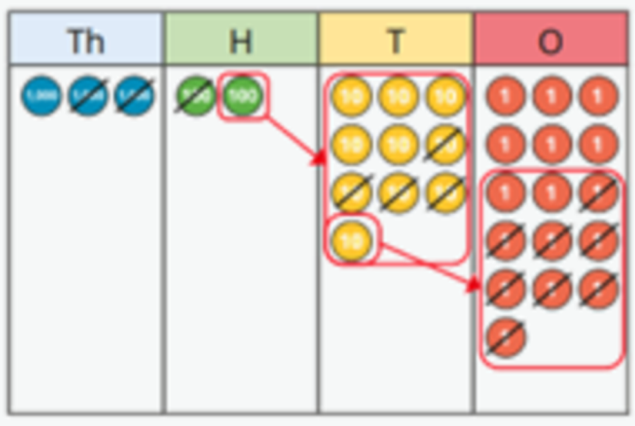
Progression of skills	Key representations		
Subtract multiples of 10 Make links to known facts within ten.	… ones − … ones = … ones so … tens − … tens = … tens  5 − 2 = 3 50 − 20 = 30	What is the same? What is different?  	
Subtract 10s from any number Make links to known facts.	… tens − … tens = … tens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

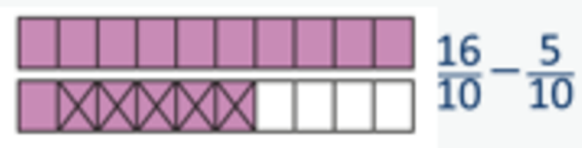
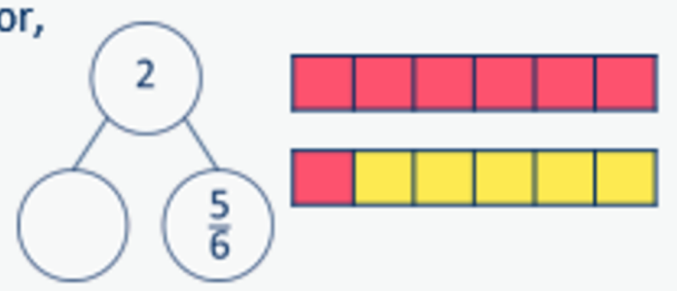
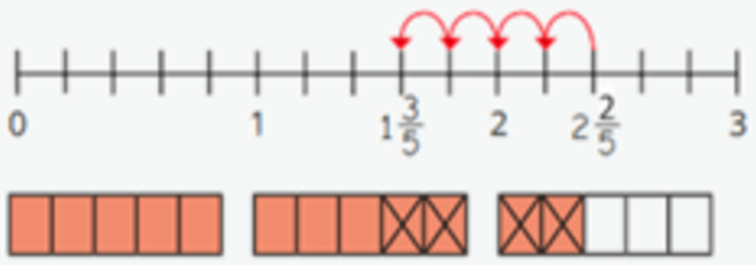
Progression of skills	Key representations		
Subtract two 2-digit numbers (not across a ten)	… ones − … ones = … ones … tens − … tens = … tens   3 ones − 1 one = 2 ones 4 tens − 2 tens = 2 tens 2 tens and 2 ones = 22		
Subtract two 2-digit numbers (across a ten) Begin to exchange 1 ten for 10 ones.	I 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 

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    

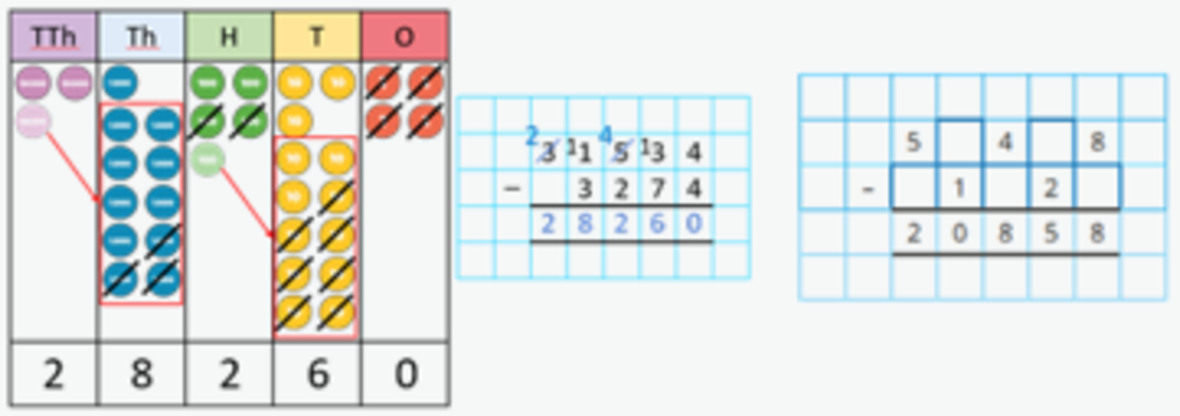
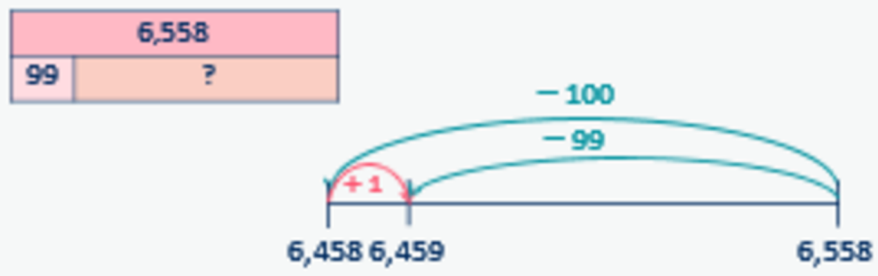
Progression of skills	**Key representations**
Subtract two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit subtract 2-digit numbers.	I need to subtract … ones. I do/do not need to make an exchange. I need to subtract … tens. I do/do not need to make an exchange. 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

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  $\frac{5}{5} - \frac{1}{5}$ $\frac{4}{5} - \frac{1}{5}$ $\frac{3}{5} - \frac{1}{5}$ 

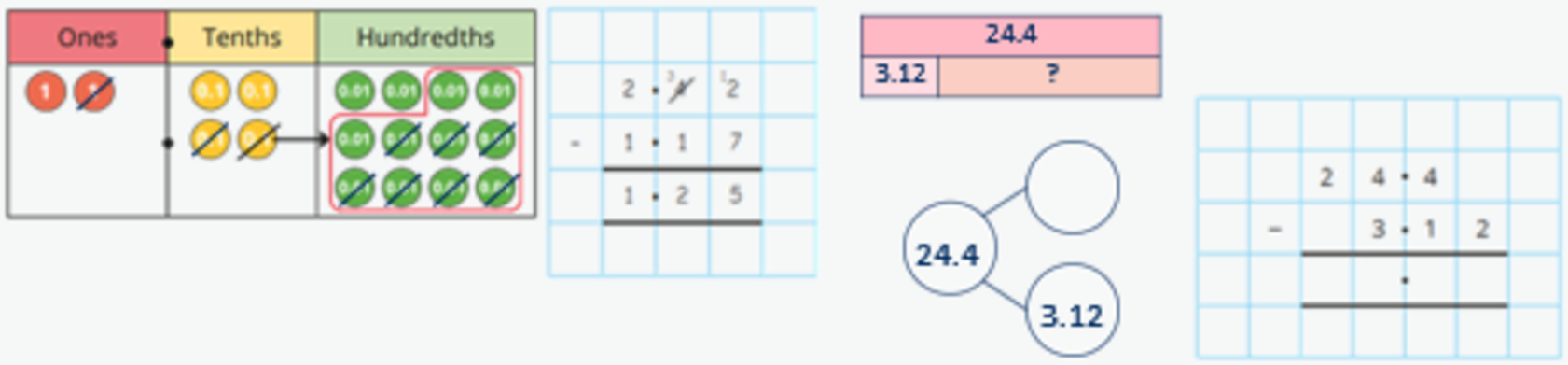
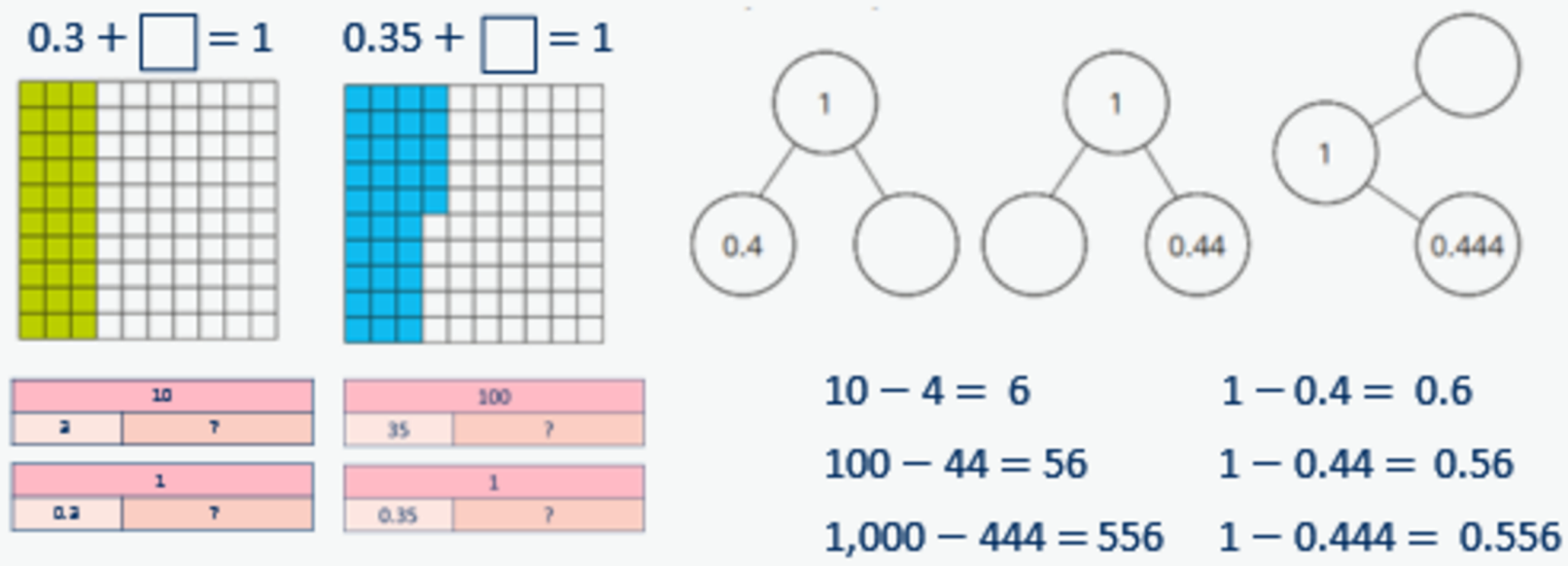
Year 4	▪ Subtract numbers with up to 4 digits using a formal written method. ▪ Solve simple measure and money problems involving fractions and decimals to 2 decimal places. ▪ Subtract fractions with the same denominator.
Progression of skills	**Key representations**
Subtract 1s, 10s, 100s and 1,000s 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 − ☐ = 4,430 4,433 − ☐ = 4,033 4,433 − ☐ = 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…  

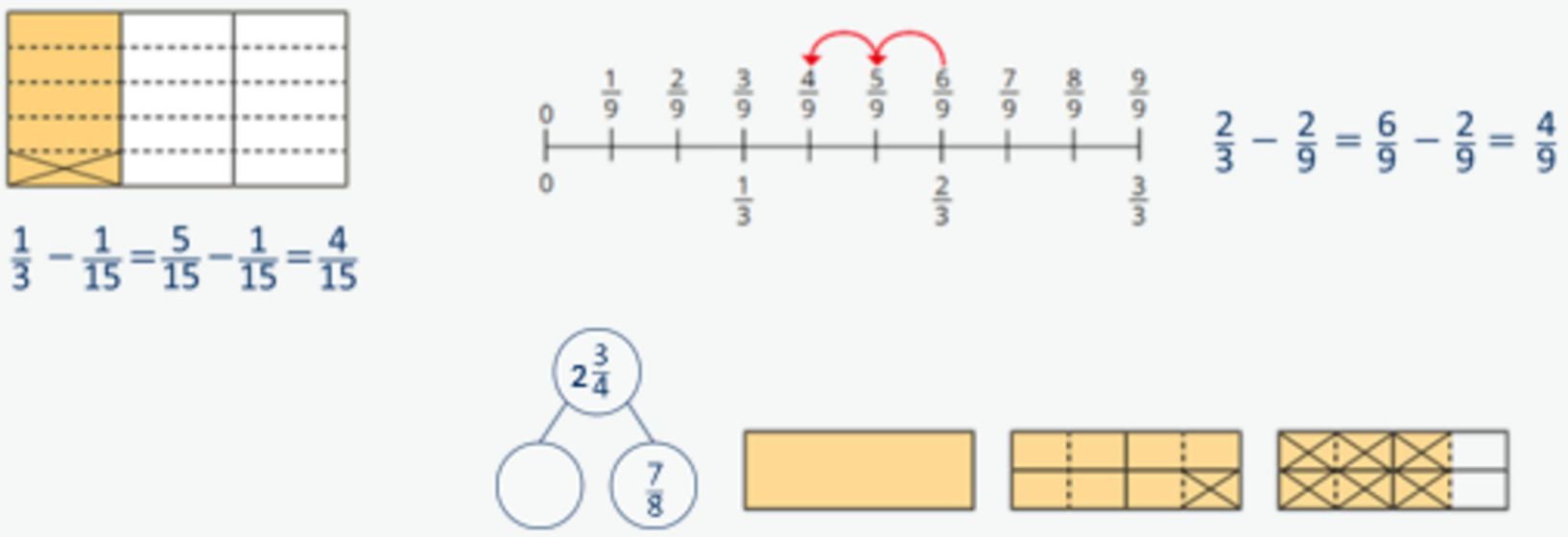
Progression of skills	Key representations	
Subtract decimal numbers in the context of money Emphasis here is on partitioning and use of number lines rather than formal written calculations.	I can partition £... into £... and 100p £... − £... = £... 100p − ...p = ...p **£5 − £3.26** £4 − £3 = £1 100p − 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 	 

