

# Worlingham CEVC Calculation Policy 2024-2025

Appendix: exemplars for calculation strategies within each year group.





*Worlingham*  
*CEVC*  
*Primary*  
*School*  
*Addition*

**Worlingham CEVC  
Primary School**

**ADDITION**

**EYFS**

**VOCABULARY:** add, more, and, make, sum, total, altogether equals, score, double, one more, two more, ten more..., how many more to make... ?, how

**Progression of skills/method:**

**Example/Representation (NOTE: Within EYFS, lots of different representations are used and adapted where necessary to meet the children's needs.)**

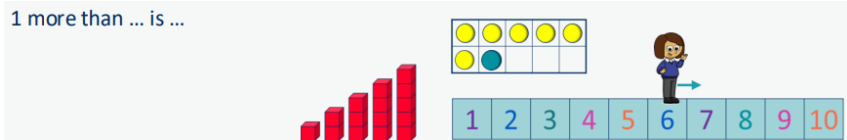
**Conceptually subitise to 5.**

(Notice the parts that make up the whole.)



**1 more.**

(Continue to link to stories, songs and rhymes.)



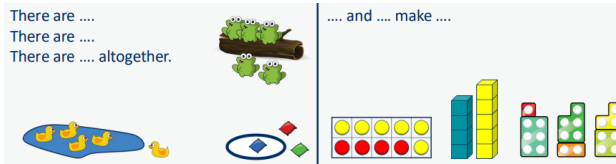
**Notice the composition of numbers within 10.**

(Link to stories, songs and rhymes.)



**Combine 2 groups**

(2 groups are combined to find the total.)



**Add more.**

(A quantity is increased.)



Using a range of practical resources and real-life contexts, pupils develop their understanding of the concept of addition through counting activities

How many dinosaurs are there?



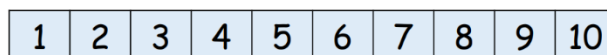
What about if I give you two more? How many are there now?

Children are introduced to the addition symbol (+) and the equals symbol (=) and use pictures/diagrams to represent the calculation

There are 2 birds. Another bird flies in. How many are there altogether?



Children are introduced to number tracks and use them to help think about more and less and will also use them to help develop their understanding of addition.



**MENTAL STRATEGIES:**

- Develop a mental image of the number system.
- Understand the value of a number to 10.
- Counting forwards and backwards.
- Recall the number bonds to 5 and begin to recall some of the number bonds to 10.
- Understand more and less.
- Subitising to 5.

**ADDITION**  
**YEAR 1**

**VOCABULARY:** number bonds, add, more, plus, make, sum, total, altogether, inverse double, near double, equals, is the same as (including equals sign), score, one more, two more... ten more, how many more to make...?, how many more is... than...?, how much more is...?

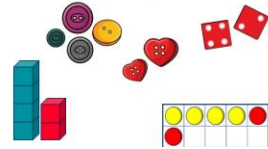
**Progression of skills/method:**

**Example/Representation:**

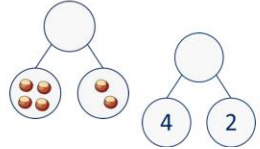
**Add together (aggregation)**

2 quantities are combined to find the total.

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



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



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

$$4 + 2 = 6$$

$$2 + 4 = 6$$

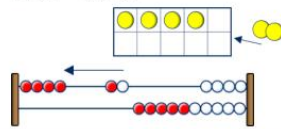
$$6 = 4 + 2$$

$$6 = 2 + 4$$

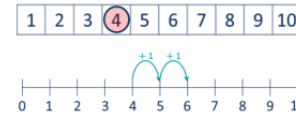
**Add more (augmentation)**

A quantity is increased.

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



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



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

$$4 + 2 = 6$$

$$2 + 4 = 6$$

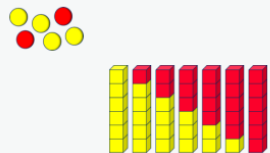
$$6 = 4 + 2$$

$$6 = 2 + 4$$

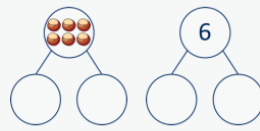
**Bonds within 10.**

Include bonds for each number within 10.

... is made of ... and ...  
... and ... make ...



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



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

$$6 + 0 = 6$$

$$5 + 1 = 6$$

$$4 + 2 = 6$$

$$3 + 3 = 6$$

$$2 + 4 = 6$$

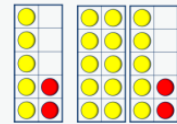
$$1 + 5 = 6$$

$$0 + 6 = 6$$

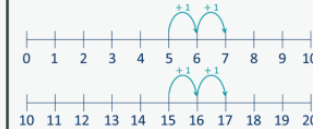
**Related facts within 20.**

Make links to known facts.

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



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



What patterns do you notice?

$$5 + 2 = 7$$

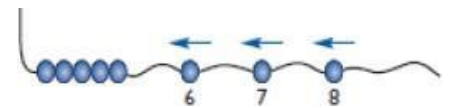
$$15 + 2 = 17$$

$$7 = 5 + 2$$

$$17 = 15 + 2$$

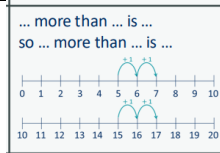
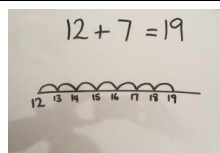
Children will be taught how to solve simple addition stories with the support of a 100 number square (Bead strings used to support addition).

$$11 + 7 = 18$$



Children are taught how to use a blank number line for addition and then encouraged to draw their own number line to help solve problems.

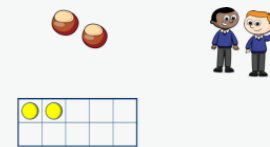
$$12 + 7 = 19$$



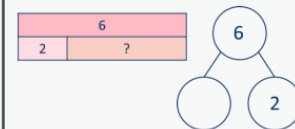
... more than ... is ...  
so ... more than ... is ...

**Missing numbers.**

How many more do you need to make ...?



If ... is the whole and ... is a part, the other part must be...



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

$$2 + \square = 6$$

$$6 = 2 + \square$$



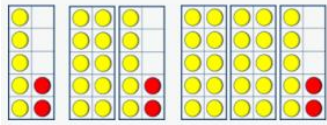
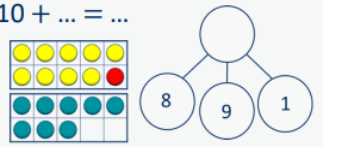
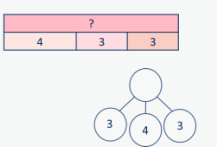
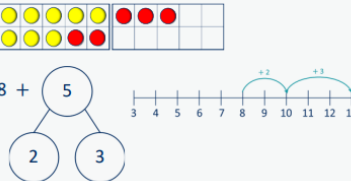
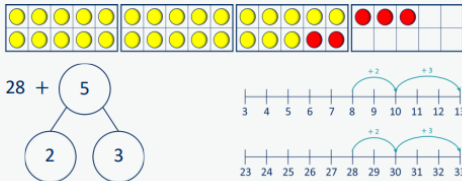
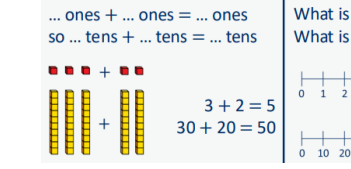
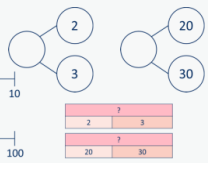
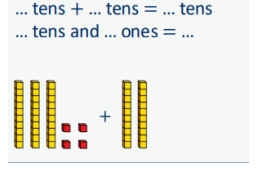

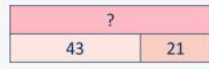
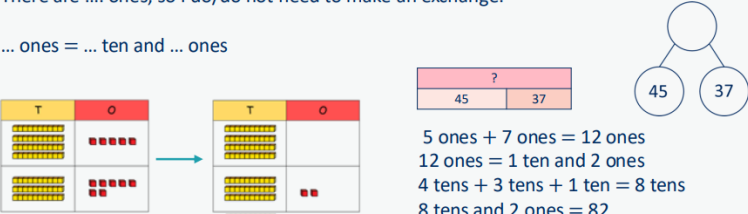
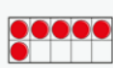
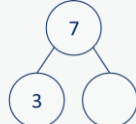
**MENTAL STRATEGIES**

- Know addition can be carried out in any order (commutative)
- Add 1-digit and 2-digit numbers to 20 including 0
- Number bonds to 20
- Doubles of numbers up to and including double 10
- Adding 10 to a single digit number
- Identify 1 more than a given number

**ADDITION**

**YEAR 2**

**KEY VOCABULARY: VOCABULARY:** add, addition, more, plus, make, sum, total, altogether, double, near double, one more, two more... ten more... one hundred more, how many more to make...?, how many more is... than...?, how much more is...?

Progression of skills	Example/Representation	
<p><b>Add ones to any number.</b> (Related facts)</p> <p>Make links to known facts.</p>	<p>I know that ... and ... = ... so ... and ... = ...</p>  <p>What do you notice? Can you continue the pattern?</p> <p><math>5 + 2 = 7</math> <math>15 + 2 = 17</math> <math>25 + 2 = 27...</math></p>	
<p><b>Add three 1-digit numbers.</b></p> <p>Prompt children to understand that addition can be done in any order (commutative) and to make links to known facts</p>	<p>... and ... are a bond to 10 <math>10 + ... = ...</math></p> 	<p>Double ... + ... = ...</p>  <p>What do you notice? Which addition is the easiest to calculate?</p> <p><math>8 + 9 + 1 =</math> <math>8 + 1 + 9 =</math> <math>9 + 1 + 8 =</math></p>
<p><b>Add across a 10.</b></p> <p>Partition the number being added to make a full ten.</p>	<p>... can be partitioned into ... and ...</p> 	<p>I add ... to get to ... then I add ...</p>  <p><math>8 + 5 = 13</math> <math>28 + 5 = 33</math></p>
<p><b>Add multiples of 10/ Add 10's to any number.</b></p> <p>Make links to known facts within 10.</p>	<p>... ones + ... ones = ... ones so ... tens + ... tens = ... tens</p> 	<p>What is the same? What is different?</p>  <p>... tens + ... tens = ... tens ... tens and ... ones = ...</p> 
<p><b>Add 2-digit numbers (not across a ten)</b></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 (across a ten)</b></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> <p><math>6 + \square = 10</math> <math>10 - \square = 6</math></p>  <p>If ... is a whole and ... is a part, then ... is the other part.</p> <p><math>\square + 3 = 7</math> <math>7 - 3 = \square</math></p> 	

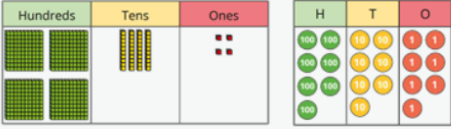
**MENTAL STRATEGIES**

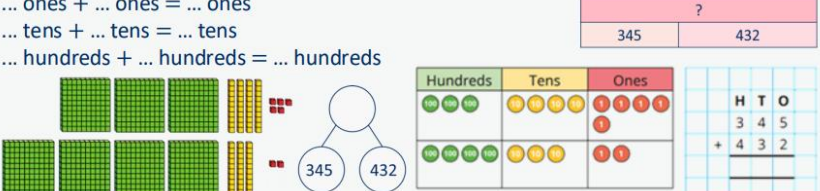
- Know that addition is the inverse of subtraction.
- Add two numbers mentally, including:
  - A 2-digit number and units.
  - A multiple of 10 and a two-digit number.
  - Two 2-digit numbers.
  - Three 1-digit numbers.
- Use knowledge of inverse to check calculation and solve missing number problems.
- Use knowledge of number bonds to calculate number bonds to 100.
- Count on in tens from any given number. (e.g. 19-29-39-49 etc.)

