

# Egerton Church of England Primary School

*Together, we inspire, nurture and thrive*



**Perseverance** **Compassion** **Respect** **Honesty** **Forgiveness** **Hope**

## Calculations Policy

### Key Contact Personnel in School

**Mrs Julia Head**

Headteacher

**Mr Dan Langford**

Maths Subject Leader

Date written: **April 2025**

Date of next review: **April 2028**

Year R

In Year R, Egerton Primary School follows the NCETM Mastering Number programme ([Early Years | NCETM](#)) Pupils cover the key concepts of cardinality and counting; comparison; composition; pattern; shape and space; and measures. This provides a solid foundation for when pupils being completing our Year 1 curriculum and beyond.

Autumn 1	Week 1	Week 2	Week 3	Week 4	Week 5
Focus	Subitising	Counting, ordinality and cardinality	Composition	Subitising	Comparison
Set 1	Subitising within 3	Focus on counting skills	Explore how all numbers are made of 1s  Focus on composition of 3 and 4	Subitise objects and sounds	Comparison of sets - 'just by looking'  Use the language of comparison: <i>more than</i> and <i>fewer than</i>
Autumn 2	Week 6	Week 7	Week 8	Week 9	Week 10
Focus	Counting, ordinality and cardinality	Comparison	Composition	Composition	Counting, ordinality and cardinality
Set 2	Focus on counting skills  Focus on the 'five-ness of 5' using one hand and the die pattern for 5	Comparison of sets - by matching  Use the language of comparison: <i>more than</i> , <i>fewer than</i> , <i>an equal number</i>	Explore the concept of 'whole' and 'part'	Focus on the composition of 3, 4 and 5	Practise object counting skills  Match numerals to quantities within 10  Verbal counting beyond 20

Spring 1	Week 11	Week 12	Week 13	Week 14	Week 15
Focus	Subitising	Counting, ordinality and cardinality	Composition	Composition	Composition
Set 3	Subitise within 5 focusing on die patterns  Match numerals to quantities within 5	Counting – focus on ordinality and the 'staircase' pattern  See that each number is one more than the previous number	Focus on 5	Focus on 6 and 7 as '5 and a bit'	Compare sets and use language of comparison: <i>more than, fewer than, an equal number to</i>  Make unequal sets equal
Spring 2	Week 16	Week 17	Week 18	Week 19	Week 20
Focus	Counting, ordinality and cardinality	Comparison	Composition	Composition	Composition
Set 4	Focus on the 'staircase' pattern and ordering numbers	Focus on ordering of numbers to 8  Use language of <i>less than</i>	Focus on 7	Doubles – explore how some numbers can be made with 2 equal parts	Sorting numbers according to attributes - odd and even numbers

Summer 1	Week 21	Week 22	Week 23	Week 24	Week 25	
Focus	Counting, ordinality and cardinality	Subitising	Composition	Composition	Comparison	
Set 3	Counting – larger sets and things that cannot be seen	Subitising – to 6, including in structured arrangements	Composition – ‘5 and a bit’	Composition - of 10	Comparison – linked to ordinality  Play track games	
Summer 2	Week 26	Review and assess	Review and assess	Review and assess	Review and assess	Review and assess
Set 4	Subitise to 5  Introduce the rekenrek	Automatic recall of bonds to 5	Composition of numbers to 10	Comparison	Number patterns	Counting

This policy shows the progression of calculation cross the school from Year 1 to year

6. This is split up into 4 areas: addition, subtraction, multiplication and division.

## Progression of skills - Addition

Year group	Skill
Year 1	<ul style="list-style-type: none"><li>• Add together</li><li>• Add more</li><li>• Bonds within 10</li><li>• Related facts within 20</li><li>• Missing numbers</li></ul>
Year 2	<ul style="list-style-type: none"><li>• Add 1s to any number (related facts)</li><li>• Add three 1-digit numbers</li><li>• Add across a 10</li><li>• Add multiples of 10</li><li>• Add 10s to any number</li><li>• Add two 2-digit numbers (not across a ten)</li></ul>

	<ul style="list-style-type: none"> <li>• Add two 2-digit numbers (across a ten)</li> <li>• Missing numbers</li> </ul>
Year 3	<ul style="list-style-type: none"> <li>• Add 1s, 10s and 100s to a 3-digit number</li> <li>• Add two numbers (no exchange)</li> <li>• Add two numbers across a 10 or 100</li> <li>• Complements to 100</li> <li>• Add fractions with the same denominator within 1 whole</li> <li>• Calculate the duration of events</li> </ul>
Year 4	<ul style="list-style-type: none"> <li>• Add 1s, 10s and 100s to a 4-digit number</li> <li>• Add up to two 4-digit numbers</li> <li>• Add decimal numbers in the context of money</li> <li>• Add fractions and mixed numbers with the same denominator beyond 1 whole</li> </ul>
Year 5	<ul style="list-style-type: none"> <li>• Add using mental strategies</li> <li>• Add whole numbers with more than 4 digits</li> <li>• Add decimals with up to 2 decimal places</li> <li>• Complements to 1</li> </ul>

	<ul style="list-style-type: none"><li>• Add fractions with denominators that are a multiple of one another</li></ul>
Year 6	<ul style="list-style-type: none"><li>• Add integers up to 10 million</li><li>• Add decimals with up to 3 decimal places</li><li>• Order of operations</li><li>• Negative numbers</li><li>• Add fractions</li></ul>

**Year 1**

- Read, write and interpret mathematical statements involving addition (+) and equals (=) signs.
- Represent and use number bonds within 20
- Add 1-digit and 2-digit numbers to 20, including zero.
- Solve one-step problems that involve addition, using concrete objects and pictorial representations, and missing number problems such as  $7 = \square + 2$

**Progression of skills**

**Key representations**

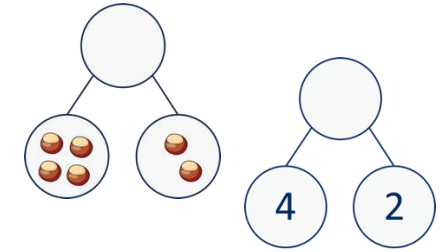
**Add together**  
(aggregation)

2 quantities are combined to find the total.

There are ...  
There are ...  
There are ... altogether.

The illustrations show a stack of 4 blue blocks and 2 red blocks; several buttons of different colors and shapes; two dice; and a ten-frame containing 4 yellow beads and 2 red beads.

... is a part.  
... is a part.  
... is the whole.



... plus ... is equal to ...  
... is equal to ... + ...

$$4 + 2 = 6$$

$$2 + 4 = 6$$

$$6 = 4 + 2$$

$$6 = 2 + 4$$

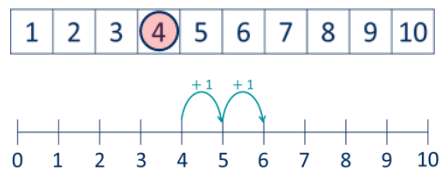
**Add more**  
(augmentation)

A quantity is increased.

First... Then... Now...

The illustrations show two children and a bus; a ten-frame with 4 yellow beads and 2 more yellow beads being added; and a number line with 4 red beads and 2 more red beads being added.

I start at ...  
I jump on ...  
I land on ...



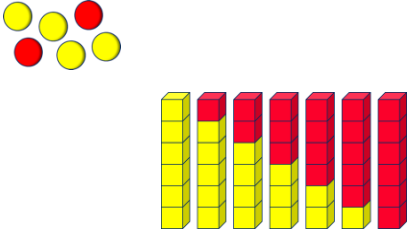
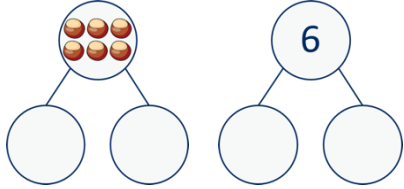
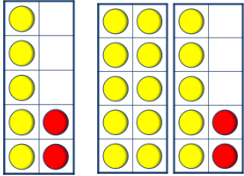
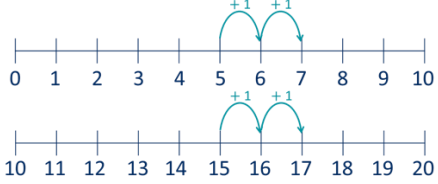
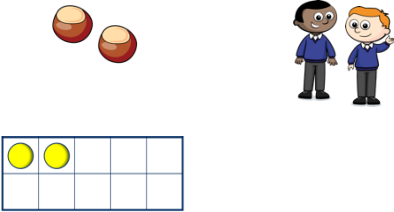
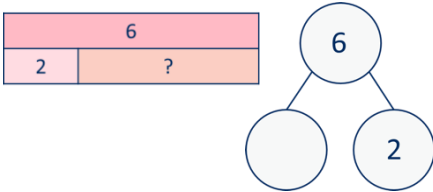

... plus ... is equal to ...  
... is equal to ... + ...

$$4 + 2 = 6$$

$$2 + 4 = 6$$

$$6 = 4 + 2$$

$$6 = 2 + 4$$

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

**Year 2**

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

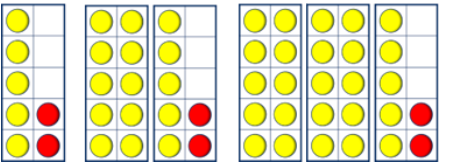
**Progression of skills**

**Key representations**

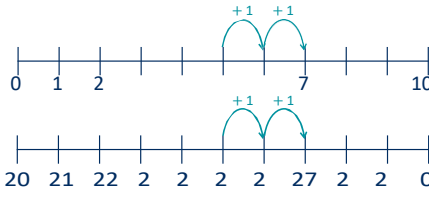
**Add ones to any number (related facts)**

Make links to known facts.

I know that ... and ... = ...  
so ... and ... = ...



... more than ... is ...  
so ... more than ... is ...



What do you notice?  
Can you continue the pattern?

$$5 + 2 = 7$$

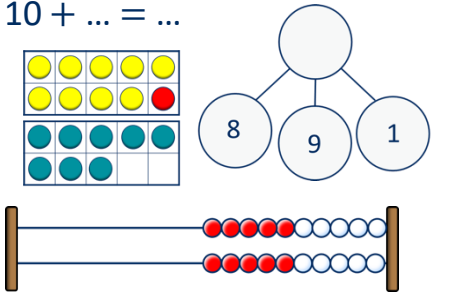
$$15 + 2 = 17$$

$$25 + 2 = 27...$$

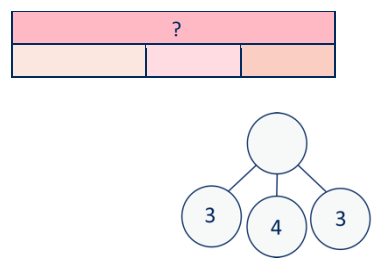
**Add three 1-digit numbers**

Prompt children to understand that addition can be done in any order and to make links to known facts.

... and ... are a bond to 10  
 $10 + ... = ...$



Double ... + ... = ...



What do you notice?  
Which addition is the easiest to calculate?

$$8 + 9 + 1 =$$

$$8 + 1 + 9 =$$

$$9 + 1 + 8 =$$

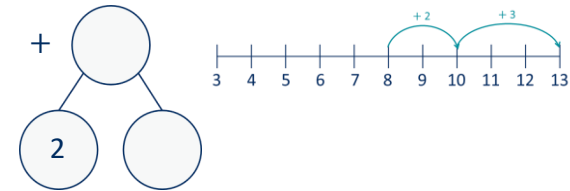
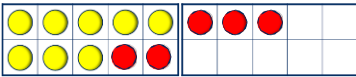
**Progression of skills**

**Key representations**

**Add across a 10**

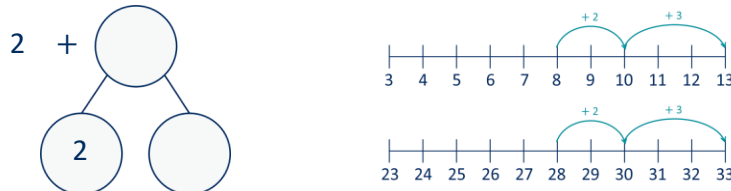
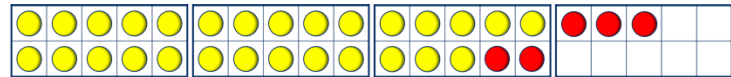
Partition the number being added to make a full ten.

... can be partitioned into ... and ...



I add ... to get to ... then I add ...

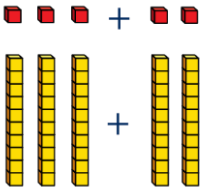
$8 + 5 = 13$   
 $28 + 5 = 33$



**Add multiples of 10**

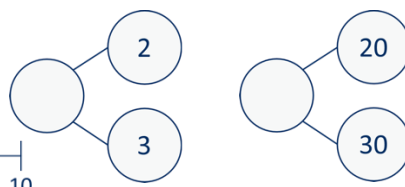
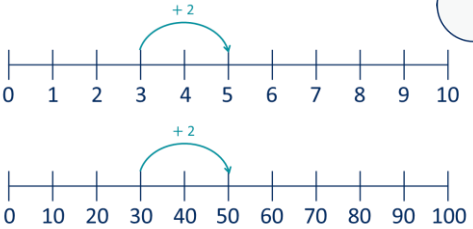
Make links to known facts within ten.

... ones + ... ones = ... ones  
so ... tens + ... tens = ... tens



$3 + 2 = 5$   
 $30 + 20 = 50$

What is the same?  
What is different?

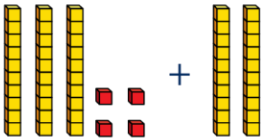


?	
2	3
?	
20	30

**Add 10s to any number**

Make links to known facts.

... tens + ... tens = ... tens  
... tens and ... ones = ...

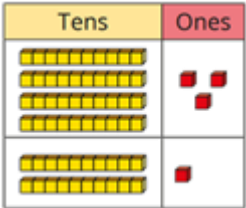
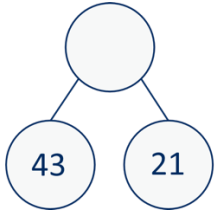
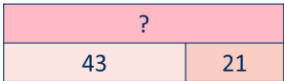
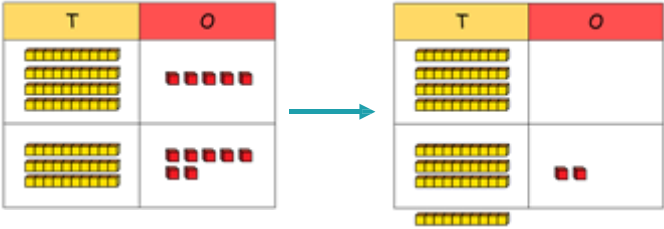
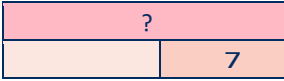
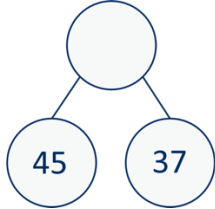
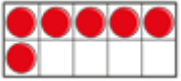
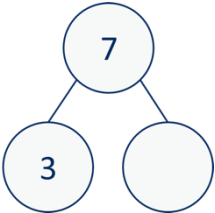
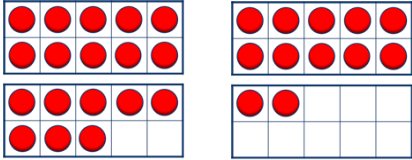


To add ... I need to add 10 ... times.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

I know that ... and ... = ...  
so ... and ... = ...

$30 + 20 = 50$   
 $34 + 20 = 54$

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

**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.

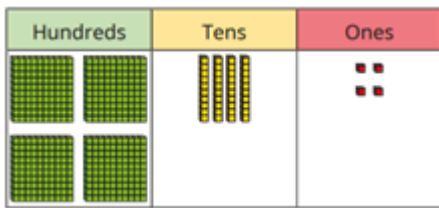
**Progression of skills**

**Key representations**

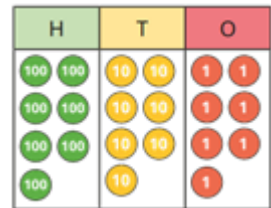
**Add 1s, 10s or 100s to a 3-digit number**

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?