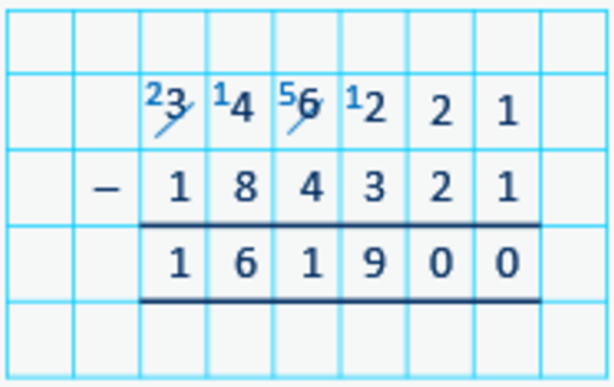
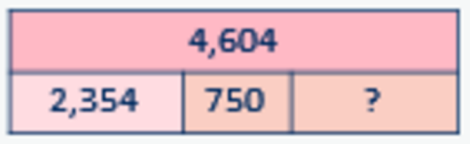
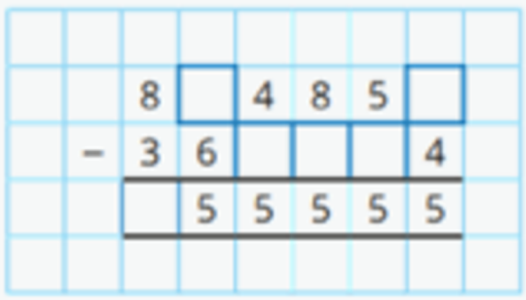
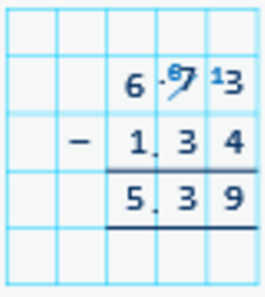
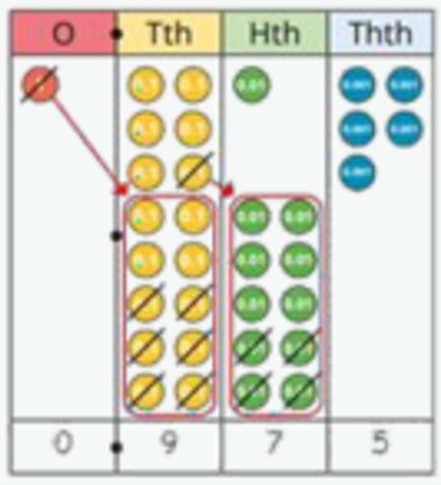
Year 5	Key representations
	▪ Subtract whole numbers with more than 4 digits. ▪ Subtract numbers mentally with increasingly large numbers. ▪ Subtract decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 ▪ Subtract fractions with the same denominator, and denominators that are multiples of the same number.

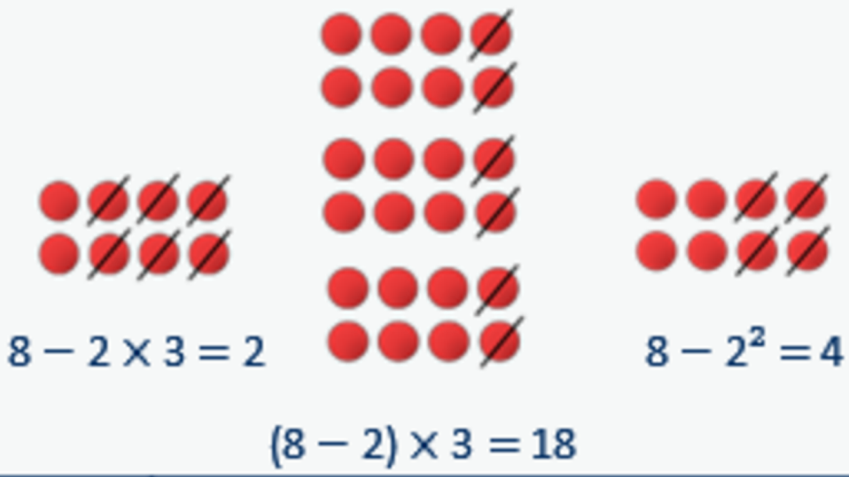
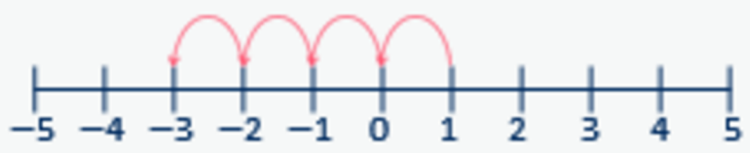
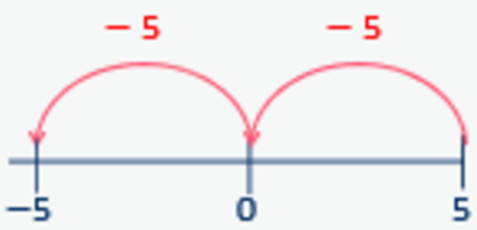
Progression of skills	Key representations
Subtract whole numbers with more than 4 digits Encourage children to estimate and use inverse operations to check answers to calculations.	I can exchange 1 ... for 10 ... 
Subtract using mental strategies Subtract 1s, 10s, 100s etc from any number. Use number bonds and related facts.	 48,650 − 300 = 48,650 − 30,000 = 48,650 − 30 =
	To subtract ..., I can subtract ... then add ... 

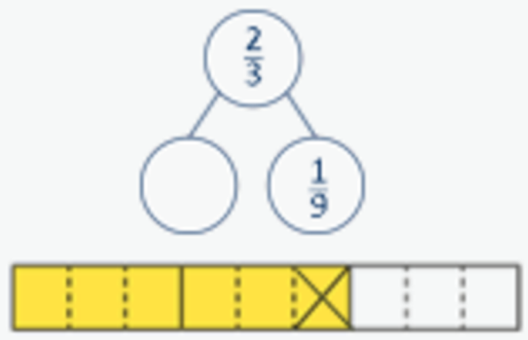
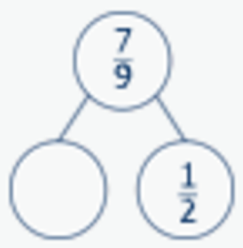
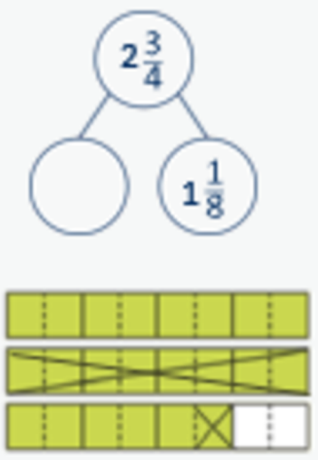
Subtraction

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	

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. 

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 ...   

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 ...  
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

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 …  $2\frac{3}{4} - 1\frac{1}{8} = 1\frac{5}{8}$

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

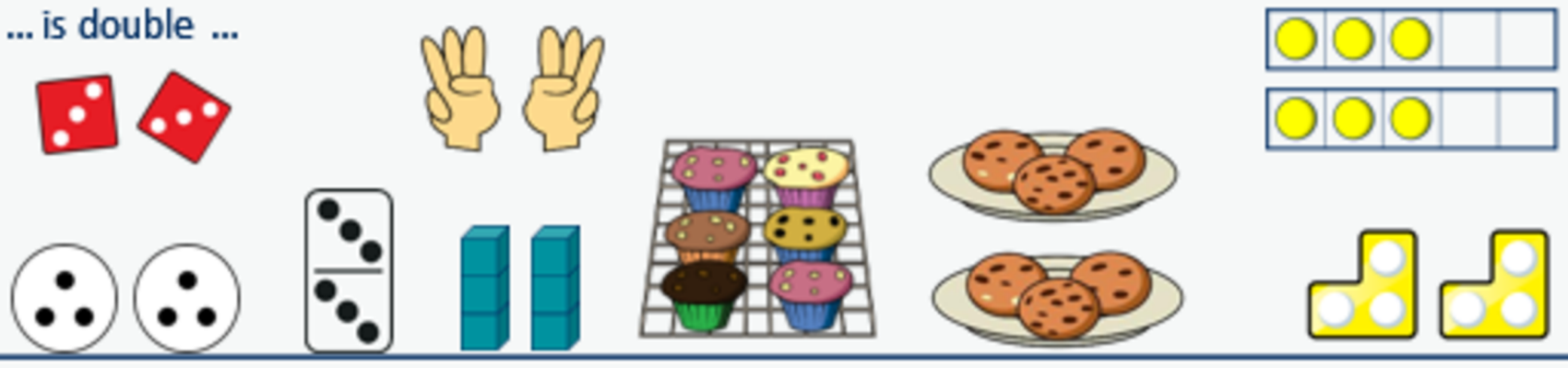
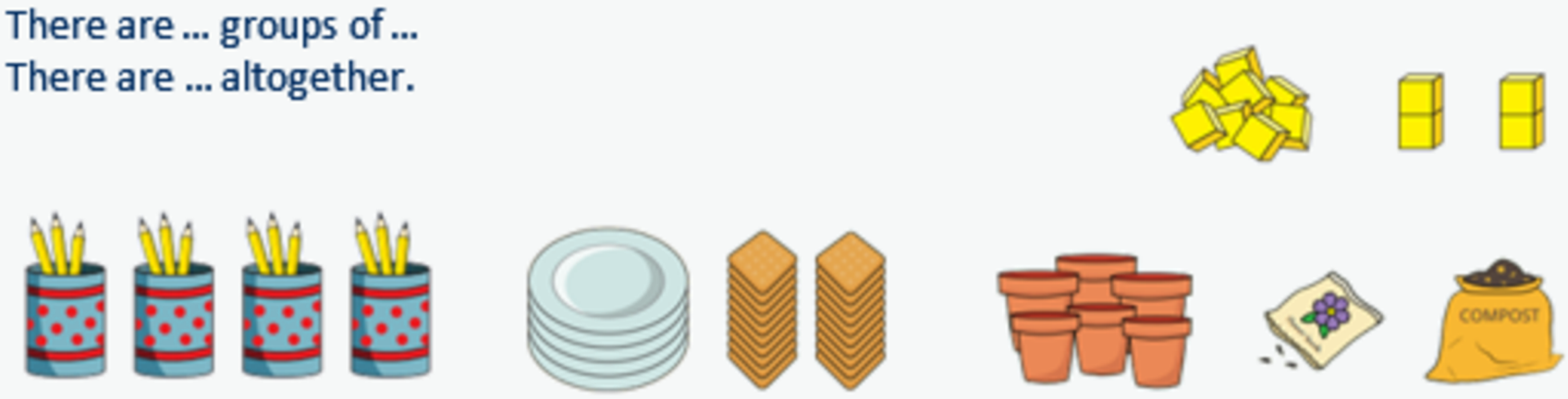
Year group	Skill
Year 2	• Link repeated addition and multiplication • Use arrays • Double • The 2 times-table • The 10 times-table • The 5 times-table • Missing numbers
Year 3	• The 3 times-table • The 4 times-table • The 8 times-table • Related facts • Multiply a 2-digit number by a 1-digit number -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

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

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

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

Multiplication

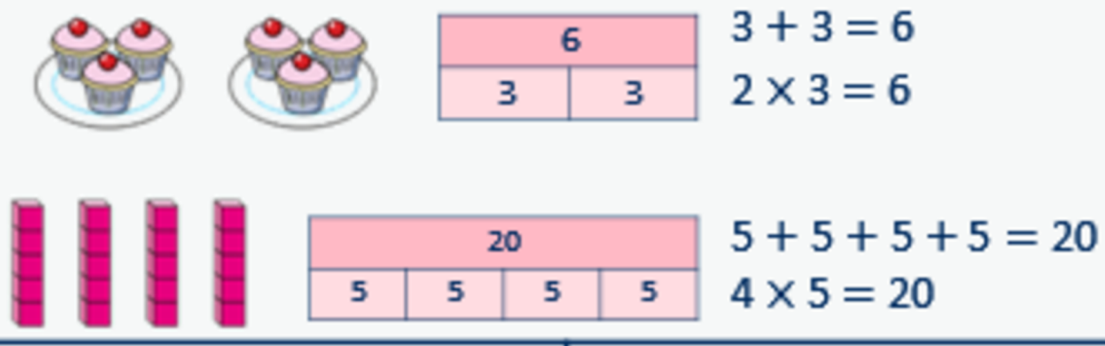
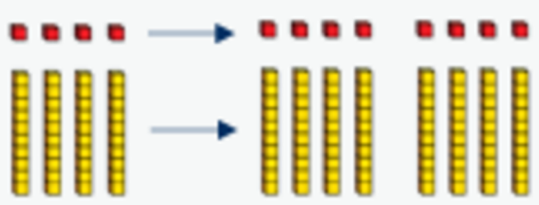
Reception	▪ Have a deep understanding of number to 10, including the composition of each number. ▪ Subitise (recognise quantities without counting) up to 5 ▪ Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts. ▪ 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. 