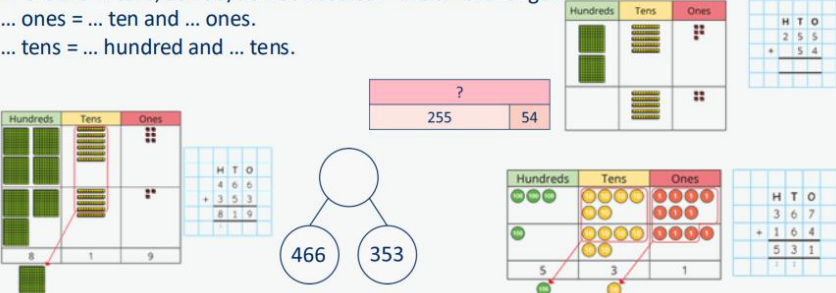
**ADDITION**

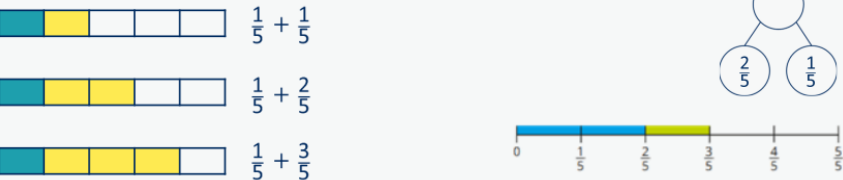
**YEAR 3:**

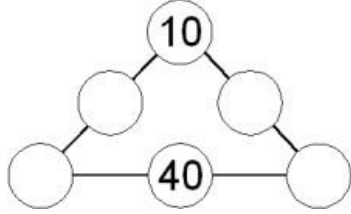
**VOCABULARY:** add, increase, total, plus, sum, more, altogether, column addition, estimate, inverse, double, near double, one more, ten more... one hundred more, how many more to make ...? how many more is... than ...? how much more is...?, tens boundary, hundreds boundary

<b>Method:</b>	<b>Example/Representation:</b>	
<b>Add 1's, 10's or 100's to a 3-digit number.</b>	The ones/tens/hundreds column will increase by ...	What patterns do you notice?
Emphasis on mental strategies including number bonds and related facts.	 $444 + 5 =$ $777 + 2 =$ $444 + 50 =$ $777 + 20 =$ $444 + 500 =$ $777 + 200 =$	$235 + 3 =$ $235 + 30 =$ $235 + 300 =$  $111 + \square = 118$ $604 + 20 =$ $111 + \square = 181$ $604 + 50 =$ $111 + \square = 811$ $604 + 90 =$

<b>Add two numbers (no exchange)</b>	... ones + ... ones = ... ones ... tens + ... tens = ... tens ... hundreds + ... hundreds = ... hundreds	
Mental strategies and the introduction of the formal method.		

<b>Add two numbers across 10 or 100.</b>	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.	
Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.		

<b>Add fractions with the same denominator within 1 whole.</b>	When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths	
Make links with known facts.		

Children will solve one and two-step addition problems (including missing number problems)	This number triangle has missing numbers. The numbers along each edge must add up to 90. Put all the numbers: 20, 30, 50 and 60 in the circles to make the totals correct.	
		

**MENTAL STRATEGIES:**

- Add numbers mentally, including:
  - a three-digit number and a single digit number
  - a 3-digit number and multiples of 10
  - a 3-digit number and multiples of 100
- Estimate the answer to a calculation and use inverse operations to check answers
- Know number pairs that total 1000 (multiples of 100)

Calculate 10 or 100 more than any given number

**ADDITION**

**YEAR 4**

**VOCABULARY:** add, addition, more, plus, increase, sum, total, altogether, score, double, near double, tens boundary, hundreds boundary, thousands boundary, inverse

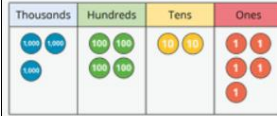
**Progression of skills / Method:**

**Add 1's, 10's, 100's to a 4-digit number.**

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

**Example/Representation:**

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



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

What patterns do you notice?

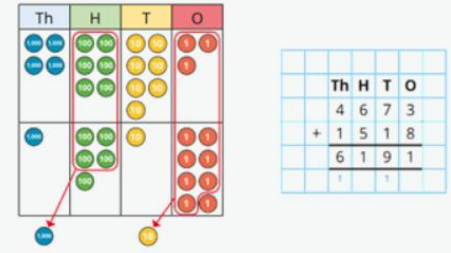
$2,350 + 3 =$   
 $2,350 + 30 =$   
 $2,350 + 300 =$   
 $2,350 + 3,000 =$   
  
 $6,040 + 200 =$        $2,211 + \square = 2,251$   
 $6,040 + 500 =$        $2,211 + \square = 2,215$   
 $6,040 + 900 =$        $2,211 + \square = 2,511$

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

Children will add numbers with up to 4-digits using the formal written method of column addition. 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 ...



**Add decimal numbers in the context of money.**

Emphasis on partitioning and use of number lines rather than formal calculations.

... pence + ... pence = ... pence  
 ... pounds + ... pounds = ... pounds



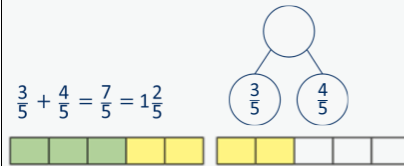
$45p + 25p = 70p$   
 $£2 + £3 = £5$   
 $£5 + 70p = £5.70$

£3.25 can be partitioned into £3 + 20p + 5p

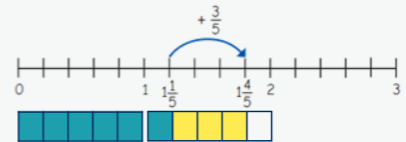


**Add fractions and mixed numbers with the same denominator beyond 1 whole.**

When adding fractions with the same denominator, I only add the numerator.  
 ... fifths + ... fifths = ... fifths



$\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}$



**MENTAL STRATEGIES:**

- Add numbers mentally, including:
  - a 4-digit number and multiples of one thousand
- Use knowledge of doubles to derive related facts (e.g  $15 + 16 = 31$  because  $15 + 15 = 30$  and  $30 + 1 = 31$ )
- Know number pairs that total 1000 (multiples of 10)
- Estimate the answer to a calculation and use inverse operations to check answers

**ADDITION**

**YEAR 5**

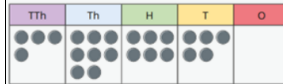
**VOCABULARY:** Efficient written method, add, addition, more, plus, increase, sum, total, altogether, score, tens boundary, hundreds boundary, thousands boundary, units boundary, tenths boundary, inverse

**Progression of skills / Method:**

**Example/Representation:**

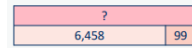
**Add using mental strategies.**

Add 1's, 10's, 100's etc to any number. Use number bonds and related facts.



48,650 + 300 =  
48,650 + 30,000 =  
48,650 + 30 =

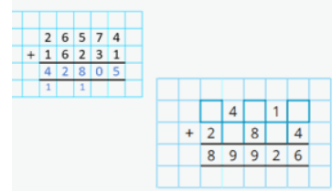
To add ..., I can add ... then subtract ...



**Add whole numbers with more than 4-digits.**

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

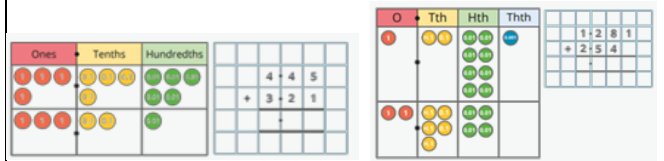
I can exchange 10... for 1...



**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.

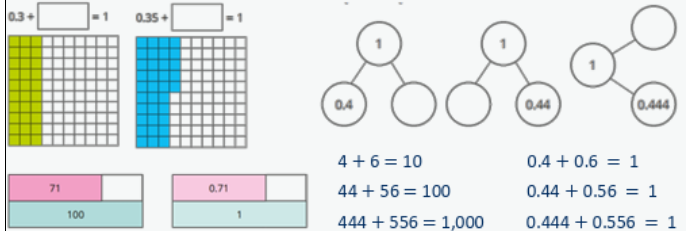
I do/do not need to make an exchange because...  
I can exchange 10... for 1...



**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.

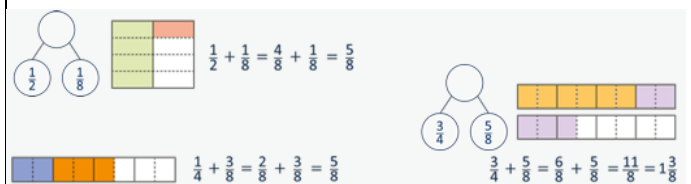


**Add fractions with denominators that are a multiple of one another.**

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.

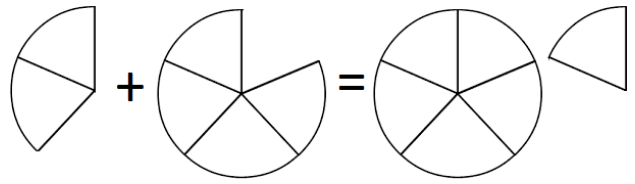


Recognise mixed numbers and improper fractions and convert from one to the other



Practise adding fractions where calculations exceed one as a mixed number

$$\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$$



**MENTAL STRATEGIES:**

- Add numbers mentally with increasingly large numbers (e.g.  $10,162 + 2,300 = 12,462$ )
- Mentally add tenths (e.g.  $0.2 + 0.6 = 0.8$ ) and 1-digit whole numbers and tenths ( $8 + 0.3 = 8.3$ )
- Use number bonds to 100 knowledge to calculate complements to one using hundredths (e.g.  $0.83 + 0.17 = 1$ )
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

**YEAR 6**

**VOCABULARY:** order of operations, column addition, add, in total, answer, tens boundary, hundreds boundary, thousands boundary, millions boundary, units boundary, tenths boundary, hundredths boundary, decimal place, inverse

**Method:**

**Example/Representation:**

**Add integers up to 10 million.**

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

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

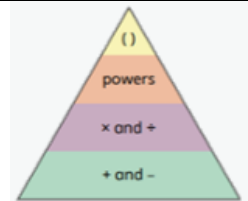
Progress to numbers with digits in different place value columns.  
Encourage children to check that they have lined up the columns correctly.

23.361 + 9.08 + 59.77 + 1.3 = 93.511

**Order of operations**

Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction.  
\*When no brackets are shown and the operations have the same priority, work left to right.

...has greater priority than..., so the first part of the calculation I need to do first is...



**Negative numbers**

Children add to negative numbers and carry out calculations which cross 0.

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

$-3 + 5 = 2$

The difference between -5 and -1 is 4

The difference between -5 and 5 is 10

**Add fractions**

Convert fractions to the same denominator before adding. Progress from fractions where one denominator is a multiple of the other, to any fractions and then add mixed numbers.

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

The lowest common multiple of 3 and 4 is 12.

...is made up of... wholes and ...

**MENTAL STRATEGIES:**

- Add numbers mentally with increasingly large numbers (e.g  $10,162 + 2,300 = 12,462$ )
- Add decimal numbers mentally (up to 2 decimal places)
- Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.



