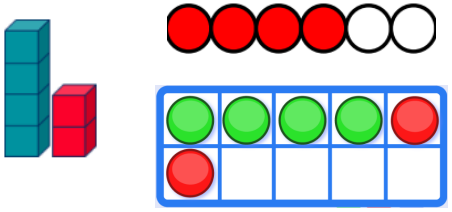
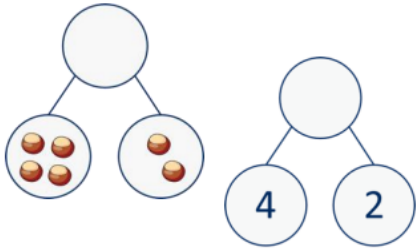
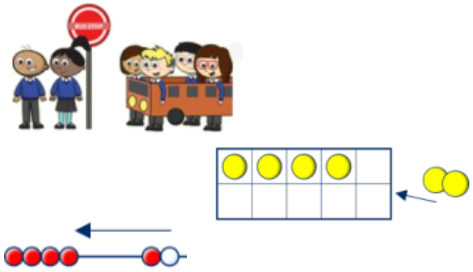
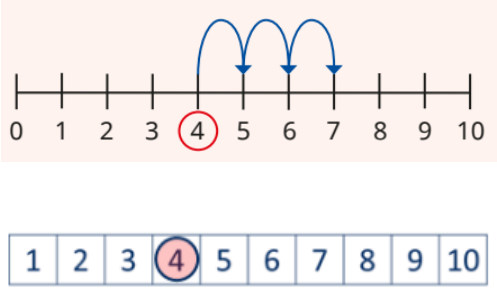
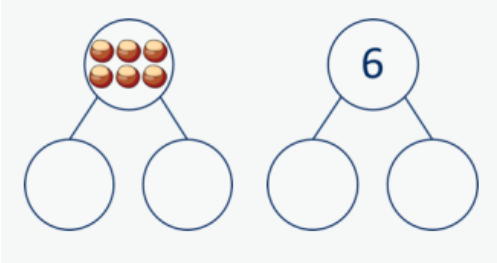
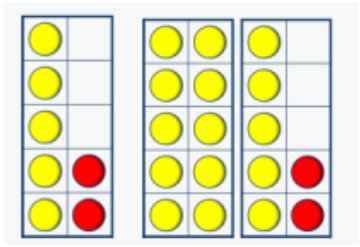
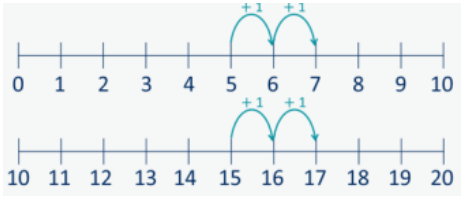
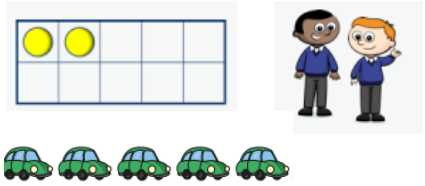
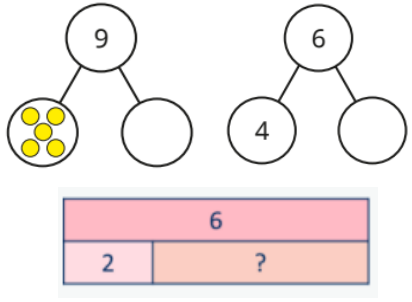
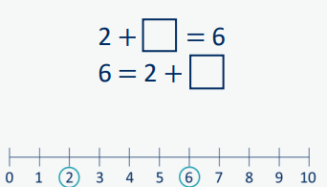
LHPS Calculations Policy

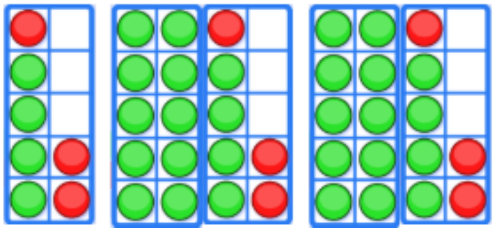
ADDITION

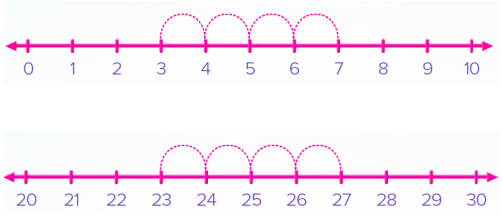
YEAR 1	★ Read, write and interpret mathematical statements involving addition (+) and equals (=) signs. ★ Represent and use number bonds within 20 ★ Add 1-digit and 2-digit numbers to 20, including zero. ★ Solve one-step problems that involve addition, using concrete objects and pictorial representations, and missing number problems such as 7 = + 2		
KEY VOCABULARY	**Addition, add together, double, efficient, equal to, fact family, greater, group, inverse, near double number bond, plus, symbol, systematic, total**		
Progression of Skills	**Key representations**		
Add together ***(aggregation)*** 2 quantities are combined to make a 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. *Starting at the larger number, count on to the smaller number one by one to find the total.*	**First there were …** **Then … more were added.** **Now there were …** **… + …= …** 	**I start on…** **I jump on…** **I count on…** 	**… plus … is equal to …** **… is equal to … + …** **4 + 2 = 6** **2 + 4 = 6** **6 = 4 + 2** **6 = 2 + 4**

Progression of Skills	Key representations		
Bonds within 10 *Includes bonds for all numbers up to 10.* *Encourage children to notice patterns.*	**… is made of … and …** **… and … make …** 	**… can be partitioned into … and …** 	**… plus … is equal to …** **… 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 … + … = …** 	**… more than … is … ,** **so … more than … is …** 	**What patterns do you notice?** **5 + 2 = 7** **15 + 2 = 17** **7 = 5 + 2** **17 = 15 + 2**
Missing Numbers *Make links to known facts.*	**How many more do we need to make … ?** 	**If … is the whole, and … is a part, the other part must be …** 	**… plus … is equal to …** **… is equal to … + …** 

<table>
<tr><td>YEAR 2</td><td colspan="3">★ Recall and use addition facts to 20 fluently, and derive and use related facts up to 100
★ Add numbers using concrete objects, pictorial representations, and mentally, including:
- a two-digit number and 1s
- a two-digit number and 10s
- 2 two-digit numbers
- adding 3 one-digit numbers
★ Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</td></tr>
<tr><td>KEY VOCABULARY</td><td colspan="3">Calculation, exchange, method, multiple, one(s), operation, partition, related facts, ten(s), value, increase, sum</td></tr>
<tr><td>Progression of Skills</td><td colspan="3">Key representations</td></tr>
<tr><td>Add ones to any number
(related facts)

Make links to known facts.</td><td>I know that … and … is … , so I know … + … = …

  </td><td>… more than … is … , so … more than … is …

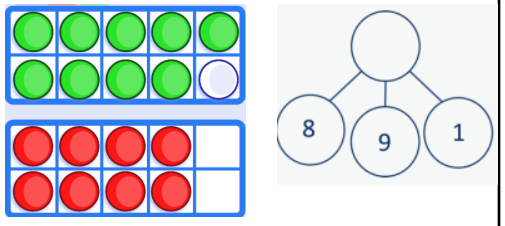
 
</td><td>What do you notice?

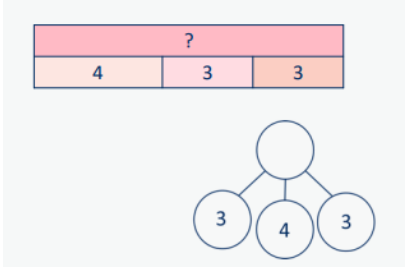
Can you continue the pattern?

4 + 3 = 7
14 + 3 = 17
24 + 3 = 27…</td></tr>
<tr><td>Add three one-digit numbers

Prompt children to understand that addition can be done in any order and to make links to known facts.</td><td>… and … are a bond to 10,

10 + … = …

 
</td><td>Double … + … = …

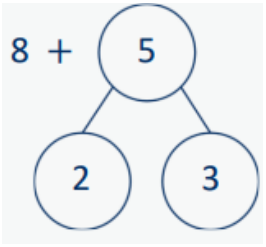
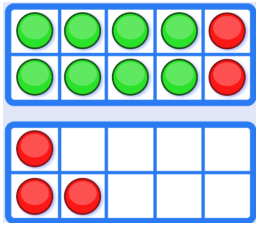
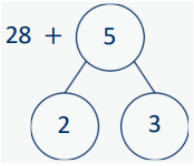
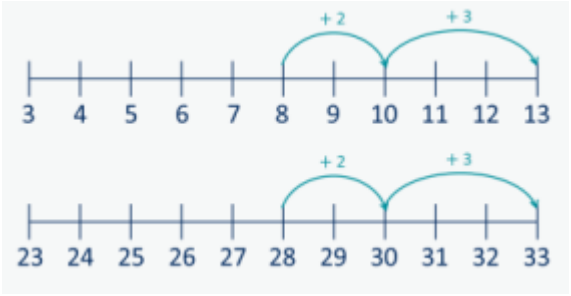
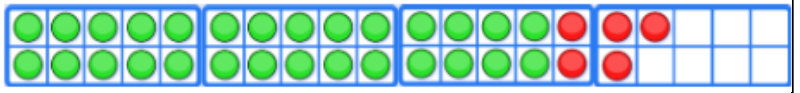
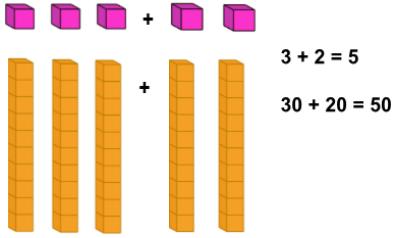
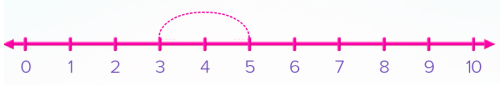
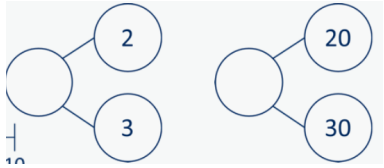
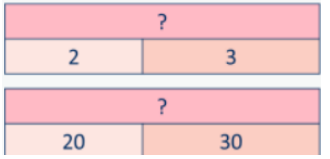
 
</td><td>What do you notice?

Which calculation is the easiest to calculate?

8 + 9 + 1 =

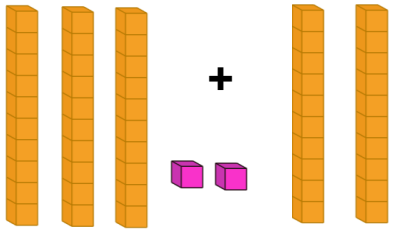
1 + 8 + 9 =

9 + 1 + 8 =</td></tr>
</table>

Progression of Skills	Key representations	
Add across a ten *Partition the number being added to make a whole 10.*	**… can be partitioned into … and …**   	**I add … to get to … and then I add …** **8 + 5 = 13** **28 + 5 = 33**   
Add multiples of 10 *Make links to known facts within 10.* *e.g. I know 7 + 3 = 10,* *so 70 + 30 = 100*	**… ones + … ones = … , so … tens and …** **tens = … tens** 	**What is the same? What is different?** **3 + 2 = 5**    

<table>
<tr><th>Progression of Skills</th><th colspan="3">Key representations</th></tr>
<tr>
<td>Add 10s to any number

Make links to known facts.</td>
<td>… tens + … tens = … tens
…tens + … ones = …

  </td>
<td>To add … to …, I need to add ten … times.

<table>
<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>
<tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr>
<tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr>
<tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr>
<tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr>
</table>
</td>
<td>I know that … + … = … ,

so … + … = ….

30 + 20 = 50

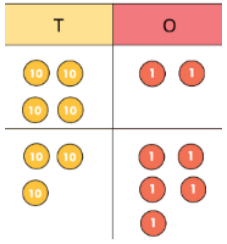
32 + 20 = 52</td>
</tr>
<tr>
<td>Add 2-digit numbers (not across a ten)

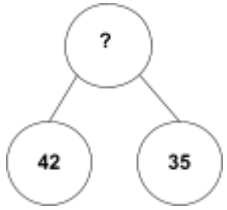
Lining up ones and tens will help with later written methods.</td>
<td colspan="3">… ones + …ones = … ones

… tens + … tens = … tens

… tens + … ones = …

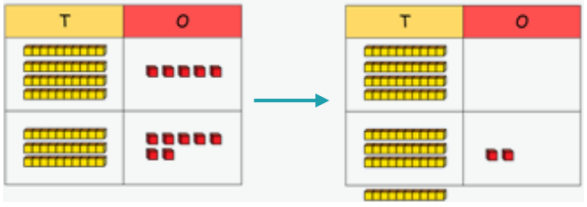


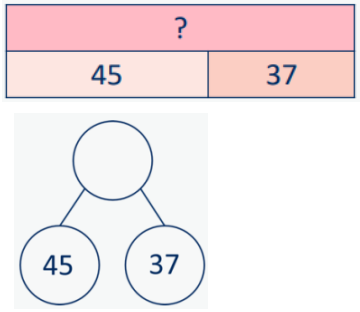


2 ones + 5 ones = 7 ones
4 tens + 3 tens = 7 tens
7 tens + 7 ones = 77</td>
</tr>
<tr>
<td>Add 2-digit numbers (across a ten)

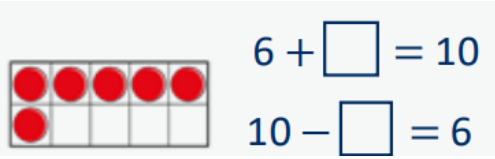
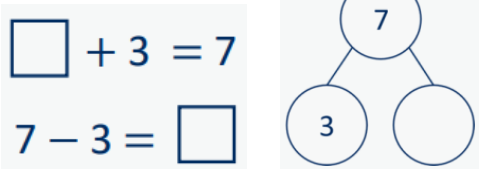
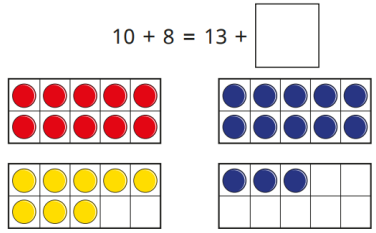
Begin to exchange 10 ones for 1 ten.</td>
<td colspan="3">There are … ones, so I do/do not need to make an exchange.

… ones = … ten and … ones

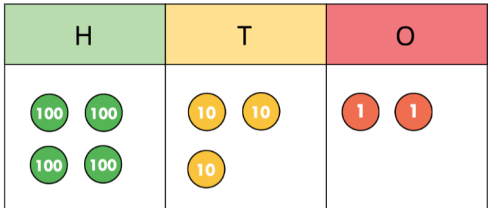
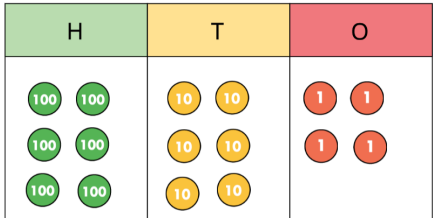
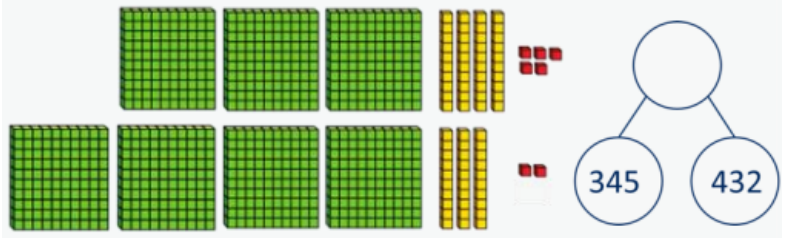
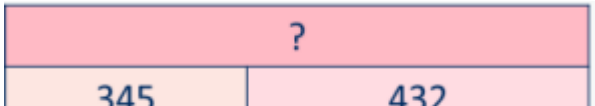
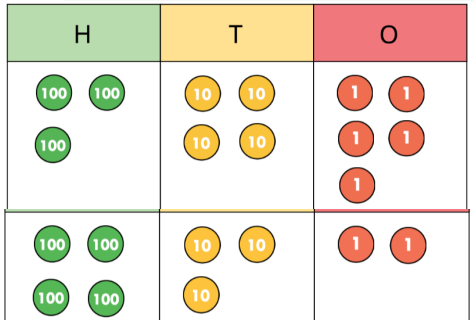
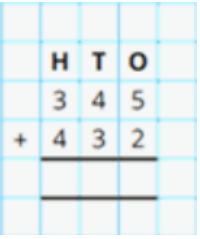
 



5 ones + 7 ones = 12 ones
12 ones = 1 ten and 2 ones
4 tens + 3 tens + 1 ten = 8 tens
8 tens + 2 ones = 82</td>
</tr>
</table>

Progression of Skills	Key representations		
Missing Numbers *Solve missing number problems, and use the inverse to check.*	**How many more do you need to make … ?** 	**If … is a whole and … is a part, then … is the other part.** 	**… can be partitioned into … and …** 

Year 3	★ Add numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. ★ Add numbers with up to three digits, using formal written methods of columnar addition. ★ Add fractions with the same denominator within 1 whole ★ Calculate the time taken by particular events or tasks.
KEY VOCABULARY	**Column addition, digit, estimate, exchange, hundred(s), inverse, crossing the 10, crossing the 100**

Progression of Skills	Key Representations
Add 1s, 10s or 100s to a 3-digit number *Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.*	**The ones/tens/hundreds column will increase by…**   **432 + 5 =** **432 + 50 =** **432 +500 =** **664 + 3 =** **664 + 30 =** **664 + 300 =** **What patterns do you notice?** 235 + 3 = 235 + 30 = 235 + 300 = 604 + 20 = 604 + 50 = 604 + 90 = 111 + ☐ = 118 111 + ☐ = 181 111 + ☐ = 811
Add two numbers (no exchange) *Mental strategies and introduction of formal written method.*	**… ones + … ones = … ones** **… tens + … tens = … tens** **… hundreds = … hundreds = … hundreds**    

Add two numbers across a 10 or 100

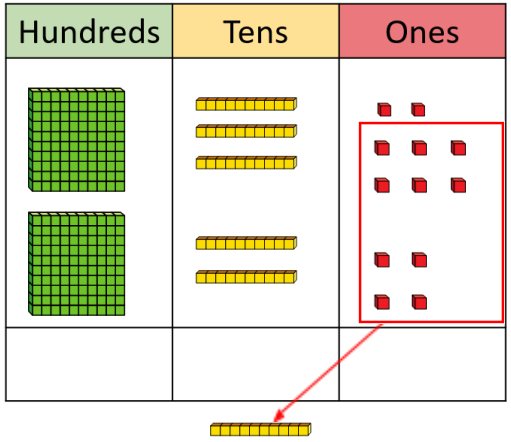
Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.

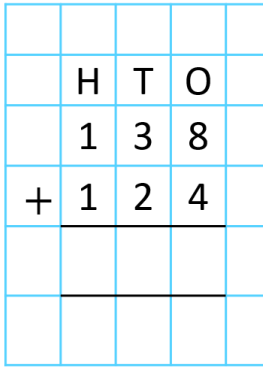
There are … ones, so I do/do not have to make an exchange.

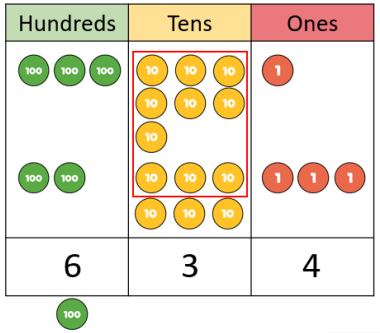
There are … tens, so I do/do not have to make an exchange

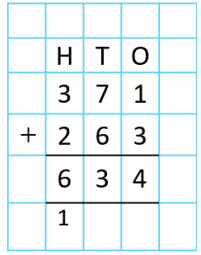
… ones = … tens and …ones

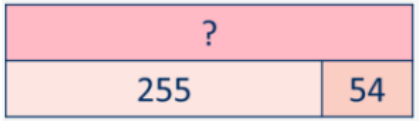
… tens = … hundreds and … tens

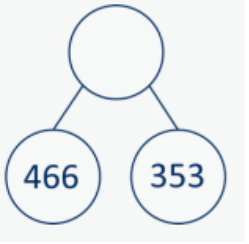








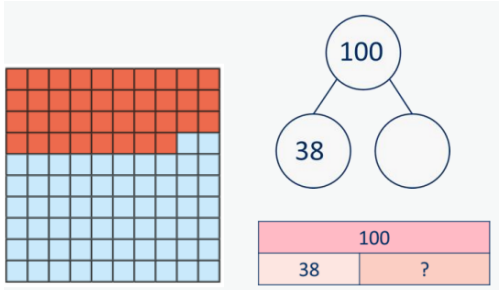




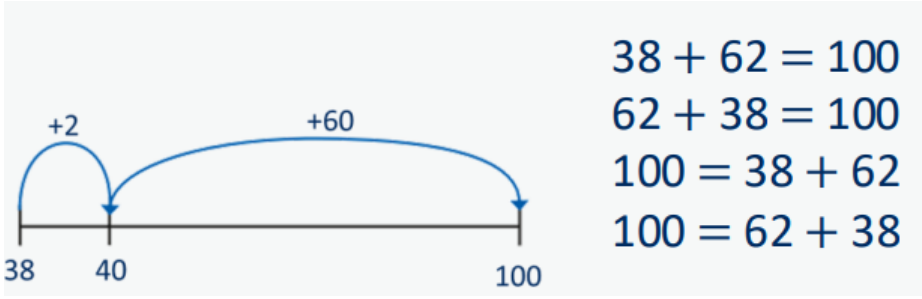
Complements to 100

Pairs of numbers which total 100

… plus … is equal to 100



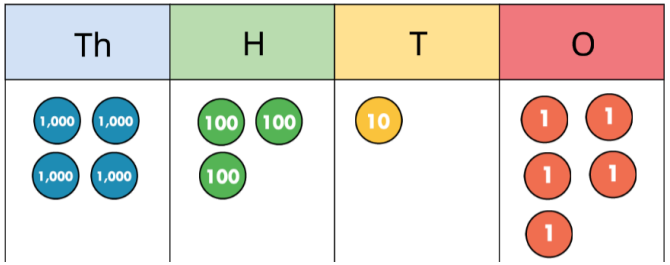
I add … to get to the next ten, and then add … to get to 100.