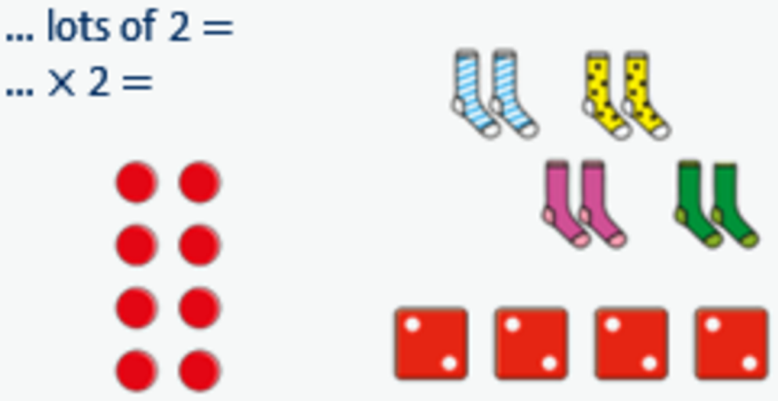
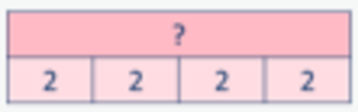
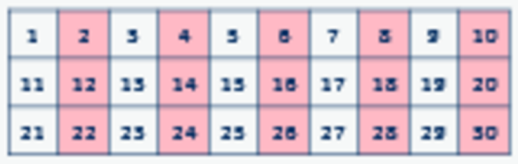
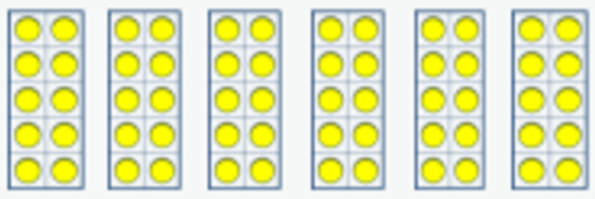
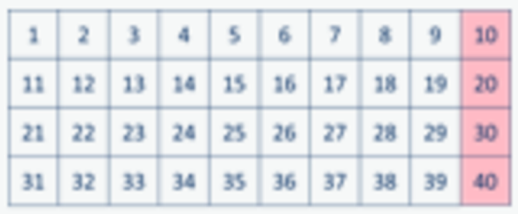
Year 1	▪ Count in multiples of twos, fives and tens. ▪ Solve one-step problems involving multiplication, using concrete objects, pictorial representations and arrays with the support of the teacher.	
Progression of skills	**Key representations**	
Count in 2s, 5s and 10s Begin by counting objects that 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? 
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. 	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.

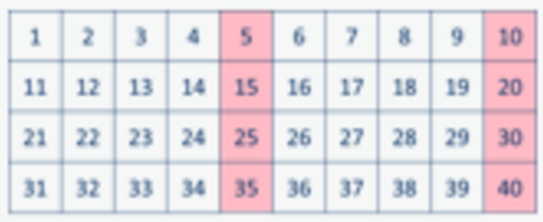
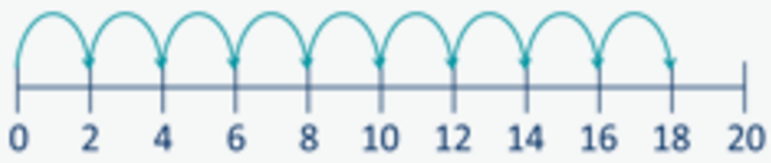
Complete the number track/number line by counting in …s.



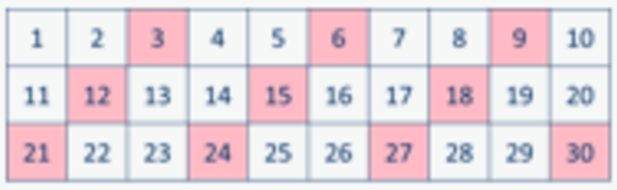
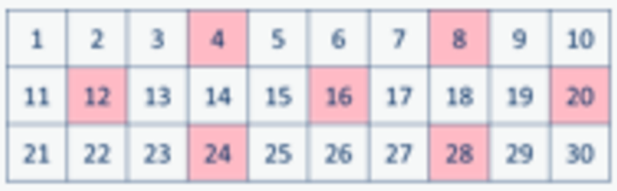
Progression of skills	Key representations
Make arrays Children use their knowledge of adding equal groups to arrange objects in columns and rows.	There are ... rows of ... There are ... altogether. There are ... columns of ... There are ... altogether. 
Make doubles Children understand that doubles are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

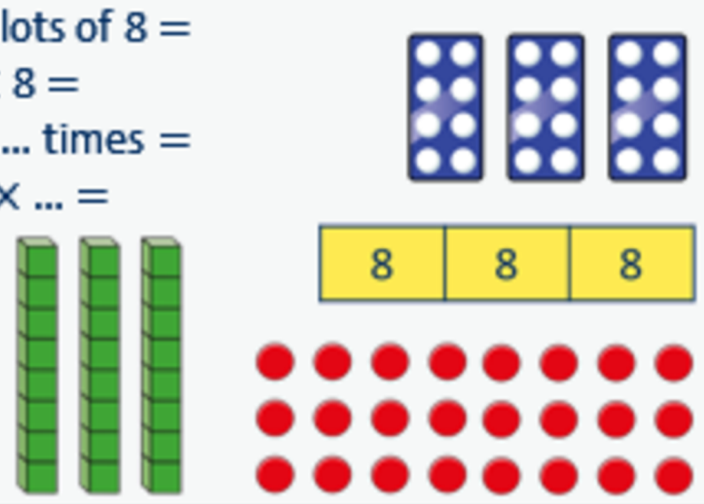
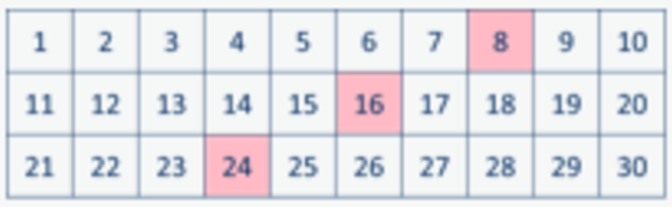
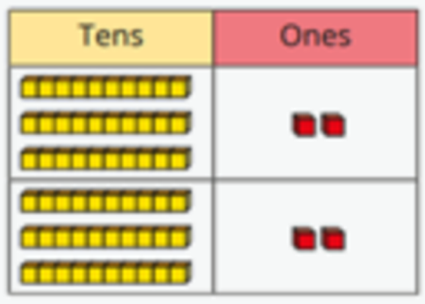
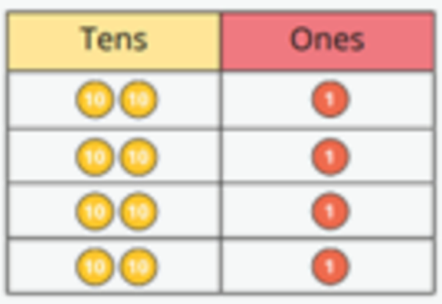
Year 2	▪ Recall and use multiplication facts for the 2, 5 and 10 multiplication tables. ▪ Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs. ▪ Show that multiplication of two numbers can be done in any 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.  3 + 3 = 6 2 × 3 = 6 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

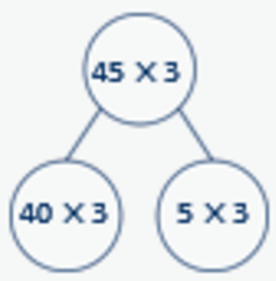
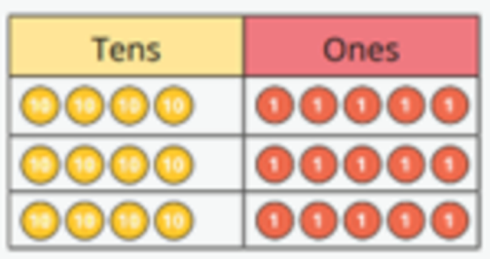
Progression of skills	Key representations	
The 2 times-table Encourage daily counting in multiples both forwards and back. Notice that all multiples of 2 are even numbers.	... lots of 2 = ... × 2 =    ? | 2 | 2 | 2 | 2	... times 2 is equal to ...  1 × 2 = 2 2 = 1 × 2 2 × 2 = 4 4 = 2 × 2 3 × 2 = 6 6 = 3 × 2  0 2 4 6 8 10 12 14 16 18 20 22 24
The 10 times-table Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.	... lots of 10 = ... × 10 =   ? | 10 | 10 | 10 | 10 | 10 | 10 	... times 10 is equal to ...  1 × 10 = 10 10 = 1 × 10 2 × 10 = 20 20 = 2 × 10 3 × 10 = 30 30 = 3 × 10  0 10 20 30 40 50 60 70 80 90 100 110 120

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 =    ? | 5 | 5 | 5 | 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  0 5 10 15 20 25 30 35 40 45 50 55 60
Missing numbers Make links to known facts.	... is equal to ... groups of ... 18 socks, how many pairs?   0 2 4 6 8 10 12 14 16 18 20	... times ... is equal to ... □ × 2 = 18 18 = 2 × □

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.

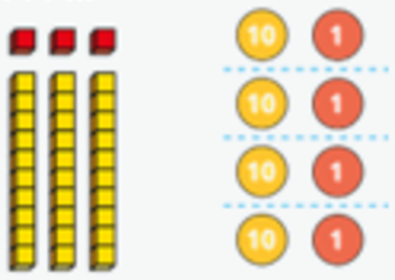
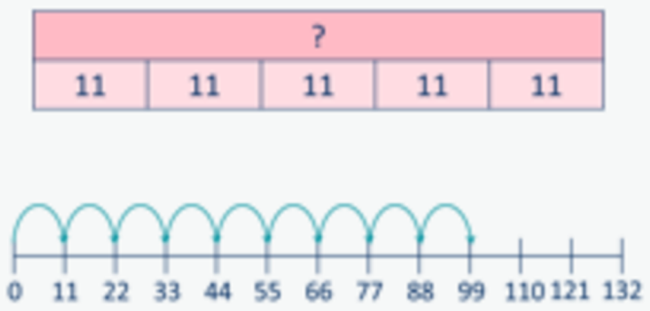
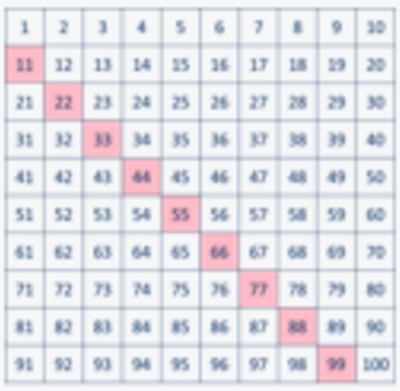
Progression of skills	Key representations	
The 3 times-table Encourage daily counting in multiples both forwards and back.	... groups of 3 = ... × 3 = 3, ... times = 3 × ... =  	... times 3 is equal to ...  4 × 3 = 12 12 = 4 × 3 
The 4 times-table Encourage daily counting in multiples both forwards and 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 ...  3 × 4 = 12 12 = 3 × 4 

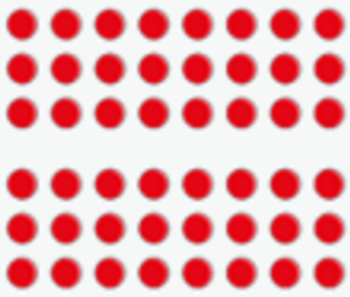
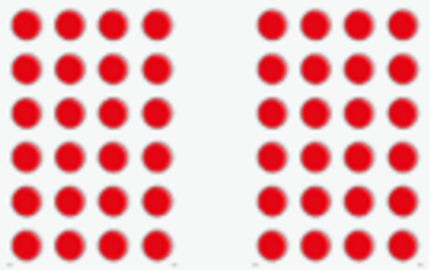
Progression of skills	Key representations	
The 8 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2, 4 and 8 times-tables.	... lots of 8 = × 8 = 8, ... times = 8 × ... = 	... times 8 is equal to ...  3 × 8 = 24 24 = 3 × 8 
Related 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  

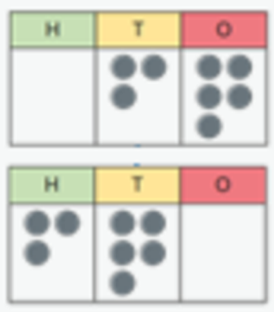
Progression of skills	Key representations
Multiply a 2-digit number by a 1-digit number - with exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method.	… tens multiplied by … is equal to … tens. … ones multiplied by … is equal to … ones.  $20 \times 4 = 80$ $4 \times 4 = 16$ $24 \times 4 = 96$  
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.