Worlingham  
CEVC  
Primary  
School  
Subtraction

**SUBTRACTION**

**EYFS**

**VOCABULARY:** subtract, take (away), leave, how many are left/left over?, how many have gone?, one less, two less... ten less..., how many fewer is... than...?, difference between, is the same as.

**Method**

**Conceptually subitise to 5.**  
  
Notice the whole parts that make up the whole.

**Example/Representation**  
What do you see?  
How do you see it?

**1 less.**  
  
Continue to link to stories, songs and rhymes.

1 less than...is...

**Using a range of practical resources and real-life contexts.**  
  
Pupils develop their understanding of the concept of subtraction as taking away through counting activities

I had 9 sweets and I ate 2. How many have I got left?

**Notice the composition of numbers within 10.**  
  
Link to stories, songs and rhymes.

How many...?  
How many altogether...?

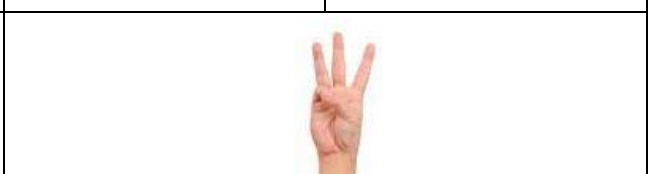
How many ways can you make...?

**Partition**  
  
Using objects, explore different ways to partition a number into 2 or more parts.

There are .... altogether.  
I can see...here and ...there.

...and ... make...

Children will use their fingers to help with subtraction, e.g.  $5 - 2 = 3$ .  
A child will start with the biggest number in their head '5' and hold 5 fingers up  
They will put 2 fingers down then count how many fingers are left.



Children are introduced to number tracks and use them to help think about more and less and will also use them to help develop their understanding of subtraction.

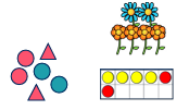
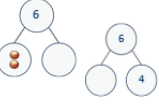
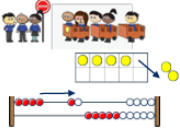

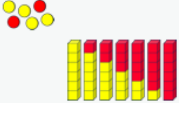
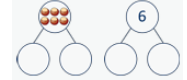
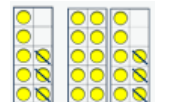
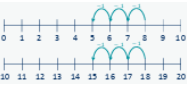
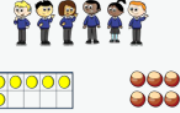
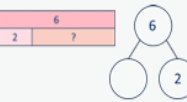
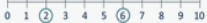

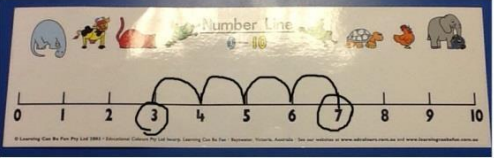


Children are introduced to the subtraction symbol (-) and the equals symbol (=) and use pictures/diagrams to represent the calculation.

$5 - 2 =$

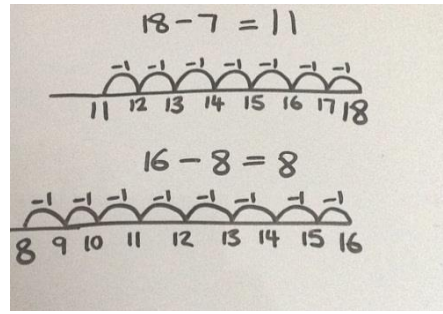
- MENTAL STRATEGIES:**
- Develop a mental image of the number system.
  - Children count backwards using familiar number rhymes (e.g '10 Green Bottles', '5 Fat Sausages').
  - Count backwards from different starting points.
  - Recall one less of a number.

**YEAR 1**

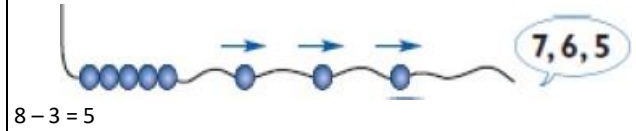
**VOCABULARY:** subtract, take away, minus, leave, how many fewer is...than..?, how much less is..? half, halve, how many are left/left over?, how many are gone?, one less, two less, ten less..., how many fewer is... than...?, how much less is...? =, equals, sign, is the same as, count on, count back, difference between. how many more is...than..?, how much more is..?

Method:	Example/Representation:		
<p><b>Find a part</b></p> <p>Link to number bonds and known facts. E.g. <math>2 + 4 = 6</math> so if 6 is the whole and 4 is a part, the other part must be 2.</p>	<p>There are... in total. ...are... How many are not...?</p> 	<p>...is the whole. ...is a part. ...is a part.</p> 	<p>...subtract...is equal to ... ...is equal to ... - ...</p> <p><math>6 - 2 = 4</math> <math>6 - 4 = 2</math></p> <p><math>4 = 6 - 2</math> <math>2 = 6 - 4</math></p>
<p><b>Take away</b></p> <p>A quantity is decreased.</p>	<p>First... Then... Now...</p> 	<p>I start at... I jump back... I land on...</p> 	<p>...minus... is equal to ... ...is equal to.. - ...</p> <p><math>6 - 2 = 4</math> <math>6 - 4 = 2</math></p> <p><math>4 = 6 - 2</math> <math>2 = 6 - 4</math></p>
<p><b>Bonds within 10</b></p> <p>Focus on subtraction.</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> <p><math>6 - 0 = 6</math> <math>6 - 1 = 5</math> <math>6 - 2 = 4</math> <math>6 - 3 = 3</math> <math>6 - 4 = 2</math> <math>6 - 5 = 1</math> <math>6 - 6 = 0</math></p>
<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> <p><math>8 - 3 = 5</math> <math>18 - 3 = 15</math></p> <p><math>5 = 8 - 3</math> <math>15 = 18 - 3</math></p>
<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> <p><math>6 - \square = 2</math> <math>2 = 6 - \square</math></p> 
<p><b>Children will solve one-step subtraction problems (including missing number problems).</b></p> <p>Children will use concrete objects and pictorial representations.</p>			
<p>Children will use a prepared number line to solve simple subtraction stories and number sentences by counting backwards.</p>	 <p><math>7 - 4 = 3</math></p>		
<p>Children will be taught how to solve simple subtraction stories with the support of a 100-number square.</p>	 <p><math>20 - 4 = 16</math></p>		
<p>Children will be taught to use a number track to support subtraction by counting backwards.</p>	<p><math>6 - 2 = 4</math></p> 		

Children are taught how to use a blank number line for subtraction (counting backwards) and then encouraged to draw their own number line to help solve problems.



Bead strings and counting sticks will be used to support subtraction by counting backwards.



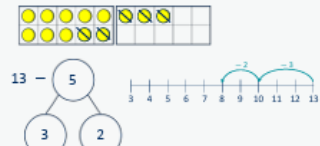
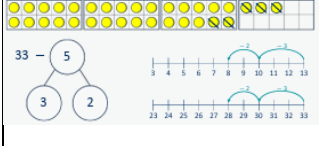



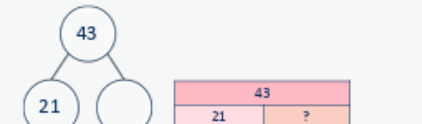

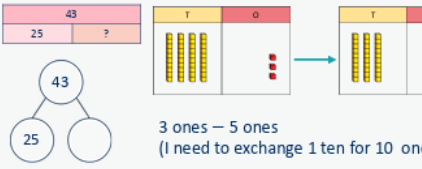
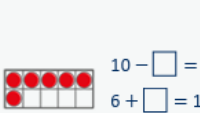
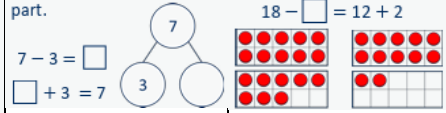


#### MENTAL STRATEGIES

- Subtract 1 and 2 digit numbers to 20 including 0
- To know that subtraction is not commutative and that the larger number must always come first
- Use knowledge of number bonds to 10 and 20 to reason ( $9 + 1 = 10$  so  $10 - 9 = 1$  and  $10 - 1 = 9$ )

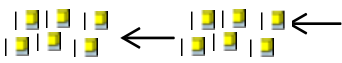
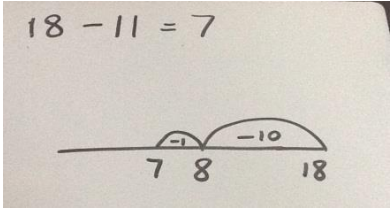
**YEAR 2**

**VOCABULARY:** subtract, minus, how many are left/left over?, how many less is... than...?, how much fewer is...?, difference between, half, halve, equals, sign, is the same as, partition, inverse, count on, count back, one less, ten less... one hundred less.

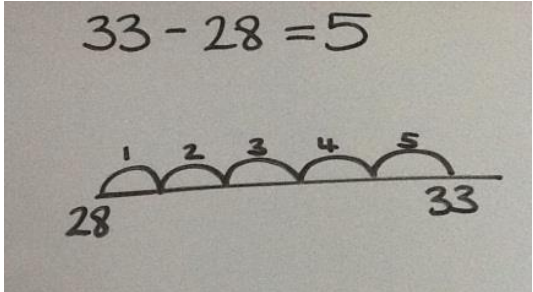
Method:	Example/Representation:																																																													
<p><b>Subtract ones from any number (related facts)</b></p> <p>Made links to known facts.</p>	<p>I know that ... minus ... = ... so ... minus ... = ...</p> 	<p>... less than ... is ... so ... less than ... is ...</p>  <p>What do you notice? Can you continue the pattern?</p> <p><math>8 - 3 = 5</math> <math>18 - 3 = 15</math> <math>28 - 3 = 25...</math></p>																																																												
<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><math>13 - 5</math></p>	<p>Make links with related facts.</p>  <p><math>33 - 5</math></p>																																																												
<p><b>Subtract multiples of 10.</b></p> <p>Make links to known facts within 10.</p>	<p>... ones - ... ones = ... ones so ... tens - ... tens = ... tens</p>  <p><math>5 - 2 = 3</math> <math>50 - 20 = 30</math></p>	<p>What is the same? What is different?</p> 																																																												
<p><b>Subtract 10's from any number.</b></p> <p>Make links to known facts.</p>	<p>... tens - ... tens = ... tens ... tens and ... ones = ...</p> 	<p>To subtract ... I need to subtract 10 ... times.</p> <p>I know that ... minus ... = ... so ... minus ... = ...</p> <table border="1" data-bbox="1093 884 1300 996"> <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> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> <tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr> <tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr> </table> <p><math>50 - 20 = 30</math> <math>54 - 20 = 34</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	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
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<p><b>Subtract two 2-digit numbers. (not across a ten)</b></p>	<p>... ones - ... ones = ... ones ... tens - ... tens = ... tens</p>  <p><math>43 - 21</math></p>	 <p><math>3 \text{ ones} - 1 \text{ one} = 2 \text{ ones}</math> <math>4 \text{ tens} - 2 \text{ tens} = 2 \text{ tens}</math> <math>2 \text{ tens and } 2 \text{ ones} = 22</math></p>																																																												
<p><b>Subtract two 2-digit numbers. (across a ten)</b></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><math>3 \text{ ones} - 5 \text{ ones}</math> (I need to exchange 1 ten for 10 ones)</p> <p><math>13 \text{ ones} - 5 \text{ ones} = 8 \text{ ones}</math> <math>3 \text{ tens} - 2 \text{ tens} = 1 \text{ ten}</math> <math>1 \text{ ten and } 8 \text{ ones} = 18</math></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>																																																												

