

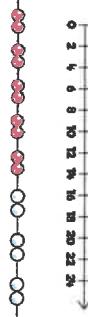
Maths Calculation Policy

Created to support the Power Maths and White Rose scheme of work.

Multiplication tables will be taught by rote in all year groups. From year 2, the multiplication tables from 2 – 12 will be practised daily. By the time the pupils reach year 4 they will be able to recall tables from 2 – 12 and know the division equivalents.

Skill: 2 times table

Year: 2



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
12	13	14	15	16	17	18	19	20	1	2	3	4	5	6	7	8	9	10	

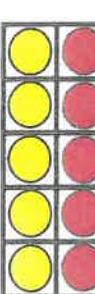
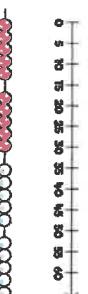
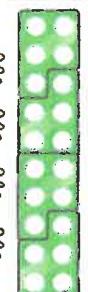
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
32	33	34	35	36	37	38	39	40	1	2	3	4	5	6	7	8	9	10	

Look for patterns in the two times table, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones.

Use different models to develop fluency.

Skill: 3 times table

Year: 3



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
12	13	14	15	16	17	18	19	20	1	2	3	4	5	6	7	8	9	10	

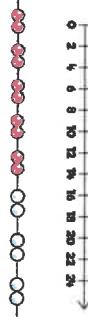
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32	33	34	35	36	37	38	39	40	1	2	3	4	5	6	7	8	9	10	

Look for patterns in the five times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd, even pattern.

Look for patterns in the three times table, using concrete manipulatives to support. Notice the odd, even, odd, even pattern using number shapes to support. Highlight the pattern in the ones using a hundred square.

Skill: 10 times table

Year: 2



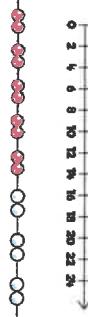
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
10	11	12	13	14	15	16	17	18	19	20	1	2	3	4	5	6	7	8	9

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
32	33	34	35	36	37	38	39	40	1	2	3	4	5	6	7	8	9	10	

Look for patterns in the ten times table, using concrete manipulatives to support. Notice the pattern in the digits—the ones are always 0, and the tens increase by 1 ten each time.

Skill: 5 times table

Year: 2



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
10	11	12	13	14	15	16	17	18	19	20	1	2	3	4	5	6	7	8	9

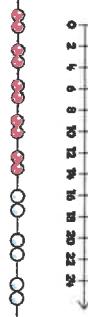
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32	33	34	35	36	37	38	39	40	1	2	3	4	5	6	7	8	9	10	

Look for patterns in the five times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd, even pattern.

Look for patterns in the three times table, using concrete manipulatives to support. Notice the odd, even, odd, even pattern using number shapes to support. Highlight the pattern in the ones using a hundred square.

Skill: 3 times table

Year: 3

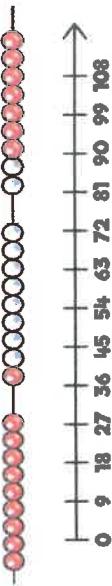


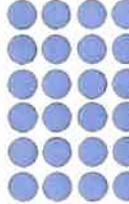
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
10	11	12	13	14	15	16	17	18	19	20	1	2	3	4	5	6	7	8	9

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
32	33	34	35	36	37	38	39	40	1	2	3	4	5	6	7	8	9	10	

Look for patterns in the three times table, using concrete manipulatives to support. Notice the odd, even, odd, even pattern using number shapes to support. Highlight the pattern in the ones using a hundred square.