<table>
<tr><td>YEAR 4</td><td colspan="2">★ Add numbers with up to 4 digits using a formal written method.
★ Solve simple measure and money problems involving fractions and decimals to 2 decimal places</td></tr>
<tr><td>KEY VOCABULARY</td><td colspan="2">Efficient, inverse, round, thousand(s)</td></tr>
<tr><td>Progression of Skills</td><td colspan="2">Key Representations</td></tr>
<tr><td rowspan="2">Add 1s, 10s and 100s to a four digit number

Emphasis should be put on mental strategies including number bonds and related facts.

Prompt children to notice which digit changes.</td><td>The ones/tens/hundreds/thousands column will increase by …

4,315 + 3 =
4,315 + 30 =
4,315 + 300 =
4,315 + 3,000 =</td><td>What patterns do you notice?

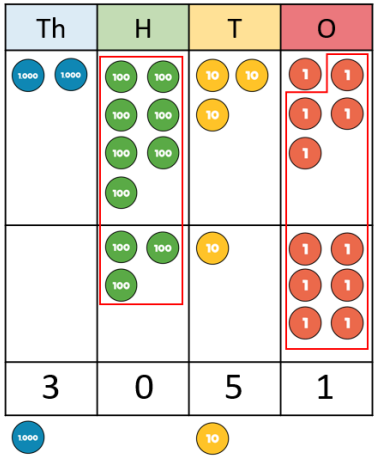
2,350 + 3 =
2,350 + 30 =
2,350 + 300 =
2,350 + 3,000 =

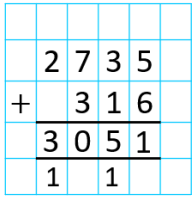
6,040 + 200 =
6,040 + 500 =
6,040 + 900 =

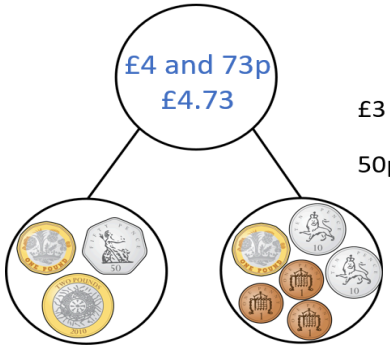
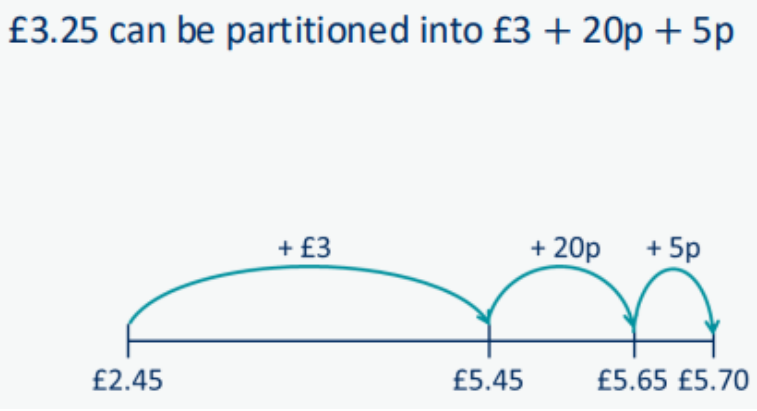
2,211 + ☐ = 2,251
2,211 + ☐ = 2,215
2,211 + ☐ = 2,511</td></tr>
<tr><td>Add up to two four digit numbers

Formal written method with up to three exchanges. Children should be encouraged to estimate and use the inverse to check answers to calculations.</td><td colspan="2">There are … ones/tens/hundreds, so I do/do not have to make an exchange.

I can exchange 10 ……. for 1 …..

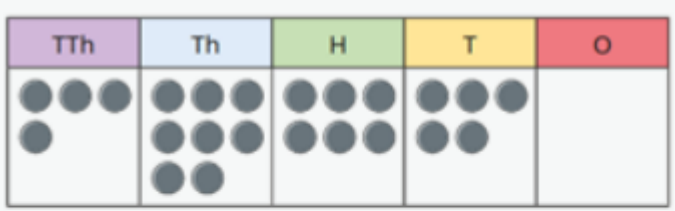

</td></tr>
</table>

Add decimal numbers in context of money *Emphasis should be placed on the use of partitioning and the number line rather than formal written methods.*	**… pence + … pence = … pence** **… pounds + … pounds = … pounds**  £3 + £1 = £4 50p + 23p = 73p	

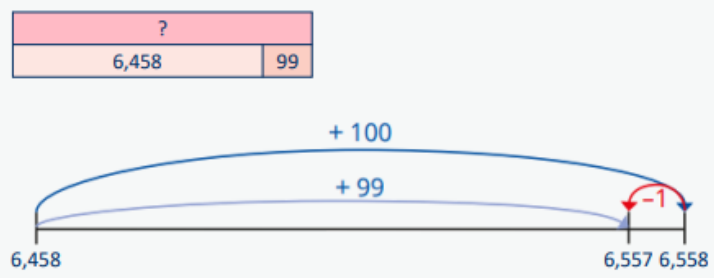
YEAR 5	★ Add whole numbers with more than 4 digits, including using formal written methods. ★ Add numbers mentally with increasingly large numbers. ★ Add decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1
KEY VOCABULARY	**Accurate, approximate, strategy**
Progression of Skills	**Key Representations**

Add using mental strategies

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



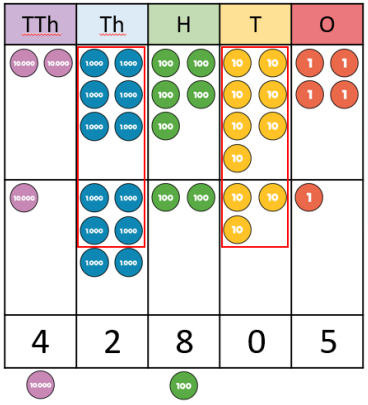
To add … , I can add … and then subtract …

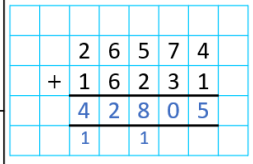


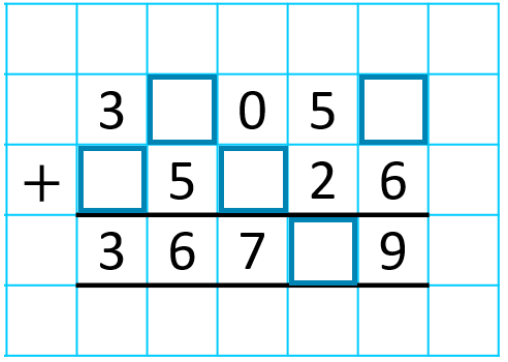
Add whole numbers with more than 4 digits

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

I can exchange 10 ……. for 1 …..





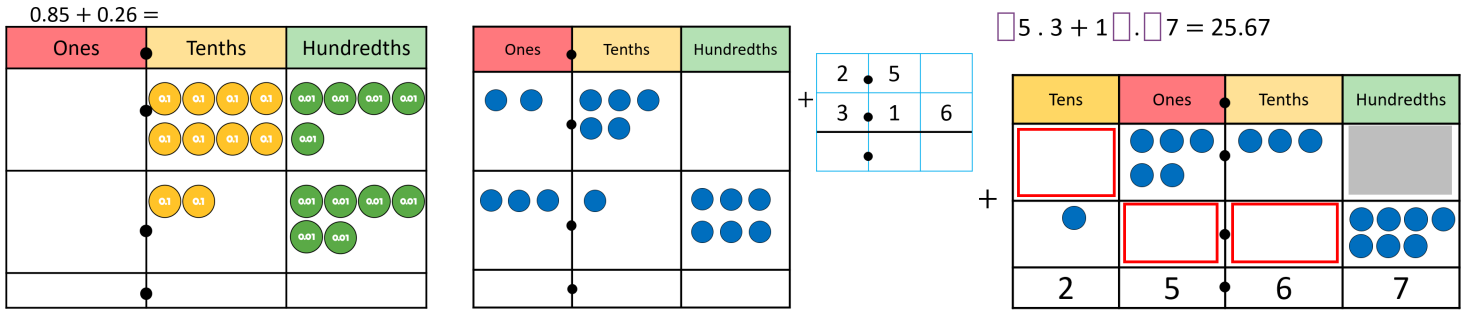


Add decimals with up to 2 decimal places,

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

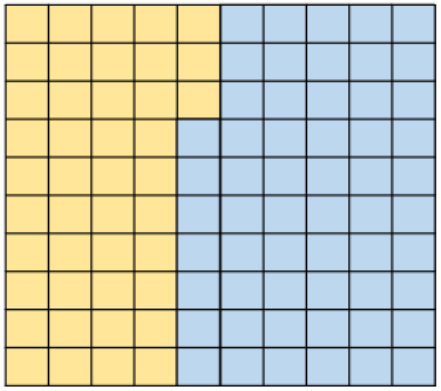
I do/do not need to make an exchange because…

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



$0.43 + \boxed{0.57} = 1$

100	
21	79

1	
0.21	0.79

$4 + 6 = 10$

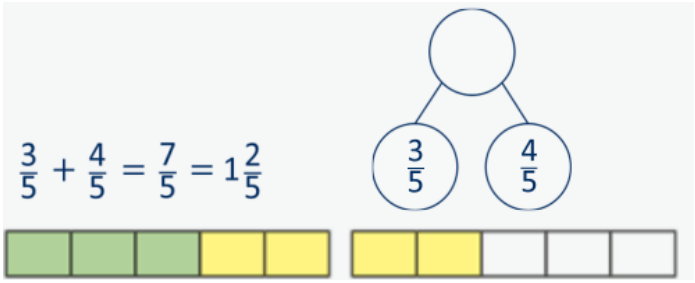
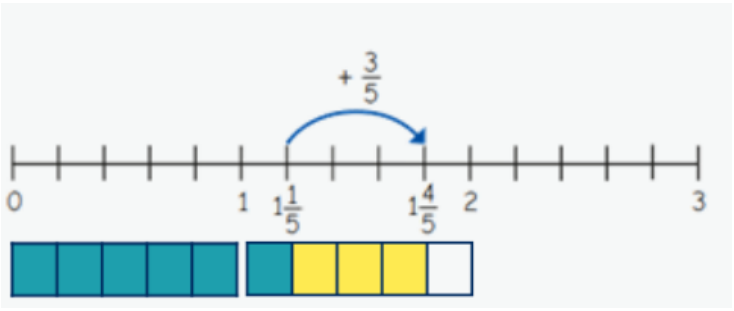
$44 + 56 = 100$

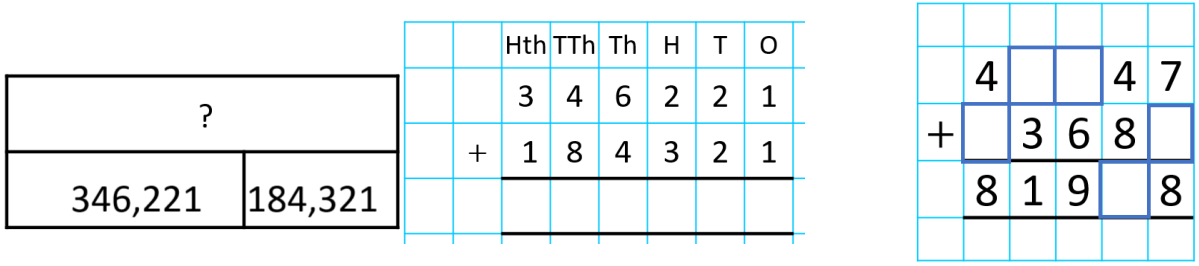
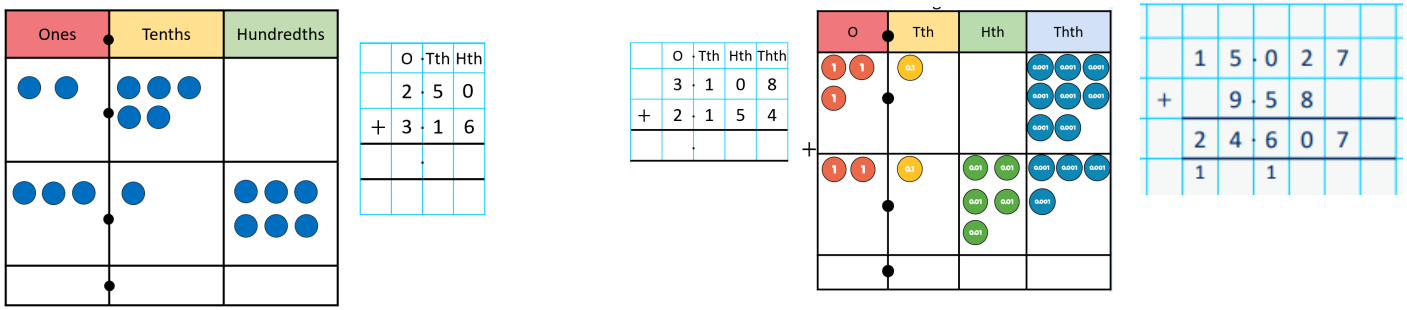
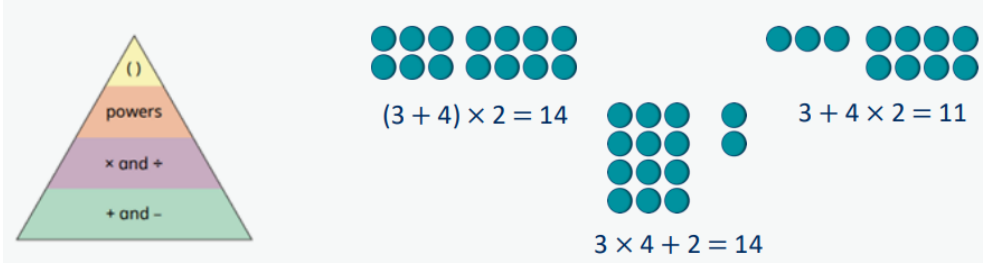
$444 + 556 = 1{,}000$

$0.4 + 0.6 = 1$

$0.44 + 0.56 = 1$

$0.444 + 0.556 = 1$

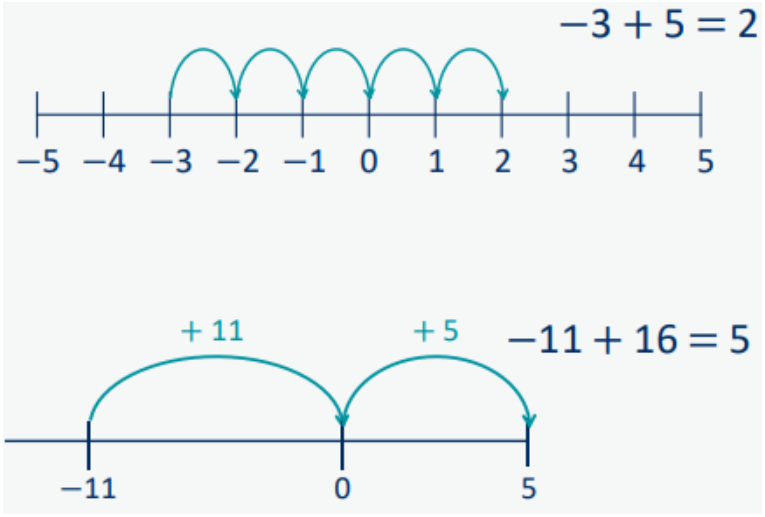
Add fractions and mixed numbers with the same denominator beyond 1 whole	**When adding fractions with the same denominator, I only add the numerator.** **… fifths + … fifths = … fifths**  

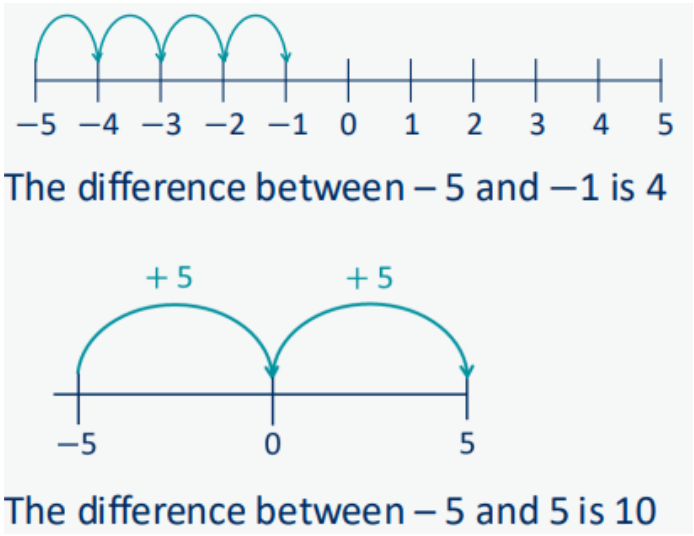
YEAR 6	★ Add larger numbers, using the formal written method of columnar addition. ★ Use their knowledge of the order of operations to carry out calculations involving the 4 operations. ★ Calculate intervals across zero
KEY VOCABULARY	**Order of operations**
Progression of Skills	**Key Representations**
Add integers up to 10 million *Encourage children to estimate and use inverse operations to check answers to calculations.*	
Add decimals with up to 3 decimal places. *Progress to numbers with digits in different place value columns.* *Encourage children to check that they have lined up the columns correctly.*	**I do/do not need to make an exchange because…** 
Order of operations *Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction.* **When no brackets are shown and the operations have the same priority, work left to right.*	 **… has greater priority than … , so the first part of the calculation I need to do is …**

Negative numbers

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

… plus … is equal to …



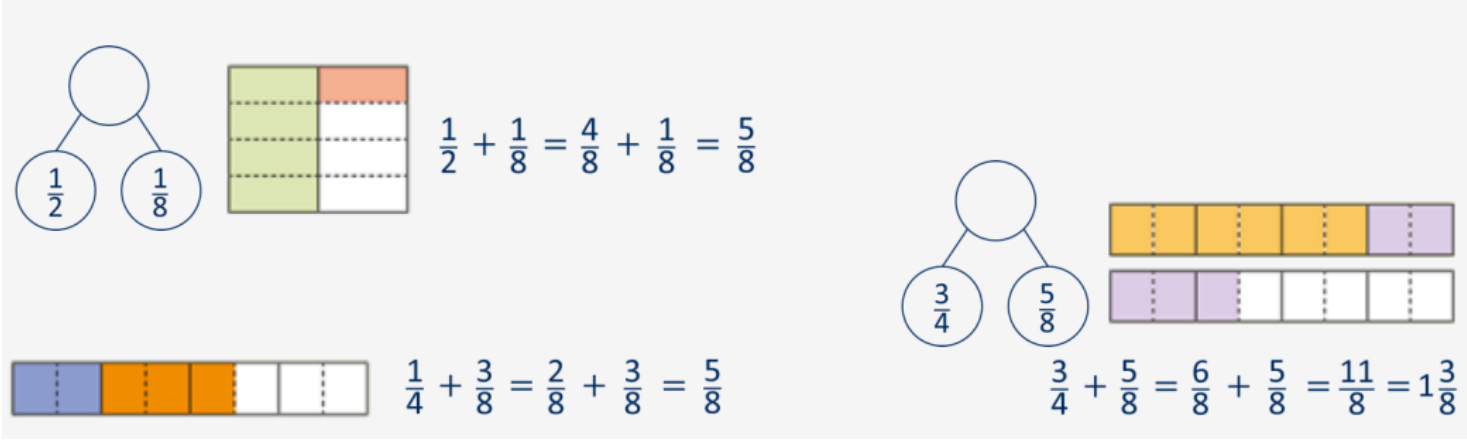


Add fractions with denominators that are a multiple of one another

Encourage children to convert fractions to the same denominator before adding.