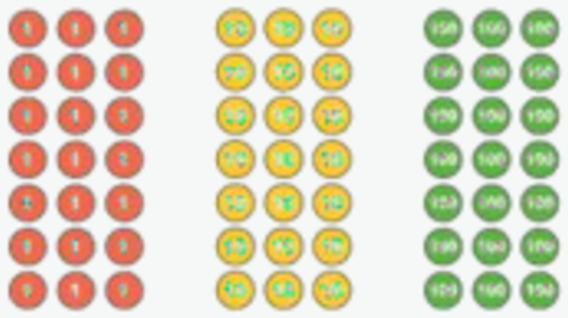
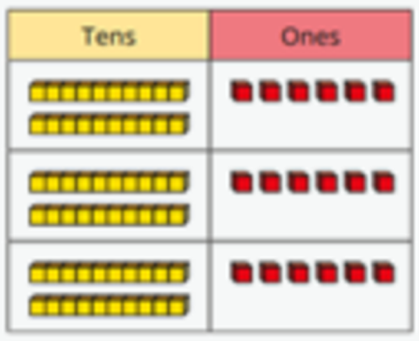
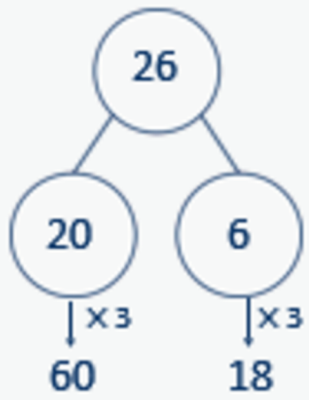
Progression of skills	Key representations
Correspondence problems (How many ways?) Encourage children to work systematically to find all the different possible combinations.	For every … , there are … possible … There are … × … possibilities altogether.   For every hat, there are two possible scarves.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

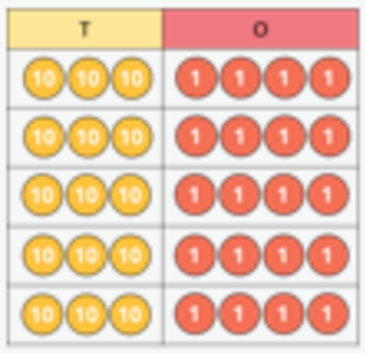
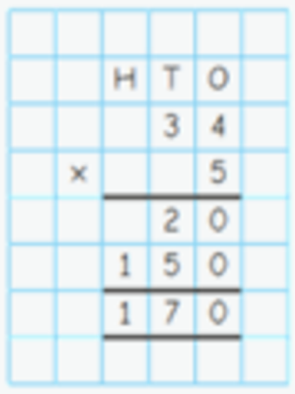
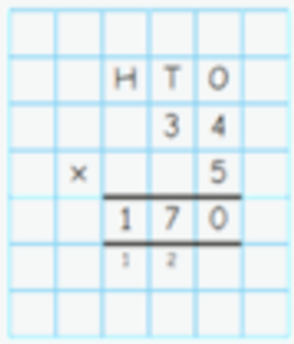
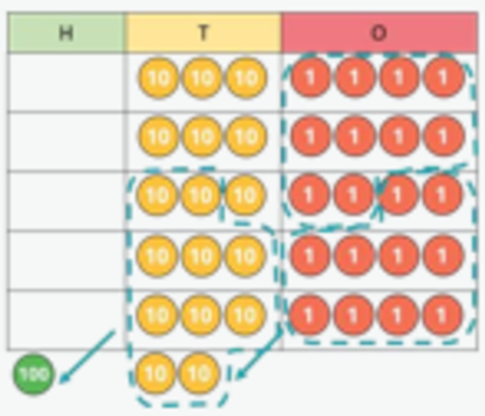
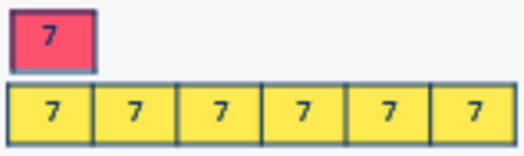
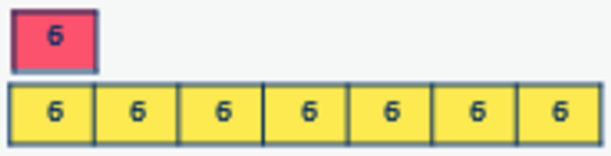
Year 4	▪ Recall multiplication facts for multiplication tables up to 12 × 12 ▪ Use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1; multiplying together three numbers. ▪ Recognise and use factor pairs and commutativity in mental calculations. ▪ Multiply two-digit 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

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 × 2 × 3 = 8 × 3 = 24 2 × 3 × 4 = 6 × 4 = 24 3 × 4 × 2 = 12 × 2 = 24
Factor pairs Children explore equivalent calculations using different factors pairs.	12 = … × …, so … × 12 = … × … × …  8 × 6 = 8 × 3 × 2 8 × 6 = 24 × 2  6 × 8 = 6 × 4 × 2 6 × 8 = 24 × 2

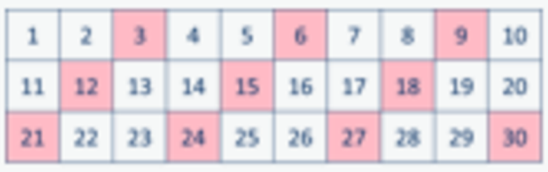
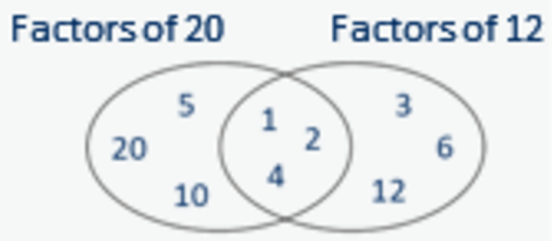
Multiply by 10 and 100 Some children may over-generalise that multiplying by 10 or 100 always results in adding zeros. This will cause issues later when multiplying decimals.	When I multiply by 10, the digits move … place value column to the left. … is 10 times the size of …  35 × 10 = 350	When I multiply by 100, the digits move … place value columns to the left. … is 100 times the size of …  14 × 100 = 1,400

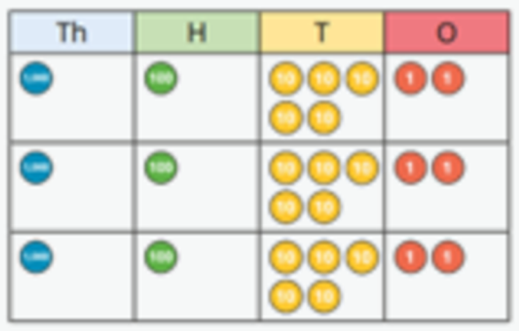
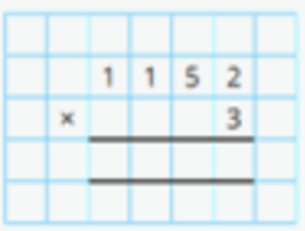
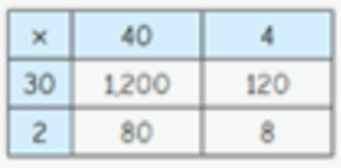
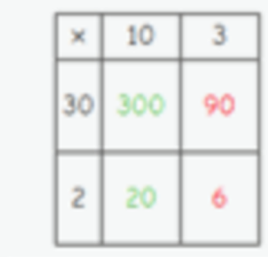
Progression of skills	Key representations
Related facts Use knowledge of multiplying by 10 and 100 to scale times-table facts.	… × … ones is equal to … ones so … × … tens is equal to … tens and … × … hundreds is equal to … hundreds.  3 × 7 = 21 3 × 70 = 210 3 × 700 = 2,100 7 × 3 = 21 7 × 30 = 210 7 × 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 × 26 = 60 + 18 = 78   26 × 8 = 80 + 80 + 48 = 208

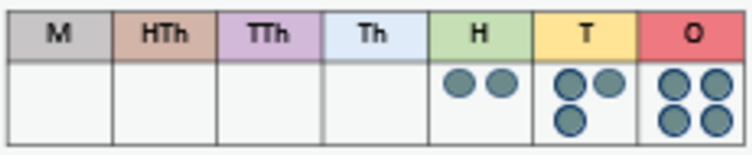
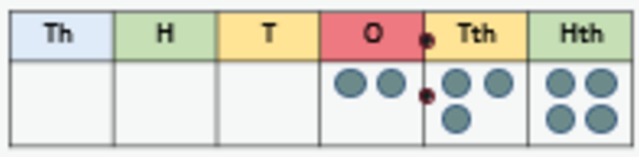
Progression of skills	Key representations
Multiply a 2 or 3-digit number by a 1-digit number The short multiplication method is introduced for the first time, initially in an expanded form.	To multiply a 2-digit number by … , I multiply the ones by … and the tens by … To multiply a 3-digit number by … , I multiply the ones by … , the tens by … and the hundreds by …   (4 × 5) (30 × 5)  
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

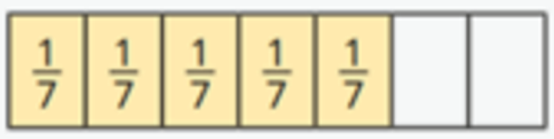
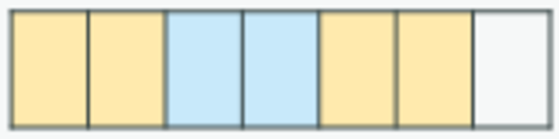
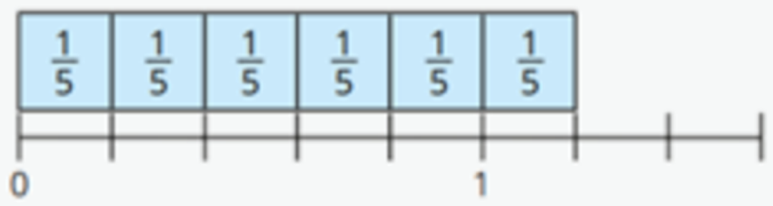
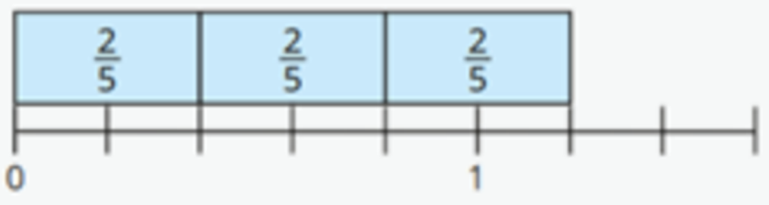
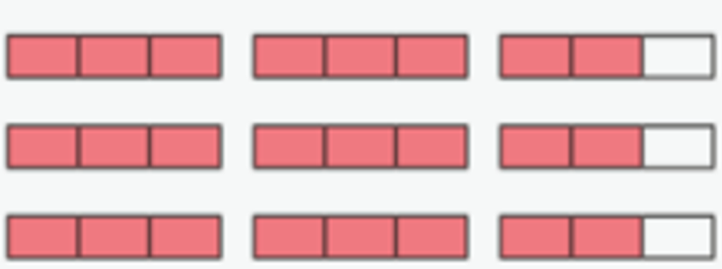
	Deep pan	Italian	Thin
Cheese	C DP	C I	C Th
Mushroom	M DP	M I	M Th
Vegetable	V DP	V I	V Th
Chicken	C DP	C I	C Th
Tuna	T DP	T I	T Th

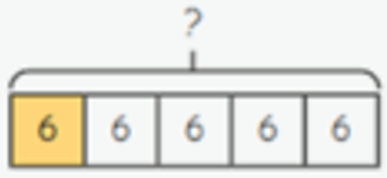
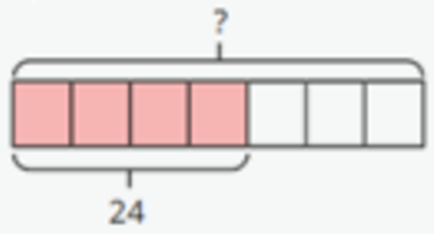
Year 5	▪ Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers ▪ Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³) ▪ Multiply numbers up to 4 digits by a one- or two-digit number using a formal 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.