Children are encouraged to use a blank number line to solve TU – TU and count back in tens and then units by:

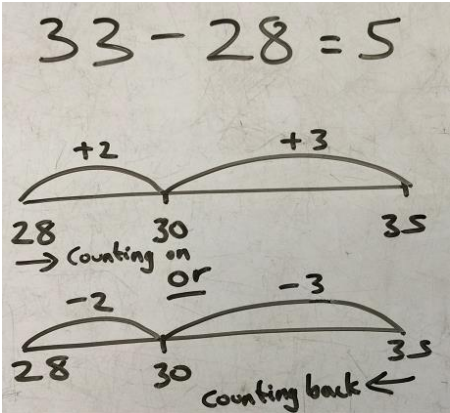
- Positioning the first number in the number sentence at the end of the number line.
- Partitioning the second number into tens and units
- Counting back in tens (or multiples of 10)
- Counting back in units



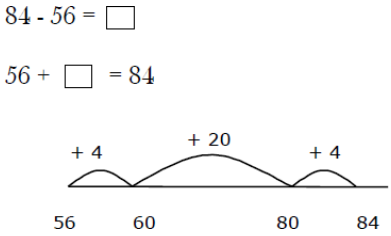
Children will use their knowledge of difference to use a blank number line to count on from the smallest number to the largest number (in tens and units) to solve subtraction number sentences (TU – TU)



Children will be encouraged to draw their own number line and begin to decide on the most efficient strategy: whether to start with the smaller number and count on or start with the larger number and count back



Recognise and use inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems



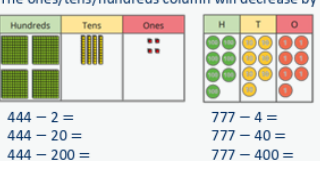
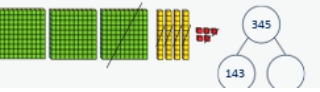
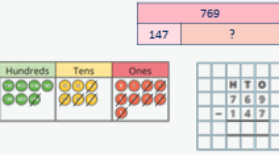

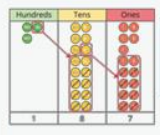

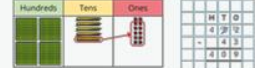

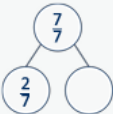
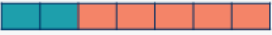
Children will solve one and two-step subtraction problems using concrete objects and pictorial representations including those involving number, quantities and measures

- MENTAL STRATEGIES:**
- To know that subtraction is the inverse of addition
  - Use knowledge of inverse to check calculations and solve missing number problems
  - Subtract numbers mentally, including:
    - subtracting units from a 2-digit number
    - subtracting a multiple of 10 from a 2-digit number
    - subtracting a 2-digit number from another 2-digit number
  - Recall and use subtraction facts to 20 fluently
  - Use knowledge of number bonds to 100 (multiples of 10) to reason ( $40 + 60 = 100$  so  $100 - 60 = 40$  and  $100 - 40 = 60$ )



**YEAR 3:**

**VOCABULARY:** leave, subtract, less, minus, column subtraction, inverse, decomposition, exchange, how many are left/left over?, difference between, how many more/fewer is... than...?, how much more/less is...?, Is the same as, equals, sign. multiples of tens and hundreds.

Method:	Example/Representation:
<p><b>Subtract 1's, 10's and 100's from a 3-digit number.</b></p> <p>Emphasis on mental strategies including number bonds and facts. Prompt children to notice which digit changes.</p>	<p>The ones/tens/hundreds column will decrease by ...</p>  <p>What patterns do you notice?</p> $235 - 3 =$ $235 - 30 =$ $235 - 300 =$ $118 - \square = 111$ $624 - 20 = \quad 181 - \square = 111$ $654 - 50 = \quad 811 - \square = 111$ $694 - 90 =$
<p><b>Subtract two numbers (no exchange)</b></p> <p>Mental strategies and introduction of formal written method.</p>	<p>... ones - ... ones = ... ones ... tens - ... tens = ... tens ... hundreds - ... hundreds = ... hundreds</p>  
<p><b>Subtract two numbers across a 10 or 100.</b></p> <p>Formal written method involving up to 2 exchanges including 3-digit subtract 2-digit numbers.</p>	<p>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 ...</p>    
<p><b>Subtract fractions with the same denominator within 1 whole.</b></p> <p>Make links with known facts.</p>	<p>When subtracting fractions with the same denominator, I only subtract the numerator. ... fifths - ... fifths = ... fifths</p>   

Children begin to set out HTU - TU (that cross the hundreds boundary) in columns and record as column subtraction with decomposition

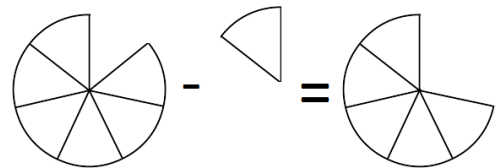
Children will solve one and two-step subtraction problems (including missing number problems)

Fill in the missing number:



Children practise subtracting fractions with the same denominator through a variety of increasingly complex problems to improve fluency

$$\frac{6}{7} - \frac{1}{7} = \frac{5}{7}$$



**MENTAL STRATEGIES:**

- Subtract numbers mentally, including:
  - Subtracting a single digit number from a 3-digit number
  - Subtracting a multiple of 10 from a 3-digit number
  - Subtracting a multiple of 10 from a 3-digit number
- Estimate the answer to a calculation and use inverse operations to check answer

**YEAR 4**

**VOCABULARY:** subtract, subtraction, minus, *decrease*, leave, how many are left/left over?, difference between, how many more/fewer is... than...?, how much more/less is...?, Is the same as, equals, sign. Column subtraction, decomposition, exchange, multiples of thousand, inverse.

**Method:**

**Examples / Key Representation:**

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

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

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



$3,425 - 2 = 3,423$       $3,425 - 200 = 3,225$   
 $3,425 - 20 = 3,405$       $3,425 - 2,000 = 1,425$

What patterns do you notice?

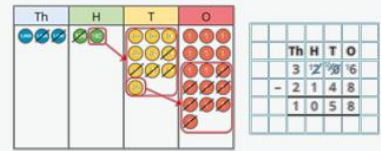
$4,356 - 3 = 4,353$   
 $4,356 - 30 = 4,326$   
 $4,356 - 300 = 4,056$   
 $4,356 - 3,000 = 1,356$   
 $4,433 - \square = 4,430$   
 $6,940 - 200 = 6,740$       $4,433 - \square = 4,033$   
 $6,940 - 300 = 6,640$       $6,940 - 300 = 6,640$   
 $6,940 - 400 = 6,540$       $4,433 - \square = 4,403$

**Subtract up to two 4-digit numbers.**

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

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

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



**Subtract decimal numbers in the context of money.**

Emphasis here is on partitioning and use of number lines rather than formal written calculations.

I can partition £... into £... and 100p

$\text{£}... - \text{£}... = \text{£}...$   
 $100\text{p} - ...\text{p} = ...\text{p}$   
 $\text{£}5 - \text{£}3.26$   
 $\text{£}4 - \text{£}3 = \text{£}1$   
 $100\text{p} - 26\text{p} = 74\text{p}$   
 $\text{£}5 - \text{£}3.26 = \text{£}1.74$

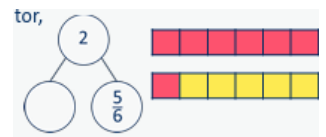
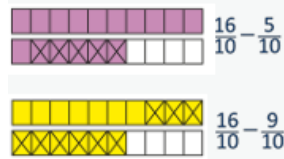


**Subtract fractions and mixed numbers with the same denominator.**

Include subtracting fractions from wholes.

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

...tenths - ... tenths = ... tenths.

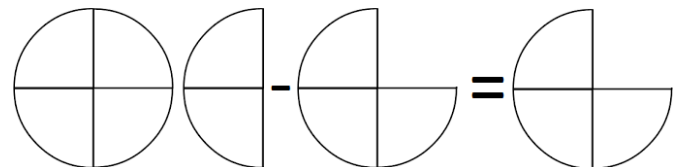


Children will subtract numbers with up to 4-digits using the formal written method of column subtraction with decomposition

$3271 - 1691 =$   
 $\begin{array}{r} 3271 \\ -1691 \\ \hline 1580 \end{array}$

Pupils continue practise in subtracting fractions with the same denominator to become fluent through a variety of increasingly complex problems beyond one whole

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



**MENTAL STRATEGIES:**

- Subtract numbers mentally, including:
- Subtracting multiples of one thousand from a 4-digit number
- Use of number pairs that total 1000 (multiples of 10) to calculate subtraction (e.g  $1,000 - 300 = 700$ )
- Estimate the answer to a calculation and use inverse operations to check answers

**YEAR 5**

**VOCABULARY:** efficient written method, subtract, subtraction, minus, decrease, difference between, inverse, decimals, units and tenths boundary, column subtraction, decomposition, exchange.

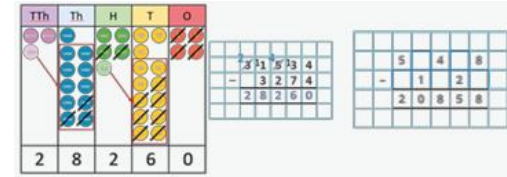
**Method:**

**Examples / Key Representation:**

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

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

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



**Subtract using mental.**

Subtract 1's, 10's, 100's etc from any number. Use number bonds and related facts.

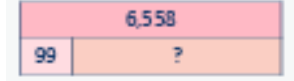


$$48,650 - 300 =$$

$$48,650 - 30,000 =$$

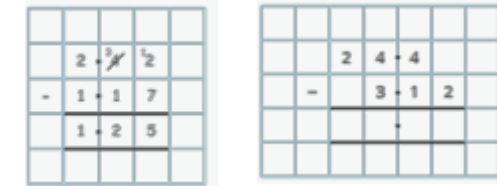
$$48,650 - 30 =$$

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



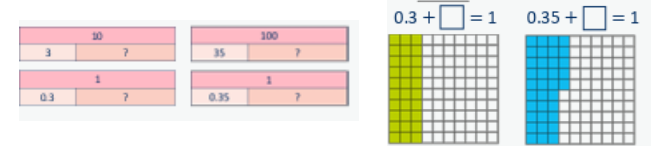
**Subtract decimals with up to 2 decimal places.**

Progress from the same number of decimal places to a different number of decimal places and from no exchange to exchange.



**Complements to 1**

Encourage children to make links with bonds to 10 and complements to 100 and 1,000 when finding missing part or subtracting from 1.



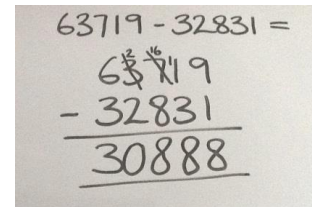
**Subtract fractions with denominators that are a multiple of one another.**

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

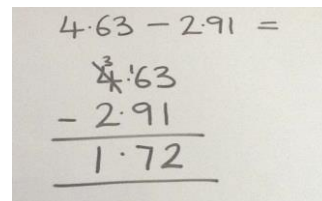
The denominator has been multiplied by ..., so the numerator needs to be multiplied by... for the fractions to be equivalent.