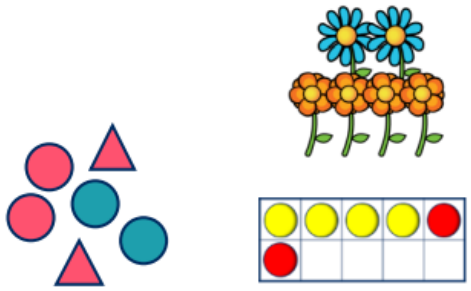
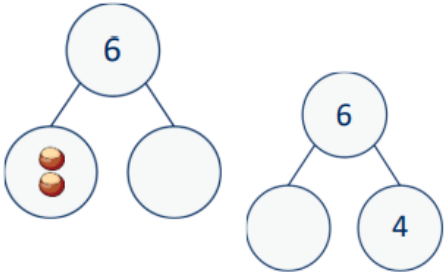
Progress from adding fractions within 1 whole to adding fractions beyond 1 whole.

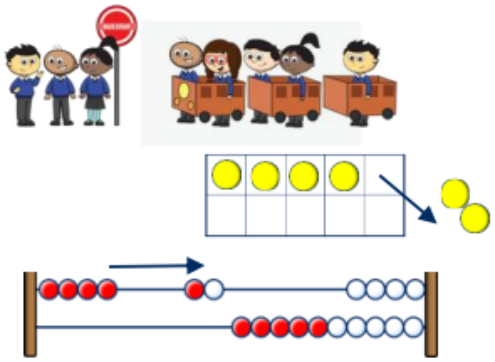
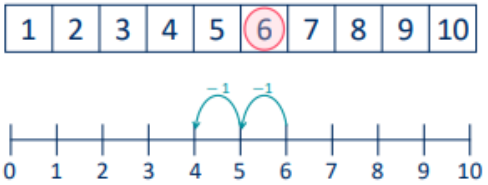
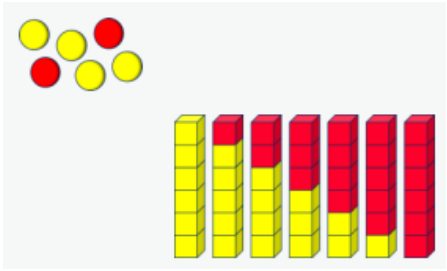
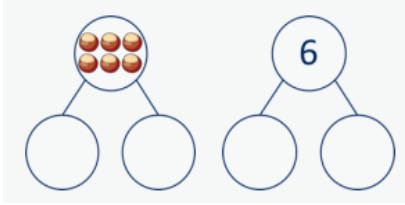
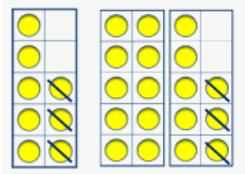
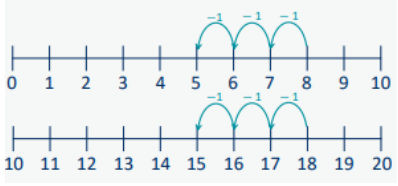
The denominator has been multiplied by …, so the numerator needs to be multiplied by… for the fractions to be equivalent.

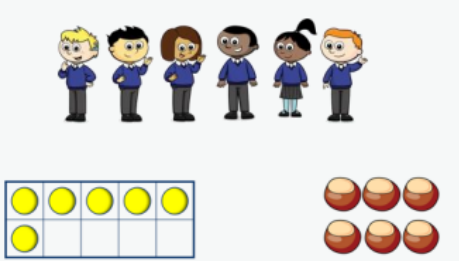
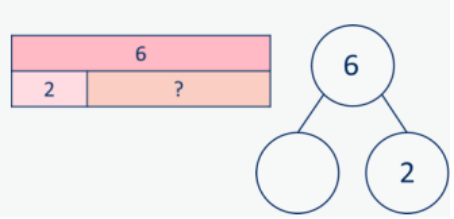
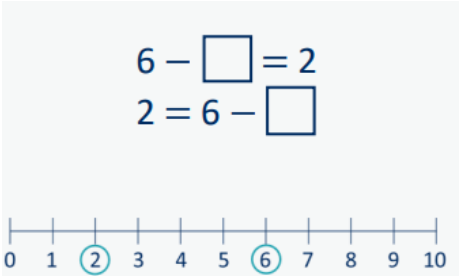


SUBTRACTION

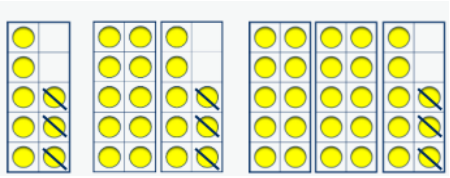
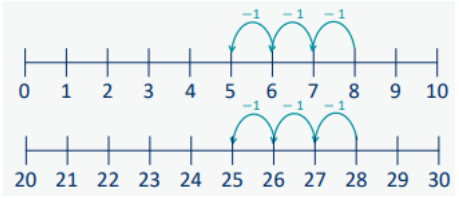
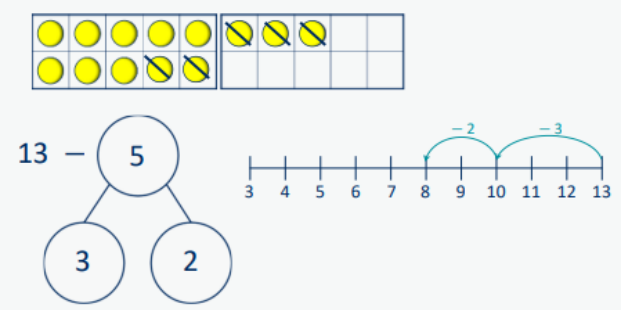
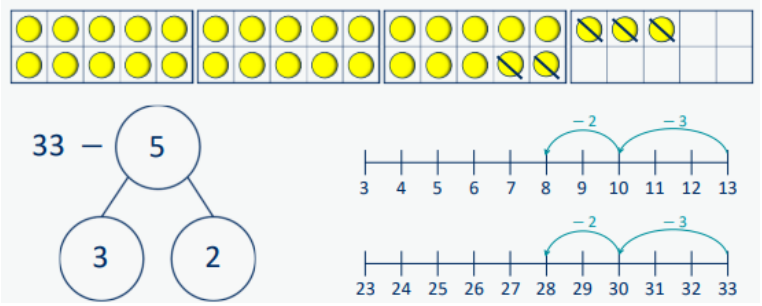
YEAR 1	★ Read, write and interpret mathematical statements involving subtraction (–) and equals (=) signs. ★ Represent and use number bonds and related subtraction facts within 20 ★ Subtract one-digit and two-digit numbers to 20, including zero. ★ Solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9
KEY VOCABULARY	**Difference, efficient, equal to, fact family, group, inverse, less, minus, number bond, plus, subtract, subtraction, symbol, systematic, total**

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

Take away A quantity is decreased.	**First… Then… Now….** 	**I start at…** **I jump back…** **I land on…**  	**… minus … is equal to.** **…is equal to … and …** $6-2=4$ $6-4=2$ $4=6-2$ $2=6-4$
Bonds to 10. Focus on subtraction. Encourage children to notice patterns.	**… is made of … and …** **… and … make …** 	**… can be partitioned into … and …**  	**… minus … is equal to.** **…is equal to … and …** $6-0=6$ $6-1=5$ $6-2=4$ $6-3=3$ $6-4=2$ $6-5=1$ $6-6=0$
Related facts within 20 Make links to known facts.	**I know that … minus … = … so** **… minus = …** 	**… less than … is … so** **… less than … is …**  	**What patterns do you notice?** $8-3=5$ $18-3=15$ $5=8-3$ $15=18-3$

Missing numbers **Make links to known facts.**	**How many do you need to subtract to make …?** 	**If … is the whole and … is a part, the other part must be…** 	**… minus … is equal to …** 

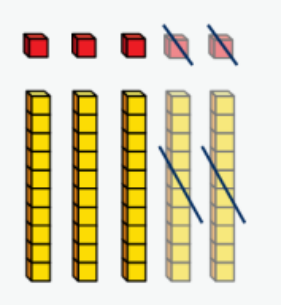
YEAR 2	★ Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100 ★ Subtract numbers using concrete objects, pictorial representations, and mentally, including: • a two-digit number and 1s • a two-digit number and 10s • 2 two-digit numbers ★ Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
KEY VOCABULARY	Calculation, decrease, exchange, method, multiple, one(s), operation, partition, related facts, ten(s), value, sum

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

Subtract multiples of 10

Make links to known facts within ten.

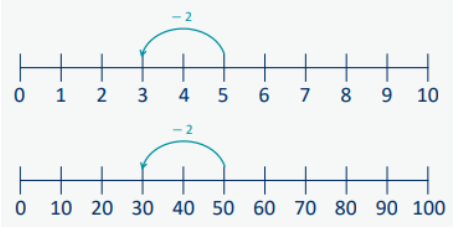
… ones − … ones = … ones so … tens − … tens = … tens

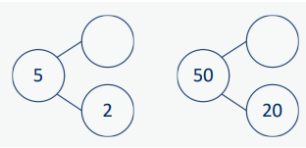


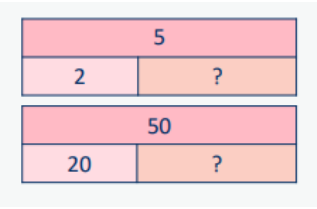
5 - 2 = 3

50 - 20 = 30

What is the same? What is different?



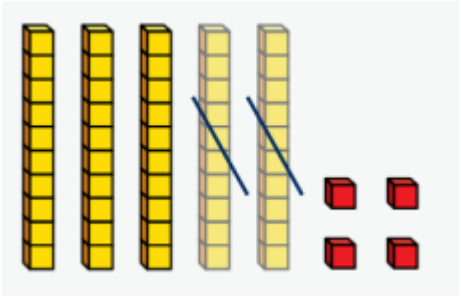




Subtract 10s from any number

Make links to known facts.

… tens − … tens = … tens … tens and … ones = …



To subtract … I need to subtract 10 … times

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

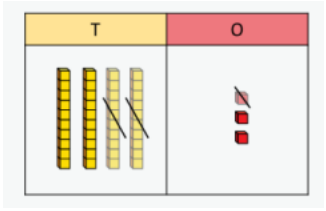
I know that … minus ... = … so … minus … = …

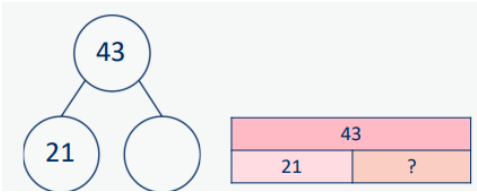
50 - 30 = 20

54 - 30 = 24

Subtract two 2-digit numbers (not across a ten)

… ones − … ones = … ones … tens − … tens = … tens

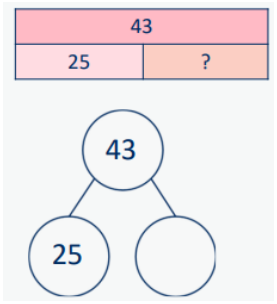


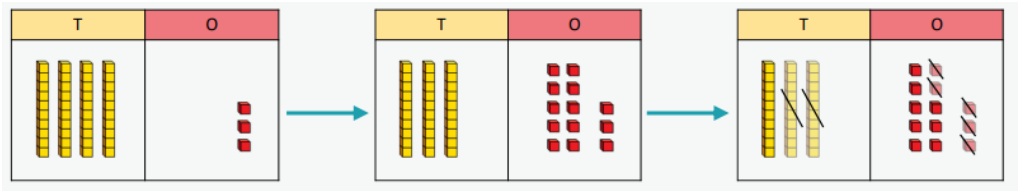


3 ones − 1 one = 2 ones
4 tens − 2 tens = 2 tens
2 tens and 2 ones = 22

<table>
<tr>
<td>Subtract two 2-digit numbers (across a ten)

Begin to exchange 1 ten for 10 ones.</td>
<td colspan="3">I need to make an exchange because I do not have enough ones to subtract … ones.

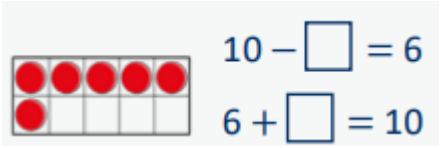
 

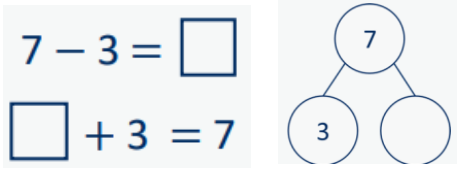


3 ones - 5 ones =
(I need to exchange one ten for ten ones)

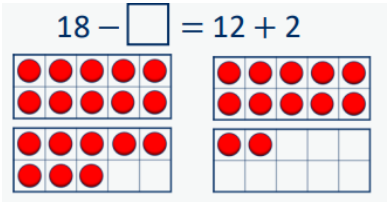
3 ones − 5 ones = 8 ones
3 tens − 2 tens = 1 ten
1 ten and 8 ones = 18</td>
</tr>
<tr>
<td>Missing numbers

Solve missing number problems and use the inverse to check.</td>
<td>How many do you need to subtract to make …?

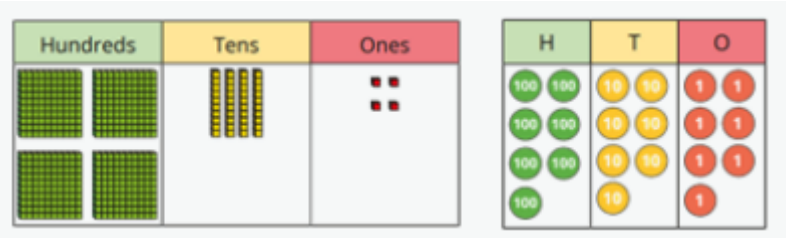
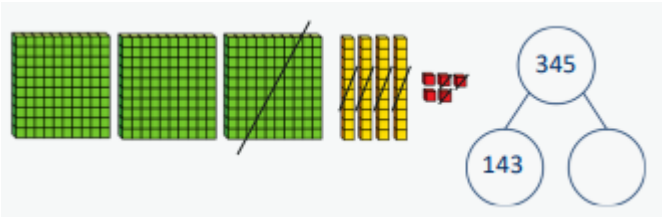
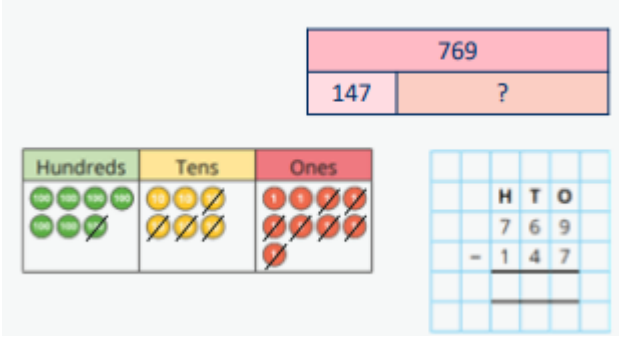
 
</td>
<td>If … is a whole and … is a part, then … is the other part.

</td>
<td>… can be partitioned into … and …

 
</td>
</tr>
</table>

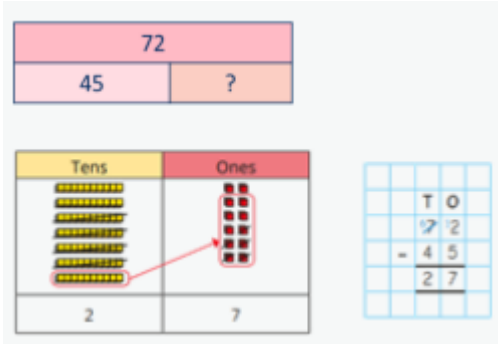
YEAR 3	★ Subtract numbers mentally, including: • a three-digit number and ones • a three-digit number and tens • a three-digit number and hundreds. ★ Subtract numbers with up to three digits, using formal written methods. ★ Subtract fractions with the same denominator within 1 whole
KEY VOCABULARY	**Column subtraction, digit, estimate, exchange, hundred(s), inverse**

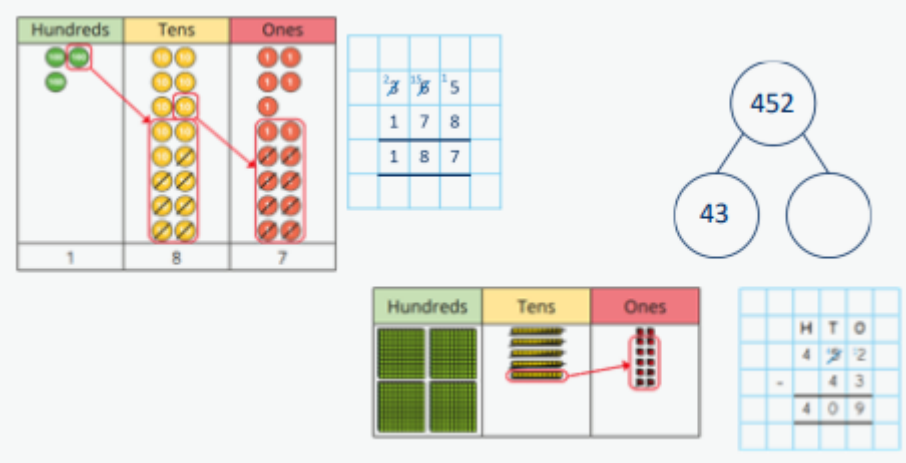
Progression of Skills	**Key Representations**	
Subtract 1s, 10s and 100s from a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	**The ones/tens/hundreds column will decrease by…**  **444 - 2 =** **444 - 20 =** **444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

Subtract two numbers across a 10 or 100

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

I need to subtract … ones. I do/do not need to make an exchange.
I need to subtract ... tens. I do/do not need to make an exchange.
I can exchange 1 … for 10 …



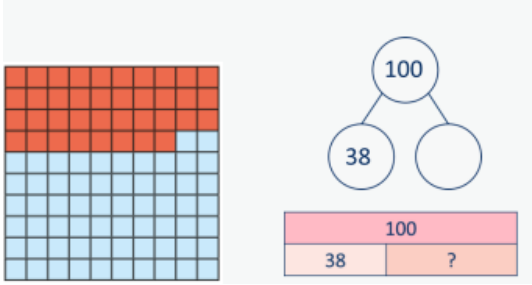


Complements to 100

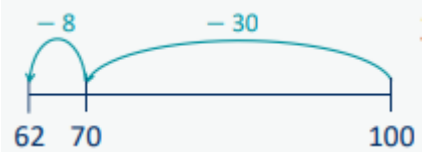
Focus on subtraction facts.

Encourage children to notice patterns.

100 minus … is equal to …



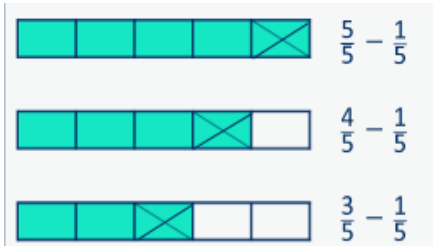
I subtract … tens and then I subtract … ones

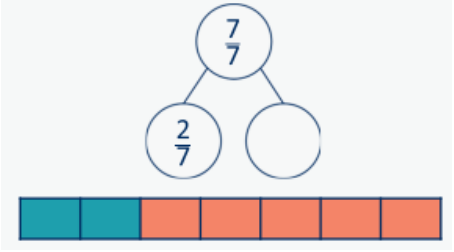


100 - 62 = 38
100 - 38 = 62
62 = 100 - 38
38 = 100 - 62

Subtract fractions with the same denominator within 1 whole
Make links with known facts.

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



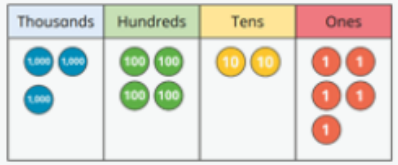


YEAR 4	**★ Subtract numbers with up to 4 digits using a formal written method** **★ Solve simple measure and money problems involving fractions and decimals to 2 decimal places** **★ Subtract fractions with the same denominator**
KEY VOCABULARY	**Efficient, inverse, round, thousand(s)**
Progression of Skills	**Key Representations**

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

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

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



3,425 − 2 =
3,425 − 20 =
3,425 − 200 =
3,425 − 2,000 =

What patterns do you notice?