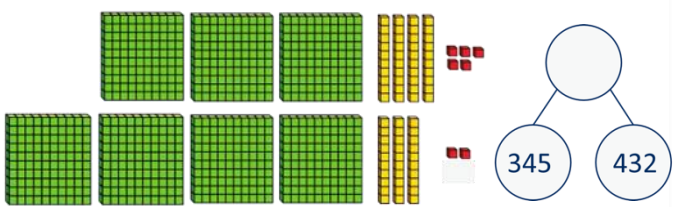
$235 + 3 =$   
 $235 + 30 =$   
 $235 + 300 =$

$604 + 20 =$	$111 + \begin{array}{ c } \hline \phantom{0} \\ \hline \end{array} = 118$
$604 + 50 =$	$111 + \begin{array}{ c } \hline \phantom{0} \\ \hline \phantom{0} \\ \hline \end{array} = 181$
$604 + 90 =$	$111 + \begin{array}{ c } \hline \phantom{0} \\ \hline \phantom{0} \\ \hline \phantom{0} \\ \hline \end{array} = 811$

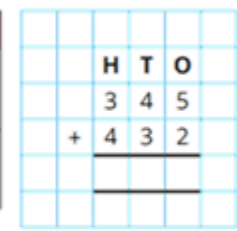
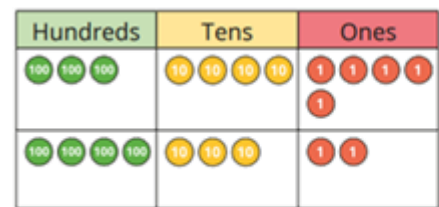
**Add two numbers (no exchange)**

Mental strategies and introduction of formal written method.

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



?	
345	432



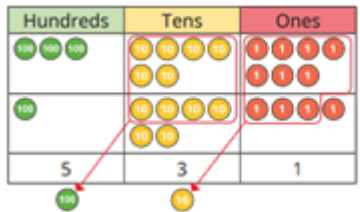
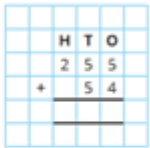
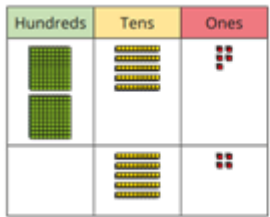
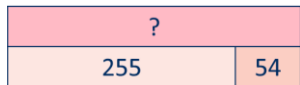
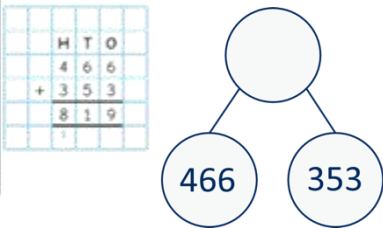
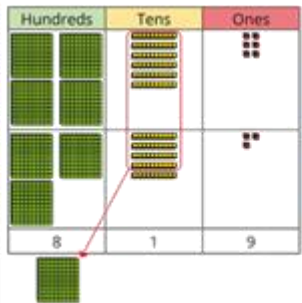
**Progression of skills**

**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.

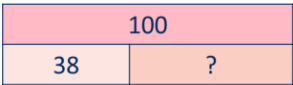
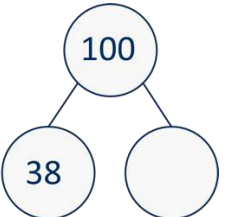
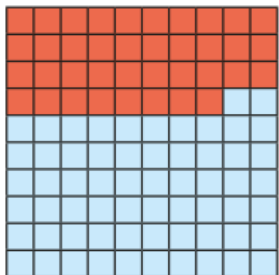
There are ... ones, so I do/do not need to make an exchange.  
 There are ... tens, so I do/do not need to make an exchange.  
 ... ones = ... ten and ... ones.  
 ... tens = ... hundred and ... tens.



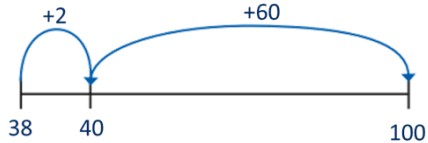
**Complements to 100**

Pairs of numbers which total 100




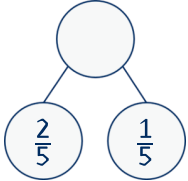



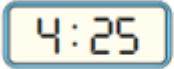
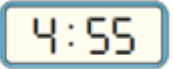
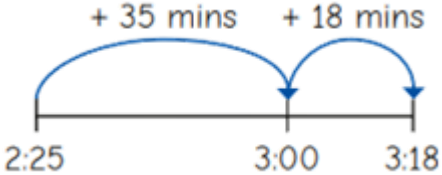
... plus ... is equal to 100



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
<p><b>Add fractions with the same denominator within 1 whole</b></p> <p>Make links with known facts.</p>	<p>When adding fractions with the same denominator, I only add the numerator.  ... fifths + ... fifths = ... fifths</p> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <math>\frac{1}{5} + \frac{1}{5}</math> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <math>\frac{1}{5} + \frac{2}{5}</math> </div> <div style="display: flex; align-items: center;">  <math>\frac{1}{5} + \frac{3}{5}</math> </div> <div style="text-align: right; margin-top: 20px;">  </div> <div style="text-align: center; margin-top: 20px;">  </div>
<p><b>Calculate the duration of events</b></p> <p>Find durations of time between a given start and end point. Children will need to calculate complements to 60</p>	<p>From ... to ... o'clock is ... minutes.  From ... o'clock to ... is ... minutes.  The total time taken is ... minutes.</p> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  <p>start</p> </div> <div style="text-align: center;">  <p>finish</p> </div> <div style="text-align: center;">  <p>start</p> </div> <div style="text-align: center;">  <p>finish</p> </div> </div> <div style="text-align: center; margin-top: 20px;">  </div>

**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.

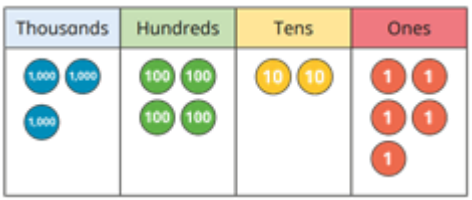
**Progression of skills**

**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 ...



$$3,425 + 3 = \quad 3,425 + 300 =$$

$$3,425 + 30 = \quad 3,425 + 3,000 =$$

What patterns do you notice?

$$2,350 + 3 =$$

$$2,350 + 30 =$$

$$2,350 + 300 =$$

$$2,350 + 3,000 =$$

$$6,040 + 200 = \quad 2,211 + \begin{array}{|c|} \hline \square \\ \hline \end{array} = 2,251$$

$$6,040 + 500 = \quad 2,211 + \begin{array}{|c|} \hline \square \\ \hline \end{array} = 2,215$$

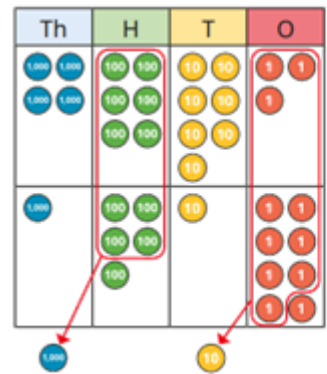
$$6,040 + 900 = \quad 2,211 + \begin{array}{|c|} \hline \square \\ \hline \end{array} = 2,511$$

**Add up to two 4-digit numbers**



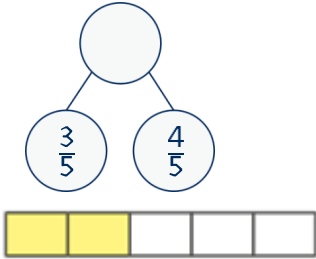
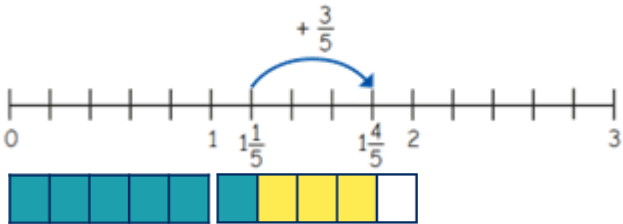
Formal written method with up to 3 exchanges. Encourage children to estimate and use inverse operations to check answers to calculations.

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

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



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

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

**Year 5**

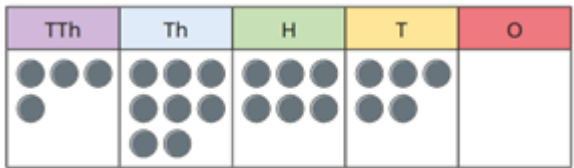
- Add whole numbers with more than 4 digits, including using formal written methods.
- Add numbers mentally with increasingly large numbers.
- Add decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1
- Add fractions with the 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.

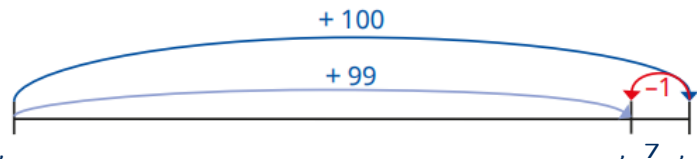
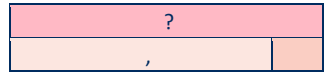


$$48,650 + 300 =$$

$$48,650 + 30,000 =$$

$$48,650 + 30 =$$

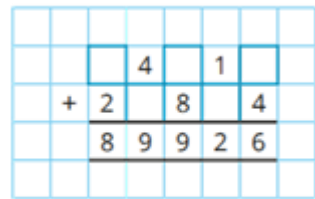
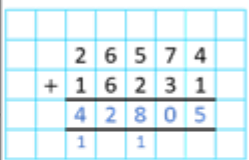
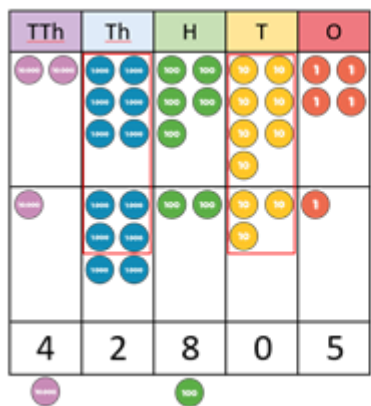
To add ..., I can add ... then subtract ...



**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 ...



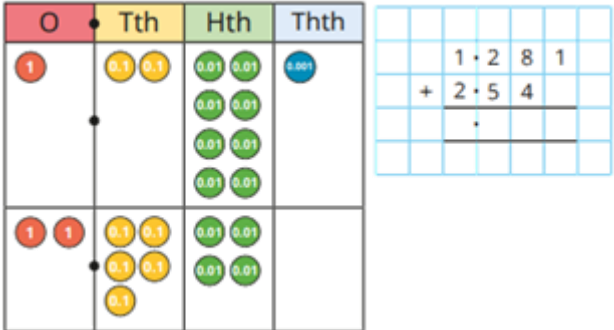
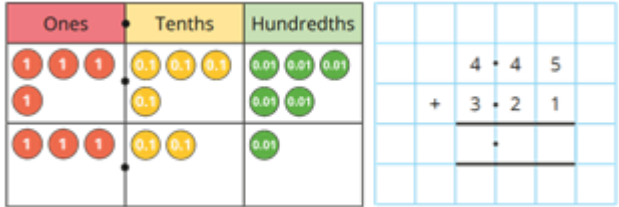
**Progression of skills**

**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.

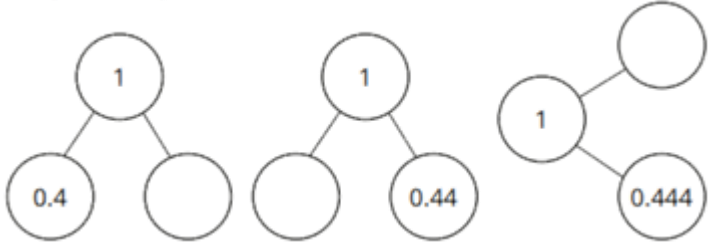
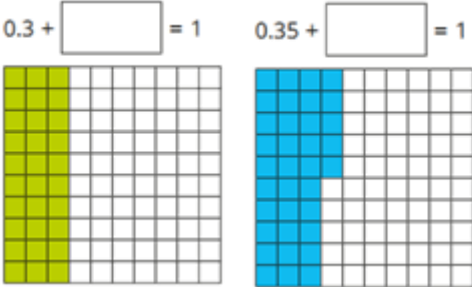
I do/do not need to make an exchange because ...  
I can exchange 10 ... for 1 ...



**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

**Progression of skills**

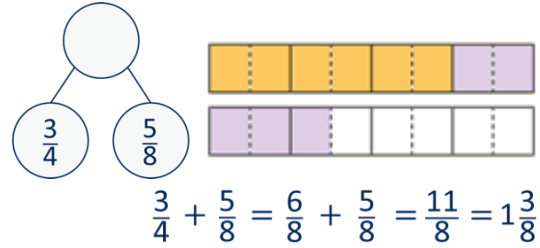
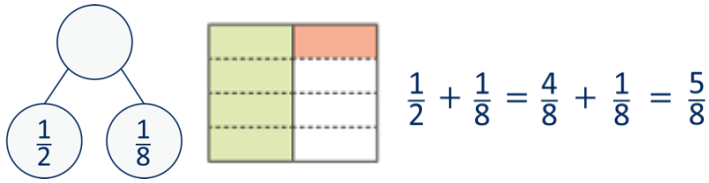
**Key representations**

**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.



<b>Year 6</b>	<ul style="list-style-type: none"> <li>• Add larger numbers, using the formal written method of columnar addition.</li> <li>• Use their knowledge of the order of operations to carry out calculations involving the 4 operations.</li> <li>• Calculate intervals across zero.</li> <li>• Add fractions with different denominators and mixed numbers, using the concept of equivalent fractions.</li> </ul>
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<b>Progression of skills</b>	<b>Key representations</b>
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**Add integers up to 10 million**

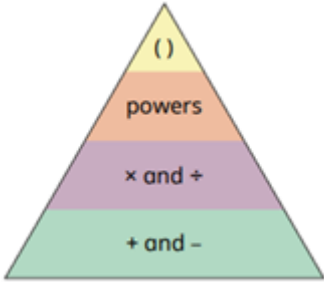
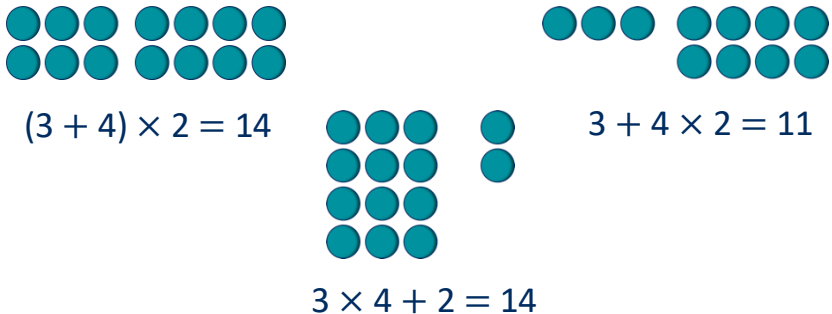
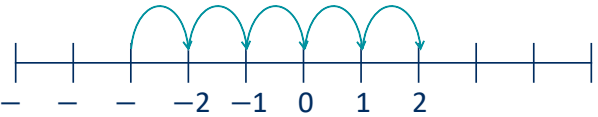
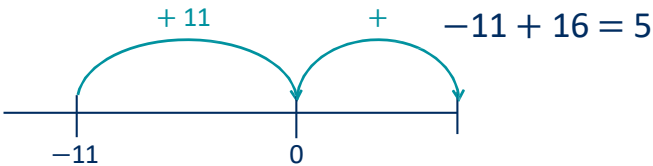
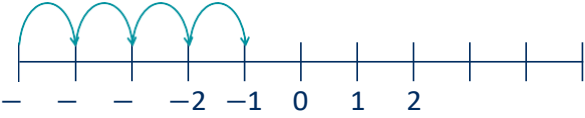
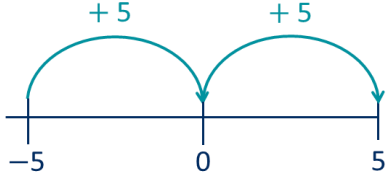
Encourage children to estimate and use inverse operations to check answers to calculations.