Children will subtract numbers with more than 4-digits using the formal written method of column subtraction with decomposition



Children will subtract decimal numbers with the same number of decimal places with decomposition

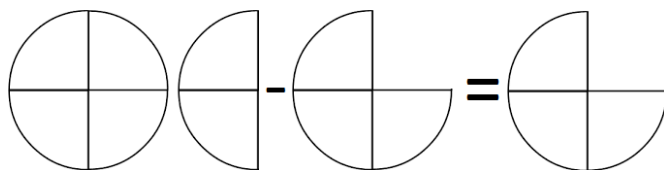


Solve multi-step problems using formal jottings and explaining reasoning behind their calculations ((eg. the Singapore Bar Method)

Practise subtracting fractions where calculations exceed one as a mixed number

$$1\frac{2}{4} - \frac{3}{4} = ?$$

$$\frac{6}{4} - \frac{3}{4} = ?$$



**MENTAL STRATEGIES:**

- Subtract increasingly large numbers mentally (e.g.  $12,654 - 1,341 = 11,213$ )
- Mentally subtract tenths (e.g.  $0.7 - 0.5 = 0.2$ ) and 1-digit whole numbers and tenths ( $8 - 0.3 = 7.7$ )
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

**YEAR 6**

**VOCABULARY:** order of operations, subtract, decrease, difference, inverse, decimals, units, tenths and hundredths boundary, column subtraction, decomposition, exchange.

**Method:**  
**Subtract integers up to 10 million.**  
 Encourage children to estimate and use inverse operations to check answers to calculations.

**Example/Key Representation:**

**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...

**Order of operations**  
 Children learn the order of priority for operations in a calculation. Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction.

...has greater priority than..., so the first part of the calculation I need to do is...

**Negative numbers**  
 Children subtract from positive and negative numbers and calculate intervals across 0.

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

The difference between -5 and -1 is 4

The difference between 5 and -5 is 10

**Subtract fractions.**  
 Convert fractions to the same denominator before subtracting. Progress from fractions where one denominator is a multiple of the other, to any fractions and then subtracting from a mixed number.

$$\frac{2}{3} - \frac{1}{9} = \frac{6}{9} - \frac{1}{9} = \frac{5}{9}$$

$$\frac{7}{9} - \frac{1}{2} = \frac{14}{18} - \frac{9}{18} = \frac{5}{18}$$

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

Children will subtract several numbers of increasing complexity and be taught to combine some of the numbers so that the subtraction can be completed

Children will subtract several decimals numbers with a different number of decimal places be taught to combine some of the numbers so that the subtraction can be completed.

Zero used as place holder

Subtract fractions and mixed numbers with different denominators using the concept of equivalent fractions

Handwritten mathematical work showing the subtraction of  $\frac{1}{3}$  from  $\frac{4}{6}$  to get  $\frac{2}{6}$ . The work includes the equation  $\frac{4}{6} - \frac{1}{3} = \frac{2}{6}$ , a diagram showing  $\frac{1}{3} = \frac{2}{6}$  with arrows and "x2" indicating the conversion, and the final equation  $\frac{4}{6} - \frac{2}{6} = \frac{2}{6}$ .

**MENTAL STRATEGIES:**

- Subtract increasingly large numbers mentally (e.g  $12,654 - 1,341 = 11,213$ )
- Subtract decimal numbers mentally (up to 2 decimal places)
- Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.



Worlingham  
CEVC Primary  
School  
Multiplication



**MULTIPLICATION**

**EYFS**

**VOCABULARY:** group, lots of, double, doubling, odd, even

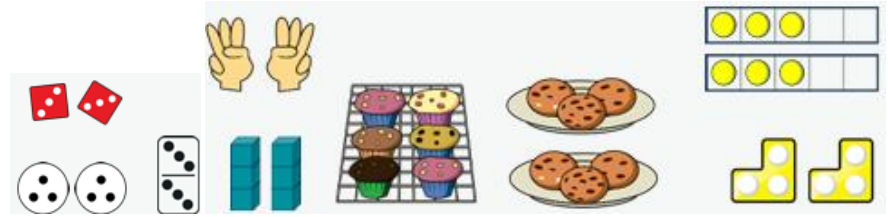
**Method**

**Example/Representation**

**Double to 10.**

Prompt children to notice that double means twice as many and to notice that there are two equal groups.

Double ...is...  
... is double....



**Make equal groups.**

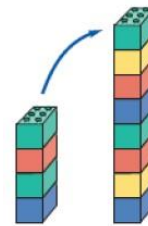
Provide opportunities to make equal groups when tidying up or during snack time. Encourage children to check that each group has the same amount.

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



Children will count groups of the same number of objects and add them together  
The children learn about grouping in practical contexts and through pictorial representations

Count groups of 2 and then count all objects to add them together.



Children will solve simple problems involving doubling

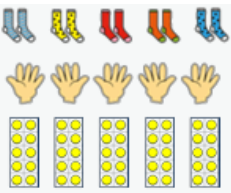

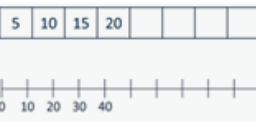
Double 4 is 8

**MENTAL STRATEGIES:**

- Develop a mental image of the number system.
- Understand the value of a number.
- Explore even and odd numbers up to 10.
- Recall the double facts up to 10.


**YEAR 1**


**VOCABULARY:** odd, even, count in twos, fives, count in tens (forwards from/backwards from), how many times? lots of, groups of, once, twice, five times, ten times, multiple of, times, multiply, multiply by, array, row, column, double.

<p><b>Method:</b></p> <p><b>Count in 2's, 5's and 10's.</b></p> <p>Begin by counting objects that naturally come in 2's, 5's and 10's, e.g. socks or fingers.</p> <p>Children will count groups of the same number of objects and add them together.</p> <p>The children learn about grouping in practical contexts, through pictorial representation.</p> <p>Bead strings and counting sticks will be used to support counting in sequences of 2s, 5s and 10's.</p>	<p><b>Example/Representation:</b></p> <p>There are...equal groups of... There are.... Altogether.</p> 	<p>Continue to colour in...s. What do you notice?</p> 	<p>Complete the number track or number line by counting in....s.</p> 
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<p>Children will be given one-step word problems to solve, involving counting in multiples of 2, 5 and 10 and doubles. Children will use concrete objects and pictorial representations to support their ideas.</p>	<p>Alfie, Joseph and Ben all have a pair of socks. How many socks are there altogether?</p>
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<p><b>Add equal groups.</b> (Repeated addition)</p> <p>Children should be able to write a repeated addition to represent equal groups and to draw pictures to represent a repeated addition.</p>	<p>There are ...groups of... There are ...altogether.</p> 	<p>What is the same? What is different?</p> <p><math>2 + 2 + 2 =</math></p> <p><math>5 + 5 + 5 =</math></p> <p><math>10 + 10 + 10 =</math></p>
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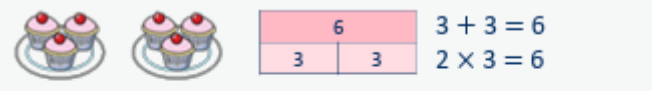
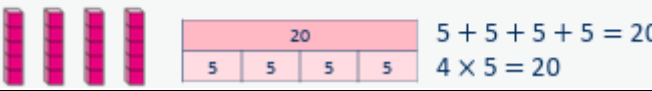
<p><b>Make arrays.</b></p> <p>Children use their knowledge of adding equal groups to arrange objects in columns and rows.</p>	<p>There are ...rows of... There are ...altogether. There are...columns of... There are ...altogether.</p> 
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<p><b>Make doubles.</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.... .....+.....=.....</p> 
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<p><b>MENTAL STRATEGIES:</b></p> <ul style="list-style-type: none"> <li>- Count forwards and backwards in multiples of 2s, 5s and 10s.</li> <li>- Recall doubles of numbers up to and including 10.</li> </ul>
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**YEAR 2**

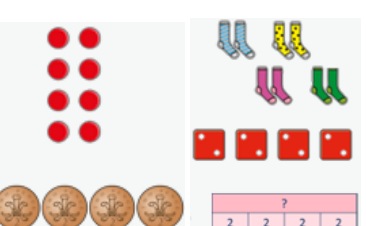
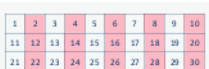

**VOCABULARY:** odd, even, twos, fives, tens, threes, lots of, groups of, once, twice, three times, five times, ten times, multiple of, times, multiply, multiply by, repeated addition, array, row, column, double.


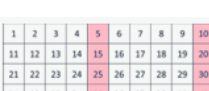

<p><b>Method:</b></p> <p><b>Link repeated addition and multiplication.</b></p> <p>Encourage children to make the link between repeated addition and multiplication.</p>	<p><b>Example/Representation:</b></p> <p>There are ...equal groups with....in each group. There are....altogether.</p>  
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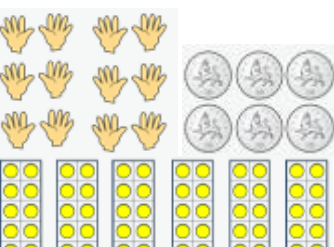
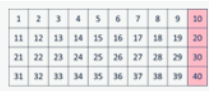

<p><b>Use arrays.</b></p> <p>Encourage children to see that multiplication is commutative.</p>	<p>There are....rows with... in each row. There are...columns with.... In each column.</p>  <p>3 lots of 5 = 15 5 + 5 + 5 = 15</p> <p>5 lots of 3 = 15 3 + 3 + 3 + 3 + 3 = 15</p>	<p>I can see.....x ..... and.....x.....</p> <p>3 x 5 = 15 5 x 3 = 15</p> <p>3 x 5 = 5 x 3</p>
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<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. Double 40 is 80.</p>
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<p><b>Missing numbers.</b></p>	<p>.....is equal to ..... groups of..... 18 socks, how many pairs?</p> 	<p>....times.....is equal to..... ? x 2 = 18 18 = 2 x ?</p>
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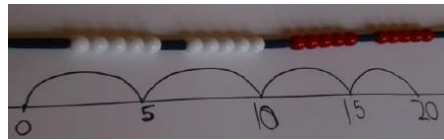
<p><b>The 2-times table.</b></p> <p>Encourage daily counting in multiples both forwards and back. Notice that all multiples of 2 are even numbers.</p>	<p>....lots of 2 = .....</p> <p>..... x 2 = .....</p> 	<p>....times 2 is equal to .....</p>  <p>1 x 2 = 2    2 = 1 x 2 2 x 2 = 4    4 = 2 x 2 3 x 2 = 6    6 = 3 x 2</p> 
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<p><b>The 5-times table.</b></p> <p>Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.</p>	<p>....lots of 5 = .....</p> <p>..... x 5 = .....</p> 	<p>....times 5 is equal to .....</p>  <p>1 x 5 = 5    5 = 1 x 5 2 x 5 = 10    10 = 2 x 5 3 x 5 = 15    15 = 3 x 5</p> 
--	--	--

<p><b>The 10-times table.</b></p> <p>Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.</p>	<p>....lots of 10 = .....</p> <p>..... x 10 = .....</p> 	<p>....times 10 is equal to .....</p>  <p>1 x 10 = 10    10 = 1 x 10 2 x 10 = 20    20 = 2 x 10 3 x 10 = 30    30 = 3 x 10</p> 
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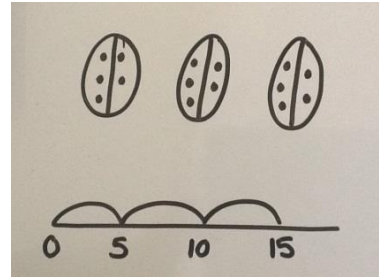
Children will understand the operation of multiplication as repeated addition on a blank number line and will use practical resources to support this

$$4 \times 5 = 15$$



Children will solve one-step multiplication problems (including missing number problems) using concrete objects and pictorial representations

I have 3 ladybirds with 5 spots each. How many spots do they have altogether?