4,356 − 3 =
4,356 − 30 =
4,356 − 300 =
4,356 − 3,000 =

4,433 − ☐ = 4,430
4,433 − ☐ = 4,033
4,433 − ☐ = 4,403

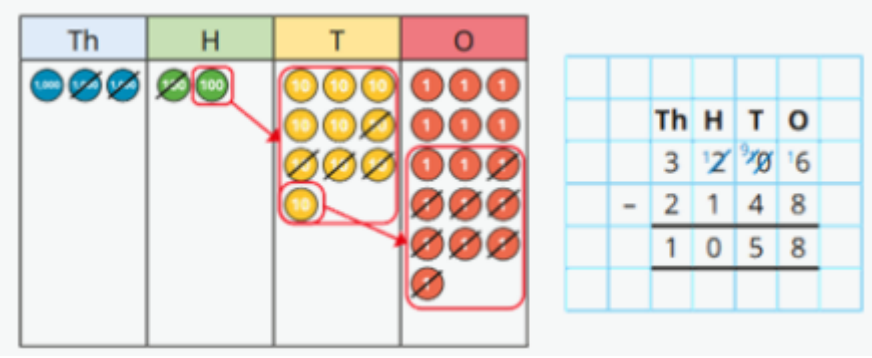
6,940 − 200 =
6,940 − 300 =
6,940 − 400 =

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.

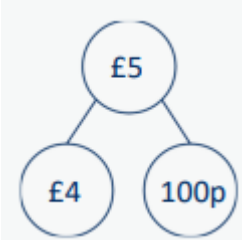
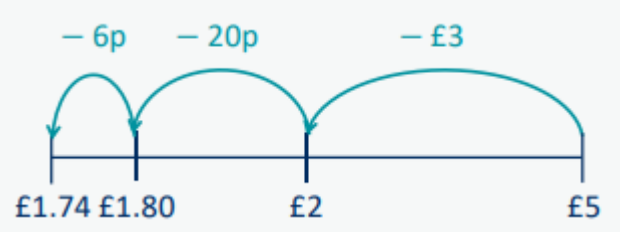
I need to subtract… ones/tens/hundreds. I do/do not need to make an exchange.

I can exchange 1… for 10…

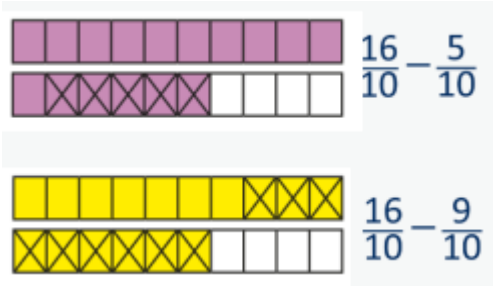


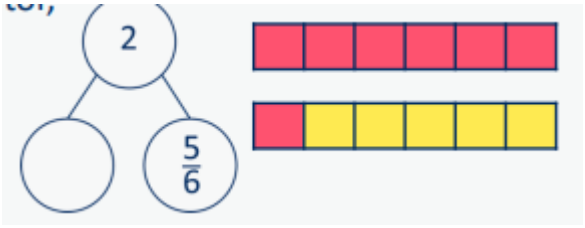
<table>
<tr>
<td>Subtract decimal numbers in the context of money

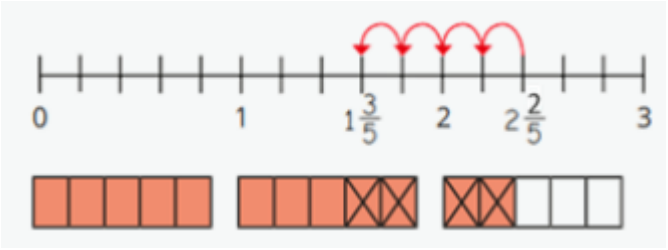
Emphasis here is on partitioning and use of number lines rather than formal written calculations.</td>
<td>I can partition £… into £… and 100p
£… − £… = £…
100p − …p = …p

£5 − £3.26
£4 − £3 = £1
100p − 26p = 74p
£5 - £3.26 = £1.74
 
</td>
<td>£3.26 can be partitioned into £3 + 20p + 6p
 
</td>
</tr>
<tr>
<td>Subtract fractions and mixed numbers with the same denominator
Include subtracting fractions from wholes.</td>
<td colspan="2">When subtracting fractions with the same denominator, I only subtract the numerator.

… tenths − … tenths = … tenths

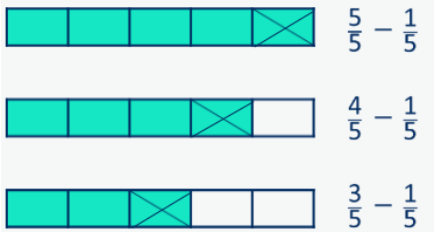
 

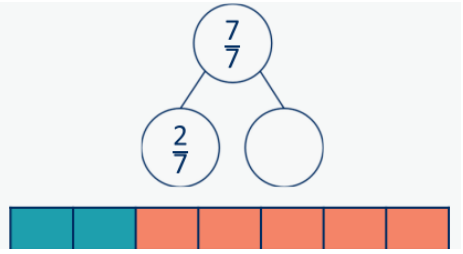
 

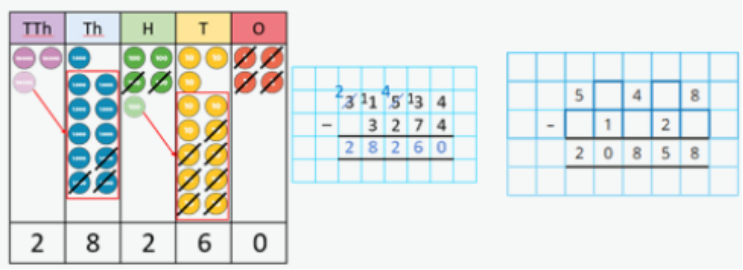
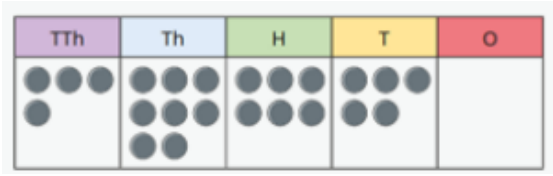
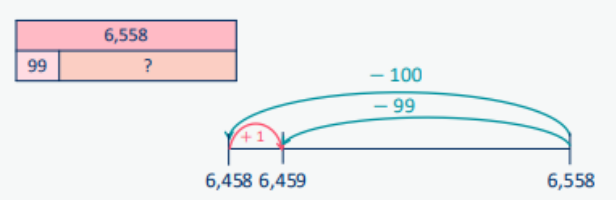
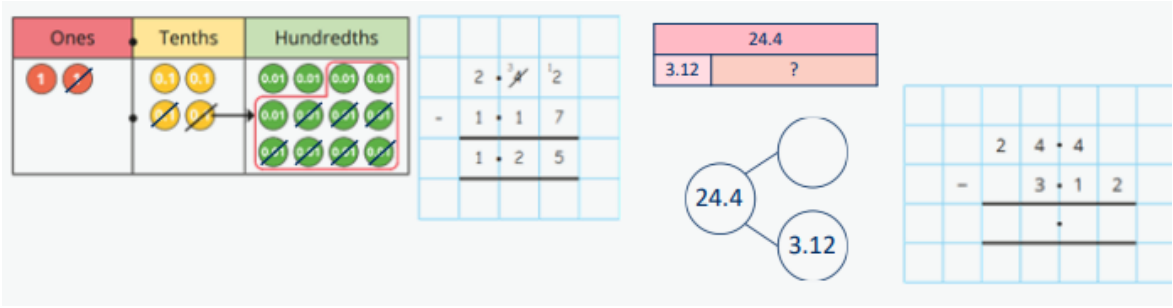
 
</td>
</tr>
<tr>
<td>Subtract fractions with the same denominator within 1 whole

Make links with known facts.</td>
<td colspan="2">When subtracting fractions with the same denominator, I only subtract the numerator.

… fifths − … fifths = … fifths

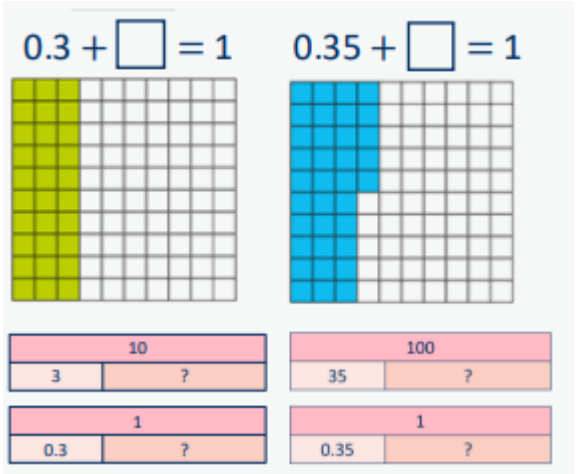
 

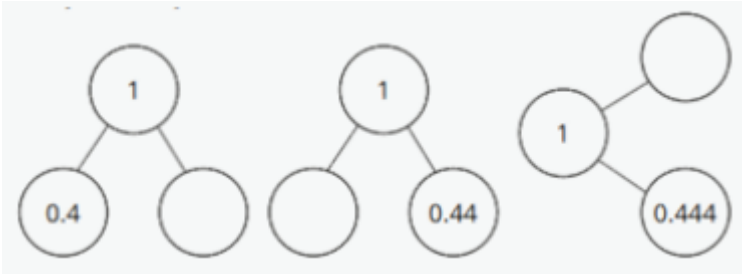
 
</td>
</tr>
</table>

YEAR 5	★ Subtract whole numbers with more than 4 digits ★ Subtract numbers mentally with increasingly large numbers ★ Subtract decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 ★ Subtract fractions with the same denominator, and denominators that are multiples of the same number
KEY VOCABULARY	**Accurate, approximate, constant difference, strategy**
Progression of Skills	**Key Representations**
Subtract whole numbers with more than 4 digits Encourage children to estimate and use inverse operations to check answers to calculations.	**I can exchange 1 … for 10 …** 
Subtract using mental strategies Subtract 1s, 10s, 100s etc from any number. Use number bonds and related facts.	 **48,650 - 300 =** **48,650 - 3000 =** **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 a missing part or subtracting from 1





10 - 4 = 6
100 - 44 = 56
1000 - 444 = 556

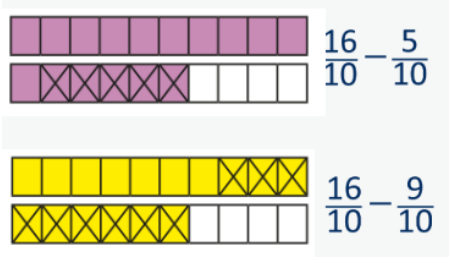
1 - 0.4 = 0.6
1 - 0.44 = 0.56
1 - 0.444 = 0.556

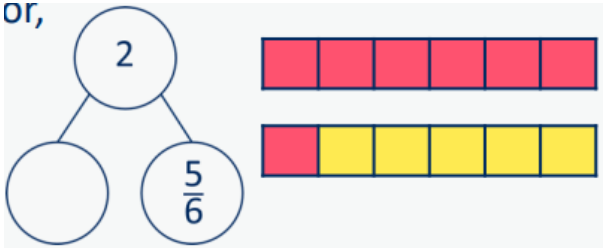
Subtract fractions and mixed numbers with the same denominator

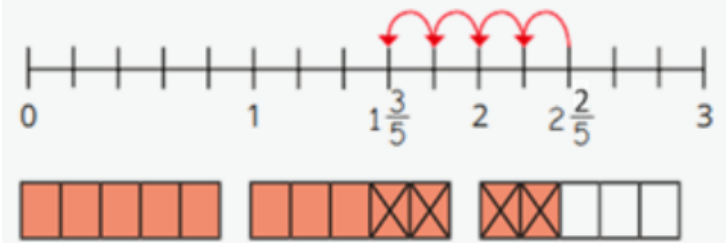
Include subtracting fractions from wholes.

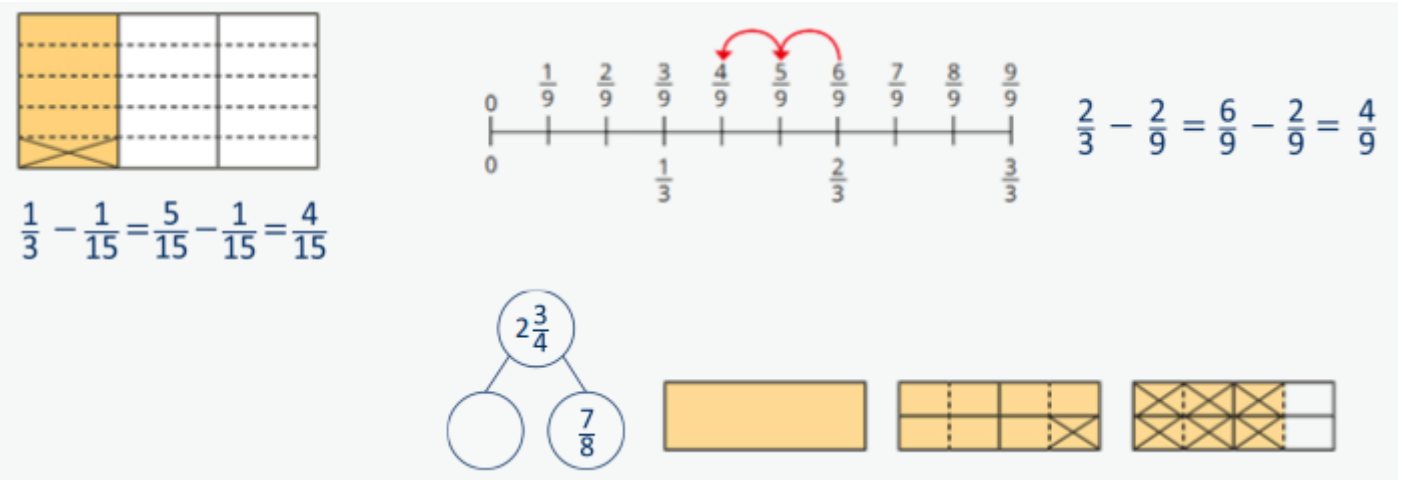
When subtracting fractions with the same denominator, I only subtract the numerator.

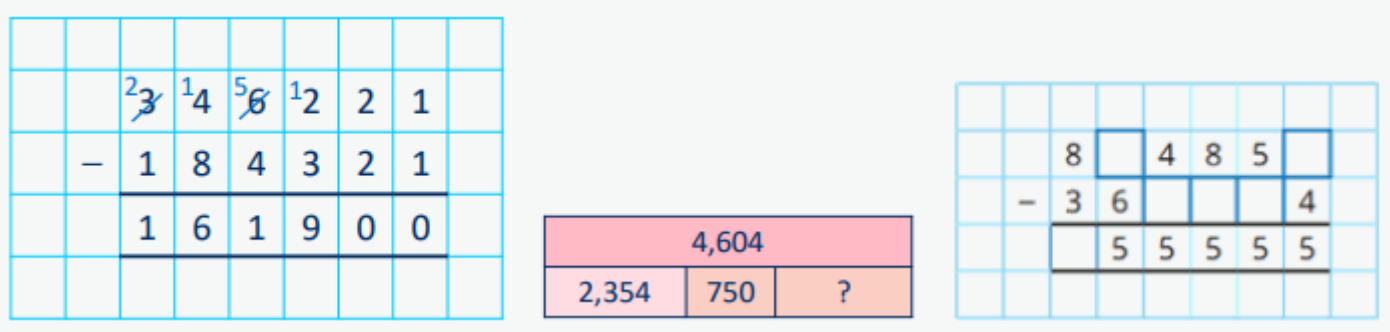
… tenths − … tenths = … tenths







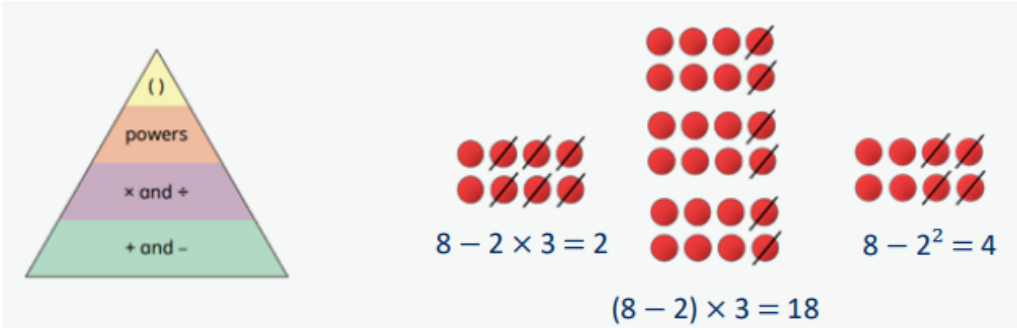
Subtract fractions with denominators that are a multiple of one another Convert fractions to the same denominator before subtracting. Progress from subtracting fractions within 1 whole to subtracting from a mixed number.	**The denominator has been multiplied by …, so the numerator needs to be multiplied by… for the fractions to be equivalent.** 

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

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.

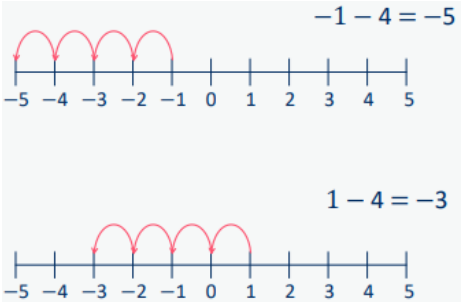
... has greater priority than …, so the first part of the calculation I need to do is …

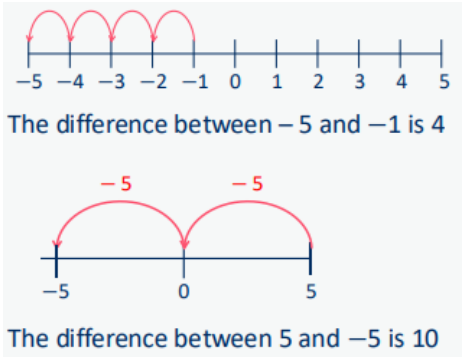


Negative numbers

Children subtract from positive and negative numbers and calculate intervals across 0

… minus … is equal to …



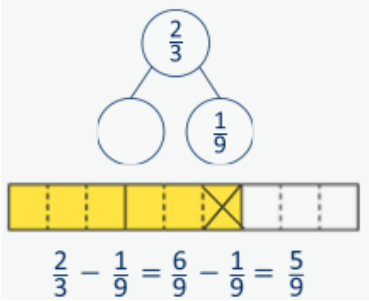


Subtract fractions

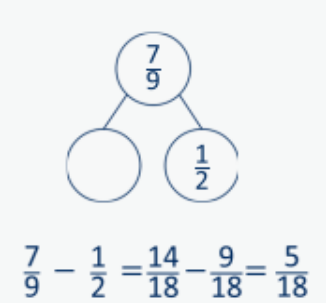
Convert fractions to the same denominator before subtracting.

Progress from fractions where one denominator is a multiple of the other, to any fractions and then subtracting from a mixed number

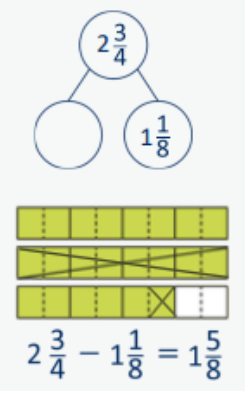
The denominator has been multiplied by …, so the numerator needs to be multiplied by…



The lowest common multiple of … and … is …

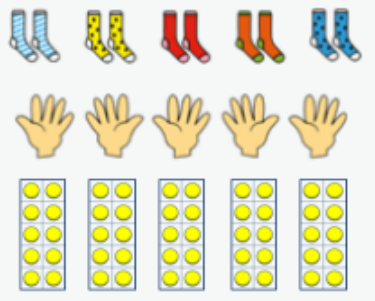
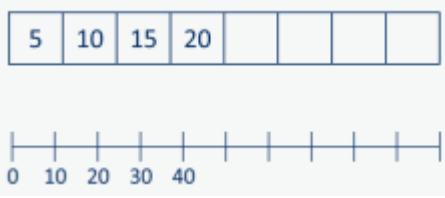


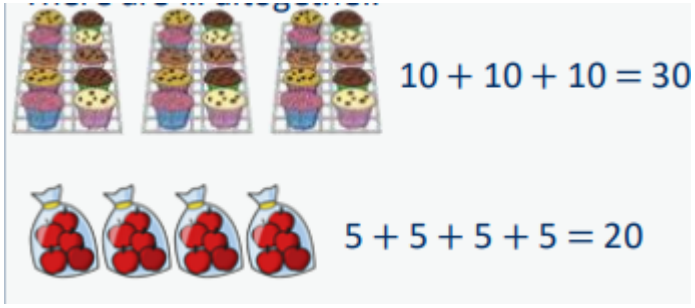
… is made up of … wholes and …



MULTIPLICATION

<table>
<tr><td>Year 1</td><td colspan="3">★ Count in multiples of twos, fives and tens
★ Solve one-step problems involving multiplication, using concrete objects, pictorial representations and arrays with the support of the teacher</td></tr>
<tr><td>KEY VOCABULARY</td><td colspan="3">array, repeated addition</td></tr>
<tr><td>Progression of Skills</td><td colspan="3">Key Representations</td></tr>
<tr><td>Count in 2s, 5s and 10s

Begin by counting objects that naturally come in 2s, 5s and 10s, for example pairs of socks or fingers.</td><td>There are … equal groups of …
There are … altogether
  </td><td>Continue to colour in ...s.
What do you notice?
 