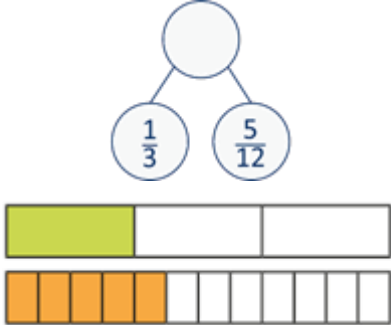
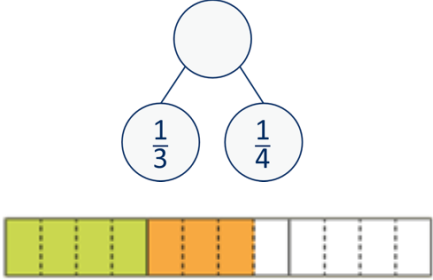
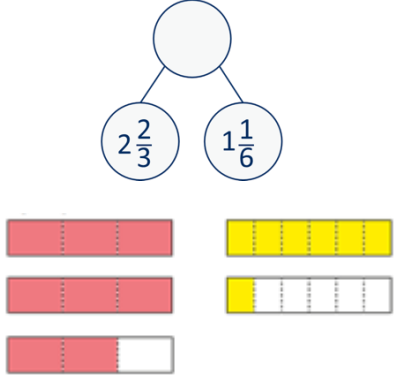
**Add decimals with up to 3 decimal places**

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	
<p><b>Order of operations</b></p> <p>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.</p>	<p>... has greater priority than ..., so the first part of the calculation I need to do is ...</p> 	
<p><b>Negative numbers</b></p> <p>Children add to negative numbers and carry out calculations which cross 0</p>	<p>... plus ... is equal to ...</p> <p><math>-3 + 5 = 2</math></p>  	 <p>The difference between <math>-5</math> and <math>-1</math> is 4</p>  <p>The difference between <math>-5</math> and 5 is 10</p>

Progression of skills	Key representations		
<p><b>Add fractions</b></p> <p>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.</p>	<p>The denominator has been multiplied by ... , so the numerator needs to be multiplied by ...</p> 	<p>The lowest common multiple of ... and ... is ...</p>  $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$	<p>...is made up of ... wholes and ...</p> 

# Progression of skills – Subtraction

Year group	Skill
Year 1	<ul style="list-style-type: none"><li>• Find a part</li><li>• Take away</li><li>• Bonds within 10</li><li>• Related facts within 20</li><li>• Missing numbers</li></ul>
Year 2	<ul style="list-style-type: none"><li>• Subtract 1s from any number (related facts)</li><li>• Subtract across a 10</li><li>• Subtract multiples of 10</li><li>• Subtract 10s from any number</li><li>• Subtract two 2-digit numbers (not across a ten)</li><li>• Subtract two 2-digit numbers (across a ten)</li><li>• Missing numbers</li></ul>

Year 3	<ul style="list-style-type: none"><li>• Subtract 1s, 10s and 100s from a 3-digit number</li><li>• Subtract two numbers (no exchange)</li><li>• Subtract two numbers across a 10 or 100</li><li>• Complements to 100</li><li>• Subtract fractions with the same denominator within 1 whole</li></ul>
Year 4	<ul style="list-style-type: none"><li>• Subtract 1s, 10s, 100s and 1,000s from a 4-digit number</li><li>• Subtract up to two 4-digit numbers</li><li>• Subtract decimal numbers in the context of money</li><li>• Subtract fractions and mixed numbers with the same denominator</li></ul>
Year 5	<ul style="list-style-type: none"><li>• Subtract whole numbers with more than 4 digits</li><li>• Subtract using mental strategies</li><li>• Subtract decimals with up to 2 decimal places</li><li>• Complements to 1</li><li>• Subtract fractions with denominators that are a multiple of one another</li></ul>

## Year 6

- Subtract integers up to 10 million
- Subtract decimals with up to 3 decimal places
- Order of operations
- Negative numbers
- Subtract fractions

**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  $\square - 9$

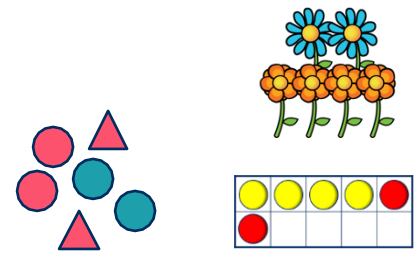
**Progression of skills**

**Key representations**

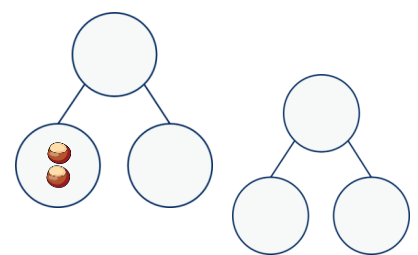
**Find a part**

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 ... − ...

$$6 - 2 = 4$$

$$6 - 4 = 2$$

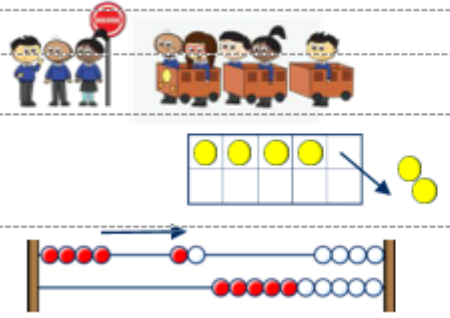
$$4 = 6 - 2$$

$$2 = 6 - 4$$

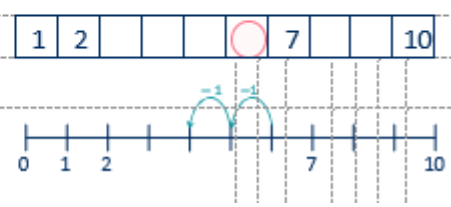
**Take away**

A quantity is decreased.

First... Then... Now...



I start at ...  
I jump back ...  
I land on ...



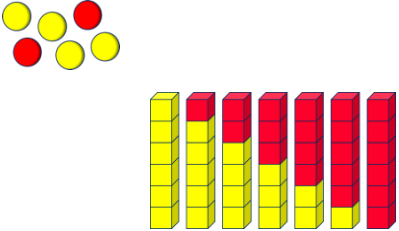
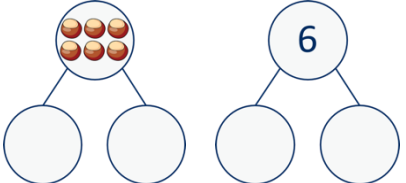
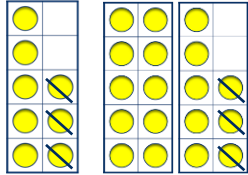
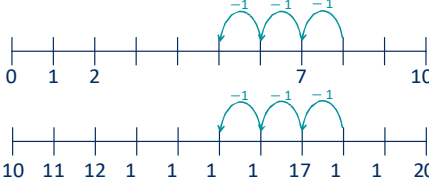
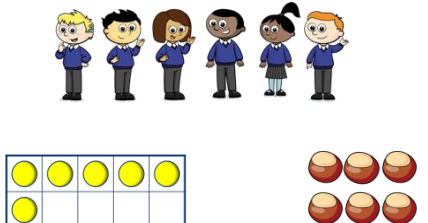
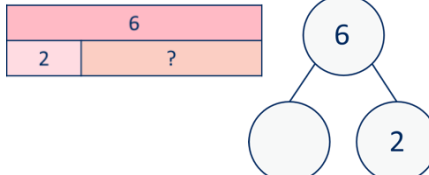

... minus ... is equal to ...  
... is equal to ... − ...

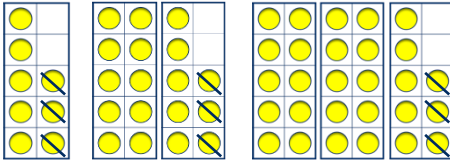
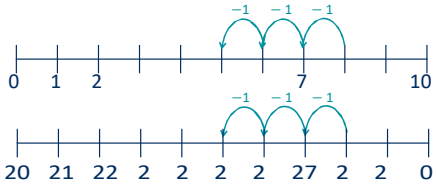
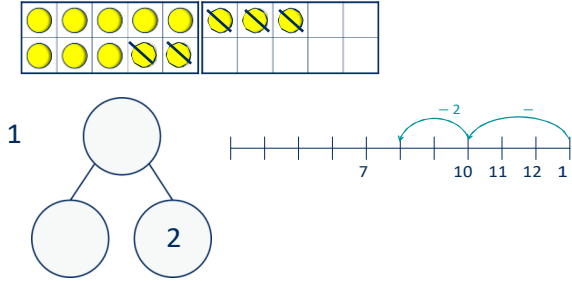
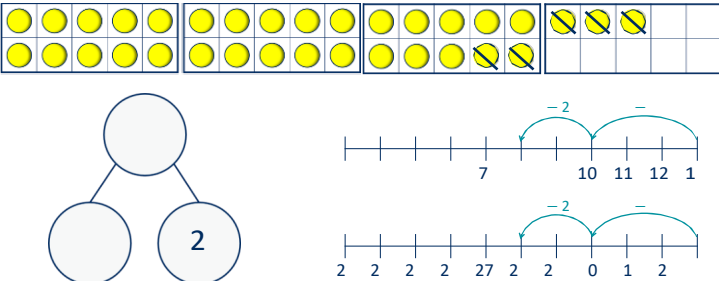
$$6 - 2 = 4$$

$$6 - 4 = 2$$

$$4 = 6 - 2$$

$$2 = 6 - 4$$

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

<p><b>Year 2</b></p>	<ul style="list-style-type: none"> <li>Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100</li> <li>Subtract numbers using concrete objects, pictorial representations, and mentally, including:             <ul style="list-style-type: none"> <li>a two-digit number and 1s</li> <li>a two-digit number and 10s</li> <li>2 two-digit numbers</li> </ul> </li> <li>Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</li> </ul>		
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>		
<p><b>Subtract ones from any number</b> (related facts)</p> <p>Make links to known facts.</p>	<p>I know that ... minus ... = ... so ... minus ... = ...</p> 	<p>... less than ... is ... so ... less than ... is ...</p> 	<p>What do you notice? Can you continue the pattern?</p> $8 - 3 = 5$ $18 - 3 = 15$ $28 - 3 = 25 \dots$
<p><b>Subtract across a 10</b></p> <p>Partition the number being subtracted to bridge through a ten.</p>	<p>... can be partitioned into ... and ...</p> 	<p>Make links with related facts.</p> 	

**Progression of skills**

**Key representations**

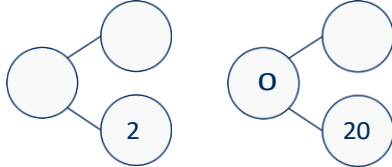
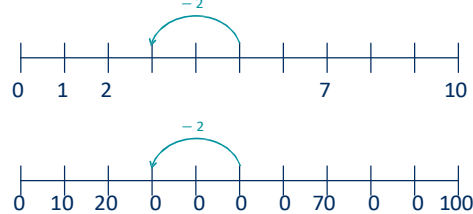
**Subtract multiples of 10**

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?



2	?
0	
20	?

**Subtract 10s from any number**

Make links to known facts.

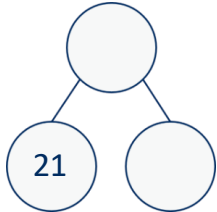
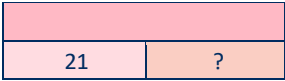
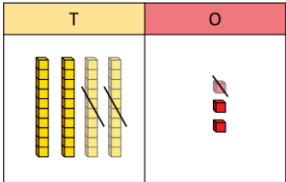
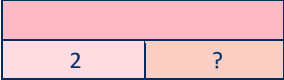
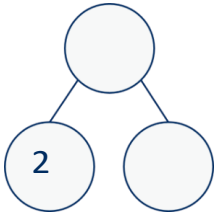
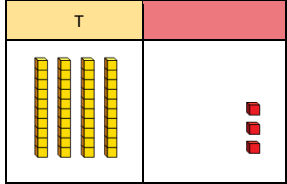
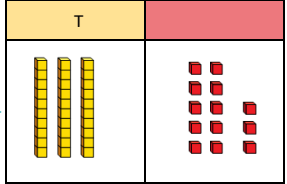
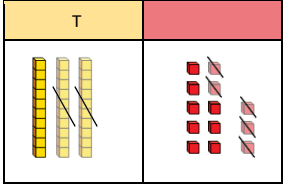
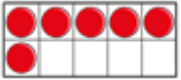
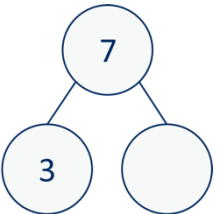
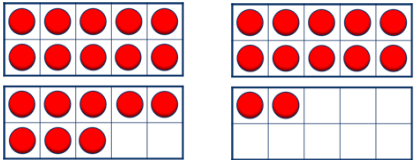
... tens – ... tens = ... tens  
... tens and ... ones = ...

To subtract ... I need to subtract 10 ... times.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

I know that ... minus ... = ...  
so ... minus ... = ...

50 – 20 = 30  
54 – 20 = 34

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

<p><b>Year 3</b></p>	<ul style="list-style-type: none"> <li>Subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds.</li> <li>Subtract numbers with up to three digits, using formal written methods.</li> <li>Subtract fractions with the same denominator within 1 whole.</li> </ul>																																							
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>																																							
<p><b>Subtract 1s, 10s and 100s from a 3-digit number</b></p> <p>Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.</p>	<p>The ones/tens/hundreds column will decrease by ...</p> <table border="1" data-bbox="593 446 1030 654"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>444 - 2 =</p> <p>444 - 20 =</p> <p>444 - 200 =</p> <table border="1" data-bbox="1064 446 1332 654"> <thead> <tr> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>777 - 4 =</p> <p>777 - 40 =</p> <p>777 - 400 =</p>	Hundreds	Tens	Ones				H	T	O				<p>What patterns do you notice?</p> <p>235 - 3 =</p> <p>235 - 30 =</p> <p>235 - 300 =</p> <p>624 - 20 =</p> <p>654 - 50 =</p> <p>694 - 90 =</p> <p>118 - <input type="text"/> = 111</p> <p>181 - <input type="text"/> = 111</p> <p>811 - <input type="text"/> = 111</p>																										
Hundreds	Tens	Ones																																						
H	T	O																																						
<p><b>Subtract two numbers (no exchange)</b></p> <p>Mental strategies and introduction of formal written method.</p>	<p>... tens - ... tens = ... tens</p> <p>... nunits - ... nunits = ... nunits</p> <table border="1" data-bbox="1646 837 1948 925"> <tr> <td></td> <td>7</td> </tr> <tr> <td>17</td> <td>?</td> </tr> </table> <table border="1" data-bbox="593 1013 1041 1197"> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" data-bbox="1366 997 1713 1117"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" data-bbox="1758 997 1948 1173"> <thead> <tr> <th></th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td>7</td> <td>6</td> <td>9</td> </tr> <tr> <td>-</td> <td>1</td> <td>4</td> <td>7</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			7	17	?							Hundreds	Tens	Ones											H	T	O		7	6	9	-	1	4	7				
	7																																							
17	?																																							
Hundreds	Tens	Ones																																						
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	7	6	9																																					
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**Progression of skills**

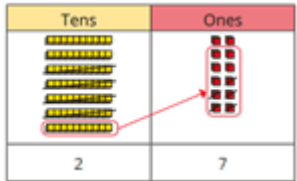
**Key representations**

**Subtract two numbers across a 10 or 100**

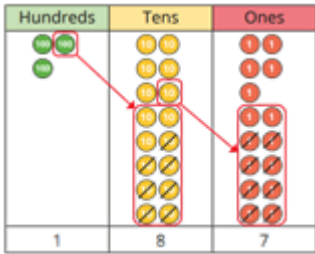
Formal written method involving up to 2 exchanges including 3-digit subtract 2-digit numbers.

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 ...

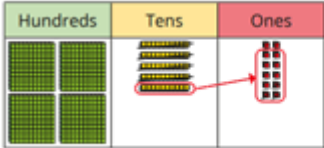
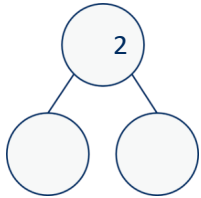
72	
45	?