Year: 3	Skill: 8 times table
<p>Encouraged daily counting in multiples, supported by a number line or a hundred square.</p> <p>Look for patterns in the eight times table, using manipulatives to support. Make links to the 4 times table, seeing how each multiple is double the fours. Notice the pattern in the ones, within each group of five multiples.</p> <p>Highlight that all the multiples are even using number shapes to support.</p>	8 16 24 32 40 48 56 64 72 80

Skill: 9 times table	Year: 4																																																																																																														
 <table border="1"> <tbody> <tr> <td>9</td><td>18</td><td>27</td><td>36</td><td>45</td></tr> <tr> <td>54</td><td>63</td><td>72</td><td>81</td><td>90</td></tr> </tbody> </table>	9	18	27	36	45	54	63	72	81	90	<p>Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.</p> <p>Look for patterns in the nine times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support as well as noting the odd, even pattern within the multiples.</p> <table border="1"> <tbody> <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> </tbody> </table> 	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	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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71	72	73	74	75	76	77	78	79	80																																																																																																						
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Year: 3	Skill: 4 times table															
<p>Encourage daily counting in multiples, supported by a number line or a hundred square.</p> <p>Look for patterns in the four times table, using manipulatives to support. Make links to the 2 times table, seeing how each multiple is double the twos. Notice the pattern in the ones within each group of five multiples.</p> <p>Highlight that all the multiples are even using number shapes to support.</p>	    <table border="1" data-bbox="293 1800 533 2085"> <tbody> <tr> <td>4</td><td>8</td><td>12</td><td>16</td><td>20</td></tr> <tr> <td>24</td><td>28</td><td>32</td><td>36</td><td>40</td></tr> <tr> <td>44</td><td>48</td><td>52</td><td>56</td><td>60</td></tr> </tbody> </table>	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
4	8	12	16	20												
24	28	32	36	40												
44	48	52	56	60												

Year: 4

Skill: 6 times table

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
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Encourage daily counting in multiples, supported by a number line or a hundred square.

Look for patterns in the six times table, seeing how each multiple is double the threes. Notice the pattern in the ones within each group of five multiples.

Highlight that all the multiples are even using number shapes to support.

Skill: 7 times table

Year: 4

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
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
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Encourage daily counting in multiples both forwards and backwards, supported by a number line or a hundred square. The seven times table can be trickier to learn due to the lack of obvious pattern in the numbers, however they already know several facts due to commutativity. Children can still see the odd/even pattern in the multiples using number shapes to support.

Skill: 12 times table

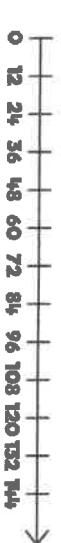
Year: 4

12	24	36	48	60
72	84	96	108	120
132	144			



Encourage daily counting in multiples, supported by a number line or a hundred square.

Look for patterns in the 12 times table, using manipulatives to support. Make links to the 6 times table, seeing how each multiple is double the sixes. Notice the pattern in the ones within each group of five multiples. The hundred square can support in highlighting this pattern.

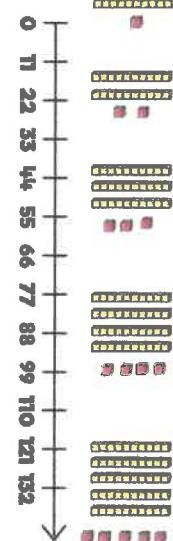


Multiplication

Skill: 11 times table

Year: 4

11	22	33	44	55	66
77	88	99	110	121	132
111	122	133	144	155	166
211	222	232	242	252	262
311	322	332	342	352	362

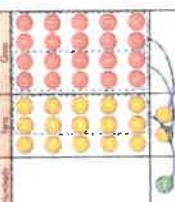


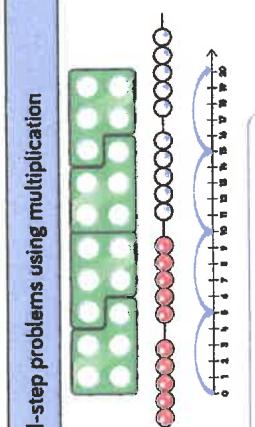
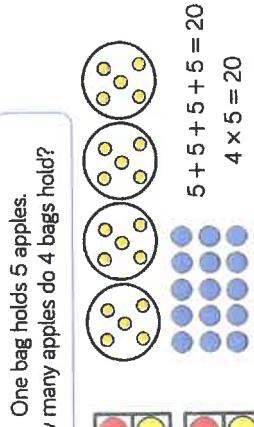
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

Look for patterns in the eleven times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to consider the pattern after crossing 100.