<table>
<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>
</table></td><td>Complete the number track/number line by counting in …s.
 
</td></tr>
<tr><td>Add equal groups
(repeated addition)

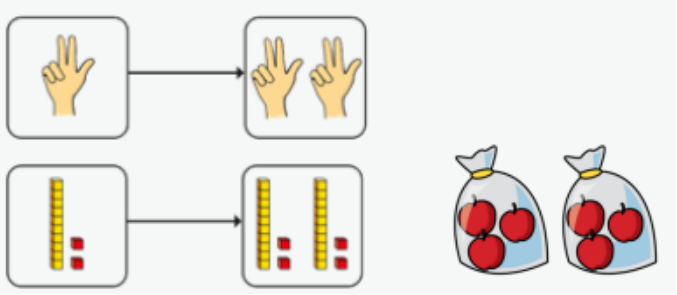
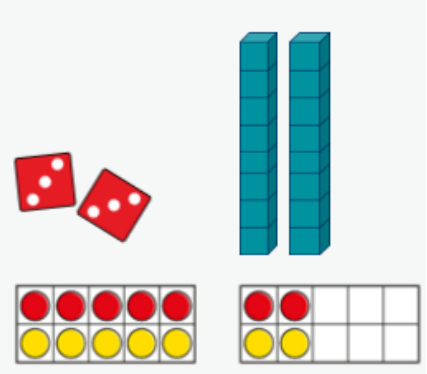
Children should be able to write a repeated addition to represent equal groups and to draw pictures or use objects to represent a repeated addition.</td><td colspan="2">There are … groups of …
There are … altogether.
 
</td><td>What is the same? What is different?

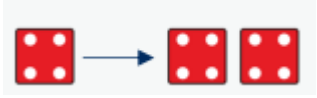
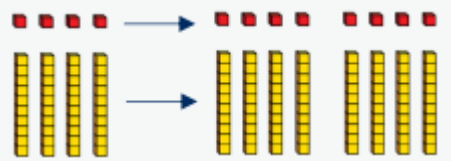
2 + 2 + 2 =

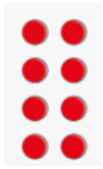
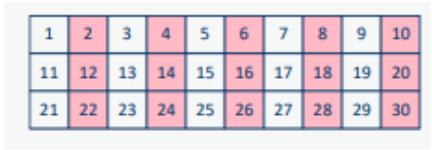
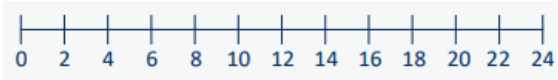
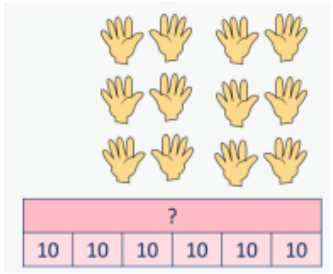
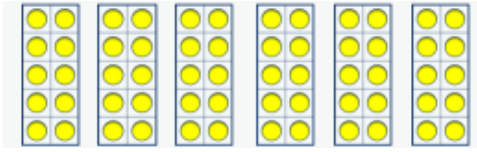
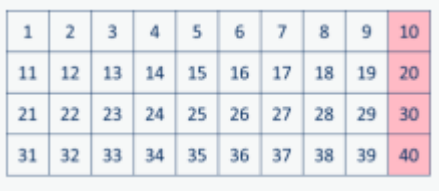
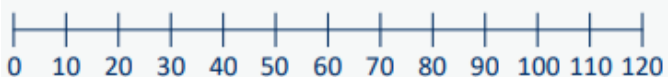
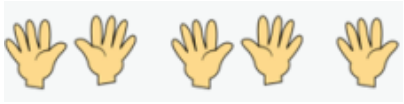
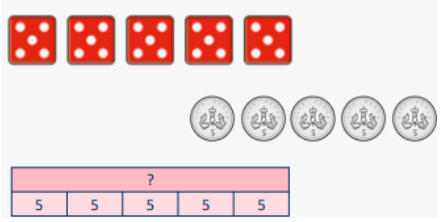
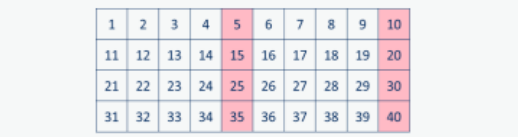
5 + 5 + 5 =

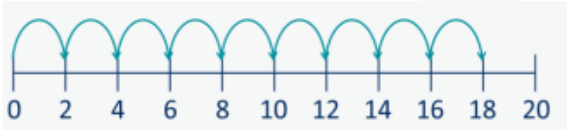
10 + 10 + 10 =

Use objects or a drawing to represent the equal groups and find how many in total.</td></tr>
</table>

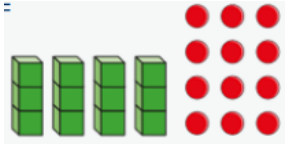
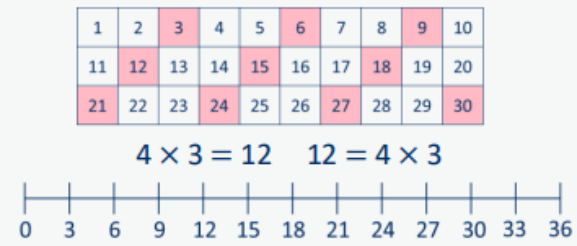
Make arrays Children use their knowledge of adding equal groups to arrange objects in columns and rows.	**There are … rows of … There are … altogether.** **There are … columns of … There are … altogether.** 
Make doubles Children understand that doubles are two equal groups. Children may begin to explore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

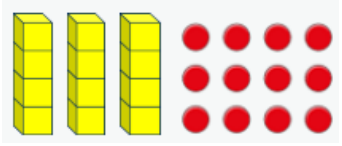
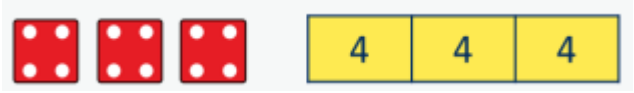
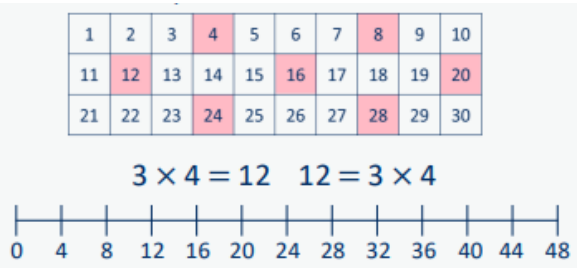
Year 2	★ Recall and use multiplication facts for the 2, 5 and 10 multiplication tables ★ Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs ★ Show that multiplication of two numbers can be done in any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

The 2 times-table Encourage daily counting in multiples both forwards and back. Notice that all multiples of 2 are even numbers.	**… lots of 2 =** **… × 2 =**   	**… times 2 is equal to …**  **1 x 2 = 2** **2 = 1 x 2** **2 x 2 = 4** **4 = 2 x 2** **3 x 2 = 6** **6 = 3 x 2** 
The 10 times-table Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.	**… lots of 10 =** **… × 10 =**   	**… times 10 is equal to …**  **1 x 10 = 10** **10 x 1 = 10** **2 x 10 = 20** **10 x 2 = 20** **3 x 10 = 30** **10 x 3 = 30** 
The 5 times-table Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.	**… lots of =** **… × 5 =**  	**… times is equal to …**  $1 \times 5 = 5$ $5 = 1 \times 5$ $2 \times 5 = 10$ $10 = 2 \times 5$ $3 \times 5 = 15$ $15 = 3 \times 5$ 

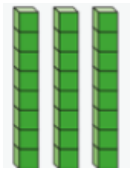
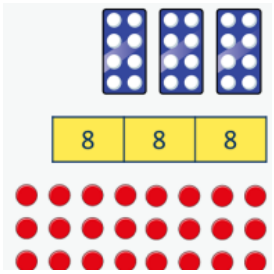
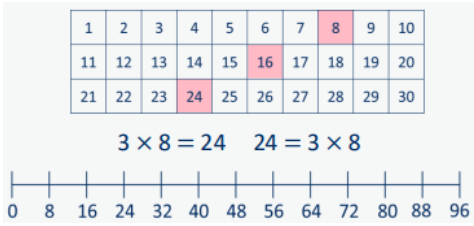
Missing numbers Make links to known facts.	**… is equal to … groups of …** **18 socks, how many pairs?**  	**… times … is equal to …** **☐ x 2 = 18** **18 = 2 x ☐**

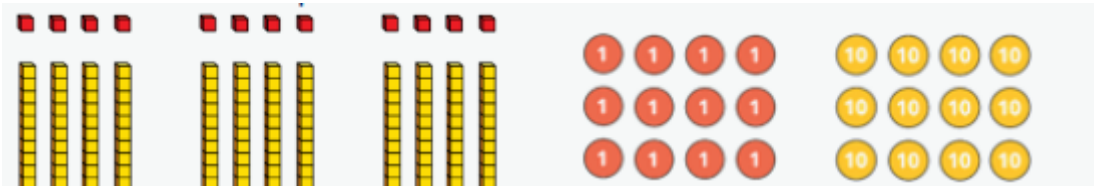
<table>
<tr><td>Year 3</td><td colspan="2">★ Recall and use multiplication facts for the 3, 4 and 8 multiplication tables
★ Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
★ Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects</td></tr>
<tr><td>KEY VOCABULARY</td><td colspan="2">commutative, inverse, multiple, product, scaling</td></tr>
<tr><td>Progression of Skills</td><td colspan="2">Key Representations</td></tr>
<tr><td>The 3 times-table

Encourage daily counting in multiples both forwards and back.</td><td>… groups of 3 = … × 3 =
… times 3 = 3 × … =
 
  </td><td>… times 3 is equal to …
  </td></tr>
<tr><td>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.</td><td>… lots of 4 = … × 4 =
… times 4 = 4 × … =
 
  </td><td>… times 4 is equal to …
  </td></tr>
</table>

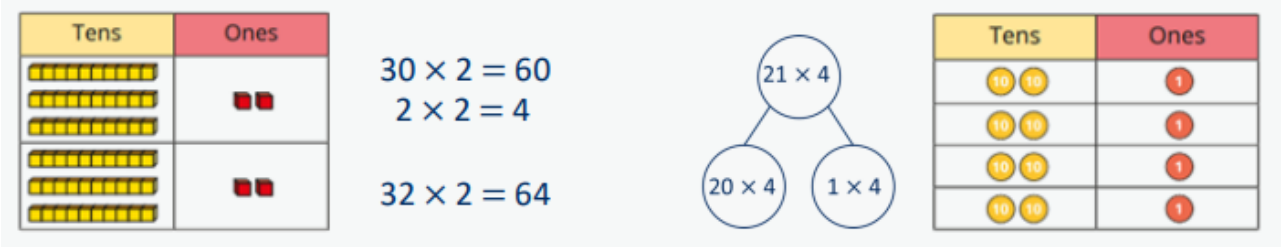
<table>
<tr>
<td>The 8 times-table Encourage daily counting in multiples both forwards and back.

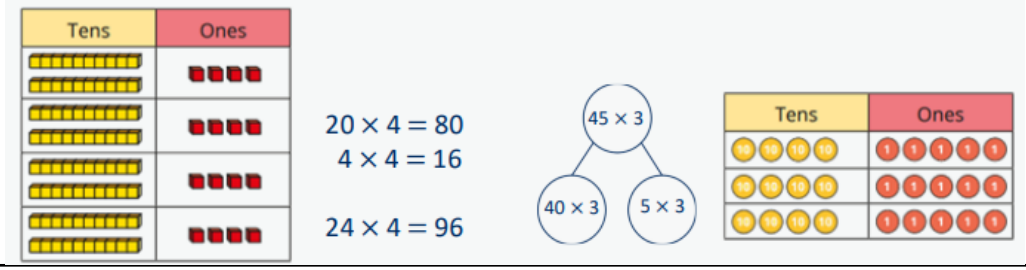
Encourage children to notice links between the 2, 4 and 8 times-tables.</td>
<td>… lots of 8 = … × 8 =
… times 8 = 8 × … =
 
 
</td>
<td>… times 8 is equal to …
 
</td>
</tr>
<tr>
<td>Related facts

Use knowledge of multiplying by 10 to scale times-table facts.</td>
<td colspan="2">… × … ones is equal to … ones, so … × … tens is equal to … tens.
 

3 x 4 = 12

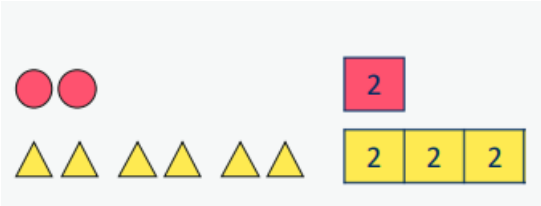
3 x 40 = 120</td>
</tr>
<tr>
<td>Multiply a 2-digit number by a 1-digit number - no exchange

Children apply their understanding of partitioning to represent and solve calculations us</td>
<td colspan="2">… tens multiplied by … is equal to … tens.
…ones multiplied by … is equal to … ones.
 
</td>
</tr>
<tr>
<td>Multiply a 2-digit number by a 1-digit number - with exchange

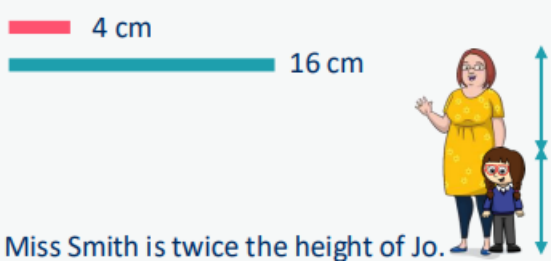
Children apply their understanding of partitioning to represent and solve calculations using the expanded method.</td>
<td colspan="2">… tens multiplied by … is equal to … tens.
… ones multiplied by … is equal to … ones.
 
</td>
</tr>
</table>

<table>
<tr>
<td>Scaling

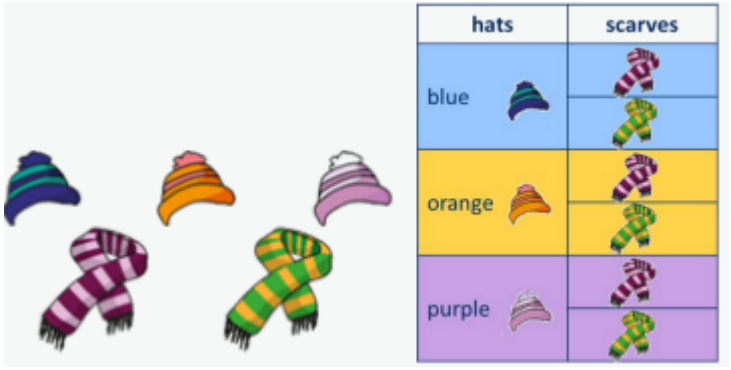
Children focus on multiplication as scaling (…. times the size) as opposed to repeated addition.</td>
<td>There are …. times as many … as …

There are 3 times as many triangles as circles.</td>
<td>… is … times the size of …
… is … times the length/height of …

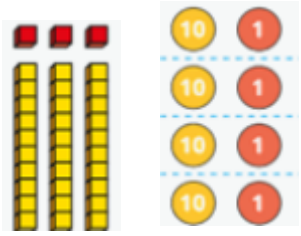
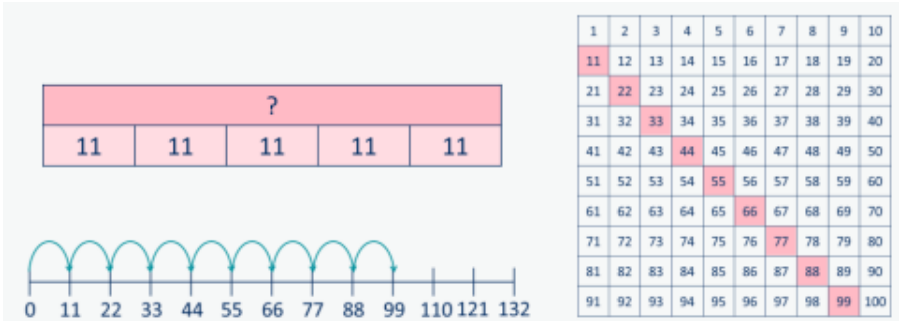
 
</td>
</tr>
<tr>
<td>Correspondence problems (How many ways?)

Encourage children to work systematically to find all the different possible combinations.</td>
<td colspan="2">For every … , there are … possible ...
There are … × … possibilities altogether.

For every hat, there are two possible scarves.

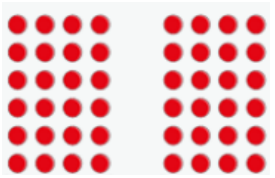
3 × 2 = 6 There are 6 possibilities altogether.</td>
</tr>
</table>

Year 4	★ Recall multiplication facts for multiplication tables up to 12 × 12 ★ Use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1; multiplying together three numbers ★ Recognise and use factor pairs and commutativity in mental calculations ★ Multiply two-digit and three-digit numbers by a one-digit number using formal written layout ★ Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects
KEY VOCABULARY	**factor, factor pair, inverse, triple, efficient**
Progression of Skills	**Key Representations**
Times-table facts to 12 × 12 Encourage daily counting in multiples both forwards and back. Encourage children to notice links between related times-tables.	**… groups of … =** **… times … is equal to …** **… × … =**  
Multiply by 1 and 0	**Any number multiplied by 1 is equal to …** **Any number multiplied by 0 is equal to …** 
	… × … = … **1 x 1 = 1** **2 x 1 = 2** **3 x 1 = 3** **4 x 1 = 4** **1 x 0 = 0** **2 x 0 = 0** **3 x 0 = 0** **4 x 0 = 0**
Multiply 3 numbers Children use their understanding of commutativity to multiply more efficiently.	**To work out … × … × …, I can first calculate … × … and then multiply the answer by …**  **4 x 2 x 3 = 8 x 3 = 24** **2 x 3 x 4 = 6 x 4 = 24** **3 x 4 x 2 = 12 x 2 = 24**

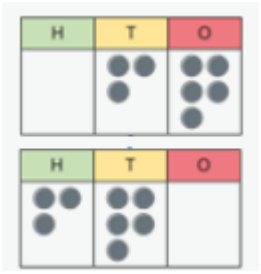
<table>
<tr>
<td>Factor pairs

Children explore equivalent calculations using different factors pairs.</td>
<td colspan="2">12 = … × … , so … × 12 = …× … × …

 
8 x 6 = 8 x 3 x 2
8 x 6 = 24 x 2

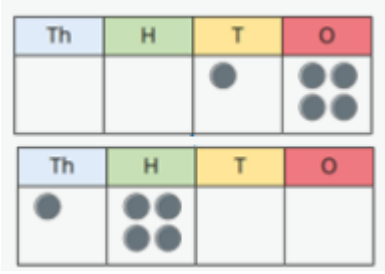
 
6 x 8 = 6 x 4 x 2
6 x 8 = 24 x 2</td>
</tr>
<tr>
<td>Multiply by 10 and 100

Some children may overgeneralise that multiplying by 10 or 100 always results in adding zeros. This will cause issues later when multiplying decimals.</td>
<td>When I multiply by 10, the digits move … place value column to the left.
… is 10 times the size of …

35 x 10 = 350

A Gattegno chart may also be used to model this concept.</td>
<td>When I multiply by 100, the digits move … place value columns to the left. … is 100 times the size of …

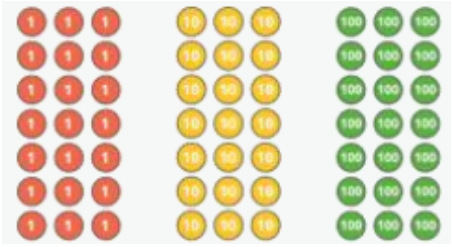
14 x 100 = 1,400

A Gattegno chart may also be used to model this concept.</td>
</tr>
<tr>
<td>Related facts

Use knowledge of multiplying by 10 and 100 to scale times-table facts.</td>
<td colspan="2">… × … ones is equal to … ones
so … × … tens is equal to … tens
and … × … hundreds is equal to … hundreds.