	T	O
	7	2
-	4	5
	2	7



<del>2</del>	<del>15</del>	1	5
1	7	8	
1	8	7	



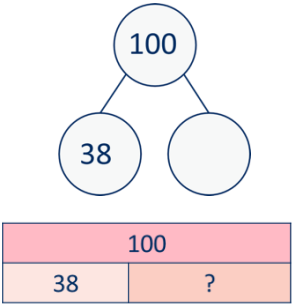
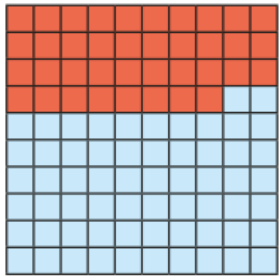
	H	T	O
	4	0	9
-	4	3	
	4	0	9

**Complements to 100**

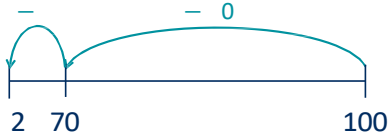
Focus on subtraction facts.

Encourage children to notice patterns.

100 minus ... is equal to ...



I subtract ... tens, then I subtract ... ones.



$$100 - 38 = 62$$

$$100 - 62 = 38$$

$$62 = 100 - 38$$

$$38 = 100 - 62$$

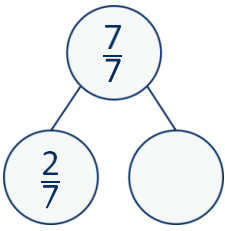
**Progression of skills**

**Key representations**

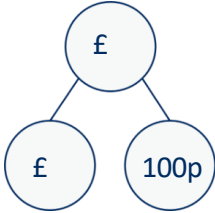
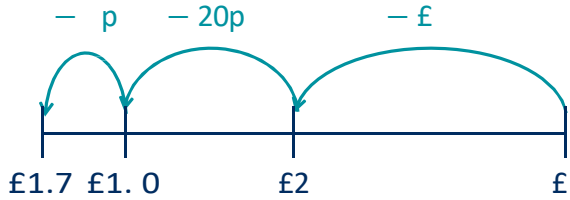
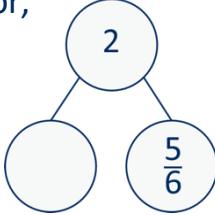
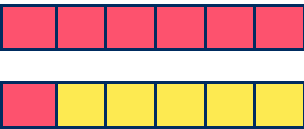
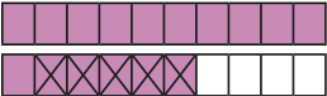

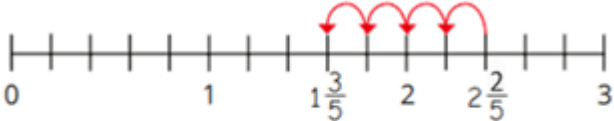
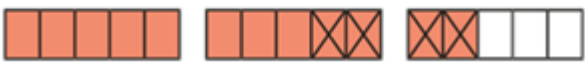
**Subtract fractions with the same denominator within 1 whole**

Make links with known facts.

When subtracting fractions with the same denominator, I only subtract the numerator.  
... fifths – ... fifths = ... fifths



<p><b>Year 4</b></p>	<ul style="list-style-type: none"> <li>Subtract numbers with up to 4 digits using a formal written method.</li> <li>Solve simple measure and money problems involving fractions and decimals to 2 decimal places.</li> <li>Subtract fractions with the same denominator.</li> </ul>																																																					
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>																																																					
<p><b>Subtract 1s, 10s, 100s and 1,000s from a 4-digit number</b></p> <p>Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.</p>	<p>The ones/tens/hundreds/thousands column will decrease by ...</p> <table border="1" data-bbox="595 485 1057 676"> <thead> <tr> <th>Thousands</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td>1,000 1,000 1,000</td> <td>100 100 100 100</td> <td>10 10</td> <td>1 1 1 1 1</td> </tr> </tbody> </table> <p> <math>3,425 - 2 =</math>      <math>3,425 - 200 =</math>  <math>3,425 - 20 =</math>    <math>3,425 - 2,000 =</math> </p>	Thousands	Hundreds	Tens	Ones	1,000 1,000 1,000	100 100 100 100	10 10	1 1 1 1 1	<p>What patterns do you notice?</p> <p> <math>4,356 - 3 =</math>  <math>4,356 - 30 =</math>  <math>4,356 - 300 =</math> </p> <p> <math>4,433 - \square = 4,430</math>  <math>4,433 - \square = 4,033</math>  <math>4,433 - \square = 4,403</math> </p> <p> <math>6,940 - 200 =</math>  <math>6,940 - 300 =</math>  <math>6,940 - 400 =</math> </p>																																												
Thousands	Hundreds	Tens	Ones																																																			
1,000 1,000 1,000	100 100 100 100	10 10	1 1 1 1 1																																																			
<p><b>Subtract up to two 4-digit numbers</b></p> <p>Formal written method with up to 3 exchanges. Encourage children to estimate and use inverse operations to check answers to calculations.</p>	<p>I need to subtract... ones/tens/hundreds. I do/do not need to make an exchange.</p> <p>I can exchange 1... for 10...</p> <table border="1" data-bbox="1122 932 1624 1259"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>1,000 1,000</td> <td>100</td> <td>10 10 10</td> <td>1 1 1</td> </tr> <tr> <td><del>1,000</del></td> <td><del>100</del></td> <td><del>10</del> <del>10</del> <del>10</del></td> <td><del>1</del> <del>1</del> <del>1</del></td> </tr> <tr> <td></td> <td></td> <td>10 10 10</td> <td>1 1 1</td> </tr> <tr> <td></td> <td></td> <td><del>10</del> <del>10</del> <del>10</del></td> <td><del>1</del> <del>1</del> <del>1</del></td> </tr> <tr> <td></td> <td></td> <td></td> <td>1 1 1</td> </tr> <tr> <td></td> <td></td> <td></td> <td><del>1</del> <del>1</del> <del>1</del></td> </tr> <tr> <td></td> <td></td> <td></td> <td>1 1 1</td> </tr> </tbody> </table> <table border="1" data-bbox="1655 970 1951 1225"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>2</td> <td>4</td> <td>8</td> </tr> <tr> <td>-</td> <td>2</td> <td>1</td> <td>4</td> </tr> <tr> <td colspan="4"><hr/></td> </tr> <tr> <td>1</td> <td>0</td> <td>5</td> <td>8</td> </tr> </tbody> </table>		Th	H	T	O	1,000 1,000	100	10 10 10	1 1 1	<del>1,000</del>	<del>100</del>	<del>10</del> <del>10</del> <del>10</del>	<del>1</del> <del>1</del> <del>1</del>			10 10 10	1 1 1			<del>10</del> <del>10</del> <del>10</del>	<del>1</del> <del>1</del> <del>1</del>				1 1 1				<del>1</del> <del>1</del> <del>1</del>				1 1 1	Th	H	T	O	3	2	4	8	-	2	1	4	<hr/>				1	0	5	8
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Progression of skills	Key representations	
<p><b>Subtract decimal numbers in the context of money</b></p> <p>Emphasis here is on partitioning and use of number lines rather than formal written calculations.</p>	<p>I can partition £... into £... and 100p</p> <p>£... - £... = £...</p> <p>100p - ...p = ...p</p> <p><b>£5 - £3.26</b></p> <p>£4 - £3 = £1</p> <p>100p - 26p = 74p</p> <p>£5 - £3.26 = £1.74</p> 	<p>£3.26 can be partitioned into £3 + 20p + 6p</p> 
<p><b>Subtract fractions and mixed numbers with the same denominator</b></p> <p>Include subtracting fractions from wholes.</p>	<p>When subtracting fractions with the same denominator, I only subtract the numerator.</p> <p>... tenths - ... tenths = ... tenths</p>    <p><math>\frac{16}{10} - \frac{5}{10}</math></p>  <p><math>\frac{16}{10} - \frac{9}{10}</math></p>  	

**Year 5**

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

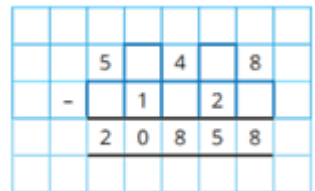
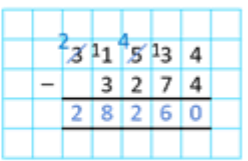
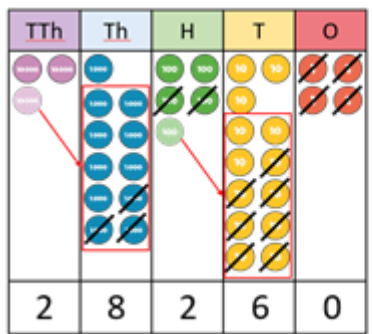
**Progression of skills**

**Key representations**

**Subtract whole numbers with more than 4 digits**

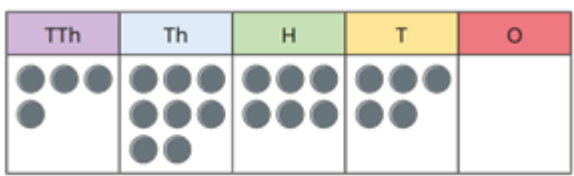
I can exchange 1 ... for 10 ...

Encourage children to estimate and use inverse operations to check answers to calculations.



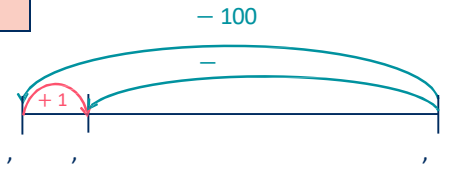
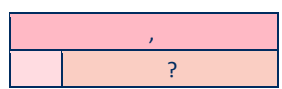
**Subtract using mental strategies**

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 ...



Progression of skills	Key representations
<p><b>Subtract decimals with up to 2 decimal places</b></p> <p>Progress from the same number of decimal places to a different number of decimal places and from no exchange to exchange.</p>	
<p><b>Complements to 1</b></p> <p>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</p>	

**Progression of skills**

**Subtract fractions with denominators that are a multiple of one another**

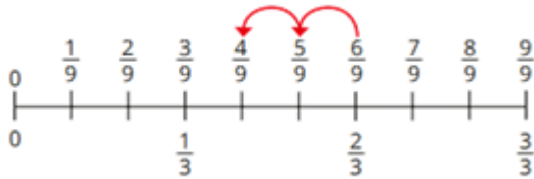
Convert fractions to the same denominator before subtracting. Progress from subtracting fractions within 1 whole to subtracting from a mixed number.

**Key representations**

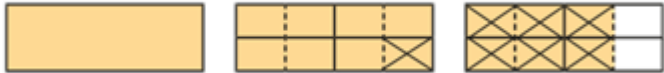
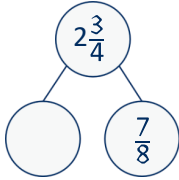
The denominator has been multiplied by ..., so the numerator needs to be multiplied by... for the fractions to be equivalent.



$$\frac{1}{3} - \frac{1}{15} = \frac{5}{15} - \frac{1}{15} = \frac{4}{15}$$



$$\frac{2}{3} - \frac{2}{9} = \frac{6}{9} - \frac{2}{9} = \frac{4}{9}$$



<b>Year 6</b>	<ul style="list-style-type: none"> <li>Subtract larger numbers, using the formal written methods of columnar subtraction.</li> <li>Use their knowledge of the order of operations to carry out calculations involving the 4 operations.</li> <li>Calculate intervals across zero.</li> <li>Subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.</li> </ul>
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<b>Progression of skills</b>	
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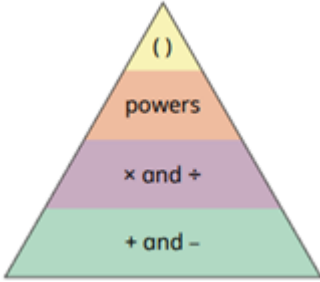
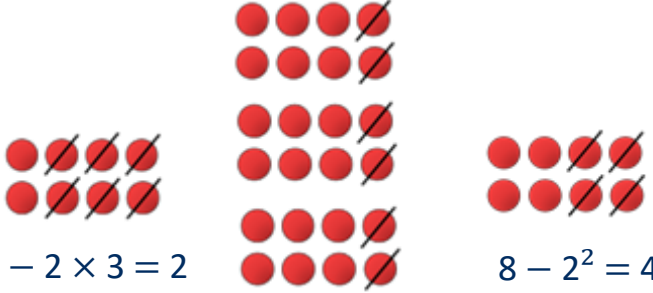
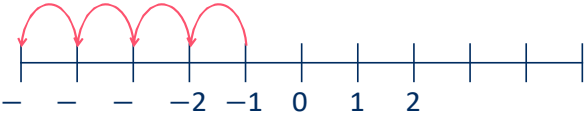
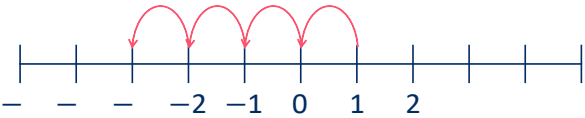
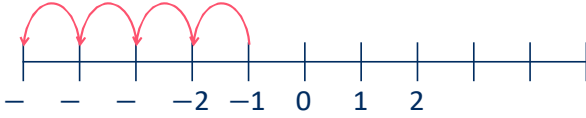
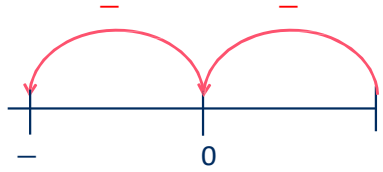
**Subtract integers up to 10 million**

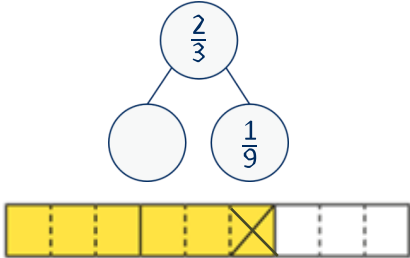
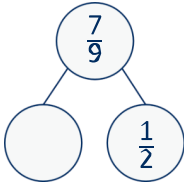
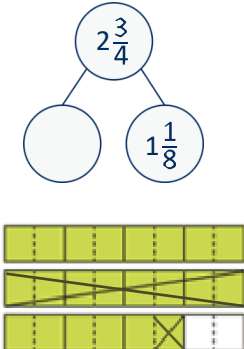
Encourage children to estimate and use inverse operations to check answers to calculations.

**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	
<p><b>Order of operations</b></p> <p>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.</p>	<p>... has greater priority than ... , so the first part of the calculation I need to do is ...</p> 	 <p><math>8 - 2 \times 3 = 2</math></p> <p><math>(8 - 2) \times 3 = 18</math></p> <p><math>8 - 2^2 = 4</math></p>
<p><b>Negative numbers</b></p> <p>Children subtract from positive and negative numbers and calculate intervals across 0</p>	<p>... minus ... is equal to ...</p> <p><math>-1 - 4 = -5</math></p>  <p><math>1 - 4 = -3</math></p> 	 <p>The difference between <math>-5</math> and <math>-1</math> is 4</p>  <p>The difference between 5 and <math>-5</math> is 10</p>

Progression of skills	Key representations		
<p><b>Subtract fractions</b></p> <p>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.</p>	<p>The denominator has been multiplied by ... , so the numerator needs to be multiplied by...</p>  $\frac{2}{3} - \frac{1}{9} = \frac{6}{9} - \frac{1}{9} = \frac{5}{9}$	<p>The lowest common multiple of ... and ... is ...</p>  $\frac{7}{9} - \frac{1}{2} = \frac{14}{18} - \frac{9}{18} = \frac{5}{18}$	<p>... is made up of ... wholes and ...</p>  $2\frac{3}{4} - 1\frac{1}{8} = 1\frac{5}{8}$

# Progression of skills – Multiplication

Year group	Skill
Year 1	<ul style="list-style-type: none"><li>• Count in 2s, 5s and 10s</li><li>• Add equal groups</li><li>• Make arrays</li><li>• Make doubles</li></ul>
Year 2	<ul style="list-style-type: none"><li>• Link repeated addition and multiplication</li><li>• Use arrays</li><li>• Double</li><li>• The 2 times-table</li><li>• The 10 times-table</li><li>• The 5 times-table</li><li>• Missing numbers</li></ul>
Year 3	<ul style="list-style-type: none"><li>• The 3 times-table</li><li>• The 4 times-table</li><li>• The 8 times-table</li><li>• Related facts</li></ul>

	<ul style="list-style-type: none"><li>• Multiply a 2-digit number by a 1-digit number - no exchange</li><li>• Multiply a 2-digit number by a 1-digit number - with exchange</li><li>• Scaling</li><li>• Correspondence problems</li></ul>
Year 4	<ul style="list-style-type: none"><li>• Times-table facts to <math>12 \times 12</math></li><li>• Multiply by 1 and 0</li><li>• Multiply 3 numbers</li><li>• Factor pairs</li><li>• Multiply by 10 and 100</li><li>• Related facts</li><li>• Mental strategies</li><li>• Multiply a 2 or 3-digit number by a 1-digit number</li><li>• Scaling</li><li>• Correspondence problems</li></ul>

Year 5	<ul style="list-style-type: none"><li>• Multiples and factors</li><li>• Square and cube numbers</li><li>• Multiply numbers up to 4 digits by a 1-digit number</li><li>• Multiply numbers up to 4 digits by a 2-digit number</li><li>• Multiply by 10, 100 and 1,000</li><li>• Mental strategies</li><li>• Multiply fractions by a whole number</li><li>• Multiply mixed numbers by a whole number</li><li>• Find the whole</li></ul>
Year 6	<ul style="list-style-type: none"><li>• Multiply numbers up to 4 digits by a 2-digit number</li><li>• Multiply by 10, 100 and 1,000</li><li>• Order of operations</li><li>• Multiply decimals by integers</li><li>• Multiply fractions by fractions</li><li>• Find the whole</li><li>• Calculations involving ratio</li></ul>

**Year 1**

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

**Progression of skills**      **Key representations**

**Count in 2s, 5s and 10s**

Begin by counting objects that naturally come in 2s, 5s and 10s, for example pairs of socks or fingers.