**MENTAL STRATEGIES:**

- Count forwards and backwards in multiples of 3.
- Know the 2, 5 and 10 times tables (in and out of order)
- Recognise odd and even numbers

**YEAR 3:**

**VOCABULARY:** multiply, times, groups of, equal groups of, multiple of, multiplied by, estimate, inverse, grid multiplication, expanded column multiplication, partition, commutative, associative, product.

**Method:** **Example/Representation:**

**The 3-times table.**  
Encourage daily counting in multiples both forwards and back.

.....groups of 3 = ....  
..... x 3 = .....  
3, ..... times = ....

.....times 3 is equal to....

$4 \times 3 = 12$     $12 = 4 \times 3$

**The 4-times table.**  
Encourage daily counting in multiples both forwards and back.  
Encourage children to notice links between the 2 and 4 times-tables.

.....groups of 4 = ....  
..... x 4 = .....  
4, ..... times = ....  
4 x .... = ....

.....times 4 is equal to....

$3 \times 4 = 12$     $12 = 3 \times 4$

$3 \times 4 = 12$     $12 = 3 \times 4$

**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.

..... x .... Ones is equal to .... Ones.  
So..... X ..... tens is equal to ..... tens.

**Related facts.**  
Use knowledge of multiplying by 10 to scale times-tables facts.

..... x .... Ones is equal to .... Ones.  
So..... X ..... 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	$30 \times 2 = 60$
2	2	$2 \times 2 = 4$
32	2	$32 \times 2 = 64$

**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	4	$20 \times 4 = 80$
4	4	$4 \times 4 = 16$
24	4	$24 \times 4 = 96$

**Scaling.**  
Children focus on multiplication as scaling (.....times the size) as opposed to repeated addition.

There are...times as many....as....

There are 3 times as many triangles as circles.

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

4 cm      16 cm

Miss Smith is twice the height of Jo.

Children will be taught to multiply numbers (TU x U) using the formal written method of expanded column multiplication and make the link to grid method.

$$\begin{array}{r} 23 \\ \times 4 \\ \hline 12 \quad (4 \times 3) \\ + 80 \quad (4 \times 20) \\ \hline 92 \end{array}$$

**Correspondence problems (How many ways?)**  
Encourage children to work systemically to find all the different possible combinations.

For every....., there are....possible....  
There are...x....possibilities altogether.

hats	scarves
blue	red
orange	green
purple	blue

For every hat, there are two possible scarves.  $3 \times 2 = 6$

There are 6 possibilities altogether.

**MENTAL STRATEGIES:**

- Count forwards and backwards in multiples of 4, 8, 50 & 100
- Know the 3, 4 and 8 times tables (in and out of order)
- Connect the 2, 4 and 8 times tables through doubling
- Use knowledge of place value to calculate multiplication (e.g.  $2 \times 2 = 4$ ,  $2 \times 20 = 40$ ,  $2 \times 200 = 400$ )

**YEAR 4**

**VOCABULARY:** multiply, multiplied by, product, short multiplication, partition, distributive law, commutative, groups of, multiply, times, multiples, inverse.

**Method:**

**Example/Representation:**

**Times tables facts to 12 x 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 .....

.....X.....=.....

**Multiply by 1 and 0.**

... X ... = ...

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

**Multiply 3 numbers.**

Children use their understanding of commutativity to multiply more efficiently.

To work out....x....x...., I can first calculate.....x....And then multiply the answer by....

**Factor pairs.**

Children will explore equivalent calculations using different factor pairs.

12 = .....x....., so .....x 12 = .....x.....x.....

**Multiply by 10 and 100.**

Some children may overgeneralize that multiplying by 10 or 100 always results in adding zeros. This will cause issues later when multiplying decimals.

When I multiply by 10, the digits move...  
 Place value column to the left.  
 ....is 10 times the size of.....

$35 \times 10 = 350$

When I multiply by 100, the digits move....  
 Place value columns to the left.  
 ....is 100 times the size of.....

$14 \times 100 = 1,400$

**Related facts.**

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

.....X.....ones is equal to ....ones.  
 So.....X.....tens is equal to ....tens  
 And.....x.....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.

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

**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 image shows two visual representations of multiplication. On the left, base ten blocks represent  $30 \times 5$ : three tens rods (each labeled '10') and five ones units (each labeled '1'). On the right, a grid shows the multiplication  $34 \times 5$ . The grid has columns labeled H, T, O and rows labeled H, T, O. The calculation is shown as follows:  $34 \times 5 = 170$ . The grid also includes the labels  $(4 \times 5)$  and  $(30 \times 5)$ .

**Scaling.**

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

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

Two examples of scaling are shown. The first shows a red box with the number 7 and a yellow bar with seven 7s. Below it, the text reads: "A computer mouse costs £7. A keyboard costs 6 times as much." The second shows a red box with the number 6 and a yellow bar with six 6s. Below it, the text reads: "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 combinations.

For every..., there are ...possibilities.  
 There are ...x...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

Children will be taught to multiply numbers (TU x U) using the formal written method of short multiplication

Handwritten short multiplication:  $24 \times 7 = 168$ . The calculation is shown as  $24 \times 7 = 168$  with a horizontal line under 24 and a horizontal line under 168.

Children will be taught to multiply numbers (HTU & U) using long and short multiplication, starting with long and moving onto short

Handwritten long and short multiplication for  $235 \times 6 = 1410$ . The long method shows  $200 \times 6 = 1200$ ,  $30 \times 6 = 180$ , and  $5 \times 6 = 30$ , which are then added together to get 1410. The short method shows  $235 \times 6 = 1410$  with a horizontal line under 235 and a horizontal line under 1410.

Children will be taught to multiply numbers (HTU x U) using the formal written method of short multiplication

Handwritten formal short multiplication for  $235 \times 6 = 1410$ . The calculation is shown as  $235 \times 6 = 1410$  with a horizontal line under 235 and a horizontal line under 1410.



Solve problems involving multiplying and adding to multiply two or three- digit numbers by one digit

Harriet has 7 friends who each have 24 apples. Joseph has 3 friends who each have 27 apples. How many apples do Harriet and Joseph's friends have altogether?

Handwritten calculations showing the solution to the problem:

$$\begin{array}{r} 24 \\ \times 7 \\ \hline 168 \end{array}$$
$$\begin{array}{r} 27 \\ \times 3 \\ \hline 81 \end{array}$$
$$\begin{array}{r} 168 \\ + 81 \\ \hline 249 \end{array}$$

249 apples altogether

**MENTAL STRATEGIES:**

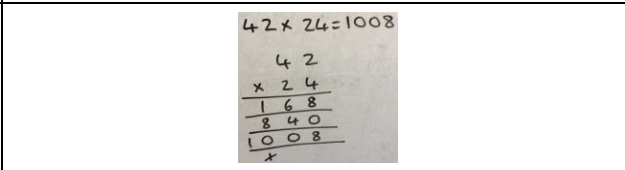
- Know all times tables up to and including  $12 \times 12$  (by the end of Year 4)
- Recognise and use factor pairs (e.g factor pairs for numbers up to and including 10)
- Know that  $TU \times 5$  is  $TU \times 10$  then divide by 2 (e.g  $18 \times 5 = (18 \times 10) \div 2 = 90$ )
- Know that  $TU \times 9$  is  $TU \times 10$  then subtract  $TU$  (e.g  $18 \times 9 = (18 \times 10) - 18 = 162$ )

**YEAR 5**

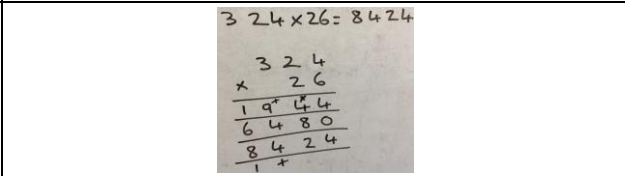
**VOCABULARY:** composite numbers, prime number, prime factor, cube number, square number, derive, factor pairs, formal written method, times, multiply, multiplied by, multiple of, product, short multiplication, partition, long multiplication, scaling, decimal place, units, tenths and hundreds.

**Method:** **Example/Representation:**

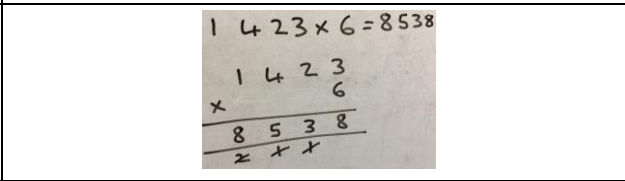
Children will be taught to multiply numbers (TU x TU) using the formal written method of long multiplication



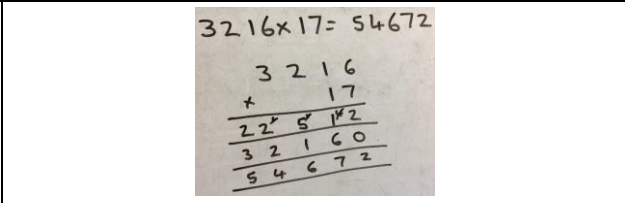
Children will be taught to multiply numbers (HTU x TU) using the formal written method of long multiplication



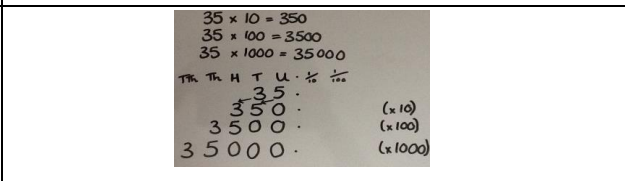
Children will be taught to multiply numbers (ThHTU x U) using the formal written method of short multiplication



Children will be taught to multiply numbers (ThHTU x TU) using the formal written method of long multiplication



Children will learn to multiply whole numbers and those involving decimals by 10, 100 and 1000 by moving the digits around the fixed decimal on a place value grid



Children will solve problems involving multiplication, including scaling

Alfie runs 3400m on Sports Day. His friend, Harry, runs three times as far. How far does Harry run?

With the use of materials and diagrams, pupils will multiply proper fractions and mixed numbers by whole numbers

$$\frac{1}{4} \times 2 = \frac{2}{4}$$

$$1\frac{1}{4} \times 2 = 2\frac{2}{4}$$

\_\_\_\_\_

**MENTAL STRATEGIES:**

- Recognise and calculate factor pairs for any number
- Use times table knowledge to derive multiples of any number
- Establish whether a number is a prime number (up to 100) or a composite number (not prime) and recall prime numbers up to 19
- To know what a square number is and recall all square numbers (up to and including 144)

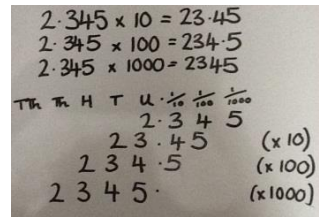
To know what a cube number is and recall the first 5 cube numbers

**YEAR 6**

**VOCABULARY:** common factors, multiples, prime, formal written method, multiply, multiplied by, multiple of, product, short and long multiplication, partition, scaling, decimal place, units, tenths and hundredths.