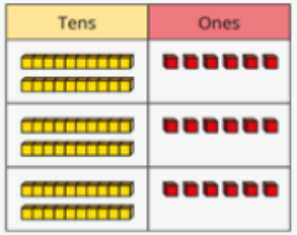
3 x 7 = 21
3 x 70 = 210
3 x 700 = 2100

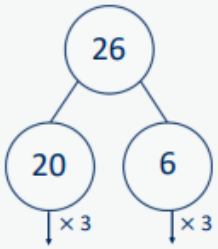
7 x 3 = 21
7 x 30 = 210
7 x 300 = 2100

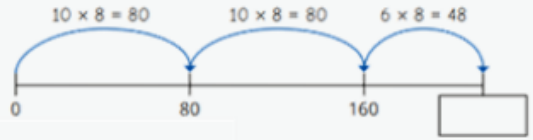
  </td>
</tr>
</table>

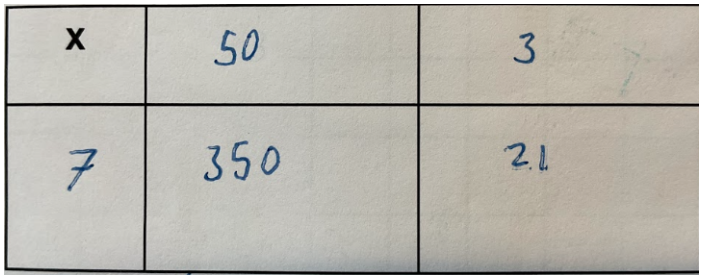
<table>
<tr>
<td>Mental strategies

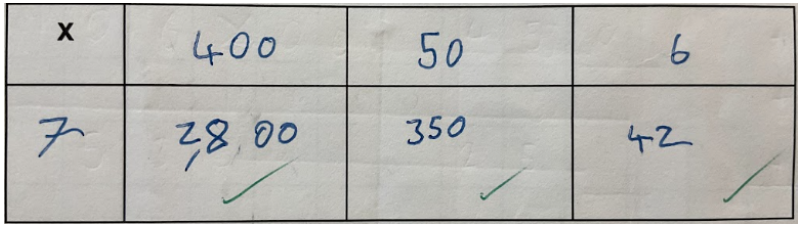
Partition 2 or 3-digit numbers to multiply using informal methods.</td>
<td>… tens multiplied by … is equal to … tens.
…ones multiplied by … is equal to … ones.

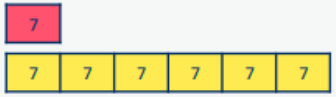
3 × 26 = 60 + 18 = 78
 



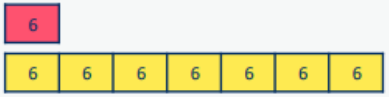
26 × 8 = 80 + 80 + 48 = 208</td>
</tr>
<tr>
<td>Multiply a 2 or 3-digit number by a 1-digit number</td>
<td> 


</td>
</tr>
<tr>
<td>Scaling

Children focus on multiplication as scaling (… times the size).</td>
<td>… is … times the size of …

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

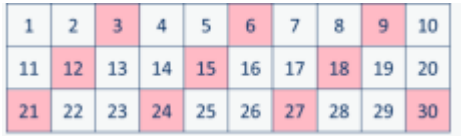
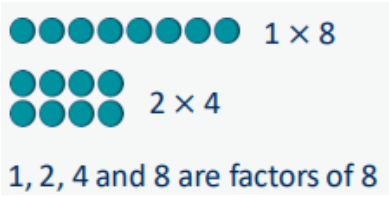
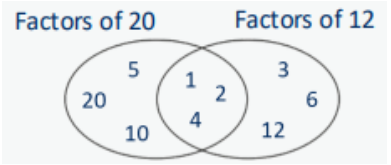
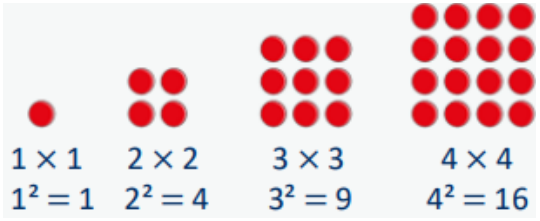
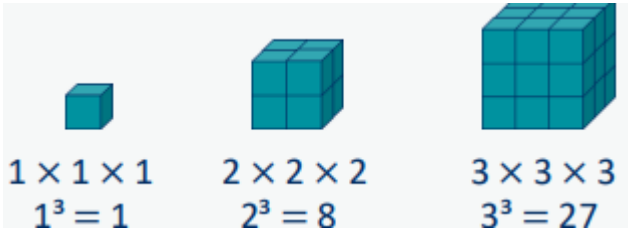
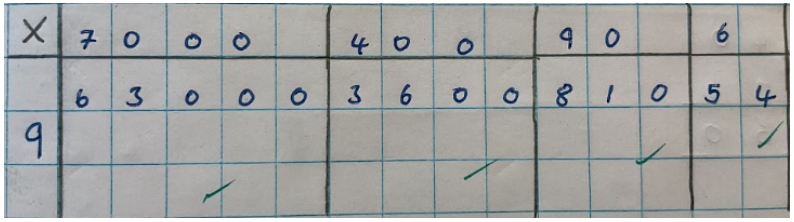
A red ribbon is 6 cm.
A yellow ribbon is 7 times as long.</td>
</tr>
<tr>
<td>Correspondence problems

Encourage children to use tables to show all the different possible combinations.</td>
<td>For every … , there are … possibilities.
There are … × … possibilities altogether.

A pizza company offers a choice of 5 toppings and 3 bases.
5 x 3 = 15

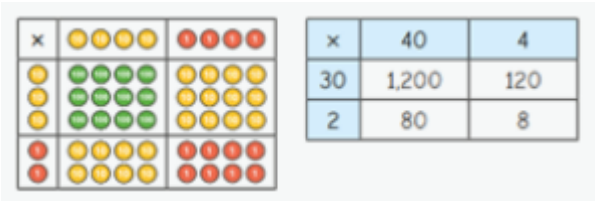
<table>
<tr><th></th><th>Deep pan</th><th>Italian</th><th>Thin</th></tr>
<tr><td>Cheese</td><td>C DP</td><td>C I</td><td>C Th</td></tr>
<tr><td>Mushroom</td><td>M DP</td><td>M I</td><td>M Th</td></tr>
<tr><td>Vegetable</td><td>V DP</td><td>V I</td><td>V Th</td></tr>
<tr><td>Chicken</td><td>C DP</td><td>C I</td><td>C Th</td></tr>
<tr><td>Tuna</td><td>T DP</td><td>T I</td><td>T Th</td></tr>
</table></td>
</tr>
</table>

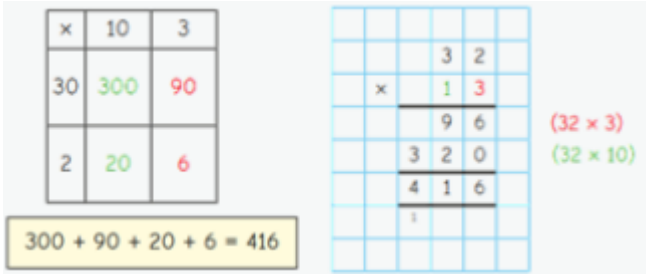
Year 5	★ Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers ★ Recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³) ★ Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method ★ Multiply numbers mentally drawing upon known facts ★ Multiply whole numbers and those involving decimals by 10, 100 and 1000
KEY VOCABULARY	**common multiple, common factor, cube number, prime number, square number**

Progression of Skills	**Key Representations**		
Multiples and factors Encourage children to notice patterns and make links with known facts	**… is a multiple of … because … × … = …**   	**… is a factor of … because … × … = …**  	**The common factors of … and … are …** 
Square and cube numbers	**… squared means … × …**  	**… cubed means … × … × …**  	
Multiply numbers up to 4 digits by a 1-digit number This builds on the short multiplication method introduced in Y4	 		

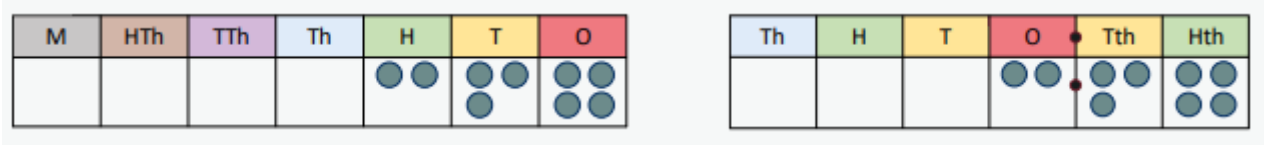
<table>
<tr>
<td>Multiply numbers up to 4 digits by a 2-digit number

Numbers are first partitioned using an area model then long multiplication is introduced for the first time.</td>
<td>I can partition … into … and …

 
<table>
<tr><td>×</td><td>40</td><td>4</td></tr>
<tr><td>30</td><td>1,200</td><td>120</td></tr>
<tr><td>2</td><td>80</td><td>8</td></tr>
</table></td>
<td>First, I multiply by the … then I multiply by the …

 
<table>
<tr><td>×</td><td>10</td><td>3</td></tr>
<tr><td>30</td><td>300</td><td>90</td></tr>
<tr><td>2</td><td>20</td><td>6</td></tr>
</table>
300 + 90 + 20 + 6 = 416
3 2
× 1 3
9 6
3 2 0
4 1 6
(32 × 3)
(32 × 10)</td>
</tr>
<tr>
<td>Multiply by 10, 100 and 1,000

Some children may overgeneralise that multiplying by a power of 10 always results in adding zeros. This will cause issues later when multiplying decimals.</td>
<td colspan="2">To multiply by 10/100/1,000, I move all the digits … places to the left.
… is 10/100/1,000 times the size of …

 
<table>
<tr><td>M</td><td>HTh</td><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr>
<tr><td></td><td></td><td></td><td></td><td>●●</td><td>●●
●●</td><td>●●
●●</td></tr>
</table>
<table>
<tr><td>Th</td><td>H</td><td>T</td><td>O</td><td>Tth</td><td>Hth</td></tr>
<tr><td></td><td></td><td></td><td>●●</td><td>●●
●●</td><td>●●
●●</td></tr>
</table>
234 x 10 = 2,340
234 x 100 = 23,400
234 x 1000 = 234,000

2.34 x 10 = 23.4
2.34 x 100 = 234
2.34 x 1000 = 2,340</td>
</tr>
<tr>
<td>Mental strategies

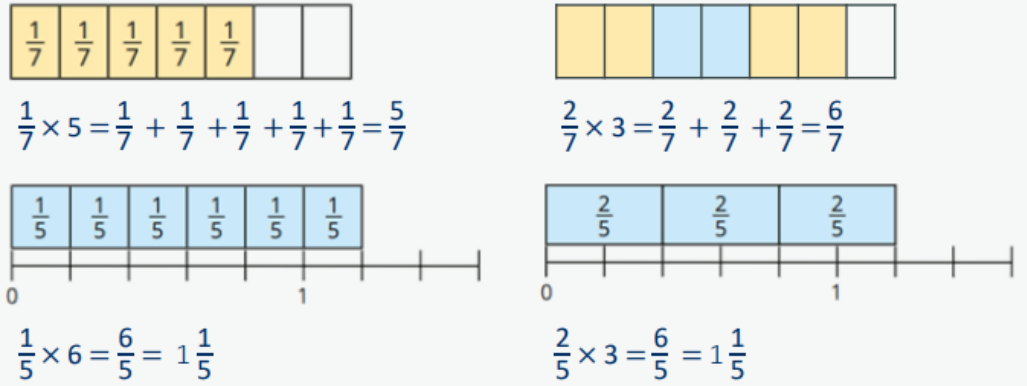
Children continue to use efficient mental strategies such as partitioning and knowledge of factor pairs and related facts to multiply</td>
<td colspan="2">The most efficient strategy to calculate … × … is … To calculate … × 12, I can do … × … × …

For example: 121 × 12
I could calculate 100 × 12 plus 20 × 12 plus 1 × 12
I could calculate 121 × 10 plus 121 × 2
I could calculate 121 × 6 × 2
I could calculate 121 × 4 × 3</td>
</tr>
</table>

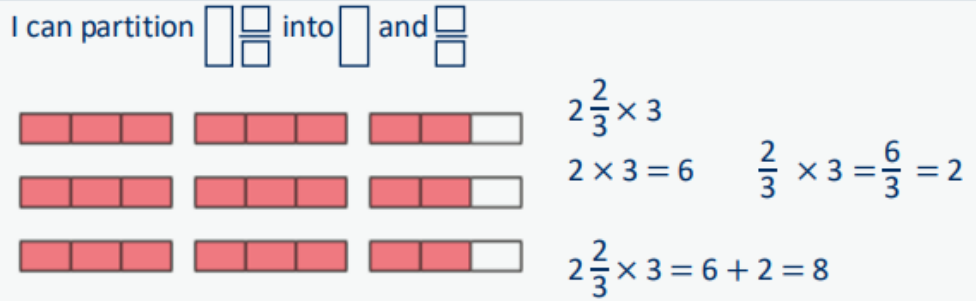
Multiply fractions by a whole number

Make links with repeated addition.
E.g.1 ×4/5 = ⅕ + ⅕ + ⅕ + ⅕

To multiply a fraction by an integer, I multiply the numerator by the integer and the denominator remains the same.

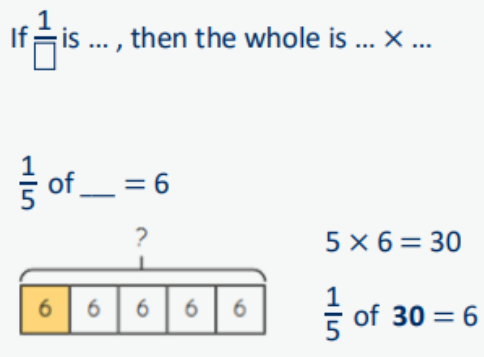


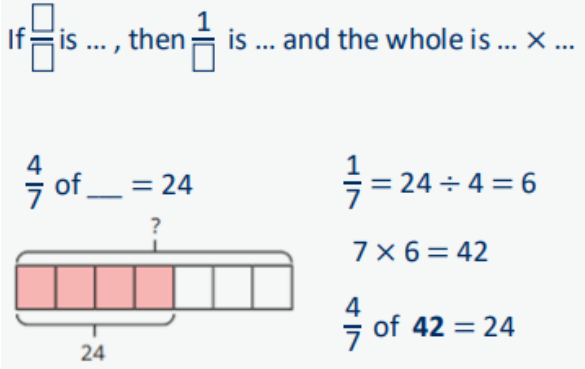
Multiply mixed numbers by a whole number

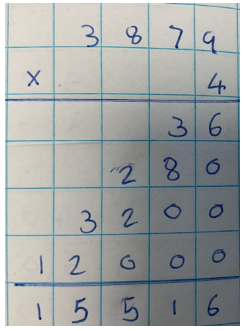
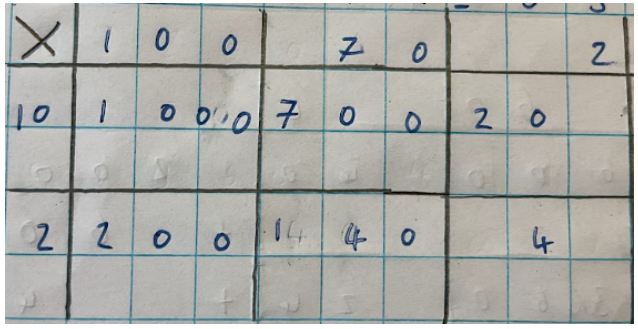
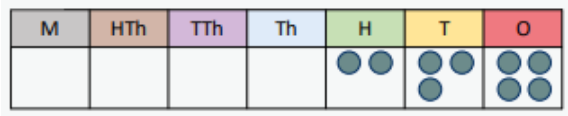
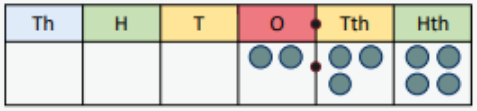


Find the whole

Children multiply to find the whole from a given part.



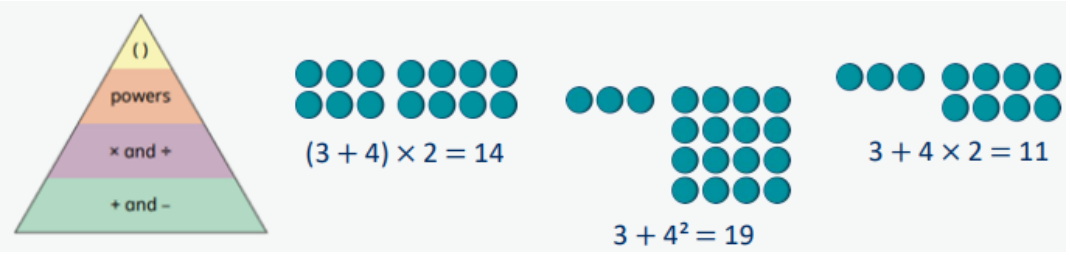


Year 6	★ Identify common factors and common multiples ★ Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication ★ Multiply numbers by 10, 100 and 1,000 ★ Multiply one-digit numbers with up to two decimal places by whole numbers ★ Use their knowledge of the order of operations to carry out calculations involving the 4 operations ★ Multiply simple pairs of proper fractions, writing the answer in its simplest form ★ Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts ★ Solve problems involving the calculation of percentages
KEY VOCABULARY	**Grid method, long multiplication, order of operations,**
Progression of Skills	**Key Representations**
Multiply numbers up to 4 digits by a 2-digit number	 
Multiply by 10, 100 and 1,000 Some children may overgeneralise that multiplying by a power of 10 always results in adding zeros. This will cause issues later when multiplying decimals.	**To multiply by 10/100/1,000, I move all the digits … places to the left.** **… is 10/100/1,000 times the size of …**   **234 x 10 = 2,340** **234 x 100 = 23,400** **234 x 1000 = 234,000** **2.34 x 10 = 23.4** **2.34 x 100 = 234** **2.34 x 1000 = 2,340**

Order of operations

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

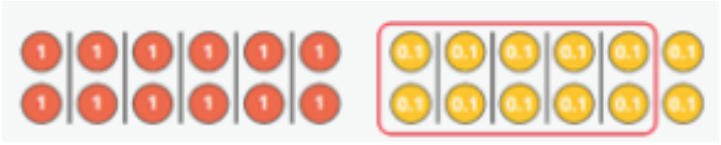
… has greater priority than …, so the first part of the calculation I need to do is …



Multiply decimals by integers

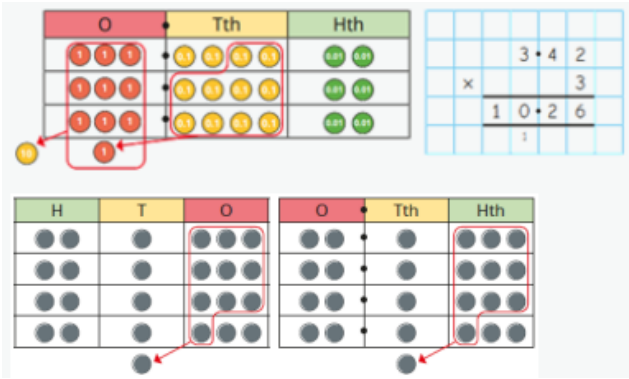
This is the first time children multiply decimals by numbers other than 10, 100 or 1,000 Encourage them to make links with known facts and whole number multiplication.

I know that …× … = …, so I also know that …× … = …



6 x 2 = 12 **6 x 0.2 = 1.2**

I need to exchange 10 … for 1 …

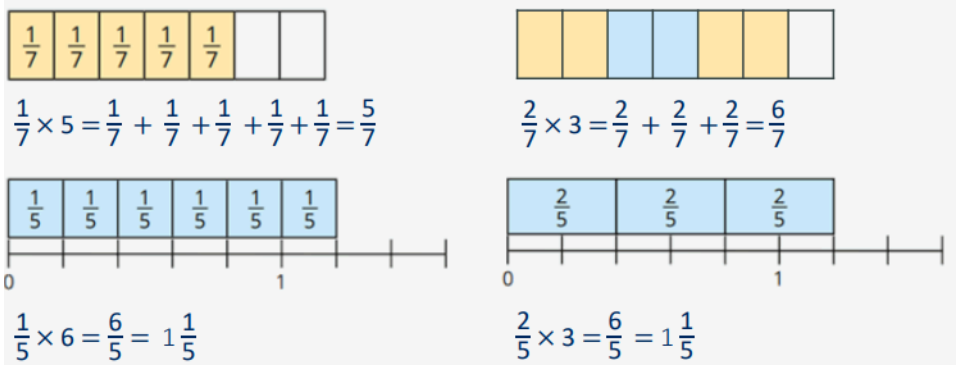


213 x 4 = 852 **2.13 x 4 = 8.52**

Multiply fractions by a whole number

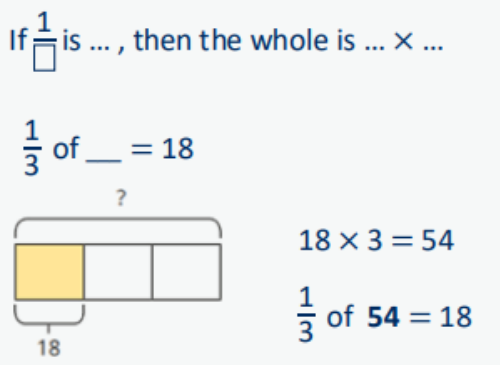
Make links with repeated addition. E.g. ⅕ x 4 = ⅕ + ⅕ + ⅕ + ⅕

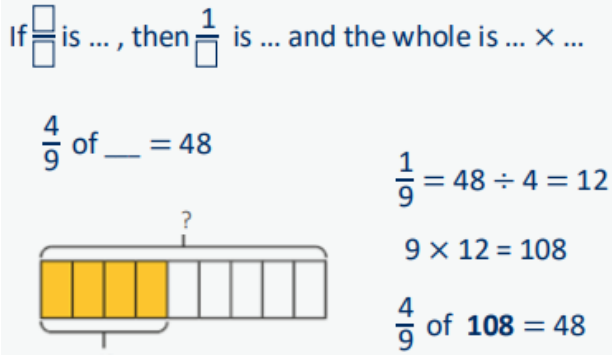
To multiply a fraction by an integer, I multiply the numerator by the integer and the denominator remains the same.