There are ... equal groups of ...  
There are ... altogether.

Continue to colour in ...s  
What do you notice?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

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

5	10	15	20				
---	----	----	----	--	--	--	--

**Add equal groups (repeated addition)**

Children should be able to write a repeated addition to represent equal groups and to draw pictures or use objects to represent a repeated addition.

There are ... groups of ...  
There are ... altogether.

$10 + 10 + 10 = 30$

$5 + 5 + 5 + 5 = 20$

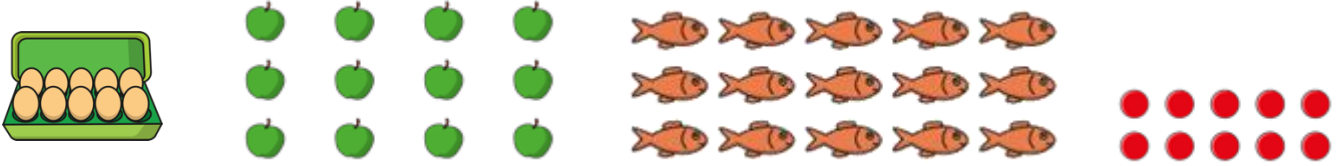
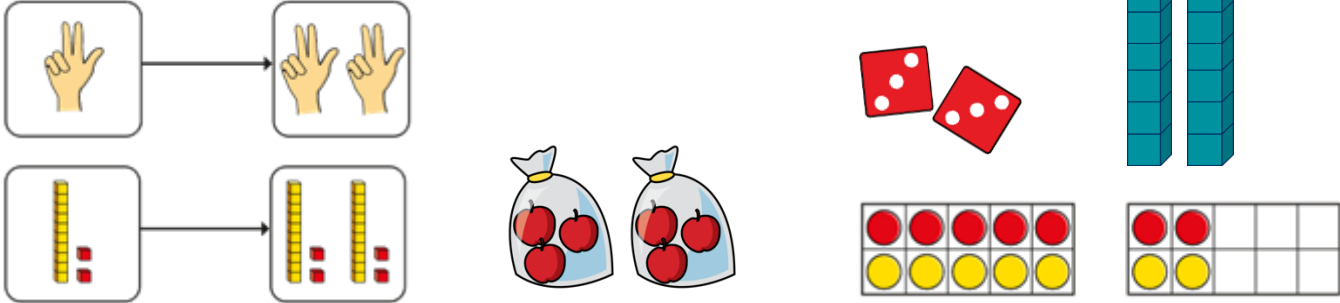
What is the same? What is different?


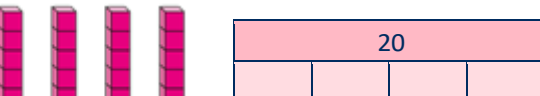



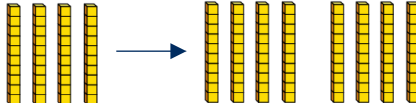
$2 + 2 + 2 =$

$5 + 5 + 5 =$

$10 + 10 + 10 =$

Use objects or a drawing to represent the equal groups and find how many in total.

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

<p><b>Year 2</b></p>	<ul style="list-style-type: none"> <li>Recall and use multiplication facts for the 2, 5 and 10 multiplication tables.</li> <li>Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (<math>\times</math>) and equals (<math>=</math>) signs.</li> <li>Show that multiplication of two numbers can be done in any order (commutative).</li> </ul>	
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>	
<p><b>Link repeated addition and multiplication</b></p> <p>Encourage children to make the link between repeated addition and multiplication.</p>	<p>There are ... equal groups with ... in each group. There are ... altogether.</p>  <p><math>3 + 3 = 6</math> <math>2 \times 3 = 6</math></p>  <p><math>5 + 5 + 5 + 5 = 20</math> <math>4 \times 5 = 20</math></p>	
<p><b>Use arrays</b></p> <p>Encourage children to see that multiplication is commutative.</p>	<p>There are ... rows with ... in each row. There are ... columns with ... in each column.</p>  <p>3 lots of 5 = 15 <math>5 + 5 + 5 = 15</math> 5 lots of 3 = 15 <math>3 + 3 + 3 + 3 + 3 = 15</math></p>	<p>I can see ... <math>\times</math> ... and ... <math>\times</math> ...</p> <p><math>3 \times 5 = 15</math> <math>5 \times 3 = 15</math> <math>3 \times 5 = 5 \times 3</math></p>
<p><b>Double</b></p> <p>Encourage children to make links with related facts.</p>	<p>Double ... is ...</p>  <p>Double 4 = 4 + 4 Double 4 is 8</p>	<p>Double ... is ... so double ... is ...</p>  <p>Double 4 is 8</p>  <p>Double 40 is 80</p>

**Progression of skills**

**Key representations**

**The 2 times-table**

Encourage daily counting in multiples both forwards and back. Notice that all multiples of 2 are even numbers.

... lots of 2 =  
... × 2 =

... times 2 is equal to ...

1	2				7			10	
11	12	1	1	1	1	17	1	1	20
21	22	2	2	2	2	27	2	2	0

$1 \times 2 = 2$      $2 = 1 \times 2$   
 $2 \times 2 = 4$      $4 = 2 \times 2$   
 $3 \times 2 = 6$      $6 = 3 \times 2$



**The 10 times-table**

Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.

... lots of 10 =  
... × 10 =

... times 10 is equal to ...

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

$1 \times 10 = 10$      $10 = 1 \times 10$   
 $2 \times 10 = 20$      $20 = 2 \times 10$   
 $3 \times 10 = 30$      $30 = 3 \times 10$






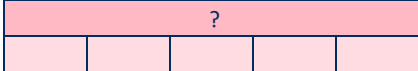
**Progression of skills**

**Key representations**

**The 5 times-table**

Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.

... lots of =  
 $\dots \times 5 =$

... times is equal to ...

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40


$1 \times 5 = 5$        $5 = 1 \times 5$   
 $2 \times 5 = 10$      $10 = 2 \times 5$   
 $3 \times 5 = 15$      $15 = 3 \times 5$

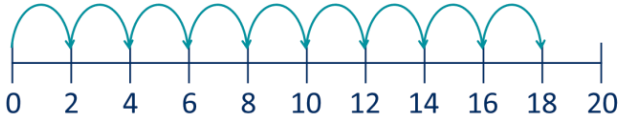


**Missing numbers**

Make links to known facts.



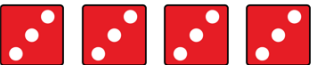
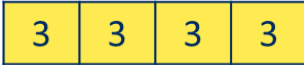


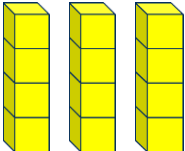



... is equal to ... groups of ...

18 socks, how many pairs? 



... times ... is equal to ...

$\square \times 2 = 18$   
 $18 = 2 \times \square$

<p><b>Year 3</b></p>	<ul style="list-style-type: none"> <li>Recall and use multiplication facts for the 3, 4 and 8 multiplication tables.</li> <li>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.</li> <li>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.</li> </ul>																															
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>																															
<p><b>The 3 times-table</b></p> <p>Encourage daily counting in multiples both forwards and back.</p>	<p>... groups of = </p> <p>... <math>\times 3 =</math></p> <p>, ... times = </p> <p><math>3 \times \dots =</math></p>  	<p>... times is equal to ...</p> <table border="1" data-bbox="1408 592 1895 730"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> </table> <p><math>4 \times 3 = 12</math>   <math>12 = 4 \times 3</math></p> 	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
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11	12	13	14	15	16	17	18	19	20																							
21	22	23	24	25	26	27	28	29	30																							
<p><b>The 4 times-table</b></p> <p>Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2 and 4 times-tables.</p>	<p>... groups of = </p> <p>... <math>\times 4 =</math></p> <p>, ... times = </p> <p><math>4 \times \dots =</math></p>  	<p>... times is equal to ...</p> <table border="1" data-bbox="1408 959 1895 1098"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> </table> <p><math>3 \times 4 = 12</math>   <math>12 = 3 \times 4</math></p> 	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
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11	12	13	14	15	16	17	18	19	20																							
21	22	23	24	25	26	27	28	29	30																							

**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 =  
 $\times 8 =$   
 , ... times =  
 $8 \times \dots =$

... times is equal to ...

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

$3 \times 8 = 24$      $24 = 3 \times 8$



**Related facts**

Use knowledge of multiplying by 10 to scale times-table facts.

...  $\times$  ... ones is equal to ... ones  
 so ...  $\times$  ... tens is equal to ... tens.

$3 \times 4 = 12$   
 $3 \times 40 = 120$

**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.

Tens	Ones
30	2
20	2

$30 \times 2 = 60$   
 $2 \times 2 = 4$   
 $32 \times 2 = 64$











Tens	Ones
20	1
10	1
10	1
10	1
10	1

Progression of skills	Key representations
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**Multiply a 2-digit number by a 1-digit number - with exchange**

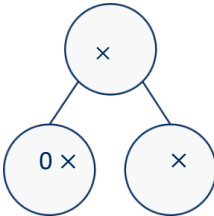
Children apply their understanding of partitioning to represent and solve calculations using the expanded method.







... tens multiplied by ... is equal to ... tens.  
 ... ones multiplied by ... is equal to ... ones.

Tens	Ones
	
	
	
	
	

$20 \times 4 = 80$   
 $4 \times 4 = 16$

$24 \times 4 = 96$

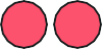



Tens	Ones
	
	
	


**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.

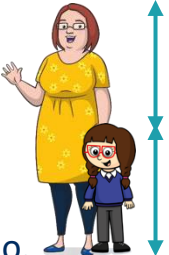
... is ... times the size of ...  
 ... is ... times the length/height of ...



4 cm



16 cm



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 ...  $\times$  ... possibilities altogether.



	hats	scarves
blue		 
orange		 
purple		 

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  $12 \times 12$
- 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  $12 \times 12$**

Encourage daily counting in multiples both forwards and back. Encourage children to notice links between related times-tables.

... groups of ... =  
 ... times ... is equal to ...  
 ...  $\times$  ... =

... groups of ... =  
 ... times ... is equal to ...  
 ...  $\times$  ... =

?				
11	11	11	11	11


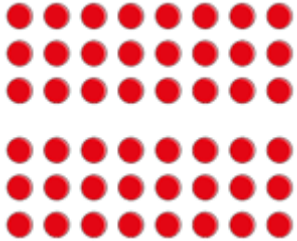
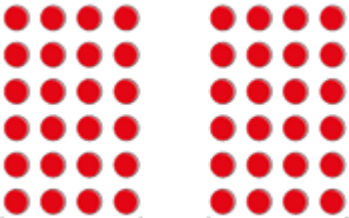
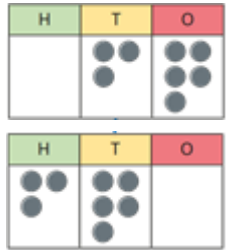
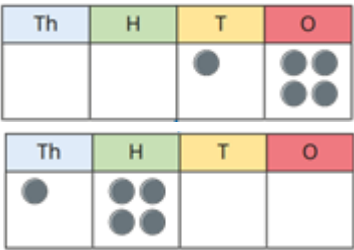
1	2	3	4	5	6	7	8	9	10
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41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

**Multiply by 1 and 0**

Any number multiplied by 1 is equal to ...  
 Any number multiplied by 0 is equal to ...

...  $\times$  ... = ...

$1 \times 1 = 1$	$1 \times 0 = 0$
$2 \times 1 = 2$	$2 \times 0 = 0$
$3 \times 1 = 3$	$3 \times 0 = 0$
$4 \times 1 = 4$	$4 \times 0 = 0$




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

Progression of skills	Key representations
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**Related facts**

Use knowledge of multiplying by 10 and 100 to scale times-table facts.







... × ... ones is equal to ... ones  
 so ... × ... tens is equal to ... tens  
 and ... × ... hundreds is equal to ... hundreds.

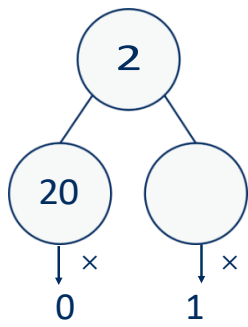
			$3 \times 7 = 21$	$7 \times 3 = 21$
			$3 \times 70 = 210$	$7 \times 30 = 210$
			$3 \times 700 = 2,100$	$7 \times 300 = 2,100$

**Mental strategies**

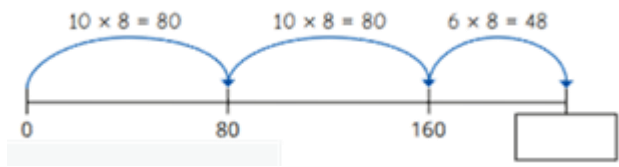
Partition 2 or 3-digit numbers to multiply using informal methods.

... tens multiplied by ... is equal to ... tens.  
 ...ones multiplied by ... is equal to ... ones.

Tens	Ones
	
	
	



$3 \times 26 = 60 + 18 = 78$



$26 \times 8 = 80 + 80 + 48 = 208$

**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 ...

The diagrams illustrate multiplication methods. On the left, an expanded form shows 30 (three tens blocks) multiplied by 5 (five ones blocks). In the middle, two grid-in multiplication problems are shown:  $4 \times 5 = 20$  and  $30 \times 5 = 150$ . On the right, a place value chart (H, T, O) shows the multiplication  $34 \times 5 = 170$  with arrows indicating the carrying process from ones to tens and then to hundreds.

**Scaling**

Children focus on multiplication as scaling ( ... times the size).

... is ... times the size of ...

A red box contains the number 7. Below it is a row of six yellow boxes, each containing the number 7.

A computer mouse costs £7  
 A keyboard costs 6 times as much.

A red box contains the number 6. Below it is a row of seven yellow boxes, each containing the number 6.

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 ...  $\times$  ... possibilities altogether.

A pizza company offers a choice of 5 toppings and 3 bases.

$5 \times 3 = 15$

	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 (<sup>2</sup>) and cubed (<sup>3</sup>)
- Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers.
- Multiply numbers mentally drawing upon known facts.
- Multiply whole numbers and those involving decimals by 10, 100 and 1000
- Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.

**Progression of skills**

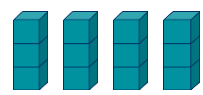
**Key representations**

**Multiples and factors**

Encourage children to notice patterns and make links with known facts.

... is a multiple of ... because

... × ... = ...



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

... is a factor of ... because

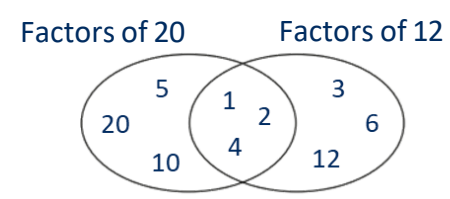
... × ... = ...

●●●●●●●● 1 × 8

●●●● 2 × 4


1, 2, 4 and 8 are factors of 8

The common factors of ... and ... are ...