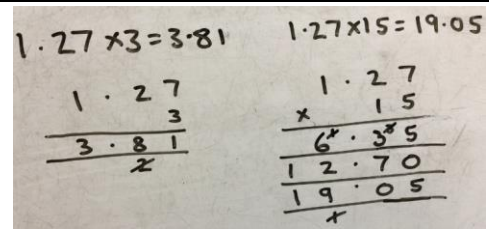
**Method:** **Example/Representation:**

Multiply numbers by 10, 100 and 1000 where the answers are up to three decimal places

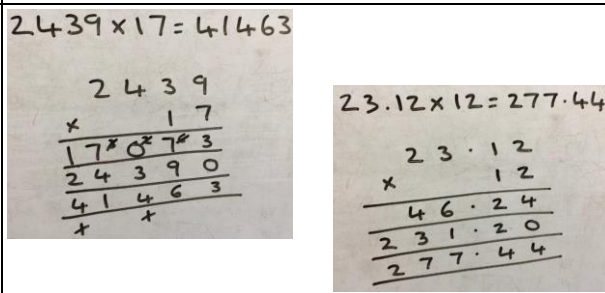


Multiply one-digit numbers with up to two decimal places by whole numbers using:

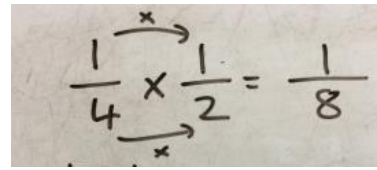
- Short multiplication when multiplying by a single digit
- Long multiplication when multiplying by a 2-digit number



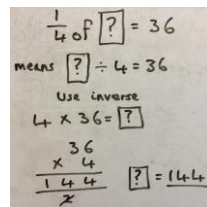
Multiply multi-digit numbers up to 4 digits by a 2-digit whole number using the formal written method of long multiplication



Multiply simple pairs of fractions, writing the answer in its simplest form



Pupils use their understanding of the relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction



	?		
36			
1/4			

**MENTAL STRATEGIES:**

- Use scaling to solve decimal number problems as whole number problems using the rule: 'the number of decimal digits in the question is the same as the number of decimal digits in the answer'
- Identify common factors, common multiples and prime numbers
- Use common factors to simplify fractions mentally
- Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy



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*Primary*  
*School*  
*Division*

*Worlingham CEVC  
Primary School*

**DIVISION**

**EYFS**

**VOCABULARY:** halve, half, share, share equally, groups, halving, sharing, grouping, equal

**Method:**

**Sharing**

Provide practical activities such as sharing items during snack time. Encourage children to check whether items have been shared fairly (equally).

**Example/Representation**

There are...altogether.  
They are shared equally between...groups.



**Grouping**

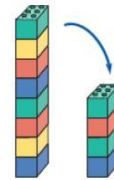
Provide opportunities to make equal groups when tidying up or during snack time. Encourage children to check that each group has the same amount. Children experience early division by sharing and distributing objects equally and counting how many are in each group.

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



Children will solve problems including halving and sharing.

What is half of 8?  
Half of 8 is 4



**MENTAL STRATEGIES:**

- Develop a mental image of the number system.
- Understand the value of a number.

**YEAR 1**

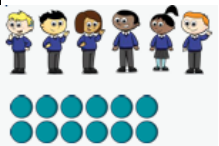
**VOCABULARY:** halve, share, share equally, groups, equal groups of, divide, divided by, left, left over

**Method** **Example/Representation**

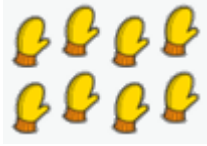
**Make equal groups- grouping.**

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.

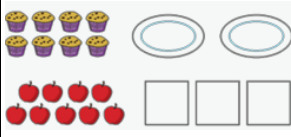


There...groups of...


**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...

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




12 shared between...is...

**Find a half.**

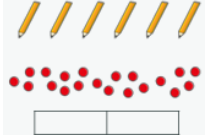
Start with practical opportunities to share a quantity into 2 groups. Progress to circling half of the objects in a picture and then to finding the whole from a given half.

To find half, I need to share into 2 equal groups.

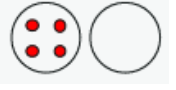


There are... in each group.

Half of...is...



If... is half, what is the whole?




4 is half of.

**Find a quarter.**

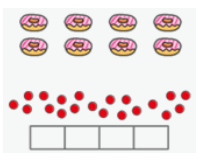
Start with practical opportunities to share a quantity into 4 groups. Progress to using pictures or bar models to find a quarter and then to finding the whole from a given quarter.

To find a quarter, I need to share into 4 equal groups.




There are...in each group.

A quarter of... is....



If ... is one quarter, what is the whole?

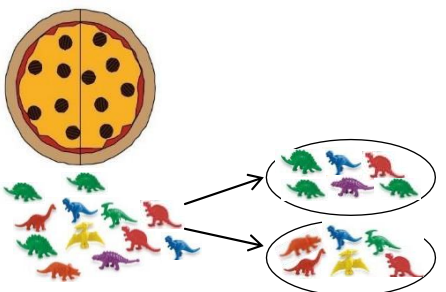


3 is one quarter of...

Children will be taught to associate 'half' with dividing by two and recognise, find and name a half as one of two equal parts.

Can you cut the pizza in half?

What is half of 12?



Children will recognise and write the division symbol ( $\div$ ) in mathematical statements, calculating the answer with the teacher using concrete objects.

$8 \div 2 = 4$



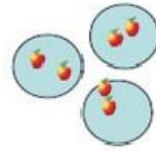
Children will understand equal groups and share items out in play scenarios.

Share 12 cakes between 3 people equally:



Children will be given a word problem to complete either practically or using pictorial representations.

Can you share 6 apples between 3 plates?



**MENTAL STRATEGIES:**

- Count forwards and backwards in multiples of 2s, 5s and 10s.

**YEAR 2**

**VOCABULARY:** groups of, equal groups of, halve, share, share equally, divide, divided by, divided into, repeated subtraction, inverse.

**Progression of skills**

**Divide by 2**

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

**Example/ Key Representations**

There are... equal groups of...  $\div 2 = \dots$

...shared equally between 2 is ...  
Half of...is...  
 $\dots \div 2 = \dots$

**Divide by 10**

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

There are... equal groups of 10.

$\dots \div 10 = \dots$   
 $6 \times 10 = 60$   
 $60 \div 10 = 6$

...shared equally between 10 is...  
 $\dots \div 10 = \dots$   
 $6 \times 10 = 60$   
 $60 \div 10 = 6$

**Divide by 5**

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

There are...equal groups of 5...

$\dots \div 5 = \dots$

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

...shared equally between 5 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 2/5/10 is equal to ...

$\frac{?}{10} \div 2 = 10$

$\frac{?}{10} \div 5 = 10$

$\frac{?}{10} \div 10 = 10$

**Unit fractions**

In year 2 the focus is on finding  $1/2$ ,  $1/4$  and  $1/3$ .

Bar models are useful to show the link between division and finding a fraction.

The objects have been shared fairly into...groups.  
 $1/?$  Of ... is...

There are...equal parts.  
There is...part circled.  
 $1/?$  Is circled.

**Non-unit fractions**

In year 2 the focus is on finding  $2/4$  and  $3/4$ .

Prompt children to notice that  $2/4$  is equivalent to  $1/2$ .

The objects have been shared fairly into...groups  
 $?/?$  of ...is...

There are ...equal parts.  
There are...parts circled.  
 $?/?$  is circled.

Children will understand the operation of division as grouping using repeated subtraction using bead strings or cubes to aid them.

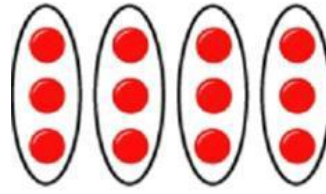
How many groups of 3 are in 12?



Children will be able to represent a division calculation using an array and groups. Also writing the division within a number sentence

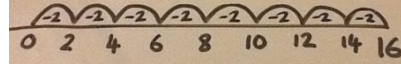
How many groups of 3 are in 12?

$$12 \div 3 = 4$$



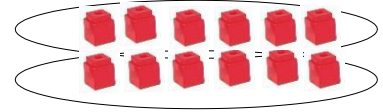
Children will use a blank number line to carry out repeated subtraction to solve a division number sentence

$$16 \div 2 = 8$$



Children will solve one-step division problems (including missing number problems) using concrete objects and pictorial representations

$$12 \div \square = 6$$

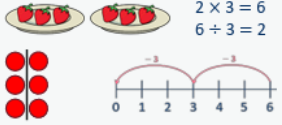
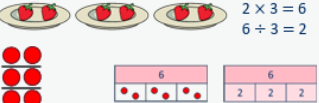
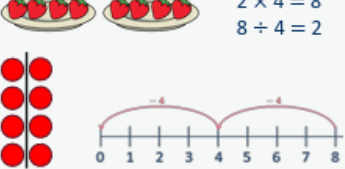
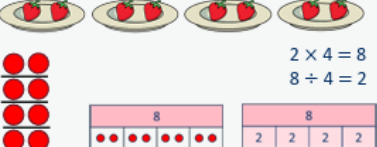
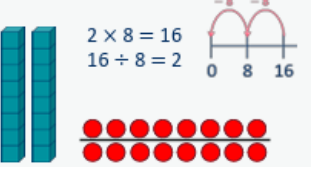
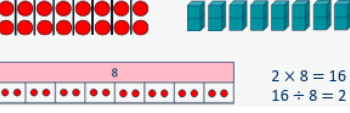
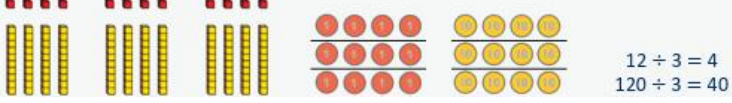

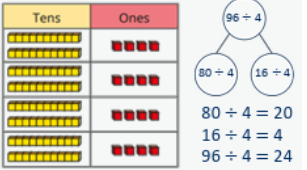
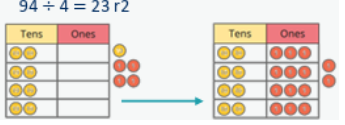
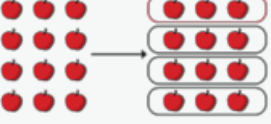


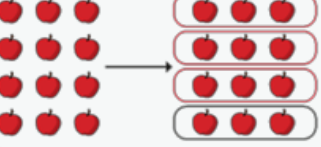




**MENTAL STRATEGIES:**

- To know that division is the inverse of multiplication
- Recall division facts for the 2, 5 and 10 times tables
- Recall halves for even numbers up to and including 20

**YEAR 3:**

**VOCABULARY:** divided by, divide, divided into, grouping, divisor, short division, remainder, inverse, quotient, divisor, dividend.