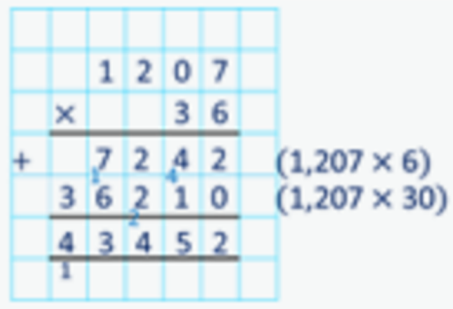
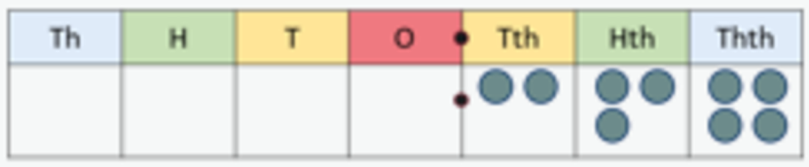
Progression of skills	**Key representations**		
Multiples and factors Encourage children to notice patterns and make links with known facts.	… is a multiple of … because … × … = …  	… is a factor of … because … × … = …  1 × 8  2 × 4 1, 2, 4 and 8 are factors of 8	The common factors of … and … are … 
Square and cube numbers	… squared means … × … 	… cubed means … × … × … 	

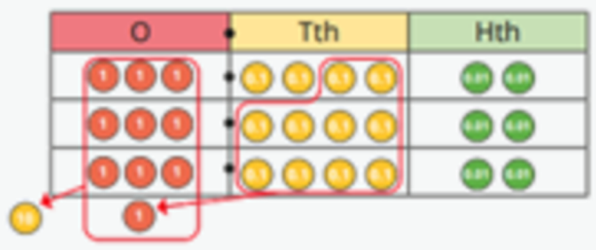
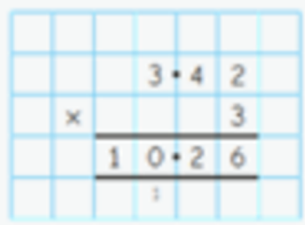
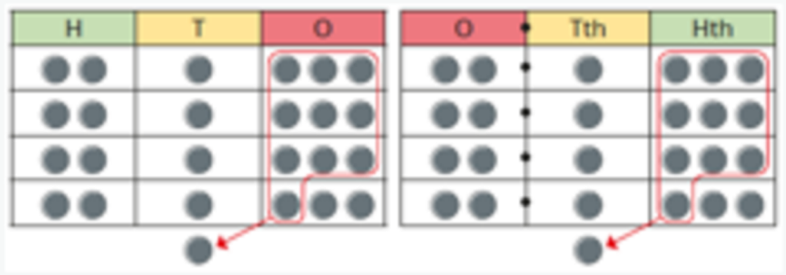
Progression of skills	**Key representations**
Multiply numbers up to 4 digits by a 1-digit number This builds on the short multiplication method introduced in Y4	To multiply a 4-digit number by … , I multiply the ones by … , the tens by … , the hundreds by … and the thousands by …  
Multiply numbers 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 …   32 × 44 = 1,200 + 80 + 120 + 8 32 × 44 = 1,408
	First, I multiply by the … Then I multiply by the …  300 + 90 + 20 + 6 = 416  (32 × 3) (32 × 10)

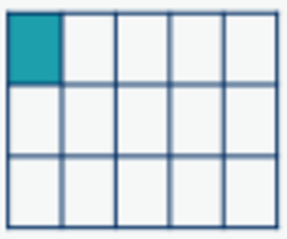
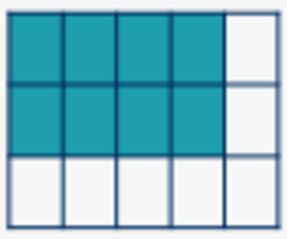
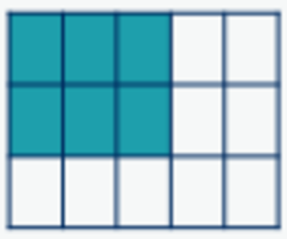
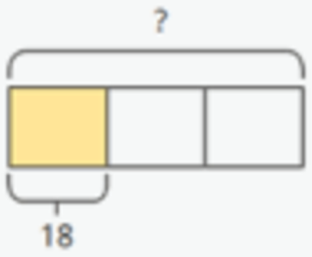
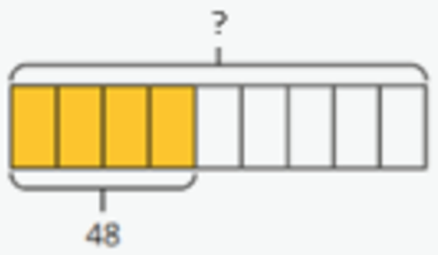
Progression of skills	Key representations
Multiply by 10, 100 and 1,000 Some children may over-generalise that multiplying by a power of 10 always results in adding zeros. This will cause issues later when multiplying decimals.	To multiply by 10/100/1,000, I move all the digits ... places to the left. ... is 10/100/1,000 times the size of ...  $234 \times 10 = 2{,}340$ $234 \times 100 = 23{,}400$ $234 \times 1{,}000 = 234{,}000$  $2.34 \times 10 = 23.4$ $2.34 \times 100 = 234$ $2.34 \times 1{,}000 = 2{,}340$
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

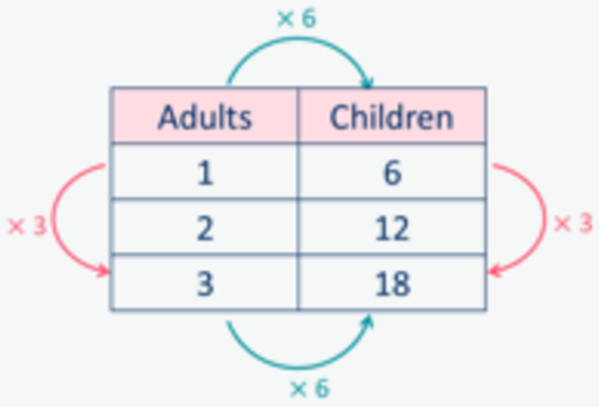
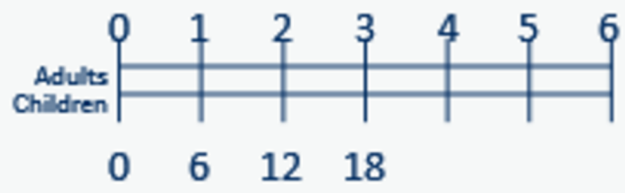
Progression of skills	Key representations
Multiply fractions by a whole number Make links with repeated addition. E.g. $\frac{1}{5} \times 4 = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$	To multiply a fraction by an integer, I multiply the numerator by the integer and the denominator remains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

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 × 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 ÷ 4 = 6 7 × 6 = 42 $\frac{4}{7}$ of 42 = 24

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. 
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

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 ...    $213 \times 4 = 852$ $2.13 \times 4 = 8.52$

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

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 … 100% 50% 50% 25% 25% 25% 25% 50% of … = …÷ 2 25% of … = …÷ 4	… % is made up of … %, and … % 100% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10% 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. adults children The ratio of adults to children is 1 : 6	 

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

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

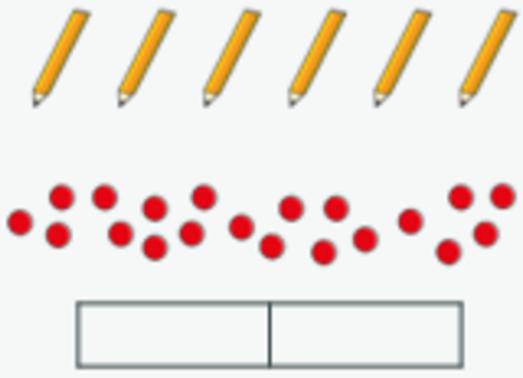
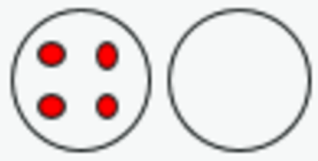
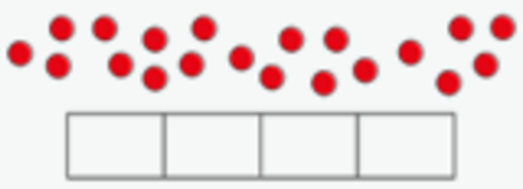
Year group	Skill
Year 4	• Division facts to 12 × 12 • Divide a number by 1 and itself • Related facts • Divide a 2 or 3-digit number by a 1-digit number • Divide by 10 and 100
Year 5	• Mental strategies • Divide numbers up to 4 digits by a 1-digit number • Divide by 10, 100 and 1,000 • Fraction of an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

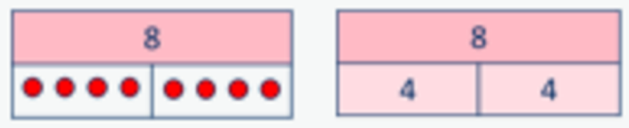
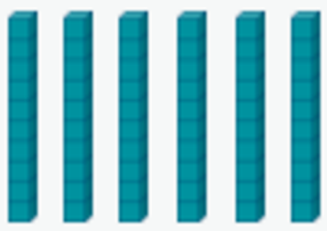
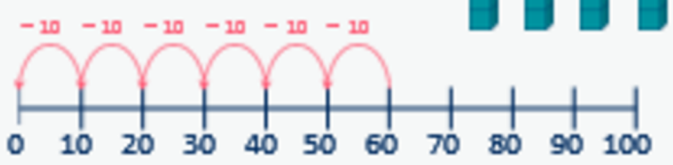
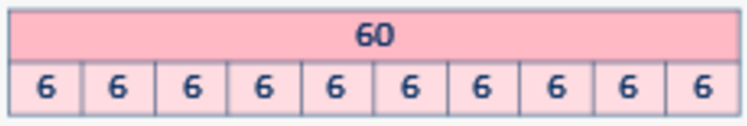
Year group	Skill
Year 6	• Short division • Mental strategies • Long division • Order of operations • Divide by 10, 100 and 1,000 • Divide decimals by integers • Decimal and fraction equivalents • Divide a fraction by an integer • Fraction of an amount • Calculate percentages • Calculations involving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

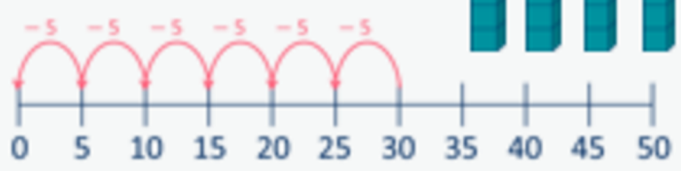
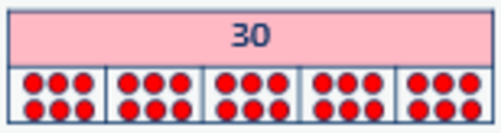
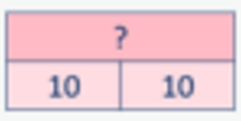
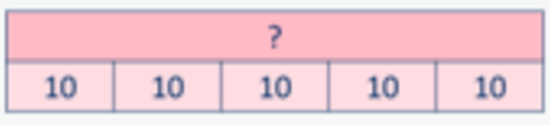
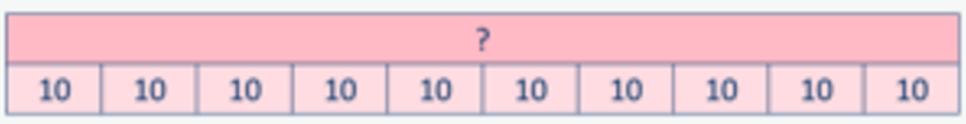
Division

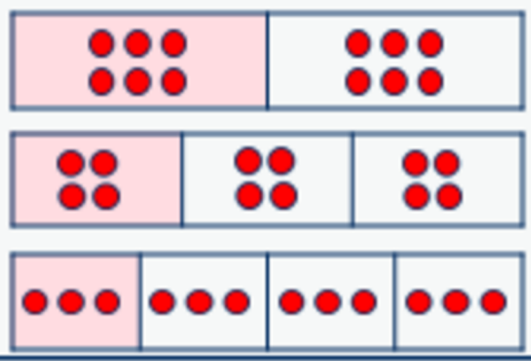
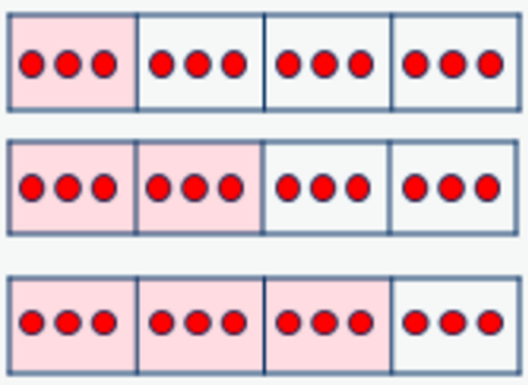
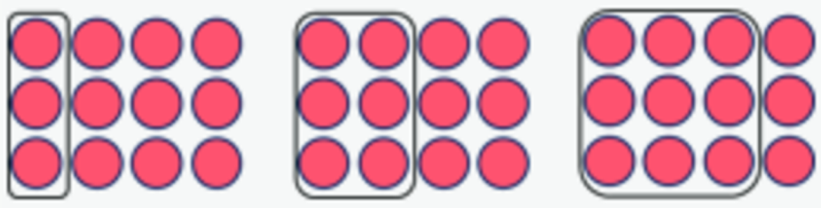
Reception	▪ Have a deep understanding of number to 10, including the composition of each number. ▪ Subitise (recognise quantities without counting) up to 5 ▪ Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts. ▪ 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. 