**Square and cube numbers**

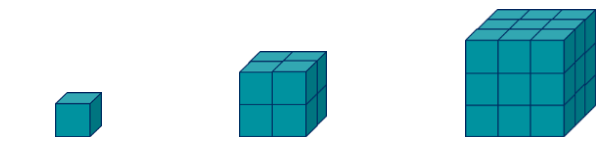
... squared means ... × ...



1 × 1    2 × 2    3 × 3    4 × 4

1<sup>2</sup> = 1    2<sup>2</sup> = 4    3<sup>2</sup> = 9    4<sup>2</sup> = 16

... cubed means ... × ... × ...



1 × 1 × 1    2 × 2 × 2    3 × 3 × 3

1<sup>3</sup> = 1    2<sup>3</sup> = 8    3<sup>3</sup> = 27

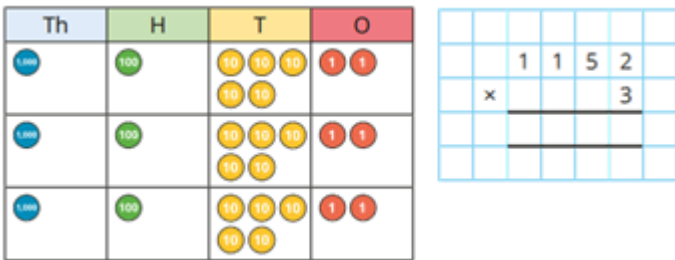
**Progression of skills**

**Key representations**

**Multiply numbers up to 4 digits by a 1-digit number**

This builds on the short multiplication method introduced in Y4

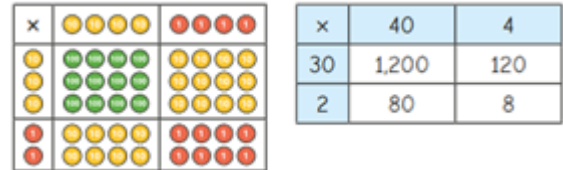
To multiply a 4-digit number by ... , I multiply the ones by ... , the tens by ... , the hundreds by ... and the thousands by ...



**Multiply numbers up to 4 digits by a 2-digit number**

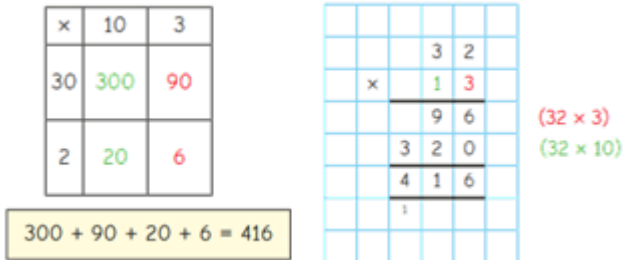
Numbers are first partitioned using an area model then long multiplication is introduced for the first time.

I can partition ... into ... and ...



$32 \times 44 = 1,200 + 80 + 120 + 8$   
 $32 \times 44 = 1,408$

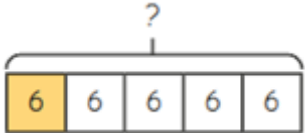
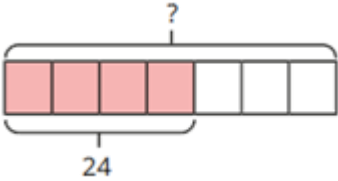
First, I multiply by the ... Then I multiply by the ...



$300 + 90 + 20 + 6 = 416$

Progression of skills	Key representations																										
<p><b>Multiply by 10, 100 and 1,000</b></p> <p>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.</p>	<p>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 ...</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px; background-color: #d9ead3;">HTh</td> <td style="width: 20px; height: 20px; background-color: #d9ead3;">TTh</td> <td style="width: 20px; height: 20px; background-color: #d9ead3;">Th</td> <td style="width: 20px; height: 20px; background-color: #d9ead3;">H</td> <td style="width: 20px; height: 20px; background-color: #d9ead3;">T</td> <td style="width: 20px; height: 20px; background-color: #d9ead3;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>● ●</td> <td>● ● ●</td> <td>● ● ● ●</td> </tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px; height: 20px; background-color: #d9ead3;">Th</td> <td style="width: 20px; height: 20px; background-color: #d9ead3;">H</td> <td style="width: 20px; height: 20px; background-color: #d9ead3;">T</td> <td style="width: 20px; height: 20px; background-color: #d9ead3;">●</td> <td style="width: 20px; height: 20px; background-color: #d9ead3;">Tth</td> <td style="width: 20px; height: 20px; background-color: #d9ead3;">Hth</td> </tr> <tr> <td></td> <td></td> <td></td> <td>● ● ●</td> <td>● ● ● ●</td> <td>● ● ● ●</td> </tr> </table> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: left;"> <p><math>234 \times 10 = 2,340</math></p> <p><math>234 \times 100 = 23,400</math></p> <p><math>234 \times 1,000 = 234,000</math></p> </div> <div style="text-align: left;"> <p><math>2.34 \times 10 = 23.4</math></p> <p><math>2.34 \times 100 = 234</math></p> <p><math>2.34 \times 1,000 = 2,340</math></p> </div> </div>		HTh	TTh	Th	H	T						● ●	● ● ●	● ● ● ●	Th	H	T	●	Tth	Hth				● ● ●	● ● ● ●	● ● ● ●
	HTh	TTh	Th	H	T																						
				● ●	● ● ●	● ● ● ●																					
Th	H	T	●	Tth	Hth																						
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<p><b>Mental strategies</b></p> <p>Children continue to use efficient mental strategies such as partitioning and knowledge of factor pairs and related facts to multiply.</p>	<p>The most efficient strategy to calculate ... <math>\times</math> ... is ... To calculate ... <math>\times</math> 12, I can do ... <math>\times</math> ... <math>\times</math> ...</p> <p>For example: <math>121 \times 12</math></p> <p>I could calculate <math>100 \times 12</math> plus <math>20 \times 12</math> plus <math>1 \times 12</math></p> <p>I could calculate <math>121 \times 10</math> plus <math>121 \times 2</math></p> <p>I could calculate <math>121 \times 6 \times 2</math></p> <p>I could calculate <math>121 \times 4 \times 3</math></p>																										



Progression of skills	Key representations	
<p><b>Find the whole</b></p> <p>Children multiply to find the whole from a given part.</p>	<p>If <math>\frac{1}{\square}</math> is ... , then the whole is ... <math>\times</math> ...</p> <p><math>\frac{1}{\square}</math> of ___ = 6</p>  <p><math>5 \times 6 = 30</math></p> <p><math>\frac{1}{\square}</math> of <b>30</b> = 6</p>	<p>If <math>\frac{\square}{\square}</math> is ... , then <math>\frac{1}{\square}</math> is ... and the whole is ... <math>\times</math> ...</p> <p><math>\frac{\square}{7}</math> of ___ = 24</p>  <p><math>\frac{1}{7} = 24 \div 4 = 6</math></p> <p><math>7 \times 6 = 42</math></p> <p><math>\frac{\square}{7}</math> of <b>42</b> = 24</p>

**Year 6**

- Identify common factors and common multiples.
- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.
- Multiply numbers by 10, 100 and 1,000
- Multiply one-digit numbers with up to two decimal places by whole numbers.
- Use their knowledge of the order of operations to carry out calculations involving the 4 operations.
- Multiply simple pairs of proper fractions, writing the answer in its simplest form.
- Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.
- Solve problems involving the calculation of percentages.

**Progression of skills**

**Key representations**

**Multiply numbers up to 4 digits by a 2-digit number**

To multiply by a 2-digit number, first multiply by the ones, then multiply by the tens and then find the total.

		1	2	0	7		
	×			3	6		
				+			
				7	2	4	2
				3	6	2	1
				4	3	4	5
				1			

(1,207 × 6)  
(1,207 × 30)

**Multiply by 10, 100 and 1,000**

Some children may over-generalise that multiplying by a power of 10 always results in adding zeros.

To multiply by 10/100/1,000, I move all the digits ... places to the left.  
... is 10/100/1,000 times the size of ...

M	HTh	TTh	Th	H	T	O	Th	H	T	O	Tth	Hth	Thth
				●●	●●	●●				●●	●●	●●	●●

$234 \times 10 = 2,340$   
 $234 \times 100 = 23,400$   
 $234 \times 1,000 = 234,000$

$0.234 \times 10 = 2.34$   
 $0.234 \times 100 = 23.4$   
 $0.234 \times 1,000 = 234$

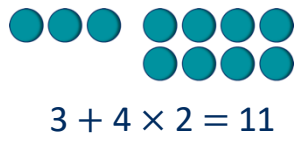
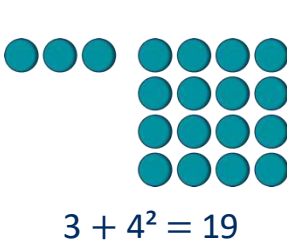
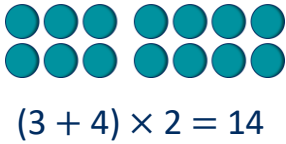
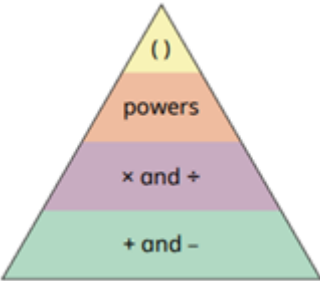
**Progression of skills**

**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 ...

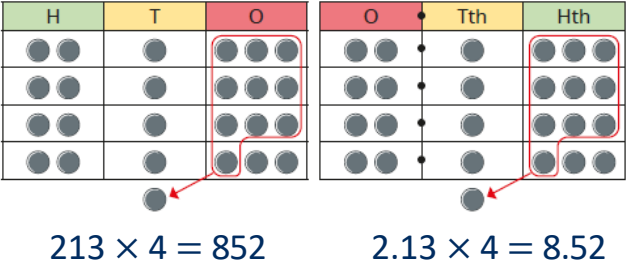
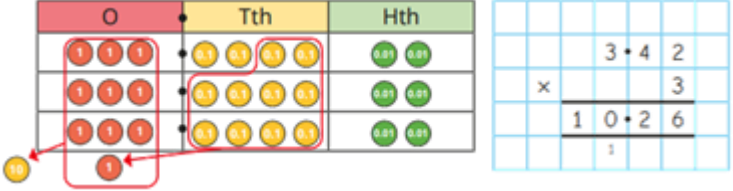
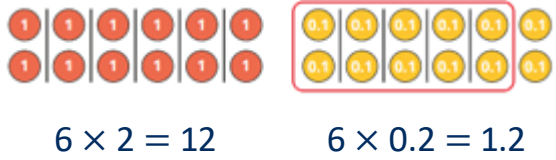


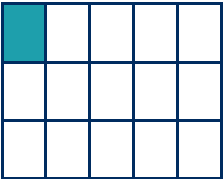
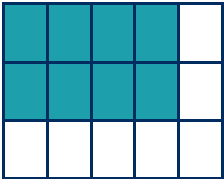
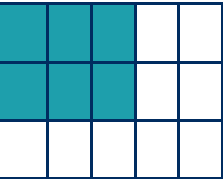
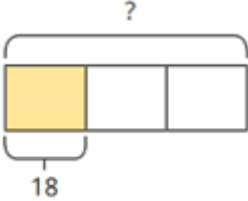
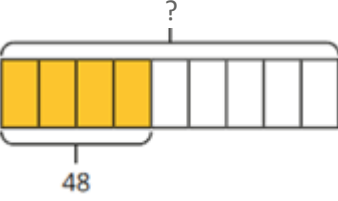
**Multiply decimals by integers**

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 ... x ... = ..., so I also know that ... x ... = ...

I need to exchange 10 ... for 1 ...



Progression of skills	Key representations	
<p><b>Multiply fractions by fractions</b></p> <p>Encourage children to give answers in their simplest form.</p>	<p>When multiplying a pair of fractions, I need to multiply the numerator and multiply the denominator.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <math display="block">\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}</math> </div> <div style="text-align: center;">  <math display="block">\frac{2}{3} \times \frac{1}{5} = \frac{2}{15}</math> </div> <div style="text-align: center;">  <math display="block">\frac{2}{3} \times \frac{2}{5} = \frac{4}{15}</math> </div> </div>	
<p><b>Find the whole</b></p> <p>Children multiply to find the whole from a given part.</p>	<p>If <math>\frac{1}{\square}</math> is ... , then the whole is ... <math>\times</math> ...</p> <p><math>\frac{1}{\square}</math> of ___ = 18</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <math>18 \times 3 = 54</math>  <math>\frac{1}{\square}</math> of <b>54</b> = 18         </div> </div>	<p>If <math>\frac{\square}{\square}</math> is ... , then <math>\frac{1}{\square}</math> is ... and the whole is ... <math>\times</math> ...</p> <p>— of ___ = 48</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <math>\frac{1}{\square} = 48 \div 4 = 12</math>  <math>9 \times 12 = 108</math>            — of <b>108</b> = 48         </div> </div>

Progression of skills	Key representations	
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**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%

0% of ... = ... ÷ 2  
2 % 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

Adults	Children
1	6
2	12
3	18

0	1	2					
0	12	1					
Adults							
Children							

# Progression of skills – Division

Year group	Skill
Year 1	<ul style="list-style-type: none"><li>• Make equal groups – grouping</li><li>• Make equal groups – sharing</li><li>• Find a half</li><li>• Find a quarter</li></ul>
Year 2	<ul style="list-style-type: none"><li>• Divide by 2</li><li>• Divide by 10</li><li>• Divide by 5</li><li>• Missing numbers</li><li>• Unit fractions</li><li>• Non-unit fractions</li></ul>
Year 3	<ul style="list-style-type: none"><li>• Divide by 3</li><li>• Divide by 4</li><li>• Divide by 8</li><li>• Related facts</li></ul>

	<ul style="list-style-type: none"> <li>• Divide a 2-digit number by a 1-digit number - no exchange</li> <li>• Divide a 2-digit number by a 1-digit number - with remainders</li> <li>• Unit fractions of a set of objects</li> <li>• Non-unit fractions of a set of objects</li> </ul>
Year 4	<ul style="list-style-type: none"> <li>• Division facts to <math>12 \times 12</math></li> <li>• Divide a number by 1 and itself</li> <li>• Related facts</li> <li>• Divide a 2 or 3-digit number by a 1-digit number</li> <li>• Divide by 10 and 100</li> </ul>
Year 5	<ul style="list-style-type: none"> <li>• Mental strategies</li> <li>• Divide numbers up to 4 digits by a 1-digit number</li> <li>• Divide by 10, 100 and 1,000</li> <li>• Fraction of an amount</li> </ul>

## 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

**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.

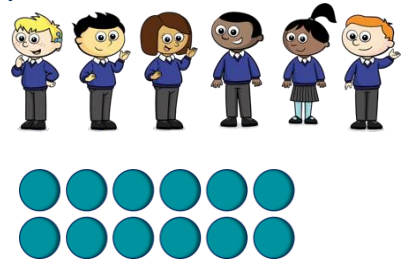
**Progression of skills**

**Key representations**

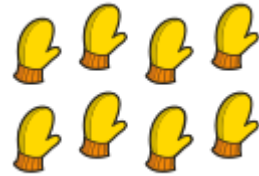
**Make equal groups - grouping**

Encourage children to physically move objects into equal groups. They can also circle equal groups when using pictures.

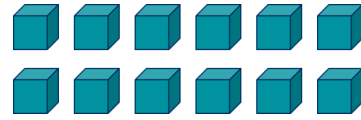
There are ... altogether.  
How many groups of ... can you make?



Circle groups of 2  
There are ... groups of 2



Take ... cubes.  
Make equal groups.

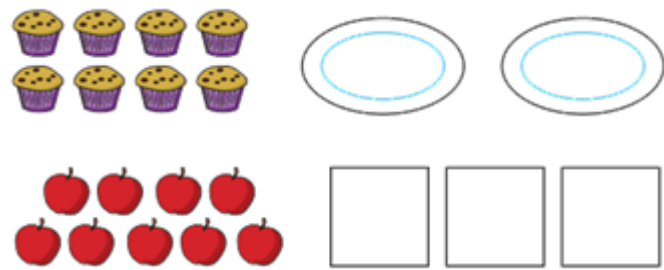


There are ... groups of ...