Representations and models			
Skill	Year		
Solve one-step problems with multiplication	1/2	Bar model Number shapes Counters	Ten frames Bead strings Number lines
Multiply 2-digit by 1-digit numbers	3/4	Place value counters Base 10	Short written method Expanded written method
Multiply 3-digit by 1-digit numbers	4	Place value counters Base 10	Short written method
Multiply 4-digit by 1-digit numbers	5	Place value counters	Short written method

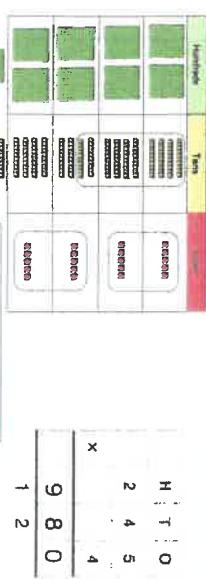
Representations and models			
Skill	Year		
Multiply 2-digit by 2-digit numbers	5	Place value counters Base 10	Short written method Grid method
Multiply 2-digit by 3-digit numbers	5	Place value counters	Short written method Grid method
Multiply 2-digit by 4-digit numbers	5/6	Formal written method	

Skill: Multiply 2-digit numbers by 1-digit numbers		Year: 3/4																																
		<p>Teachers may decide to first look at the expanded column method before moving on to the short multiplication method.</p> <p>The place value counters should be used to support the understanding of the method rather than supporting the multiplication, as children should use times table knowledge.</p>  <table style="margin-left: auto; margin-right: auto;"> <tr> <td>H</td><td>T</td><td>O</td> <td></td> </tr> <tr> <td>3</td><td>4</td><td></td> <td>x</td> </tr> <tr> <td></td><td></td><td>5</td> <td></td> </tr> <tr> <td></td><td></td><td>2</td> <td>0</td> </tr> <tr> <td></td><td></td><td>1</td> <td>5</td> </tr> <tr> <td></td><td></td><td>7</td> <td>0</td> </tr> <tr> <td></td><td></td><td></td> <td>1</td> </tr> <tr> <td></td><td></td><td></td> <td>2</td> </tr> </table> <p>34 x 5 = 170</p>	H	T	O		3	4		x			5				2	0			1	5			7	0				1				2
H	T	O																																
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Skill: Solve 1-step problems using multiplication		Year: 1/2
		<p>Children represent multiplication as repeated addition in many different ways.</p> <p>In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally.</p> <p>In Year 2, children are introduced to the multiplication symbol.</p>  <p>One bag holds 5 apples.</p> <p>How many apples do 4 bags hold?</p>  <p>$5 + 5 + 5 + 5 = 20$</p> <p>$4 \times 5 = 20$</p> <p>$5 \times 4 = 20$</p>

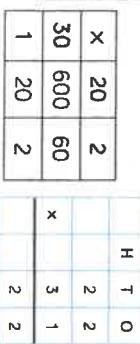
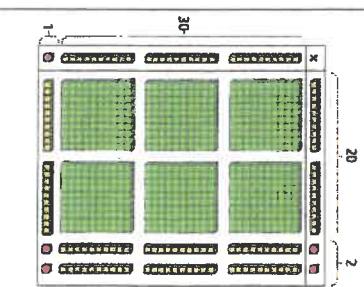
Skill: Multiply 3-digit numbers by 1-digit numbers

Year: 3/4



$$245 \times 4 = 980$$

When moving to 3-digit by 1-digit multiplication, encourage children to move towards the short, formal written method. Base 10 and place value counters continue to support the understanding of the written method. Limit the number of exchanges needed in the questions and move children away from resources when multiplying larger numbers.