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 ...	

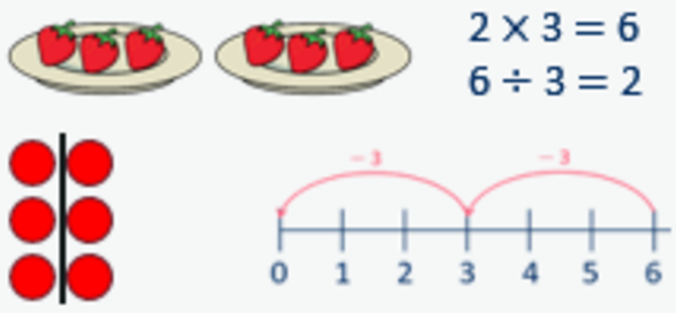
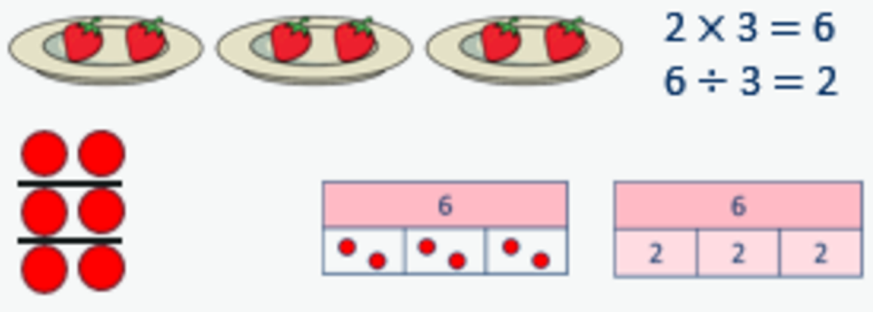
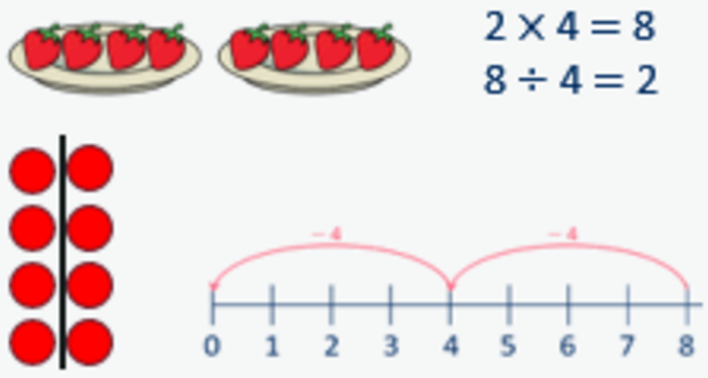
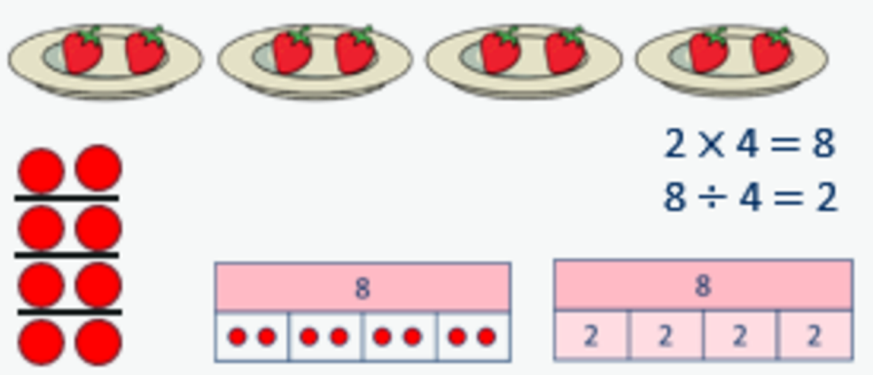
Progression of skills	Key representations		
Find a half Start with practical opportunities to share a quantity into 2 groups. Progress to circling half of the objects in a picture and then to finding the whole from a given half.	To find half, I need to share into 2 equal groups.  There are ... in each 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 ...

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 = …  4 × 2 = 8 8 ÷ 2 = 4   	… shared equally between 2 is … Half of … is … … ÷ 2 = …  4 × 2 = 8 8 ÷ 2 = 4  
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  

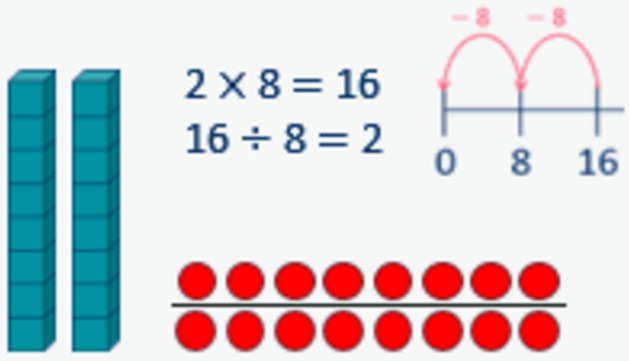
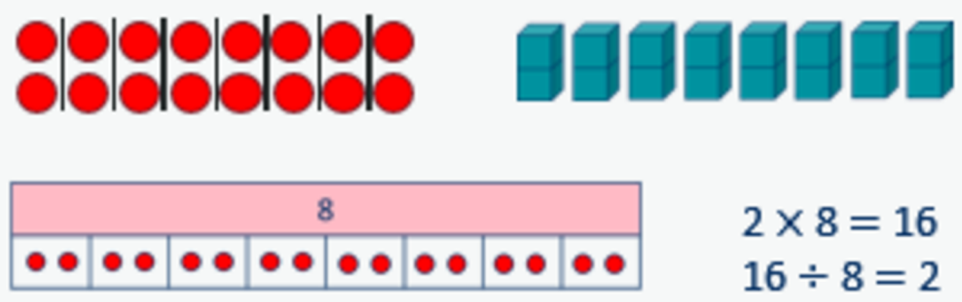
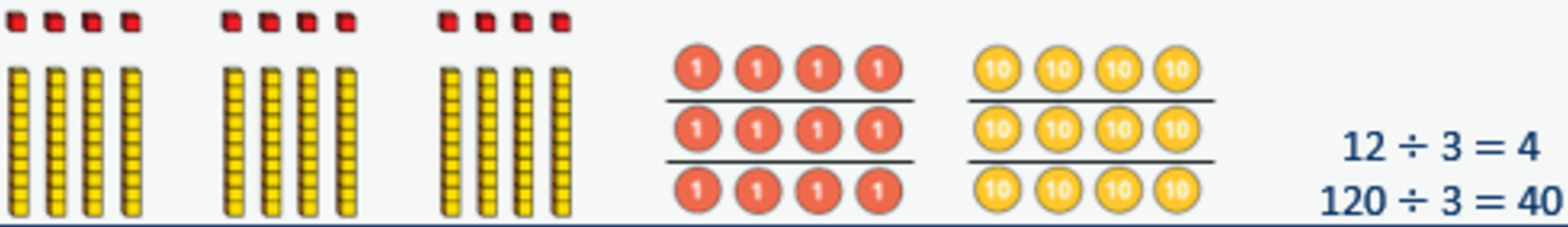
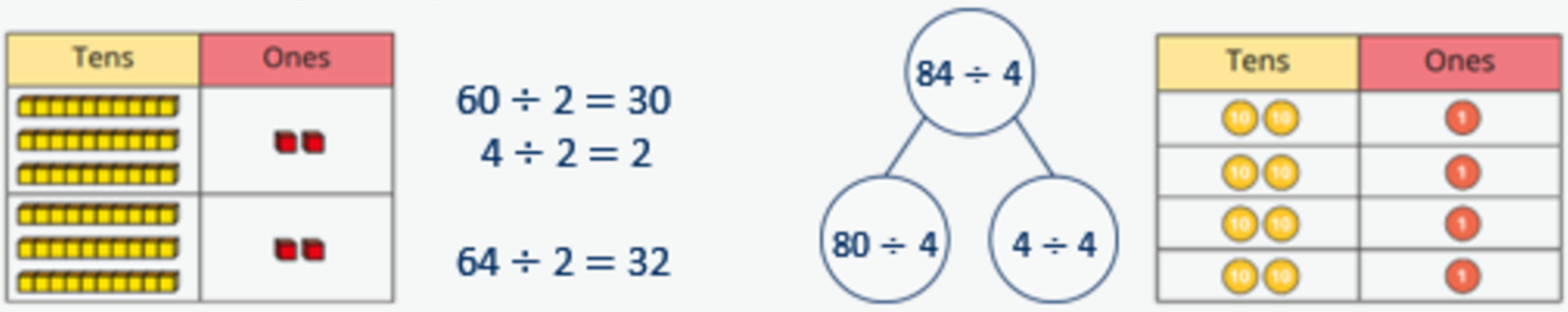
Progression of skills	Key representations	
Divide by 5 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … equal groups of 5 … ÷ 5 = …  6 × 5 = 30 30 ÷ 5 = 6   	… shared equally between 5 is … … ÷ 5 = …  6 × 5 = 30 30 ÷ 5 = 6  
Missing numbers Bar models are useful to show the link between multiplication and division.	… divided by 2/5/10 is equal to …  □ ÷ 2 = 10  □ ÷ 5 = 10  □ ÷ 10 = 10	

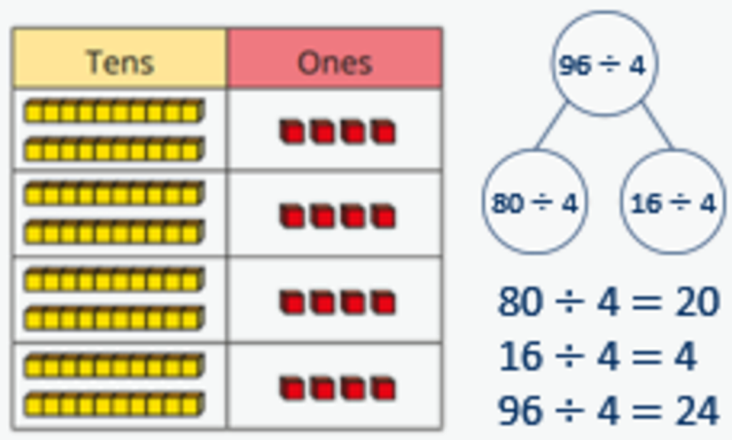
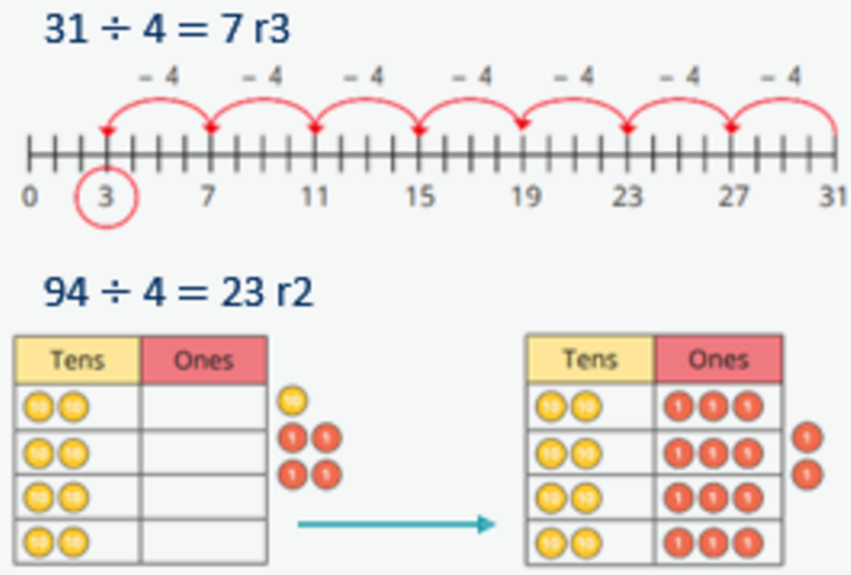
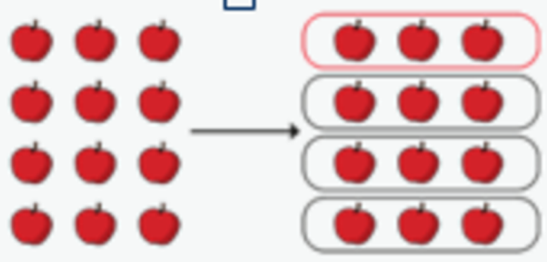
Progression of skills	Key representations	
Unit fractions In Y2 the focus is on finding $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$ Bar models are useful to show the link between division and finding a fraction.	The objects have been shared fairly into … groups. $\frac{1}{\square}$ of … is … 	There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

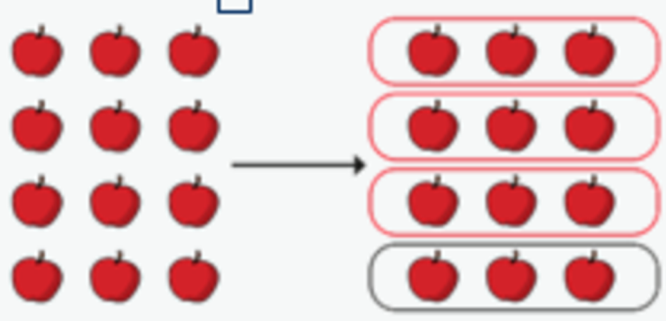
Year 3	
	▪ Recall and use division facts for the 3, 4 and 8 multiplication tables. ▪ Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. ▪ Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.