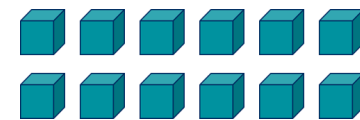
**Make equal groups – sharing**

Encourage children to check that the objects have been shared fairly and each group is the same.

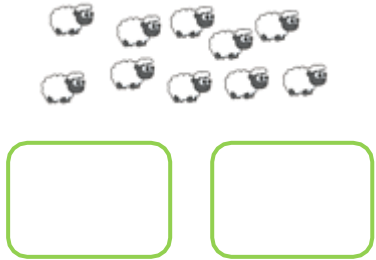
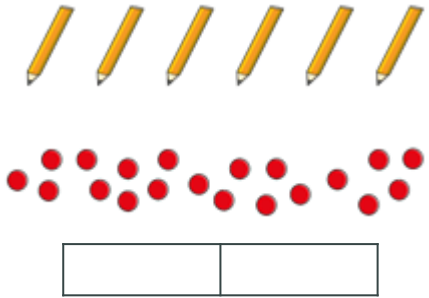
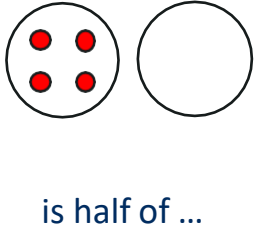
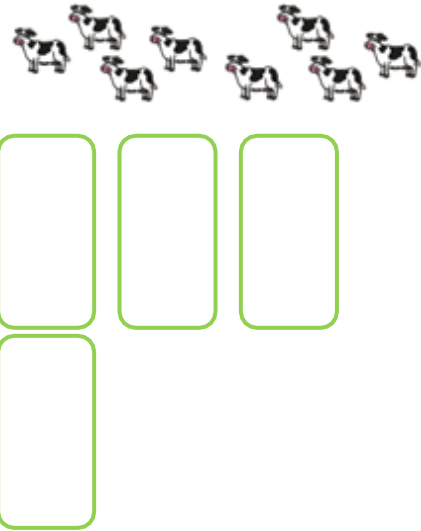
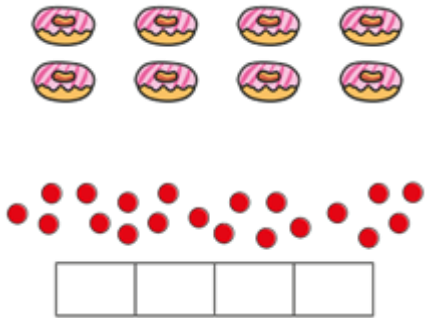
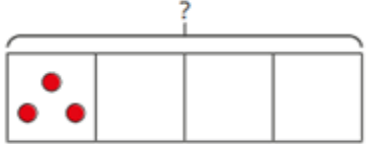
... have been shared equally between...  
There are ... on/in each ...

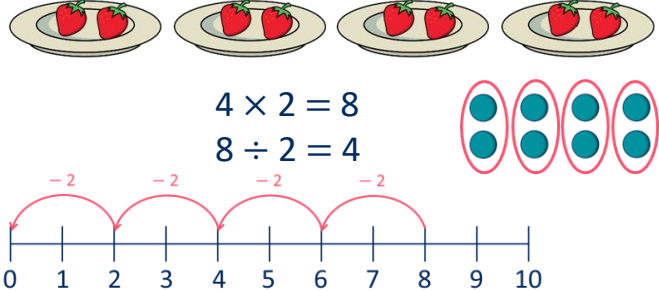
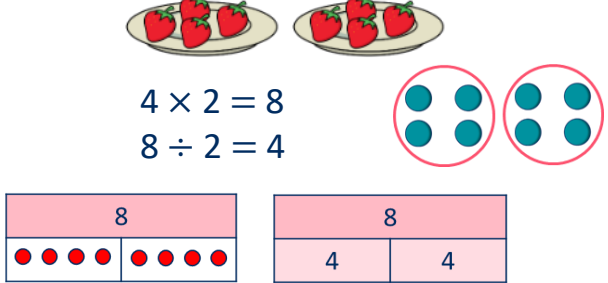
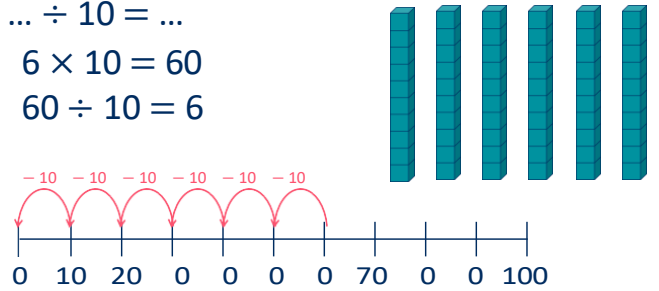
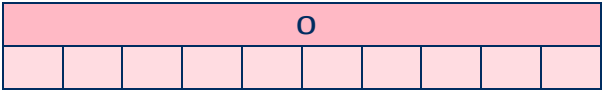


Take ... cubes.  
Share them between ...



12 shared between ... is ...

Progression of skills	Key representations		
<p><b>Find a half</b></p> <p>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.</p>	<p>To find half, I need to share into 2 equal groups.</p>  <p>There are ... in each group.</p>	<p>Half of ... is ...</p> 	<p>If ... is half, what is the whole?</p> 
<p><b>Find a quarter</b></p> <p>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.</p>	<p>To find a quarter, I need to share into 4 equal groups.</p>  <p>There are ... in each group.</p>	<p>A quarter of ... is ...</p> 	<p>If ... is one quarter, what is the whole?</p>  <p>is one quarter of ...</p>

Year 2	<ul style="list-style-type: none"> <li>Recall and use division facts for the 2, 5 and 10 multiplication tables.</li> <li>Calculate mathematical statements for division within the multiplication tables and write them using the division (<math>\div</math>) and equals (<math>=</math>) signs.</li> <li>Recognise, find, name and write fractions <math>\frac{1}{2}</math>, <math>\frac{1}{5}</math>, <math>\frac{2}{5}</math> and <math>\frac{1}{10}</math> of a quantity.</li> </ul>	
Progression of skills	Key representations	
<p><b>Divide by 2</b></p> <p>Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts and halving.</p>	<p>There are ... equal groups of 2</p> <p>... <math>\div 2 = \dots</math></p>  <p><math>4 \times 2 = 8</math>  <math>8 \div 2 = 4</math></p>	<p>... shared equally between 2 is ...</p> <p>Half of ... is ...</p> <p>... <math>\div 2 = \dots</math></p>  <p><math>4 \times 2 = 8</math>  <math>8 \div 2 = 4</math></p>
<p><b>Divide by 10</b></p> <p>Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.</p>	<p>There are ... equal groups of 10</p> <p>... <math>\div 10 = \dots</math></p> <p><math>6 \times 10 = 60</math>  <math>60 \div 10 = 6</math></p> 	<p>... shared equally between 10 is ...</p> <p>... <math>\div 10 = \dots</math></p> <p><math>6 \times 10 = 60</math>  <math>60 \div 10 = 6</math></p> 

**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  
 $\dots \div 5 = \dots$

$6 \times 5 = 30$   
 $30 \div 5 = 6$

... shared equally between is ...  
 $\dots \div 5 = \dots$

$6 \times 5 = 30$   
 $30 \div 5 = 6$

**Missing numbers**

Bar models are useful to show the link between multiplication and division.

... divided by 2/ /10 is equal to ...

?	
10	10

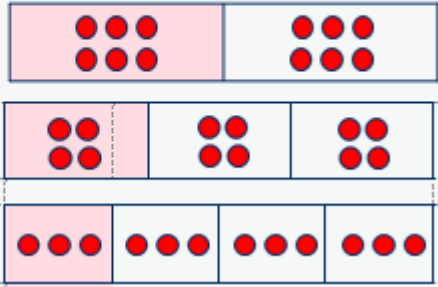

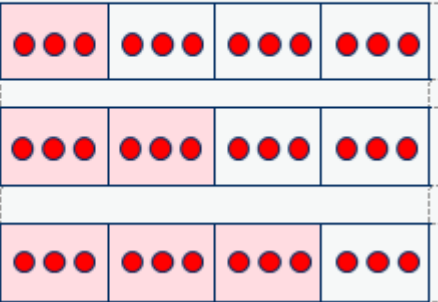
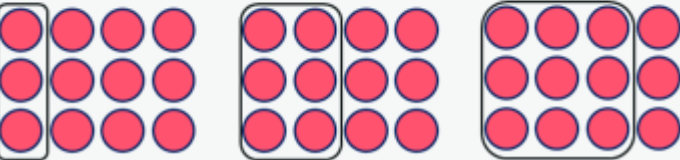
$\square \div 2 = 10$

?				
10	10	10	10	10

$\square \div 5 = 10$

?									
10	10	10	10	10	10	10	10	10	10

$\square \div 10 = 10$

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

**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.

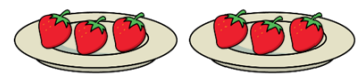
**Progression of skills**

**Key representations**

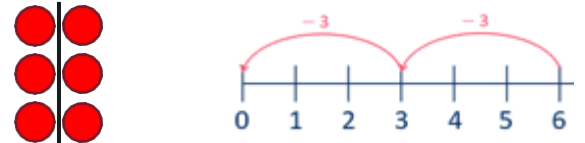
**Divide by 3**

Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.

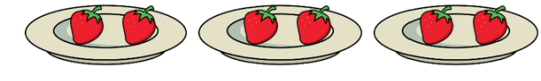
There are ... groups of in ...  
 $\dots \div 3 =$



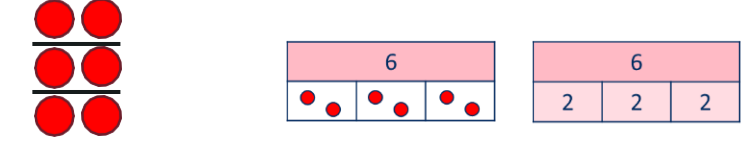
$2 \times 3 = 6$   
 $6 \div 3 = 2$



... has been shared equally into equal groups.  
 $\dots \div 3 =$




$2 \times 3 = 6$   
 $6 \div 3 = 2$



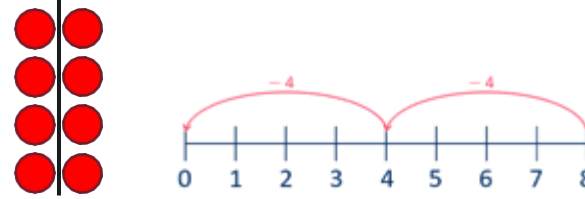
**Divide by 4**

Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.


There are ... groups of in ...  
 $\dots \div 4 =$



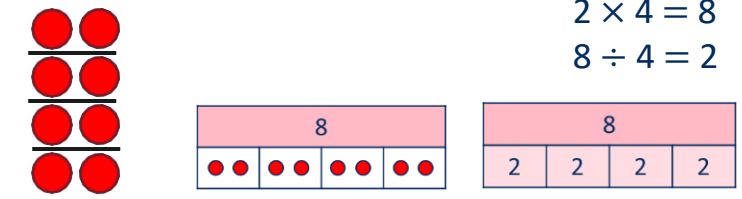
$2 \times 4 = 8$   
 $8 \div 4 = 2$

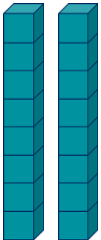
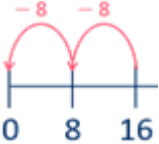
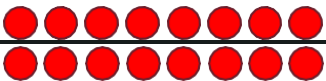

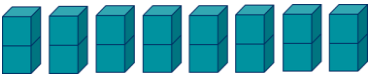
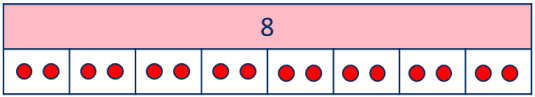

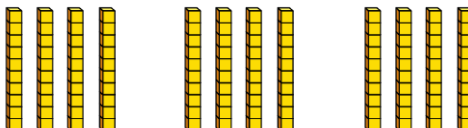


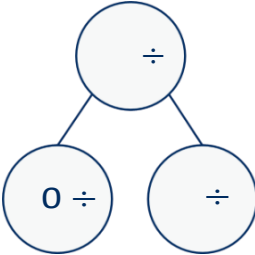


... has been shared equally into equal groups.  
 $\dots \div 4 =$



$2 \times 4 = 8$   
 $8 \div 4 = 2$



Progression of skills	Key representations																	
<p><b>Divide by 8</b></p> <p>Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.</p>	<p>There are ... groups of in ...</p> <p><math>\dots \div 8 =</math></p>  <p><math>2 \times 8 = 16</math> <math>16 \div 8 = 2</math></p>  	<p>... has been shared equally into equal groups.</p> <p><math>\dots \div 8 =</math></p>    <p><math>2 \times 8 = 16</math> <math>16 \div 8 = 2</math></p>																
<p><b>Related facts</b></p> <p>Link to known times-table facts.</p>	<p>... <math>\div</math> ... is equal to ..., so ... tens <math>\div</math> ... is equal to ... tens.</p>     <p><math>12 \div 3 = 4</math> <math>120 \div 3 = 40</math></p>																	
<p><b>Divide a 2-digit number by a 1-digit number - no exchange</b></p> <p>Partition into tens and ones to divide and then recombine.</p>	<p>... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones.</p> <table border="1" data-bbox="645 1007 981 1246"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> <p><math>60 \div 2 = 30</math> <math>4 \div 2 = 2</math> <math>64 \div 2 = 32</math></p>  <table border="1" data-bbox="1626 1007 1973 1246"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>		Tens	Ones					Tens	Ones								
Tens	Ones																	
Tens	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.

Tens	Ones

$80 \div 4 = 20$   
 $16 \div 4 = 4$   
 $96 \div 4 = 24$

There are ... groups of ...  
 There are ... remaining.

$31 \div 4 = 7 \text{ r}3$

$94 \div 4 = 23 \text{ r}2$

Tens	Ones
10 10	
10 10	
10 10	
10 10	

Tens	Ones
10 10	1 1 1
10 10	1 1 1
10 10	1 1 1
10 10	1 1 1

**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.

$\frac{1}{3}$  of 12 apples is 3 apples.

ne ... of ... is ...

$\frac{1}{3}$  of 12 is 3

$\frac{1}{3}$  of 36 is 12

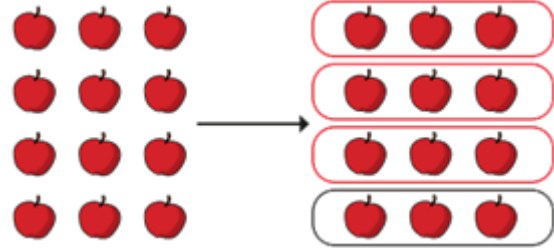
**Progression of skills**

**Key representations**

**Non-unit fractions of a set of objects**

Bar models are a useful representation and show the links with division and multiplication.

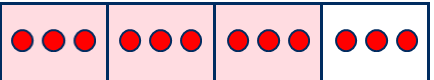
The whole is divided into ... equal parts.  
Each part is  $\frac{1}{\square}$  of the whole.



— of 12 apples is 9 apples.

$\frac{1}{\square}$  of ... is ..., so  $\frac{\square}{\square}$  of ... is ...

— of 12 is 9



$\frac{2}{\square}$  of 36 is 24



**Year 4**

- Recall division facts for multiplication tables up to  $12 \times 12$
- 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  $12 \times 12$**

Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.

There are ... groups of ... in ...  
 $\dots \div \dots =$

$2 \times 6 = 12$   
 $12 \div 6 = 2$

... has been shared equally into ... equal groups.  
 $\dots \div \dots =$

$2 \times 6 = 12$   
 $12 \div 6 = 2$

**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
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**Related facts**

Link to known times-table facts.

... ÷ ... is equal to ...  
 so ... tens ÷ ... is equal to ... tens  
 and ... hundreds ÷ ... is equal to ... hundreds.







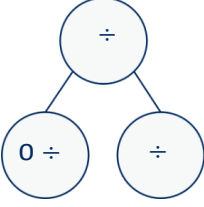
$21 \div 7 = 3$   
 $210 \div 7 = 30$   
 $2,100 \div 7 = 300$

$21 \div 3 = 7$   
 $210 \div 3 = 70$   
 $2,100 \div 3 = 700$

**Divide a 2 or 3-digit number by a 1-digit number**

Progress from divisions with no exchange, to divisions with exchange and then divisions with remainders.