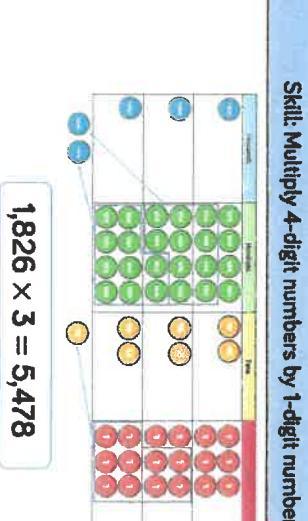
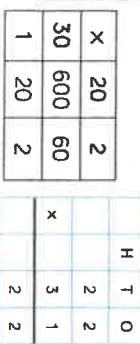
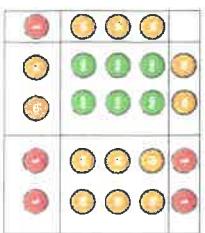


$$22 \times 31 = 682$$

Skill: Multiply 2-digit numbers by 2-digit numbers

Year: 5

When multiplying a multi-digit number by 2-digits, use the area model to help children understand the size of the numbers they are using. This links to finding the area of a rectangle by finding the space covered by the Base 10. The grid method matches the area model as an initial written method before moving on to the formal written multiplication method.

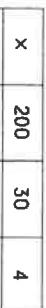
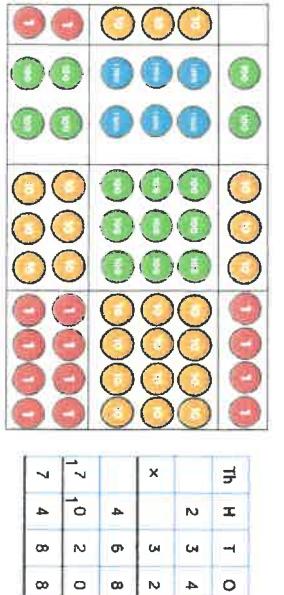


$$1,826 \times 3 = 5,478$$

When multiplying 4-digit numbers, place value counters are the best manipulative to use to support children in their understanding of the formal written method. If children are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so children can focus on the use of the written method.

Skill: Multiply 3-digit numbers by 2-digit numbers

Year: 5



$$234 \times 32 = 7,488$$

Encourage children to move towards the formal written method, seeing the links with the grid method.

Division

Skill: Multiply 4-digit numbers by 2-digit numbers

Year: 5/6

TTh	Th	H	T	O
2	7	3	9	
x		2	8	
2	1	9	1	2
2	5	3	7	
1	5	4	7	0
7	6	6	9	2

1

$$2,739 \times 28 = 76,692$$

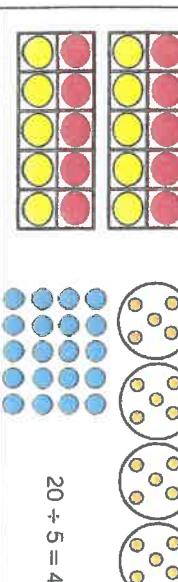
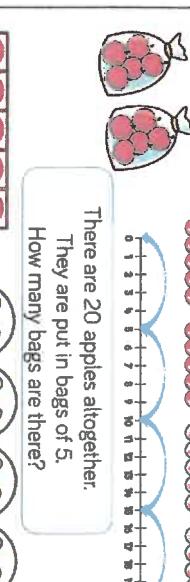
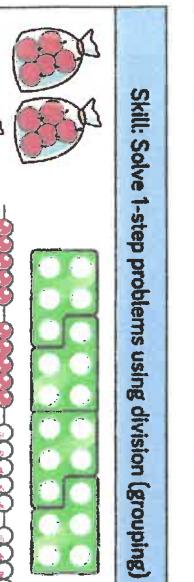
When multiplying 4-digits by 2-digits, children should be confident in the written method.