Find the whole

Children multiply to find the whole from a given part.

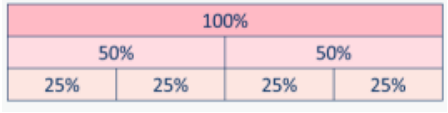




Calculate percentages

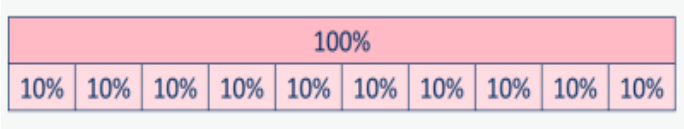
Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.

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



50% of … = …÷ 2
25% of … = …÷ 4

… % is made up of … %, and … %

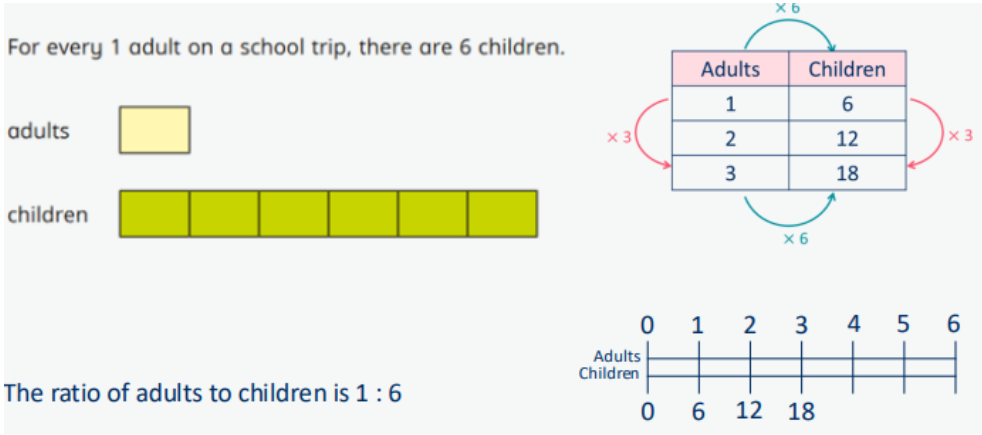


To find 30%, I can find 10% and then multiply it by 3
To find 23%, I can use 10% × 2 and 1% × 3
To find 99%, I can find 1%, then subtract from 100%

Calculations involving ratio

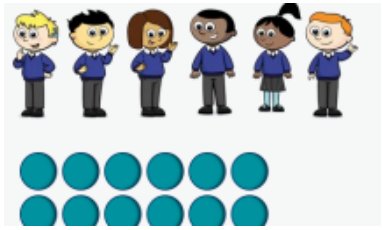
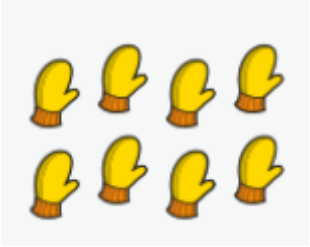
Encourage children to see the multiplicative relationship between ratios. They will need to multiply or divide each value by the same number to keep the ratio equivalent. Double number lines and ratio tables help children to see both horizontal and vertical multiplicative relationships.

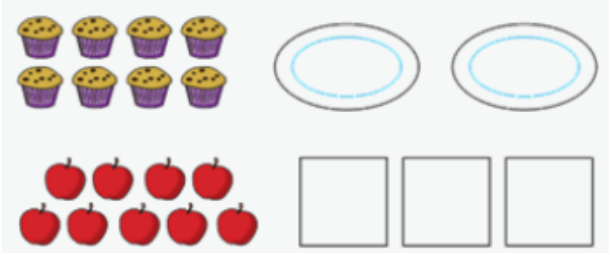
For every … , there are …

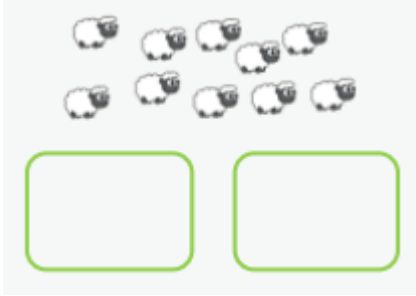
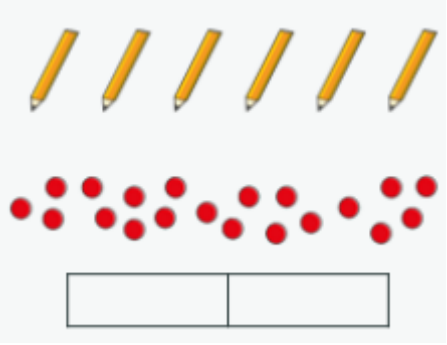
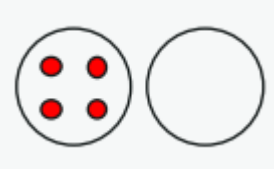
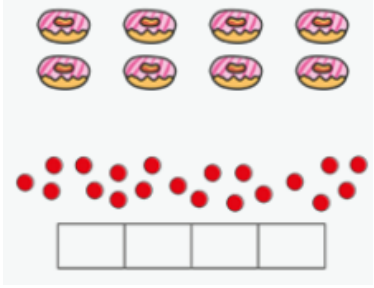
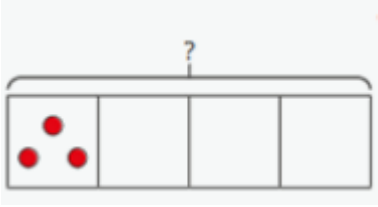


DIVISION

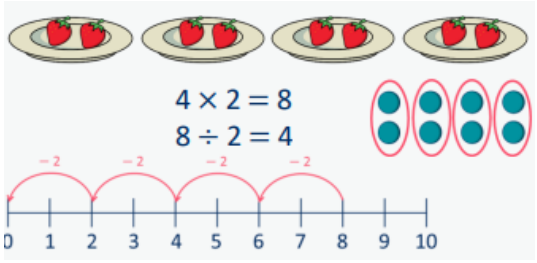
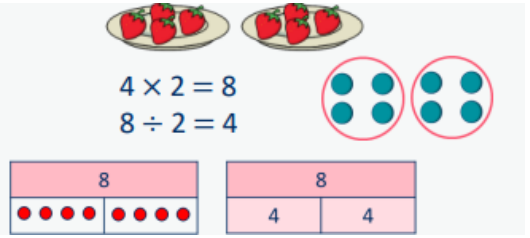
<table>
<tr><td>Year 1</td><td colspan="3">★ Solve simple one-step problems involving division, using concrete objects, pictorial representations and arrays with the support of the teacher
★ Recognise, find and name a half as one of two equal parts of a quantity
★ Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity</td></tr>
<tr><td>KEY VOCABULARY</td><td colspan="3">array, divide</td></tr>
<tr><td>Progression of Skills</td><td colspan="3">Key Representations</td></tr>
<tr><td>Make equal groups - grouping

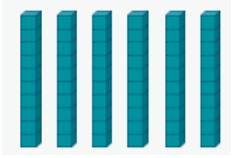
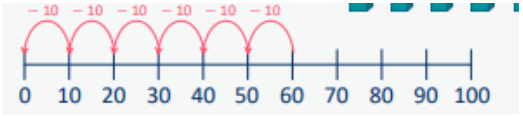
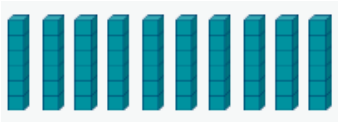
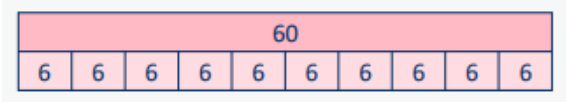
Encourage children to physically move objects into equal groups. They can also circle equal groups when using pictures.</td><td>There are … altogether. How many groups of … can you make?
  </td><td>Circle groups of 2 There are … groups of 2
  </td><td>Take … cubes. Make equal groups.
 
There are … groups of …</td></tr>
<tr><td>Make equal groups – sharing

Encourage children to check that the objects have been shared fairly and each group is the same.</td><td colspan="2">… have been shared equally between… There are … on/in each …
  </td><td>Take … cubes. Share them between …
 
12 shared between … is …</td></tr>
</table>

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 a quarter of …**

<table>
<tr><td>Year 2</td><td colspan="2">★ Recall and use division facts for the 2, 5 and 10 multiplication tables
★ Calculate mathematical statements for division within the multiplication tables and write them using the division (÷) and equals (=) signs
★ Recognise, find, name and write fractions ⅓, ¼, ½ and ¾ of a quantity</td></tr>
<tr><td>KEY VOCABULARY</td><td colspan="2">divide, even, half, odd, times-table,</td></tr>
<tr><td>Progression of Skills</td><td colspan="2">Key Representations</td></tr>
<tr><td>Divide by 2

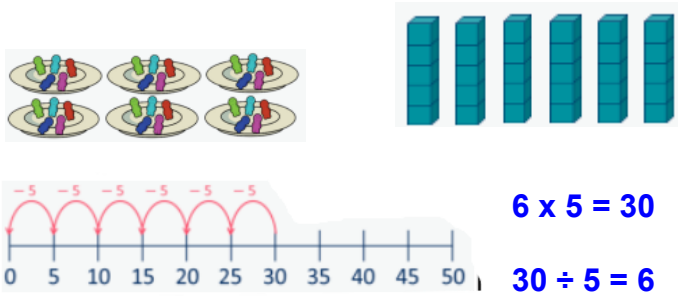
Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts and halving.</td><td>There are … equal groups of 2 … ÷ 2 = …
 
</td><td>… shared equally between 2 is …
Half of … is …
… ÷ 2 = …
 
</td></tr>
<tr><td>Divide by 10

Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.</td><td>There are … equal groups of 10.
… ÷ 10 = … …
6 x 10 = 60
60 ÷ 10 = 6
 

</td><td>… shared equally between 10 is …
6 x 10 = 60
60 ÷ 10 = 6
 

</td></tr>
</table>

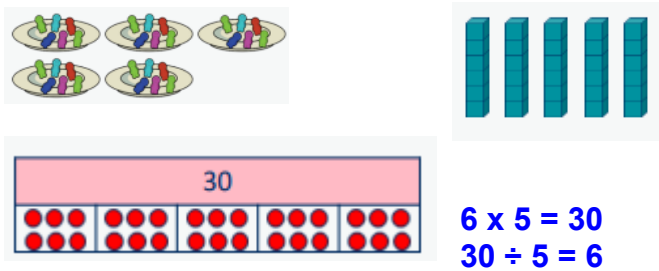
Divide by 5

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

There are … equal groups of 5.
… ÷ 5 = …



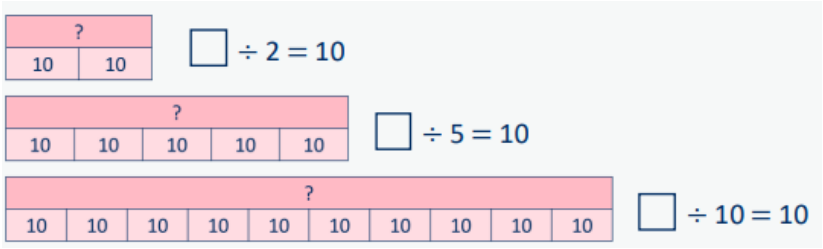
… shared equally between 5 is …
… ÷ 5 = …



Missing numbers

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

… divided by 2/ /10 is equal to …

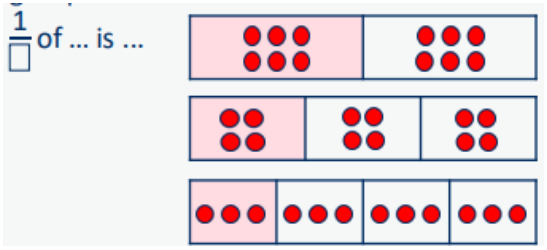


Unit fractions

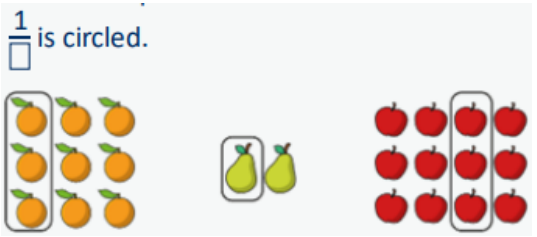
In Y2 the focus is on finding ½ , ⅓ and ¼

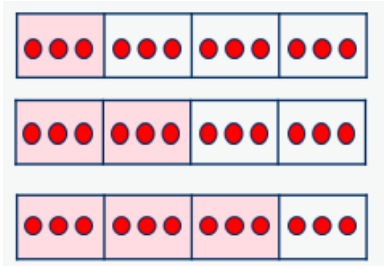
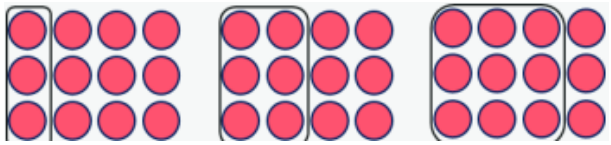
Bar models are useful to show the link between division and finding a fraction

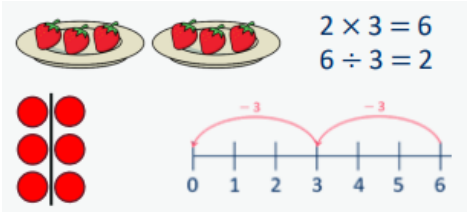
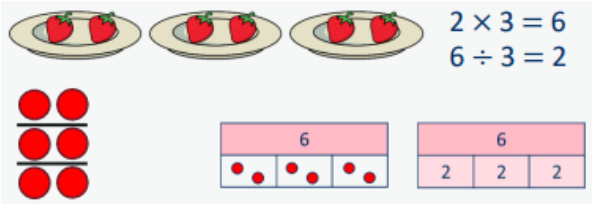
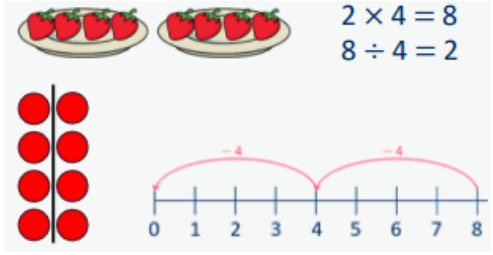
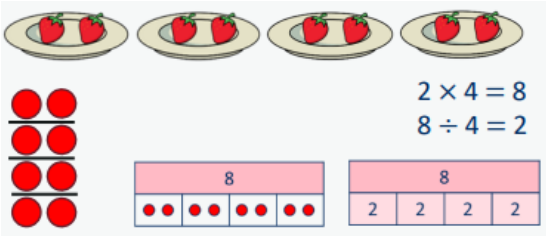
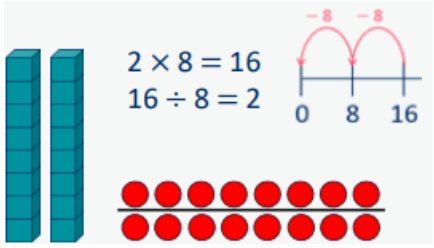
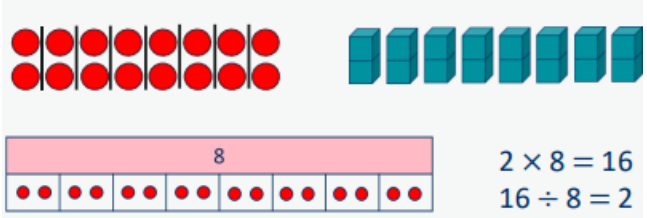
The objects have been shared fairly into … groups.



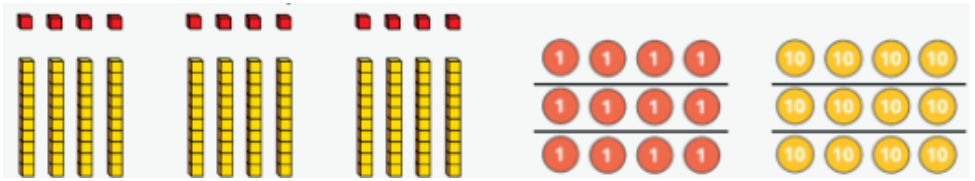
There are … equal parts. There are … parts circled.

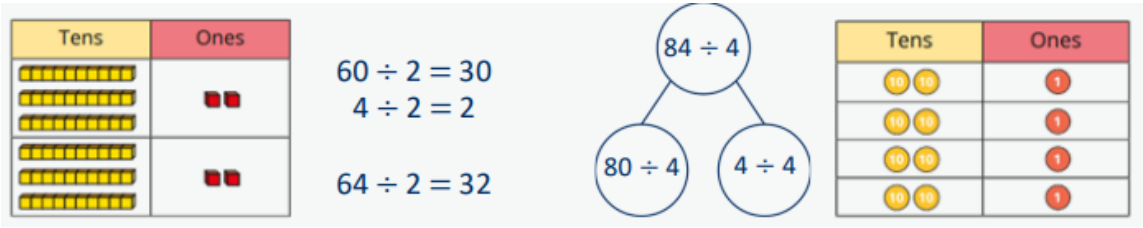


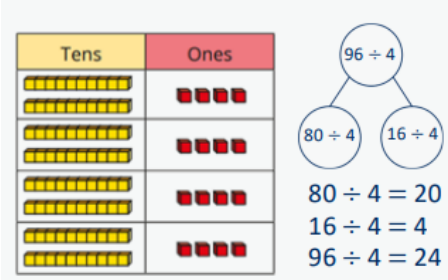
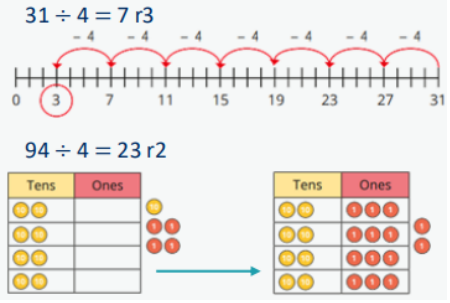
Non-unit fractions In Y2 the focus is on finding 2/4 and ¾ Prompt children to notice that 2/4 is equivalent to ½	**The objects have been shared fairly into … groups.** $\frac{\square}{\square}$ of … is … 	**There are … equal parts. There are … parts circled.** $\frac{\square}{\square}$ is circled. 

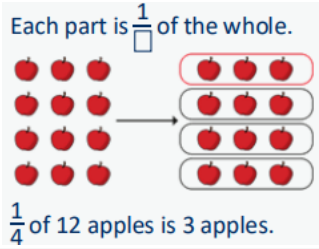
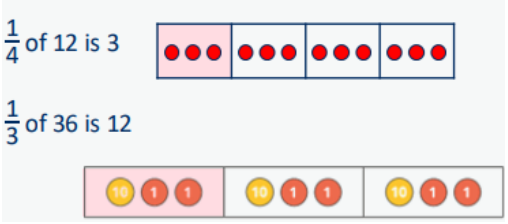
Year 3	★ Recall and use division facts for the 3, 4 and 8 multiplication tables ★ Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods ★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

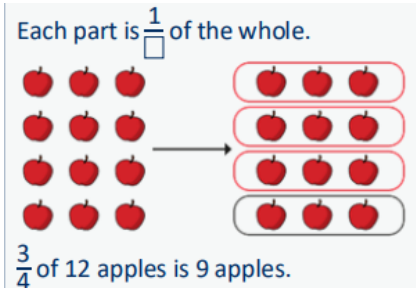
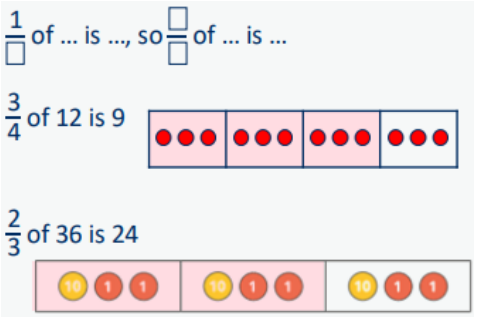
<table>
<tr>
<td>Related facts

Link to known times-table facts.</td>
<td colspan="2">… ÷ … is equal to …, so … tens ÷ … is equal to … tens.
 