Progression of skills	Example/Key representations	
<p><b>Divide by 3.</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 3 in... ... ÷ 3 = ...</p> 	<p>...has been shared equally into 3 equal groups. ... ÷ 3 = ...</p> 
<p><b>Divide by 4.</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 4 in... ... ÷ 4 = ...</p> 	<p>...has been shared equally into 4 equal groups. ... ÷ 4 = ...</p> 
<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 8 in... ... ÷ 8 = ...</p> 	<p>...has been shared equally into 8 equal groups. ... ÷ 8 = ...</p> 
<p><b>Related facts.</b></p> <p>Links to times-table facts.</p>	<p>... ÷ ... = ... is equal to ..., So.... Tens ... ÷ ... is equal to ....tens.</p> 	
<p><b>Divide a 2-digit number by a 1-digit number- no exchange.</b></p> <p>Encourage children to partition numbers flexibly to help them divide more efficiently.</p>	<p>... tens divided by... is equal to ... tens. ...ones divided by ... is equal to ...ones.</p> 	
<p><b>Divide a 2-digit number by a 1-digit number- with remainders.</b></p> <p>Encourage children to partition numbers flexibly to help them divide more efficiently.</p>	<p>... tens divided by... is equal to ... tens. ...ones divided by ... is equal to ...ones.</p> 	<p>There are....groups of.... There are....remaining.</p> 
<p><b>Unit fractions of a set of objects.</b></p> <p>Bar models are useful to show the link between division and fractions, for example, dividing by 3 and finding a third. .</p>	<p>The whole is divided into ...equal parts. Each part is 1/? Of the whole.</p>  <p>1/4 of 12 is 3</p>  <p>1/3 of 36 is 12</p> 	
<p><b>Non-unit fractions of a set of objects.</b></p> <p>Bar models are a useful representation and show the links with division and multiplication.</p>	<p>The whole is divided into...equal parts. Each part is 1/? Of the whole.</p>  <p>3/4 of 12 apples is 9 apples.</p> <p>1/4 of 12 is 3</p>  <p>1/3 of 36 is 12</p> 	

**MENTAL STRATEGIES:**

- Know the division facts from the 3, 4 and 8 times tables
- Use knowledge of place value to calculate division (e.g.  $14 \div 2 = 7$ ,  $140 \div 2 = 70$ ,  $1400 \div 2 = 700$ )

**YEAR 4**

**VOCABULARY:** factor, divisor, divided by, divided into, remainders, divisible by, equivalent, short division, derive, Quotient, inverse, remainder, multiples, exchange.

—

**Progression of skills**

**Division facts to 12 × 12**

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

**Example/Key representations**

There are ... groups of ... in ...  
... ÷ ... =

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

... has been shared equally into ... equal groups.  
... ÷ ... =

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

**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

Related facts Link to known times-table facts.

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

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

**Divide by 10 and 100**

Encourage children to notice that dividing by 100 is the same as dividing by 10 twice.

When I divide by 10, the digits move 1 place value column to the right.  
... is one-tenth the size of ...

$2 \div 10 = 0.2$        $12 \div 10 = 1.2$

When I divide by 100, the digits move 2 place value columns to the right.  
... is one-hundredth the size of ...

$2 \div 100 = 0.02$        $12 \div 100 = 0.12$

Children will use the short division method where exchange across the place value columns occurs. Pupils will be encouraged to use multiples of the divisor to assist (HTU ÷ U).

$2 \overline{)578}$	$5 \div 2 = 2 \text{ r. } 1$
$2 \overline{)5178}$	$17 \div 2 = 8 \text{ r } 1$
$2 \overline{)51718}$	$18 \div 2 = 9$
$2 \overline{)51718}$	

**MENTAL STRATEGIES:**

- Know all related division facts for all times tables up to 12 times table (by the end of Year 4)

**YEAR 5**

**VOCABULARY:** divide, divided by, divided into, divisible by, remainder, quotient, inverse, decomposing, factor, quotient, divisor, dividend, decimal place, units, tenths, scaling, short division.

**Progression of skills**

**Example/ Key Representation**

**Mental strategies**

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 ...

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

Encourage children to notice that dividing by 100 is the same as dividing by 10 twice, and that dividing by 1,000 is the same as dividing by 10 three times.

To divide by 10/100/1,000, I move all the digits ... places to the right. ... is one-tenth/one-hundredth/one-thousandth the size of ...

$$120 \div 10 = 12$$

$$120 \div 100 = 1.2$$

$$120 \div 1,000 = 0.12$$

**Fraction of an amount**

Bar models support children to understand that to find a fraction of an amount, we divide by the denominator and multiply by the numerator.

To find  $\frac{1}{5}$  of ... , I need to divide by ... and multiply by ...

$$\frac{1}{5} \text{ of } 20 =$$

$$\frac{1}{4} \text{ of } 84 =$$

$$\frac{3}{5} \text{ of } 20 =$$

$$\frac{3}{4} \text{ of } 84 =$$

If  $\frac{1}{5}$  is ... , then the whole is ... X ...

$$\frac{1}{5} \text{ of } \underline{\quad} = 6$$

$$\frac{4}{7} \text{ of } \underline{\quad} = 24$$

**MENTAL STRATEGIES:**

- Multiply and divide numbers mentally drawing upon known facts
- Associate fractions with division

**YEAR 6**

**VOCABULARY:** divide, divided by, divided into, divisible by, remainder, factor, quotient, inverse, decimal place, units, tenths, hundredths, scaling, formal written methods, divisor, dividend, quotient.

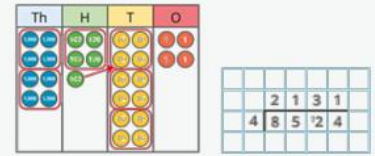
**Progression of Skills**

**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.

**Example/Key Representation**

There are ... groups of ... hundreds/tens/ones/ in ...  
I can exchange 1 ... for 10 ...



**Mental strategies**

Include partitioning and number line strategies outlined in Y5 as well as division using factors.

$$240 \div 60 = 240 \div 10 \div 6$$



$$480 \div 24 = 480 \div 4 \div 6$$



Divide numbers up to 4 digits by a two-digit whole number using the formal written method of division (chunking)  
Interpret remainders as whole number remainders, fractions or decimals.

**Long division**

432 ÷ 15 becomes

$$\begin{array}{r} 28 \text{ r } 12 \\ 15 \overline{) 432} \\ \underline{300} \\ 132 \\ \underline{120} \\ 12 \end{array}$$

Answer: 28 remainder 12

432 ÷ 15 becomes

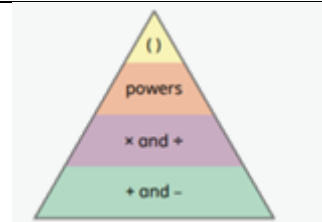
$$\begin{array}{r} 28 \\ 15 \overline{) 432} \\ \underline{300} \quad 15 \times 20 \\ \underline{132} \\ \underline{120} \quad 15 \times 8 \\ 12 \end{array}$$

$$\frac{12}{15} = \frac{4}{5}$$

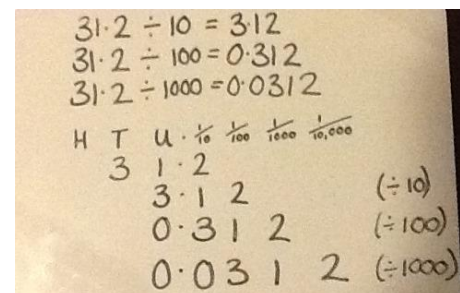
Answer:  $28 \frac{4}{5}$

**Order of operations**

Calculations in brackets should be done first, then powers. Multiplication and division should be performed before addition and subtraction



**Divide decimal numbers** with up to 3 decimal places by 10, 100 and 1000 by moving the digits around a fixed decimal



$$312 \div 10 = 31.2$$

$$312 \div 100 = 3.12$$

$$312 \div 1,000 = 0.312$$

$$906 \div 10 = 90.6$$

$$906 \div 100 = 9.06$$

$$906 \div 1,000 = 0.906$$

**Divide decimals by integers**

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

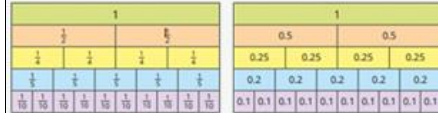
**71.25 ÷ 3**

$$\begin{array}{r} 23.75 \\ 3 \overline{) 71.25} \\ \underline{60} \phantom{00} \\ 11 \phantom{00} \\ \underline{9} \phantom{00} \\ 22 \phantom{00} \\ \underline{21} \phantom{00} \\ 15 \phantom{00} \\ \underline{15} \phantom{00} \\ 0 \phantom{00} \end{array}$$

$71.25 \div 3 = 23.75$

**Decimal and fraction equivalents**

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



$\frac{1}{5} = 0.2$     $\frac{2}{5} = 0.4$     $\frac{3}{5} = 0.6$

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

$\frac{3}{4} = \frac{75}{100} = 0.75$

**Divide a fraction by an integer**

This is the first time children divide fractions by an integer.

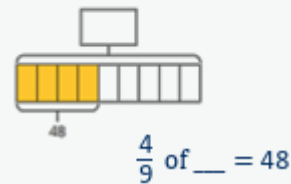
I am dividing by ... , so I can split each part into ... equal parts.

$\frac{1}{3} \div 2 = \frac{1}{6}$

**Fraction of an amount**

Children divide and multiply to find fractions of an amount. Bar models can still be used to support understanding where needed.

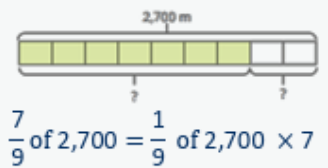
If  $\frac{\square}{\square}$  is equal to ..., then the whole is equal to ...



To find  $\frac{1}{\square}$  I divide by ...

$\frac{1}{2}$  of 36 =  $36 \div 2$   
 $\frac{1}{12}$  of 36 =  $36 \div 12$

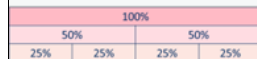
If  $\frac{1}{\square}$  is equal to ..., then  $\frac{\square}{\square}$  are equal to ...



**Calculate percentages**

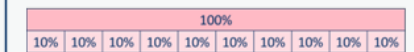
Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.

There are ... lots of ... % in 100%  
 To find ... %, I need to divide by ...



50% of ... = ...  $\div 2$   
 25% of ... = ...  $\div 4$

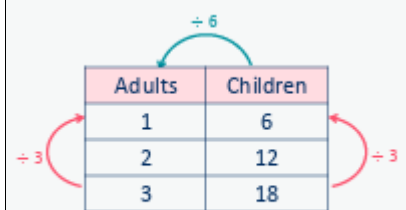
... % is made up of ... %, and ... %



To find 30%, I can find 10% and then multiply it by 3  
 To find 23%, I can use 10%  $\times 2$  and 1%  $\times 3$   
 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.



The ratio of children to adults is 6 : 1

**MENTAL STRATEGIES:**

- Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
- Calculate a fraction of an amount



## **References:**

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/238967/Mathematics\\_Appendix\\_1.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/238967/Mathematics_Appendix_1.pdf)

National Curriculum Maths Calculation Guidance

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/210969/NC\\_framework\\_document\\_-\\_FINAL.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/210969/NC_framework_document_-_FINAL.pdf)

2016 Key Stage 1& 2 Mathematics Test Framework

<http://www.newbyprimary.co.uk/wp-content/uploads/2013/01/Newby-Calculation-Policy-with-progression.pdf>

Bourne Westfield Academy Calculation Policy – with thanks to Sarah Charlton

## **Recommended Maths Websites:**

BBC KS1 Maths

<http://www.pbbc.co.uk/education/subjects/zjxhfg8>

BBC KS2 Maths

<http://www.bbc.co.uk/education/subjects/z826n39>

Singapore Maths (Using 'Bar Method' Modelling To Solve Word Problems)

<http://www.mathplayground.com/thinkingblocks.html>

(also available as free i-pad apps)

General Curriculum Games Sites – with Maths

<http://www.topmarks.co.uk/Search.aspx?Subject=16&AgeGroup=2>

<http://www.crickweb.co.uk/>

<http://resources.woodlands-junior.kent.sch.uk/maths/index.html>

Problem Solving And Reasoning

N'Rich KS1

<http://nrich.maths.org/9077>

N'Rich KS2

<http://nrich.maths.org/9084>

L6 Maths – KS3 Videos

<http://www.hegartymaths.com/ks3/all/ks3>