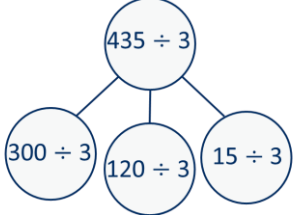
I can partition ... into ... tens and ... ones.



$80 \div 4 = 20$   
 $4 \div 4 = 1$   
 $84 \div 4 = 21$

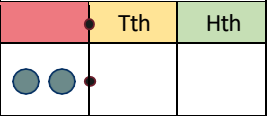
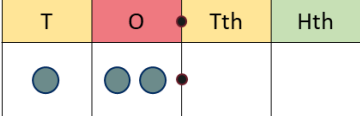
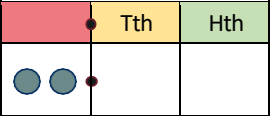
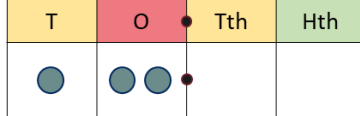
Tens	Ones
10 10	1
10 10	1
10 10	1
10 10	1

I cannot share the hundreds/tens equally, so I need to exchange 1 ... for 10 ...



$300 \div 3 = 100$   
 $120 \div 3 = 40$   
 $15 \div 3 = 5$   
 $435 \div 3 = 145$

Hundreds	Tens	Ones
100	10 10 10 10	1 1 1 1 1
100	10 10 10 10	1 1 1 1 1
100	10 10 10 10	1 1 1 1 1
100	10 10 10 10	1 1 1 1 1

Progression of skills	Key representations	
<p><b>Divide by 10 and 100</b></p> <p>Encourage children to notice that dividing by 100 is the same as dividing by 10 twice.</p>	<p>When I divide by 10, the digits move 1 place value column to the right. ... is one-tenth the size of ...</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p><math>2 \div 10 = 0.2</math></p> </div> <div style="text-align: center;">  <p><math>12 \div 10 = 1.2</math></p> </div> </div>	<p>When I divide by 100, the digits move 2 place value columns to the right. ... is one-hundredth the size of ...</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p><math>2 \div 100 = 0.02</math></p> </div> <div style="text-align: center;">  <p><math>12 \div 100 = 0.12</math></p> </div> </div>

**Year 5**

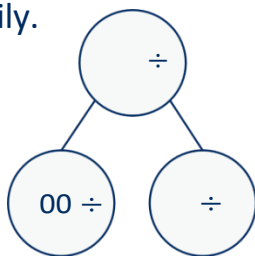
- Divide numbers mentally drawing upon known facts.
- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.
- Divide whole numbers and those involving decimals by 10, 100 and 1,000

**Progression of skills**

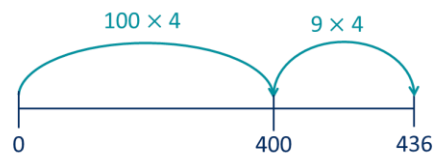
**Key representations**

**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																																																	
<p><b>Divide by 10, 100 and 1,000</b></p> <p>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.</p>	<p>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 ...</p> <table border="1" data-bbox="645 300 1070 392"> <tr><th>Th</th><th>H</th><th>T</th><th>O</th><th>Tth</th><th>Hth</th></tr> <tr><td></td><td>●</td><td>●●</td><td></td><td>●</td><td></td></tr> </table> <p data-bbox="1111 440 1330 472"><math>120 \div 10 = 12</math></p> <table border="1" data-bbox="645 408 1070 501"> <tr><th>Th</th><th>H</th><th>T</th><th>O</th><th>Tth</th><th>Hth</th></tr> <tr><td></td><td></td><td>●</td><td>●●</td><td>●</td><td></td></tr> </table> <p data-bbox="1111 549 1357 580"><math>120 \div 100 = 1.2</math></p> <table border="1" data-bbox="645 517 1070 609"> <tr><th>Th</th><th>H</th><th>T</th><th>O</th><th>Tth</th><th>Hth</th></tr> <tr><td></td><td></td><td></td><td>●</td><td>●●</td><td>●</td></tr> </table> <p data-bbox="1111 657 1402 689"><math>120 \div 1,000 = 0.12</math></p> <table border="1" data-bbox="645 625 1070 718"> <tr><th>Th</th><th>H</th><th>T</th><th>O</th><th>Tth</th><th>Hth</th></tr> <tr><td></td><td></td><td></td><td></td><td>●</td><td>●●</td></tr> </table>		Th	H	T	O	Tth	Hth		●	●●		●		Th	H	T	O	Tth	Hth			●	●●	●		Th	H	T	O	Tth	Hth				●	●●	●	Th	H	T	O	Tth	Hth					●	●●
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<p><b>Fraction of an amount</b></p> <p>Bar models support children to understand that to find a fraction of an amount, we divide by the denominator and multiply by the numerator.</p>	<p>To find <math>\frac{\square}{\square}</math> of ... , I need to divide by ... and multiply by ...</p> <table border="1" data-bbox="645 887 1025 963"> <tr><td>●●</td><td>●●</td><td>●●</td><td>●●</td><td>●●</td></tr> <tr><td>●●</td><td>●●</td><td>●●</td><td>●●</td><td>●●</td></tr> </table> <table border="1" data-bbox="1055 887 1379 963"> <tr><td>10 10</td><td>10 10</td><td>10 10</td><td>10 10</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>1</td></tr> </table> <p data-bbox="645 999 806 1062"><math>\frac{1}{-}</math> of 20 =</p> <p data-bbox="645 1134 806 1166">- of 20 =</p> <p data-bbox="1055 999 1216 1062"><math>\frac{1}{-}</math> of =</p> <p data-bbox="1055 1134 1216 1166">- of =</p>	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	10 10	10 10	10 10	10 10	1	1	1	1	<p>If <math>\frac{1}{\square}</math> is ... , then the whole is ... <math>\times</math> ...</p> <table border="1" data-bbox="1413 823 1715 963"> <tr><td colspan="5" style="text-align: center;">?</td></tr> <tr><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td></tr> </table> <p data-bbox="1816 871 2007 935"><math>\frac{1}{-}</math> of ___ = 6</p> <table border="1" data-bbox="1413 999 1760 1174"> <tr><td colspan="5" style="text-align: center;">?</td></tr> <tr><td style="background-color: #f8d7da;">■</td><td style="background-color: #f8d7da;">■</td><td style="background-color: #f8d7da;">■</td><td style="background-color: #f8d7da;">■</td><td style="background-color: #f8d7da;">■</td></tr> <tr><td colspan="5" style="text-align: center;">24</td></tr> </table> <p data-bbox="1805 1070 2007 1134">7 of ___ = 24</p>	?					6	6	6	6	6	?					■	■	■	■	■	24									
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**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,  $\frac{1}{2} \div 2 = \frac{1}{4}$  ]
- Solve problems involving the calculation of percentages.

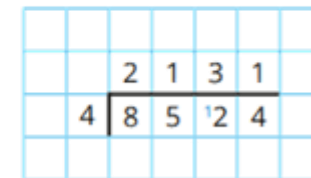
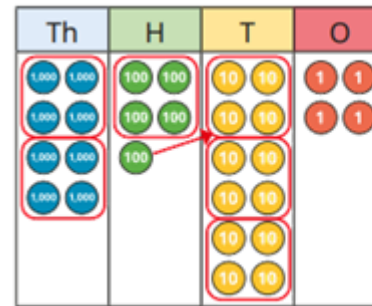
**Progression of skills**


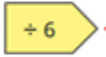
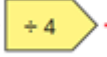
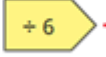
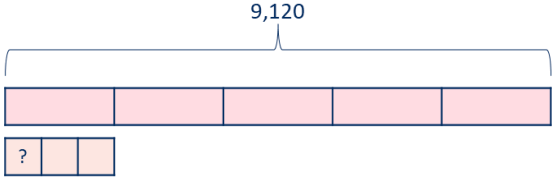
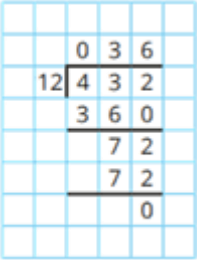
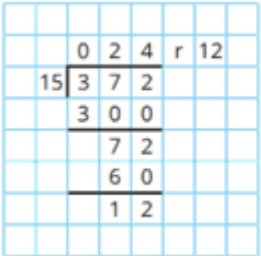
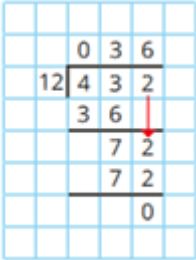
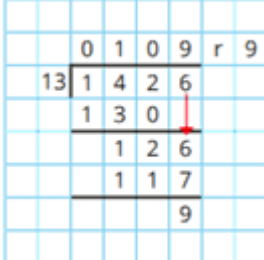
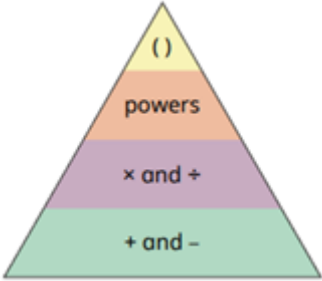
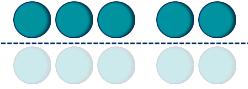

**Key representations**

**Short division**

Encourage children to interpret remainders in context, for example knowing that “ remainder 1” could mean 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 ...



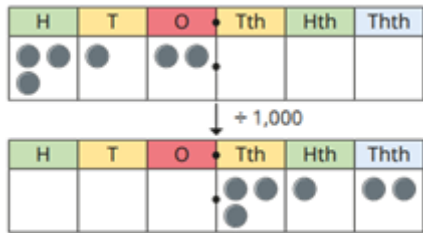
Progression of skills	Key representations	
<p><b>Mental strategies</b></p> <p>Include partitioning and number line strategies outlined in Y5 as well as division using factors.</p>	<p>To divide by ... , I can first divide by ... and then divide the answer by ...</p> <p><math>240 \div 60 = 240 \div 10 \div 6</math></p> <p>240 →  → <input type="text"/> →  → <input type="text"/></p> <p><math>480 \div 24 = 480 \div 4 \div 6</math></p> <p>480 →  → <input type="text"/> →  → <input type="text"/></p> <p><math>9,120 \div 15 = 9,120 \div 5 \div 3</math></p> 	
<p><b>Long division</b></p> <p>The long division method is introduced for the first time. Two alternative methods are shown.</p>	<p><b>Method 1</b></p>  <p><math>(12 \times 30)</math></p>  <p><math>(15 \times 20)</math></p> <p><math>(15 \times 4)</math></p>	<p><b>Method 2</b></p>  
<p><b>Order of operations</b></p> <p>Calculations in brackets should be done first, then powers. Multiplication and division should be performed before addition and subtraction.</p>	<p>... has greater priority than ..., so the first part of the calculation I need to do is ...</p>  <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><math>(6 + 4) \div 2 = 5</math></p> </div> <div style="text-align: center;">  <p><math>6 + 4 \div 2 = 8</math></p> </div> </div>	

**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.



$312 \div 10 = 31.2$   
 $312 \div 100 = 3.12$   
 $312 \div 1,000 = 0.312$

$906 \div 10 = 90.6$   
 $906 \div 100 = 9.06$   
 $906 \div 1,000 = 0.906$

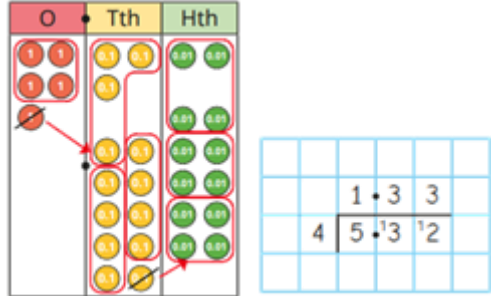
**Divide decimals by integers**

This is the first time children divide decimals by numbers other than 10, 100 or 1,000

I know that ...  $\div$  ... = ..., so I also know that ...  $\div$  ... = ...

$39 \div 3 = 13$        $3.9 \div 3 = 1.3$        $0.39 \div 3 = 0.13$

I need to exchange 1 ... for 10 ...



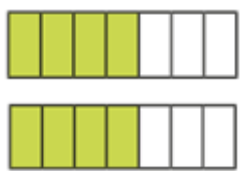
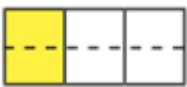

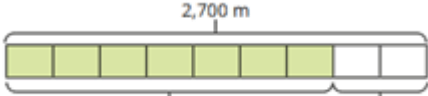

**Decimal and fraction equivalents**



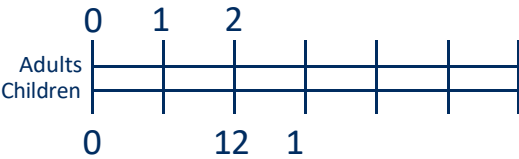
The fraction ... is equivalent to the decimal ...

$\frac{1}{10} = 0.2$        $\frac{2}{10} = 0.4$        $\frac{6}{10} = 0.6$

$\frac{\square}{\square}$  is equal to  $\frac{\square}{100}$

$\frac{3}{4} \xrightarrow{\times 25} \frac{75}{100} = 0.75$

Progression of skills	Key representations		
<p><b>Divide a fraction by an integer</b></p> <p>This is the first time children divide fractions by an integer.</p>	<p>... ones divided by 2 is ... ones so ... sevenths divided by 2 is ... sevenths.</p>  $\frac{4}{7} \div 2 = \frac{2}{7}$ $\frac{8}{7} \div 2 = \frac{4}{7}$	<p>I am dividing by ... , so I can split each part into ... equal parts.</p>  $\frac{1}{2} \div 2 = \frac{1}{4}$	<p>... is equivalent to ... so ... <math>\div</math> ... = ... <math>\div</math> ...</p>  $\frac{2}{4} = \frac{1}{2}$ <p>so <math>\frac{2}{4} \div 2 = \frac{1}{4} \div 2 = \frac{1}{8}</math></p>
<p><b>Fraction of an amount</b></p> <p>Children divide and multiply to find fractions of an amount. Bar models can still be used to support understanding where needed.</p>	<p>To find <math>\frac{1}{\square}</math> I divide by ...</p> $\frac{1}{2} \text{ of } \square = \square \div 2$ $\frac{1}{12} \text{ of } 36 = 36 \div 12$	<p>If <math>\frac{1}{\square}</math> is equal to ..., then <math>\frac{\square}{\square}</math> are equal to ...</p>  $\frac{7}{7} \text{ of } 2,700 = \frac{1}{7} \text{ of } 2,700 \times 7$	<p>If <math>\frac{\square}{\square}</math> is equal to ..., then the whole is equal to ...</p>  $\frac{\square}{\square} \text{ of } \square = 48$

Progression of skills	Key representations																																	
<p><b>Calculate percentages</b></p> <p>Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.</p>	<p>There are ... lots of ... % in 100%</p> <p>To find ... %, I need to divide by ...</p> <table border="1" data-bbox="638 287 1142 406"> <tr><td colspan="4">100%</td></tr> <tr><td colspan="2">50%</td><td colspan="2">50%</td></tr> <tr><td>25%</td><td>25%</td><td>25%</td><td>25%</td></tr> </table> <p>0% of ... = ... ÷ 2</p> <p>2 % of ... = ... ÷ 4</p>	100%				50%		50%		25%	25%	25%	25%	<p>... % is made up of ... %, and ... %</p> <table border="1" data-bbox="1209 279 1971 367"> <tr><td colspan="10">100%</td></tr> <tr><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td></tr> </table> <p>To find 30%, I can find 10% and then multiply it by 3</p> <p>To find 23%, I can use 10% × 2 and 1% × 3</p> <p>To find 99%, I can find 1%, then subtract from 100%</p>	100%										10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
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<p><b>Calculations involving ratio</b></p> <p>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.</p>	<p>For every ... , there are ...</p> <p>For every 6 children on a school trip, there is 1 adult.</p> <p>adults </p> <p>children </p> <table border="1" data-bbox="1563 691 1888 885"> <tr><td>Adults</td><td>Children</td></tr> <tr><td>1</td><td></td></tr> <tr><td>2</td><td>12</td></tr> <tr><td></td><td>1</td></tr> </table> <p>The ratio of children to adults is 6 : 1</p> 		Adults	Children	1		2	12		1																								
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