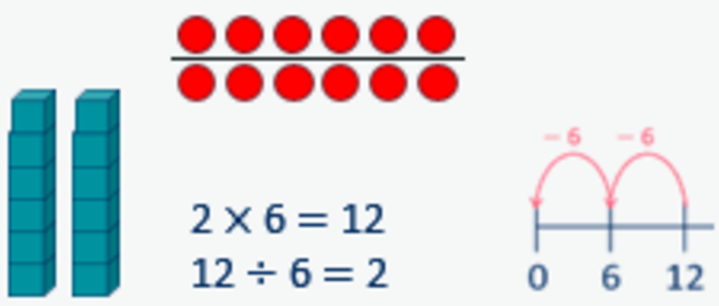
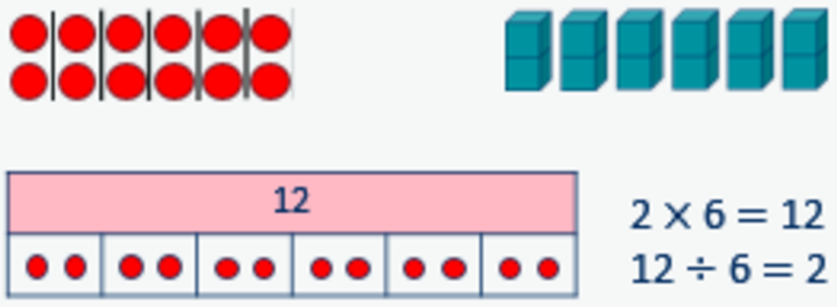
Progression of skills	Key representations	
Divide by 3 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are … groups of 3 in … … ÷ 3 = 	… has been shared equally into 3 equal groups. … ÷ 3 = 
Divide by 4 Encourage children to 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 = 

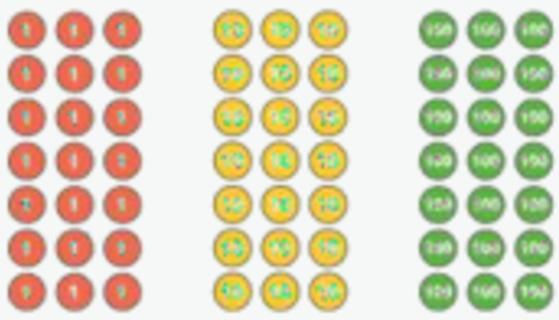
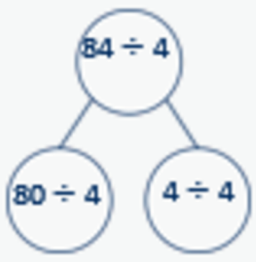
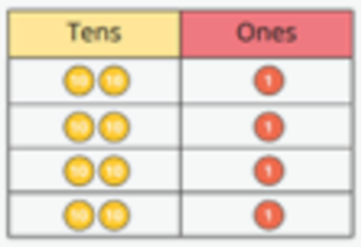
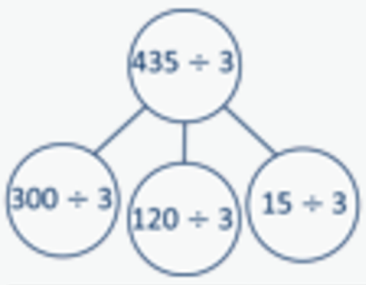
Division

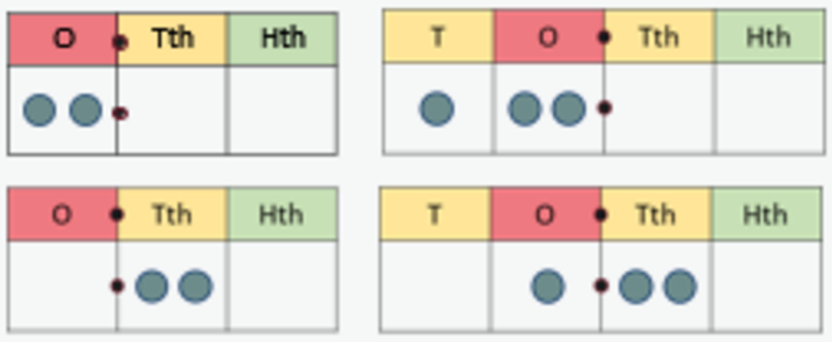
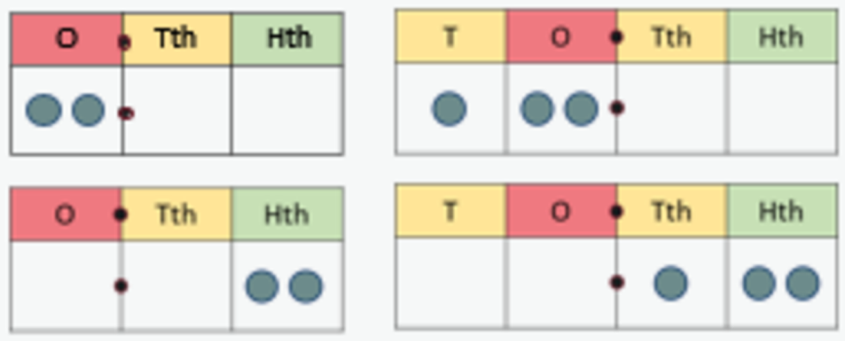
Progression of skills	Key representations	
Divide by 8 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are ... groups of 8 in ... ... ÷ 8 = 	... has been shared equally into 8 equal groups. ... ÷ 8 = 
Related facts Link to known times-table facts.	... ÷ ... is equal to ..., so ... tens ÷ ... is equal to ... tens. 	
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. 	

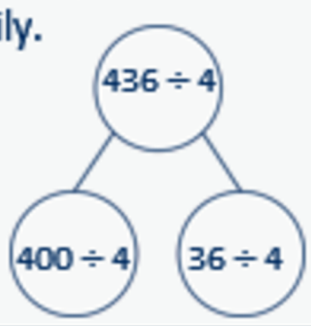
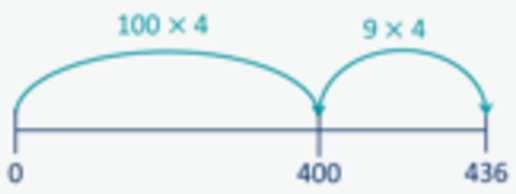
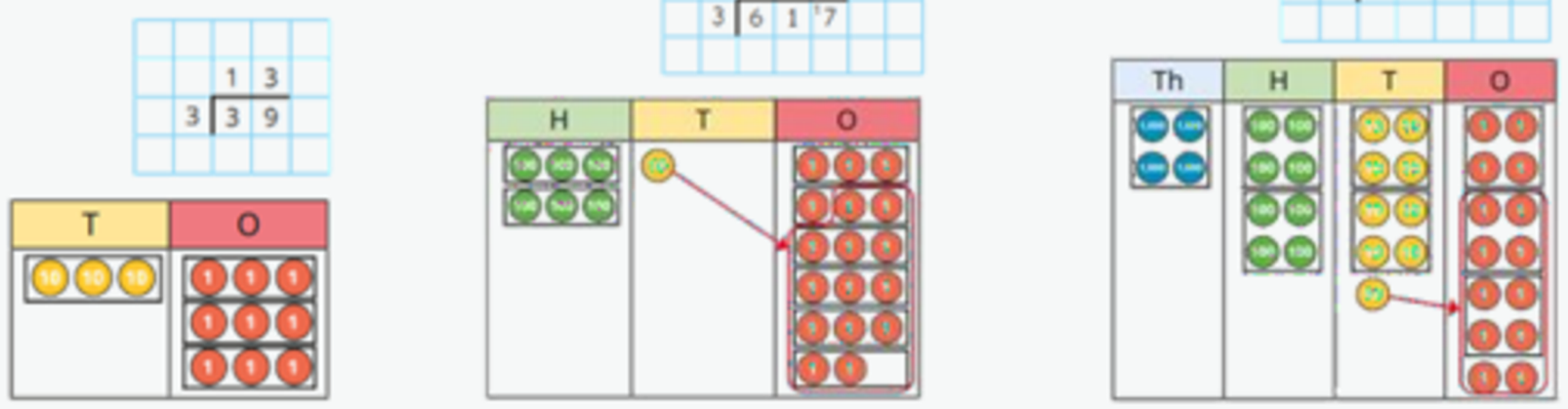
Progression of skills	Key representations	
Divide a 2-digit number by a 1-digit number - with remainders Encourage children to partition numbers flexibly to help them to divide more efficiently.	... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones. 	There are ... groups of ... There are ... remaining. 
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 

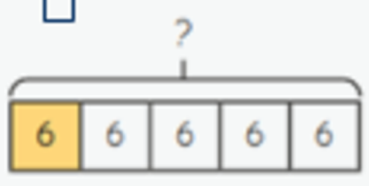
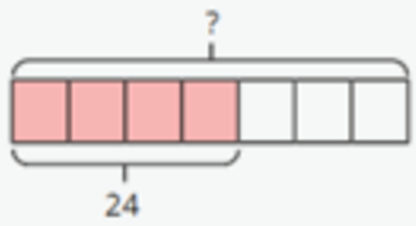
Progression of skills	Key representations	
Non-unit fractions of a set of objects Bar models are a useful representation and show the links with division and multiplication.	The whole is divided into … equal parts. Each part is $\frac{1}{\square}$ of the whole.  $\frac{3}{4}$ of 12 apples is 9 apples.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

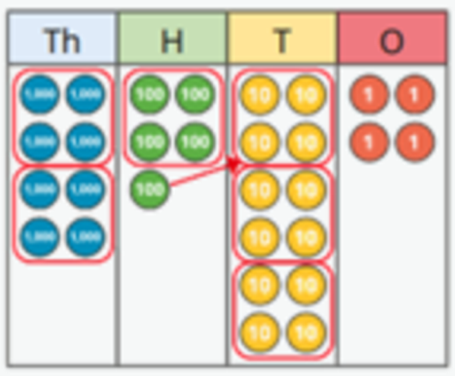
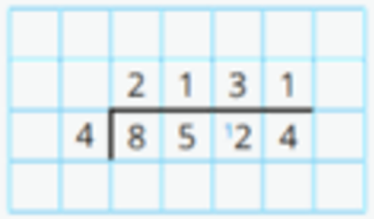
Year 4	▪ Recall division facts for multiplication tables up to 12 × 12 ▪ Use place value, known and derived facts to divide mentally, including: dividing by 1 ▪ Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and 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 … … ÷ … =  2 × 6 = 12 12 ÷ 6 = 2	… has been shared equally into … equal groups. … ÷ … =  2 × 6 = 12 12 ÷ 6 = 2
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 