12 ÷ 3 = 4
120 ÷ 3 = 40</td>
</tr>
<tr>
<td>Divide a 2-digit number by a 1-digit number - no exchange

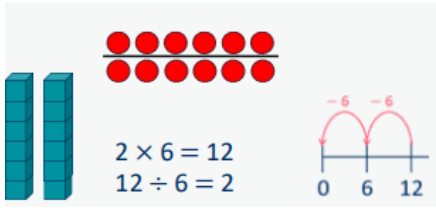
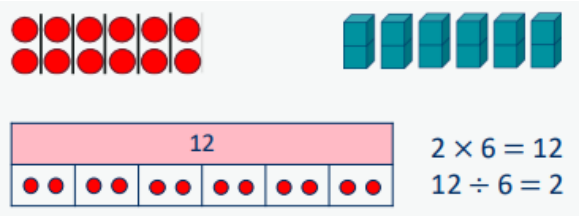
Partition into tens and ones to divide and then recombine.</td>
<td colspan="2">… tens divided by … is equal to … tens.
… ones divided by … is equal to … ones.
 
</td>
</tr>
<tr>
<td>Divide a 2-digit number by a 1-digit number - with remainders

Encourage children to partition numbers flexibly to help them to divide more efficiently.</td>
<td>… tens divided by … is equal to … tens.
… ones divided by … is equal to … ones.
 
</td>
<td>There are … groups of …
There are … remaining.
 
</td>
</tr>
<tr>
<td>Unit fractions of a set of objects

Bar models are useful to show the link between division and fractions, for example, dividing by 3 and finding a third.</td>
<td>The whole is divided into … equal parts.
 
</td>
<td>One … of … is …
 
</td>
</tr>
</table>

Non-unit fractions of a set of objects Bar models are a useful representation and show the links with division and multiplication.	**The whole is divided into … equal parts.** 	

<table>
<tr><td>Year 4</td><td colspan="2">★ Recall division facts for multiplication tables up to 12 × 12
★ Use place value, known and derived facts to divide mentally, including: dividing by 1
★ Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths</td></tr>
<tr><td>KEY VOCABULARY</td><td colspan="2">factor, factor pair, inverse, efficient</td></tr>
<tr><td>Progression of Skills</td><td colspan="2">Key Representations</td></tr>
<tr><td>Division facts to 12 × 12

Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.</td><td>There are … groups of … in …
… ÷ … =
 
</td><td>… has been shared equally into … equal groups.
… ÷ … =
 
</td></tr>
<tr><td>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.</td><td>When I divide a number by 1, the number remains the same.

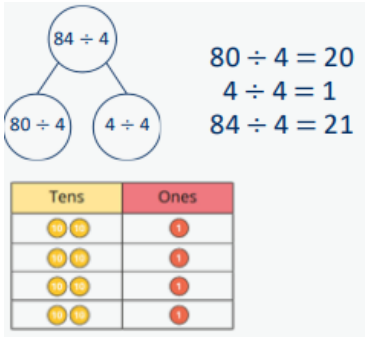
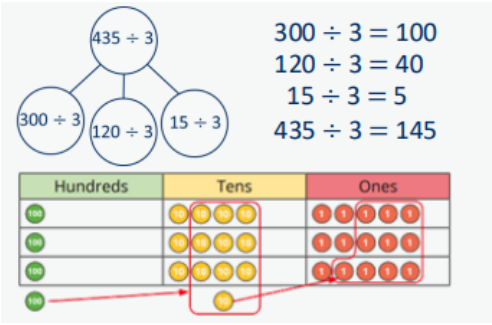
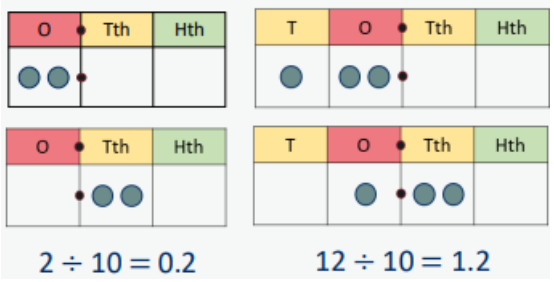
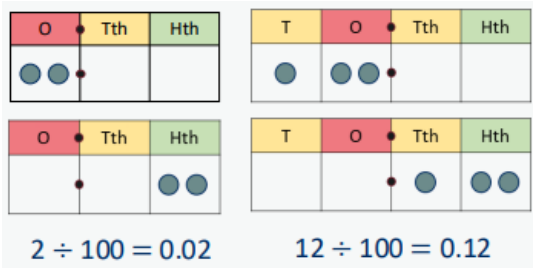
5 shared between 1 is 5
 

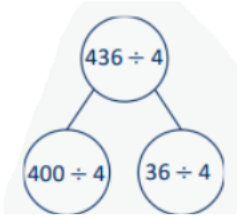
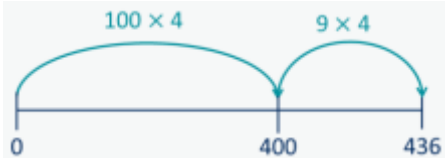
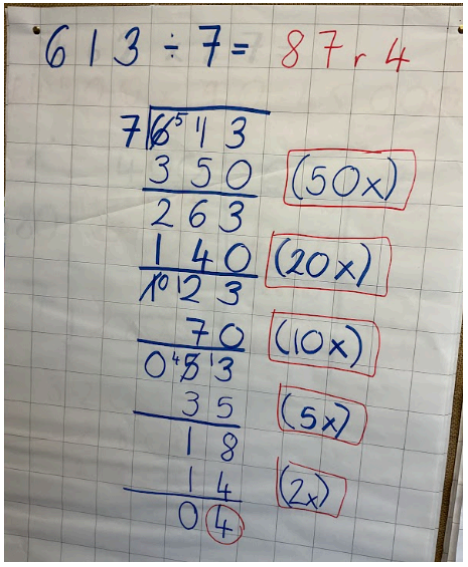
There are 5 groups of 1 in 5.
  </td><td>When I divide a number by itself, the answer is 1

5 shared between 5 is 1.
 

There is 1 group of 5 in 5.
  </td></tr>
<tr><td>Related facts Link to known times-table facts.</td><td colspan="2">… ÷ … is equal to …,
so … tens ÷ … is equal to … tens,
and … hundreds ÷ … is equal to … hundreds.
 
21 ÷ 3 = 7
210 ÷ 3 = 70
2,100 ÷ 3 = 700

21 ÷ 7 = 3
210 ÷ 7 = 30
2,100 ÷ 7 = 300</td></tr>
</table>

Divide a 2 or 3-digit number by a 1-digit number Progress from divisions with no exchange, to divisions with exchange and then divisions with remainders	**I can partition … into … tens and … ones.** 	**I cannot share the hundreds/tens equally, so I need to exchange 1 … for 10 …** 
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 …**  *A Gattegno chart may also be used to model this concept.*	**When I divide by 100, the digits move 2 place value columns to the right.** **… is one-hundredth the size of …**  *A Gattegno chart may also be used to model this concept.*

Year 5	★ Divide numbers mentally drawing upon known facts ★ Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context ★ Divide whole numbers and those involving decimals by 10, 100 and 1,000		
KEY VOCABULARY	common multiple, common factor, division, inverse,		
Progression of Skills	**Key Representations**		
Mental strategies	**I can partition … into … and … to help me to divide more easily.** 	**I can show groups of … on a number line.** 	**To divide by …, I can divide by … and then divide the result by …** **436 ÷ 4 = 436 ÷ 2 ÷ 2** **436 ÷ 2 = 218** **218 ÷ 2 = 109**
Divide numbers up to 4 digits by a 1-digit number			

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 ÷ 10 = 12

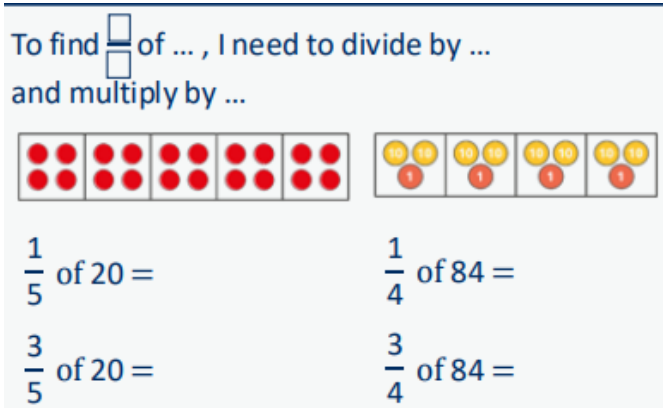
120 ÷ 100 = 1.2

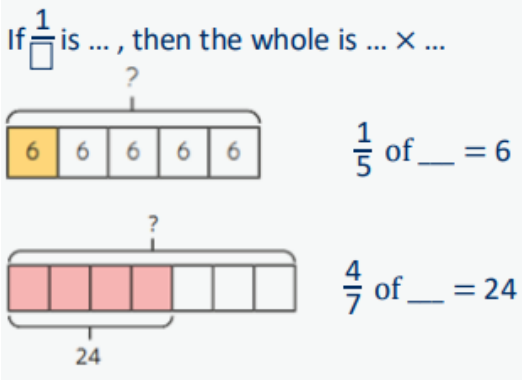
120 ÷ 1,000 = 0.12

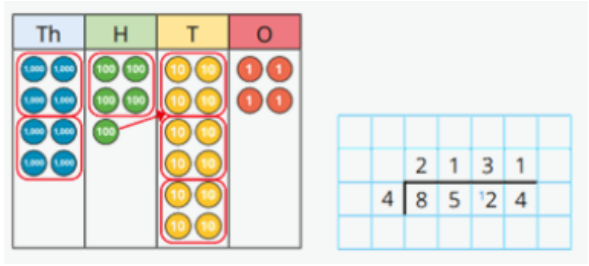
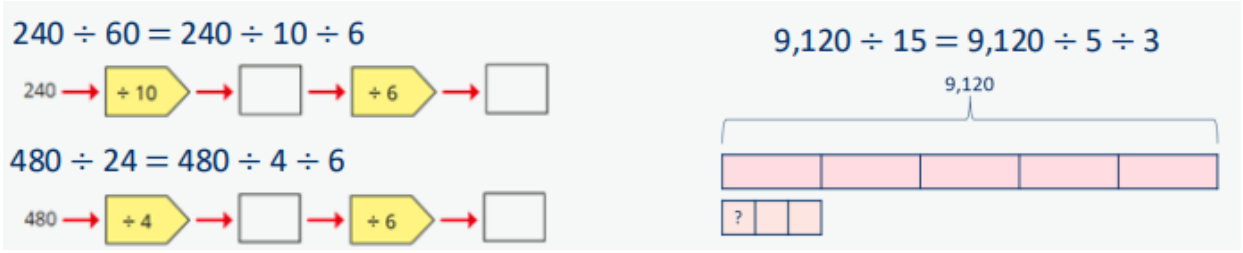
A Gattegno chart can also be used to model this concept.

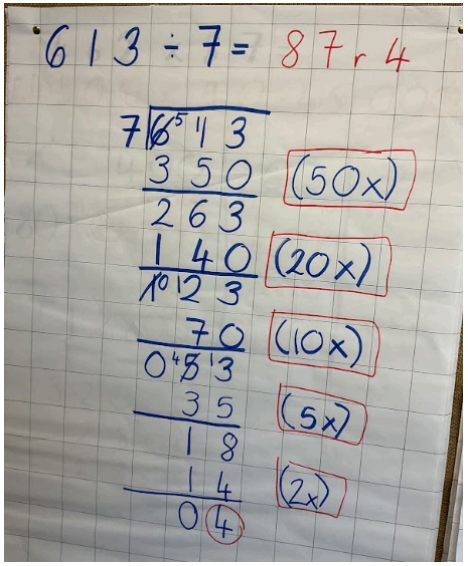
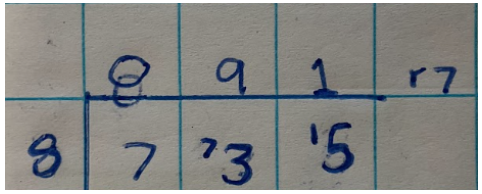
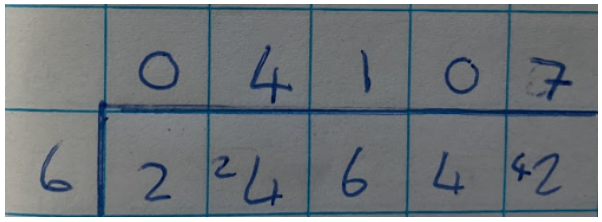
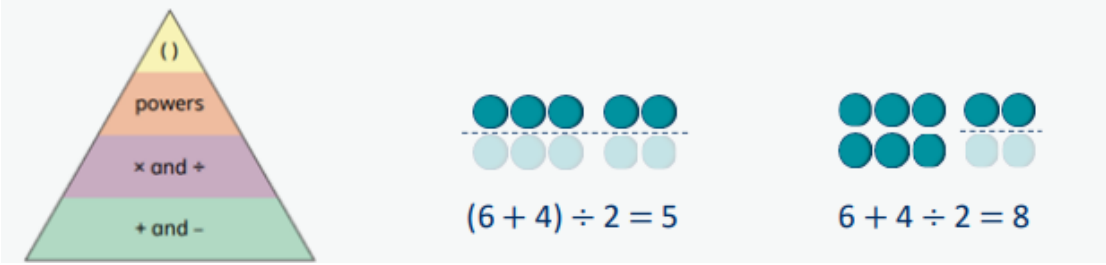
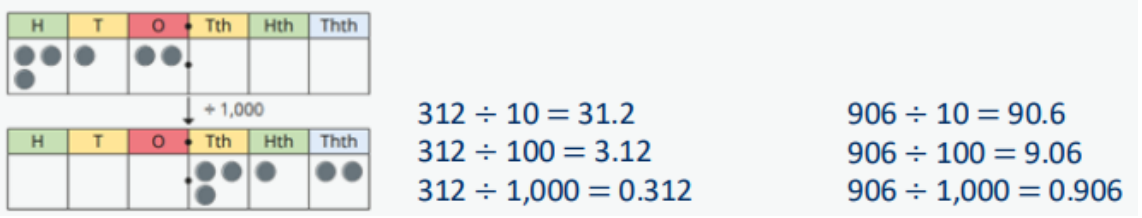
Fraction of an amount

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



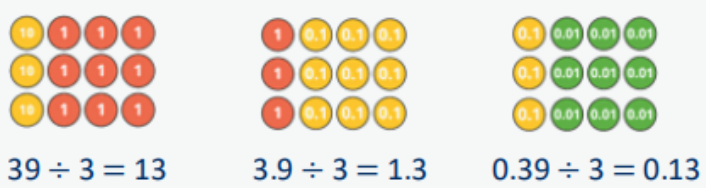


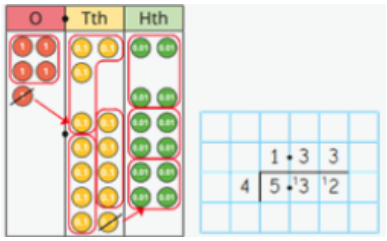
Year 6	★ Perform mental calculations, including with mixed operations and large numbers ★ Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context ★ Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context ★ Divide numbers by 10, 100 and 1,000 giving answers up to three decimal places ★ Use written division methods in cases where the answer has up to two decimal places ★ Associate a fraction with division and calculate decimal fraction equivalents ★ Solve problems involving the calculation of percentages
KEY VOCABULARY	**long division, order of operations, short division,**
Progression of Skills	**Key Representations**
Short division Encourage children to interpret remainders in context, for example knowing that " remainder 1" could mean complete boxes with 1 left over so 5 boxes will be needed.	**There are … groups of … hundreds/tens/ones/ in …** **I can exchange 1 … for 10 …** 
Mental strategies Include partitioning and number line strategies outlined in Y5 as well as division using factors.	**To divide by … , I can first divide by … and then divide the answer by …** 

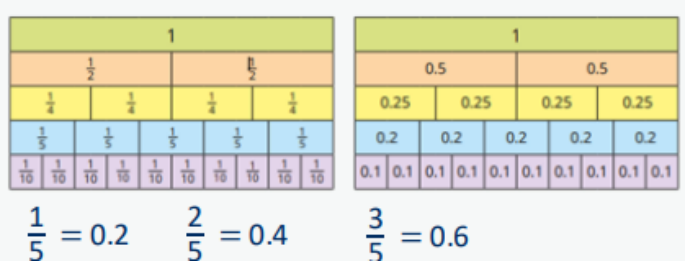
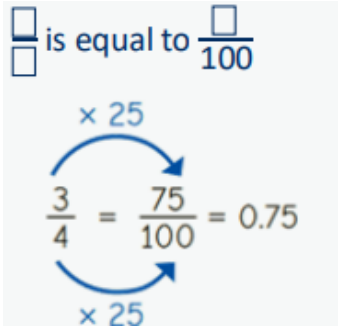
Chunking and Short Division		 
Order of operations Calculations in brackets should be done first, then powers. Multiplication and division should be performed before addition and subtraction	**… has greater priority than …, so the first part of the calculation I need to do is …** 	
Divide by 10, 100 and 1,000 Encourage children to notice that dividing by 100 is the same as dividing by 10 twice, and that dividing by 1,000 is the same as dividing by 10 three times.	**To divide by … , I move the digits … places to the right.** 	

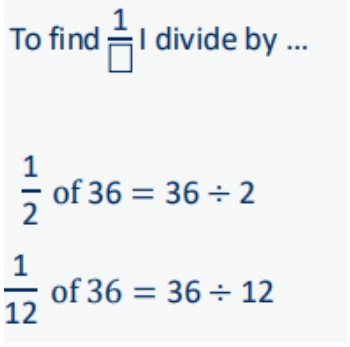
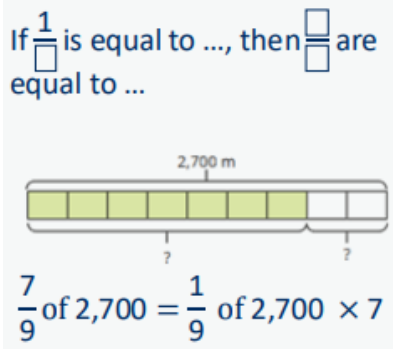
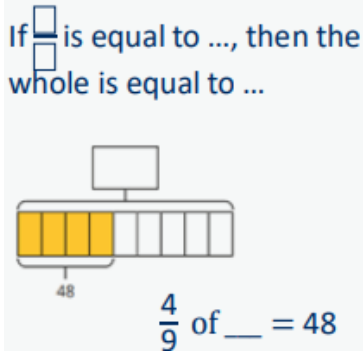
<table>
<tr>
<td>Divide decimals by integers

This is the first time children divide decimals by numbers other than 10, 100 or 1,000</td>
<td colspan="2">I know that …÷ … = …, so I also know that …÷ … = …

 
</td>
<td>I need to exchange 1 … for 10 …

 
</td>
</tr>
<tr>
<td>Decimal and fraction equivalents</td>
<td colspan="2">The fraction … is equivalent to the decimal …

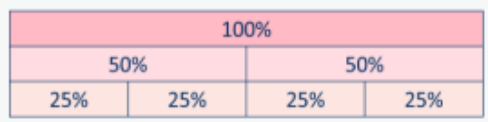
 
</td>
<td> 
</td>
</tr>
<tr>
<td>Fraction of an amount

Children divide and multiply to find fractions of an amount. Bar models can still be used to support understanding where needed.</td>
<td> 
</td>
<td> 
</td>
<td> 
</td>
</tr>
</table>

Calculate percentages

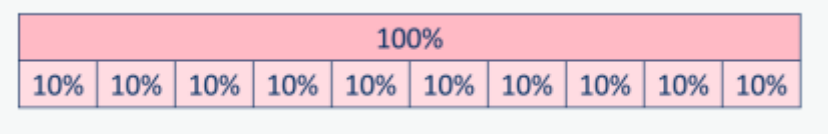
Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.

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



50% of … = …÷ 2
25% of … = …÷ 4

… % is made up of … %, and … %



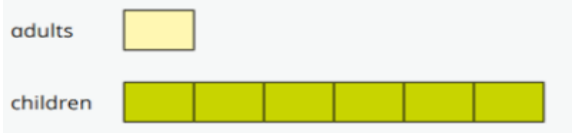
To find 30%, I can find 10% and then multiply it by 3
To find 23%, I can use 10% × 2 and 1% × 3
To find 99%, I can find 1%, then subtract from 100%

Calculations involving ratio

Encourage children to see the multiplicative relationship between ratios. They will need to multiply or divide each value by the same number to keep the ratio equivalent. Double number lines and ratio tables help children to see both horizontal and vertical multiplicative relationships.

For every … , there are …

For every 6 children on a school trip, there is 1 adult



The ratio of children to adults is 6 : 1