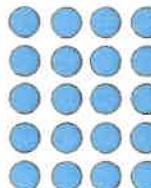
If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method. Consider where exchanged digits are placed and make sure this is consistent.

Skill	Year	Representations and models
Solve one-step problems with division (sharing)	1/2	Bar model Real life objects Arrays Counters
Solve one-step problems with division (grouping)	1/2	Number lines Arrays Counters
Divide 2-digits by 1-digit (no exchange sharing)	3	Real life objects Number shapes Bead strings Ten frames Straws Base 10 Bar model
Divide 2-digits by 1-digit (sharing with exchange)	3	Place value counters Part-whole model Straws Base 10 Bar model
Divide 3-digits by 1-digit (grouping)	4/5	Place value counters Counters Base 10 Bar model
Divide 3-digits by 1-digit (sharing with exchange)	4	Place value counters Part-whole model
Divide 3-digits by 1-digit (grouping)	4/5	Place value counters Counters Written short division

Skill	Year	Representations and models
Divide 2-digits by 1-digit (sharing with remainders)	3/4	Straws Base 10 Bar model
Divide 2-digits by 1-digit (grouping)	4/5	Place value counters Counters
Divide 3-digits by 1-digit (sharing with exchange)	4	Place value counters Part-whole model
Divide 3-digits by 1-digit (grouping)	4/5	Place value counters Counters Written short division

Skill	Year	Representations and models	
Divide 4-digits by 1-digit (grouping)	5	Place value counters	Place value grid
Divide multi-digits by 2-digits (short division)	6	Written short division	Written short division
Divide multi-digits by 2-digits (long division)	6	Written long division	List of multiples

Skill: Solve 1-step problems using division (grouping)	Year: 1/2
 <p>There are 20 apples altogether. They are put in bags of 5. How many bags are there?</p> <p>$20 \div 5 = 4$</p> <p>Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.</p>	 

<p>Skill: Solve 1-step problems using multiplication (sharing)</p>  <p>There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?</p> $20 \div 5 = 4$	<p>Year: 1/2</p> <table border="1" style="width: 100%; text-align: center; border-collapse: collapse;"> <tr> <td>?</td> <td>?</td> <td>?</td> <td>?</td> <td>?</td> </tr> </table> <p>20</p>	?	?	?	?	?
?	?	?	?	?		
<p>In Year 1, children solve problems by sharing amounts into equal groups.</p> <p>In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally.</p> <p>In Year 2, children are introduced to the division symbol.</p>						

Skill: Divide 2-digits by 1-digit (sharing with remainders)

Year: 3/4

When dividing numbers involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones.	When dividing numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones.
--	--

Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made.

Flexible partitioning in a part-whole model supports this method.

53 ÷ 4 = 13 r1

Skill: Divide 2-digits by 1-digit (sharing with remainders)

Year: 4

Children can continue to use place value counters to share 3-digit numbers into equal groups.	Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows.
---	--

This method can also help to highlight remainders.

Flexible partitioning in a part-whole model supports this method.

844 ÷ 4 = 122

Skill: Divide 2-digits by 1-digit (sharing with exchange)

Year: 3/4

When dividing numbers involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones.	When dividing numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones.
--	--

Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.

Flexible partitioning in a part-whole model supports this method.

52 ÷ 4 = 13

Skill: Divide 3-digits by 1-digit (sharing)

Year: 4/5

When using the short division method, children use grouping.	When using the short division method, children use grouping.
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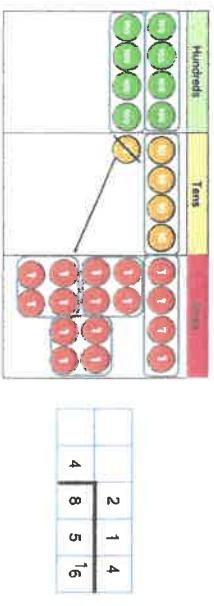
Starting with the largest place value, they group by the divisor.

Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?' Remainders can also be seen as they are left ungrouped.

844 ÷ 4 = 122

Skill: Divide 3-digits by 1-digit (grouping)

Year: 5



$$856 \div 4 = 214$$

Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number.

Place value counters or plain counters can be used on a place value grid to support this understanding. Children can also draw their own counters and group them through a more pictorial method.

Skill: Divide multi digits by 2-digits (short division)

Year: 6

When children begin to divide up to 4-digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective. Children can write out multiples to support their calculations with larger remainders.

Children will also solve problems with remainders where the quotient can be rounded as appropriate.

	0	3	6
12	4	3	72
	4	3	72

$$432 \div 12 = 36$$

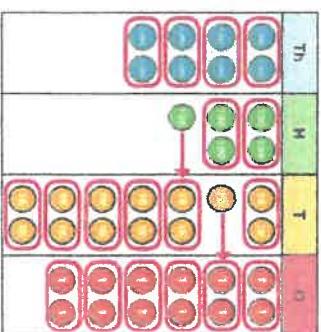
$$7,335 \div 15 = 489$$

	0	4	8	9
15	7	3	3	5
	6	0	0	0
-	1	3	3	5

	15	30	45	60	75	90	105	120	135	150
	15	30	45	60	75	90	105	120	135	150

Skill: Divide 4-digits by 1-digit (grouping)

Year: 5



$$8,532 \div 2 = 4,266$$

Place value counters or plain counters can be used on a place value grid to support children to divide 4-digits by 1-digit. Children can also draw their own counters and group them through a more pictorial method.

Children should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.

Skill: Divide multi-digits by 2-digits (long division)

Year: 6

$$\begin{array}{r} 12 \\ \times 1 \\ \hline 12 \end{array}$$

$$\begin{array}{r} 12 \\ \times 2 \\ \hline 24 \end{array}$$

$$\begin{array}{r} 12 \\ \times 3 \\ \hline 36 \end{array}$$

$$\begin{array}{r} 12 \\ \times 4 \\ \hline 48 \end{array}$$

$$\begin{array}{r} 12 \\ \times 5 \\ \hline 60 \end{array}$$

$$\begin{array}{r} 12 \\ \times 6 \\ \hline 72 \end{array}$$

$$\begin{array}{r} 12 \\ \times 7 \\ \hline 84 \end{array}$$

$$\begin{array}{r} 12 \\ \times 8 \\ \hline 96 \end{array}$$

$$\begin{array}{r} 12 \\ \times 9 \\ \hline 108 \end{array}$$

$$\begin{array}{r} 12 \\ \times 10 \\ \hline 120 \end{array}$$

$$432 \div 12 = 36$$

$$7,335 \div 15 = 489$$

	0	4	8	9
15	7	3	3	5
	6	0	0	0
-	1	3	3	5

	1	3	5
-	1	3	5
	0	0	0

Children can write out multiples to support their calculations with larger remainders.

Children will also solve problems with remainders where the quotient can be rounded as appropriate.

Glossary

Skill: Divide multi digits by 2-digits (long division)

Year: 6

1	2	4	1	1	2
1	6	3	7	2	
-	3	0	0		

When a remainder is left at the end of a calculation, children can either leave it as a remainder or convert it to a fraction.

This will depend on the context of the question.

Children can also answer questions where the quotient needs to be rounded according to the context.

$$372 \div 15 = 24 \text{ r}12$$

$$372 \div 15 = 24 \frac{4}{5}$$

1	5	3	7	2	4
-	3	0	0		

Array – An ordered collection of counters, cubes or other items in rows and columns.

Commutative – Numbers can be multiplied in any order.

Dividend – In division, the number that is divided.

Divisor – In division, the number by which another is divided.