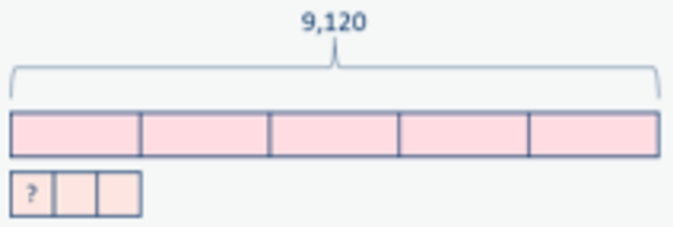
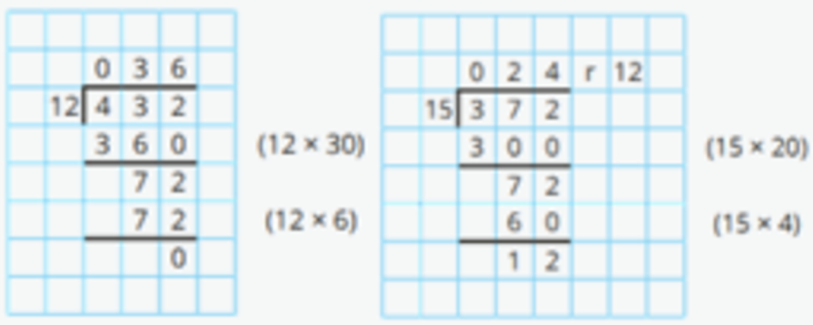
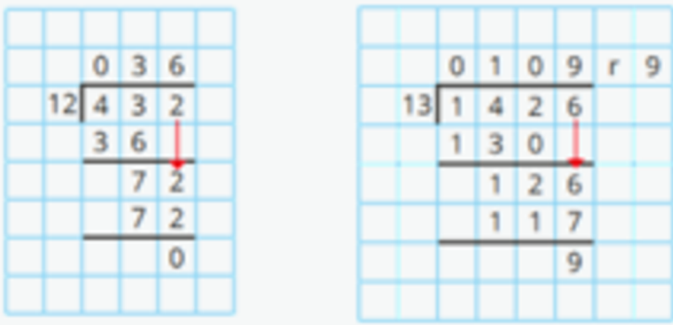
Progression of skills	Key representations	
Related facts Link to known times-table facts.	… ÷ … is equal to … so … tens ÷ … is equal to … tens and … hundreds ÷ … is equal to … hundreds.  21 ÷ 7 = 3 210 ÷ 7 = 30 2,100 ÷ 7 = 300 21 ÷ 3 = 7 210 ÷ 3 = 70 2,100 ÷ 3 = 700	
Divide a 2 or 3-digit number by a 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 ÷ 4 = 20 4 ÷ 4 = 1 84 ÷ 4 = 21  	I cannot share the hundreds/tens equally, so I need to exchange 1 … for 10 …  300 ÷ 3 = 100 120 ÷ 3 = 40 15 ÷ 3 = 5 435 ÷ 3 = 145 

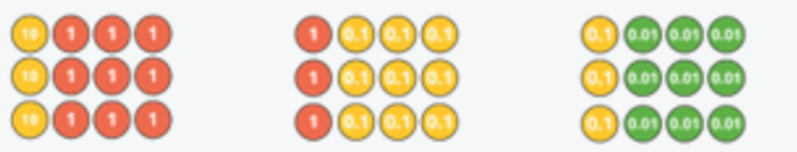
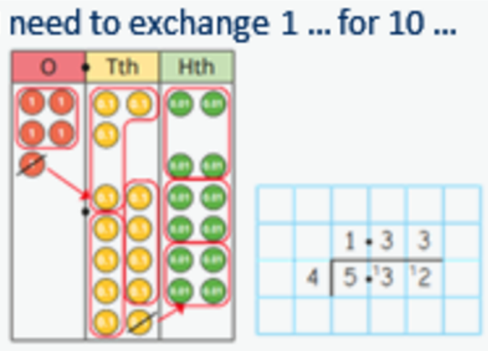
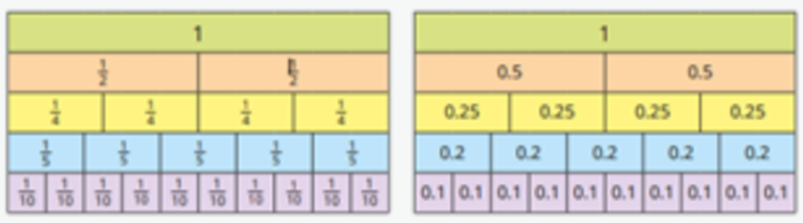
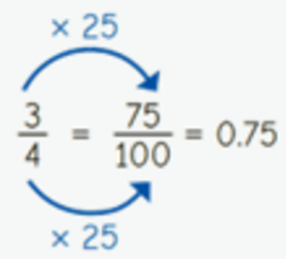
Progression of skills	Key representations	
Divide by 10 and 100 Encourage children to notice that dividing by 100 is the same as dividing by 10 twice.	When I divide by 10, the digits move 1 place value column to the right. … is one-tenth the size of …  2 ÷ 10 = 0.2 12 ÷ 10 = 1.2	When I divide by 100,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

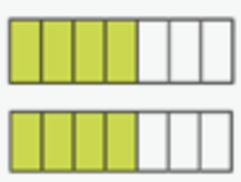
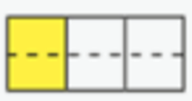
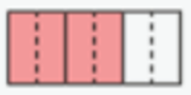
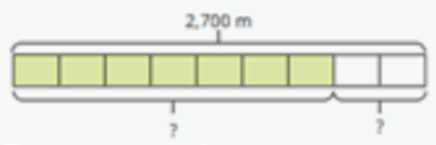
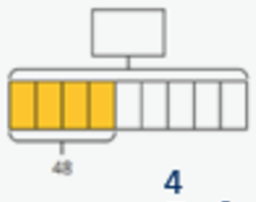
Year 5	▪ Divide numbers mentally drawing upon known facts. ▪ Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context. ▪ Divide whole numbers and those involving decimals by 10, 100 and 1,000		
Progression 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 ... $436 \div 4 = 436 \div 2 \div 2$ $436 \div 2 = 218$ $218 \div 2 = 109$
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 ... 		

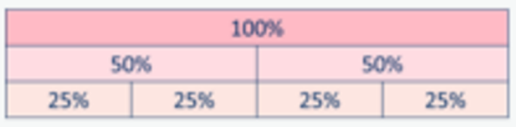
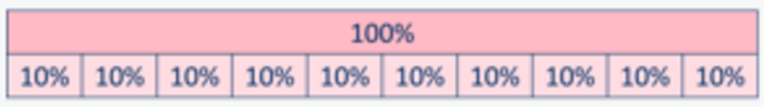
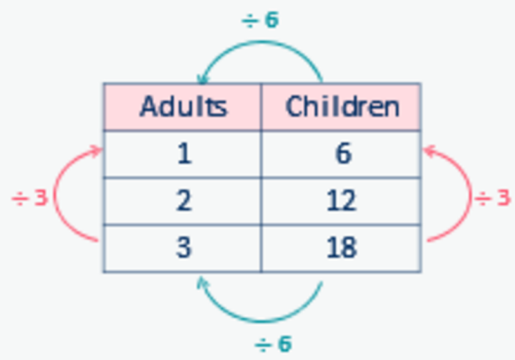
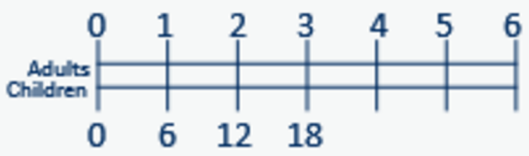
Progression of skills	Key representations	
Divide by 10, 100 and 1,000 Encourage children to notice that dividing by 100 is the same as dividing by 10 twice, and that dividing by 1,000 is the same as dividing by 10 three times.	To divide by 10/100/1,000, I move all the digits ... places to the right. ... 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 = $\frac{3}{5}$ of 20 = $\frac{1}{4}$ of 84 = $\frac{3}{4}$ of 84 =	If $\frac{1}{\square}$ is ..., then the whole is ... × ...  $\frac{1}{5}$ of ___ = 6  $\frac{4}{7}$ of ___ = 24

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 ...  

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 ... $240 \div 60 = 240 \div 10 \div 6$  $480 \div 24 = 480 \div 4 \div 6$  $9{,}120 \div 15 = 9{,}120 \div 5 \div 3$ 
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 ...   $(6 + 4) \div 2 = 5$  $6 + 4 \div 2 = 8$

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 …  1/5 = 0.2 2/5 = 0.4 3/5 = 0.6	□/□ is equal to □/100 

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.  4/7 ÷ 4 = 1/7 4/7 ÷ 2 = 2/7	I am dividing by … , so I can split each part into … equal parts.  1/3 ÷ 2 = 1/6	… is equivalent to … so … ÷ … = … ÷ …  2/3 = 4/6 so 2/3 ÷ 4 = 4/6 ÷ 4 = 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 1/□ I divide by … 1/2 of 36 = 36 ÷ 2 1/12 of 36 = 36 ÷ 12	If 1/□ is equal to …, then □/□ are equal to …  7/9 of 2,700 = 1/9 of 2,700 × 7	If □/□ is equal to …, then the whole is equal to …  4/9 of ___ = 48

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	 

The implementation of the Newton International Academy Primary Maths Calculation Policy, underpinned by the White Rose Maths scheme, will have a significant and measurable impact on students' mathematical understanding, confidence, and overall achievement. This impact aligns closely with our school's vision: An International Community of Learners, Striving for Excellence and Celebrating Success.

Impact on Students

1. Fluency and Mastery – Through consistent and structured teaching, students will develop fluency in the four key operations: addition, subtraction, multiplication, and division. By following the White Rose progression, students will master calculation strategies appropriate to their year group, enabling them to tackle increasingly complex mathematical problems with confidence.
2. Deep Conceptual Understanding – The use of the CPA (Concrete, Pictorial, Abstract) approach ensures that students gain a deep and lasting understanding of mathematical concepts. This will empower them to apply their knowledge in a variety of contexts, both within and beyond the mathematics classroom.
3. Application of Mathematical Skills – Students will be able to apply their calculation skills in real-life scenarios, cross-curricular projects, and problem-solving tasks. This will support their ability to think critically and make connections between different areas of learning, fostering their development as independent and analytical thinkers.
4. Confidence and Resilience – By using a scaffolded approach and fostering a growth mindset, students will become resilient learners who are willing to take risks, embrace challenges, and persevere through problem-solving tasks. They will develop the confidence to articulate their reasoning and explain their methods, strengthening their overall mathematical proficiency.
5. Equity and Inclusion – Through the differentiated approach embedded in the White Rose Maths scheme, all students, regardless of ability, will be supported in reaching their full potential. Those needing additional support will receive targeted interventions, while higher-achieving students will be challenged through deeper problem-solving tasks.

Impact on Teaching and Learning

1. Consistent, High-Quality Instruction – By implementing the White Rose Maths scheme as the foundation of our teaching, lessons will be well-structured, engaging, and aligned with best practices in mathematical education. This consistency across year groups ensures a smooth and progressive transition of skills from Year 1 to Year 6.
2. Effective Assessment and Progress Tracking – Teachers will use formative and summative assessments to measure progress, identify gaps, and inform future teaching. The impact of this structured approach will be evident in improved attainment and confidence in students' ability to perform calculations.
3. Professional Development and Collaboration – The policy will support teachers in continually refining their practice through professional development, sharing of best practices, and collaboration within year groups. Teachers will have access to high-quality resources, reducing workload and ensuring a focus on effective teaching and learning.

Impact on the School Community

1. An International Community of Learners – Through a shared approach to mathematical learning, students, teachers, and parents will work together to support a culture of curiosity, problem-solving, and lifelong learning. The structured approach of White Rose Maths will provide a common framework that unites our diverse student body, fostering a sense of community in the learning journey.
2. Striving for Excellence – By following a structured and progressive calculation policy, students will be consistently challenged to reach their highest potential. The emphasis on fluency, reasoning, and problem-solving ensures that every learner is striving for excellence in their mathematical journey.
3. Celebrating Success – As students build their confidence and proficiency in calculation skills, their achievements will be recognized and celebrated. Success will be measured not only in academic progress but also in students' growing confidence, resilience, and ability to apply their skills in meaningful ways. Regular recognition of progress—through class awards, displays of outstanding work, and celebration of milestones—will reinforce the joy of learning and achievement in mathematics.

Measuring Impact

To ensure the successful implementation and effectiveness of this policy, impact will be monitored through:

1. Regular Pupil Progress Meetings – Teachers will analyse assessment data and student work to evaluate progress and identify areas for further support.
2. Lesson Observations and Learning Walks – Senior leaders and subject coordinators will ensure high- quality teaching and consistency across all year groups.
3. Pupil Voice and Self-Assessment – Students will have opportunities to reflect on their learning, share their experiences, and provide feedback on their mathematical journey.
4. Parental Engagement – Parent workshops and home learning resources will be evaluated for their effectiveness in supporting student progress.

By embedding this structured approach to calculation, Newton International Academy will ensure that students develop the confidence, skills, and mindset needed to excel in mathematics, preparing them for future academic success and lifelong learning.