Exchange – Change a number or expression for another of an equal value.

Factor – A number that multiplies with another to make a product.

Multiplicand – In multiplication, a number to be multiplied by another.

Partitioning – Splitting a number into its component parts.

Product – The result of multiplying one number by another.

Quotient – The result of a division

Remainder – The amount left over after a division when the divisor is not a factor of the dividend.

Scaling – Enlarging or reducing a number by a given amount, called the scale factor

Addition

Skill	Year	Representations and models
Add two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws
Add with up to 3-digits	3	Part-whole model Bar model Place value counters Column addition
Add with up to 4-digits	4	Part-whole model Bar model Place value counters Base 10 Column addition
Add with more than 4 digits	5	Part-whole model Bar model Place value counters Column addition
Add with up to 3 decimal places	5	Part-whole model Bar model Place value counters Column addition

Skill	Year	Representations and models
Add two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes
Add 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20) Number lines (labelled) Straws

Skill: Add 1-digit numbers within 10

Year: 1

When adding numbers to 10, children can explore both aggregation and augmentation.

The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation. The combination bar model, ten frame, bead string and number track all support augmentation.

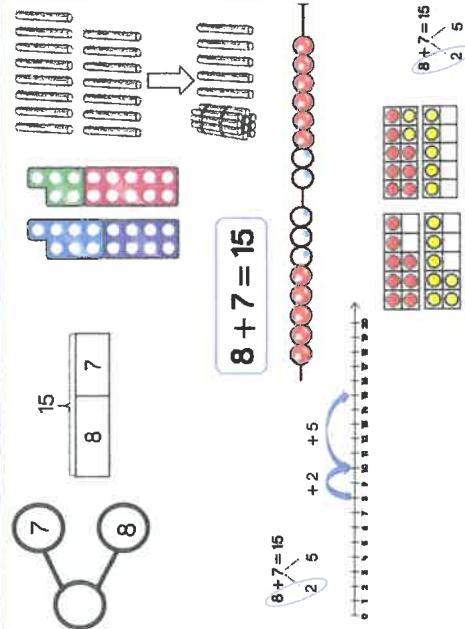
1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

Skill: Add 1 and 2-digit numbers to 20

Year: 1/2

When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps.



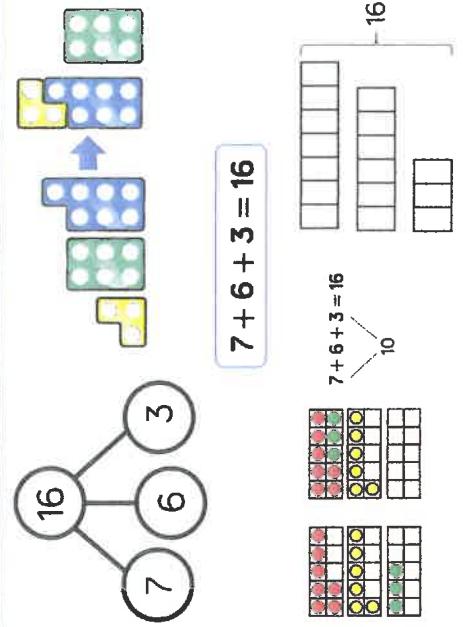
Skill: Add three 1-digit numbers

Year: 2

When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.

This supports children in their understanding of commutativity.

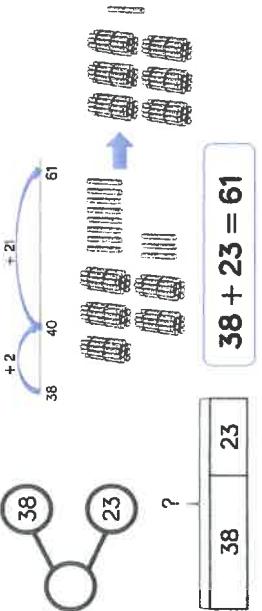
Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.



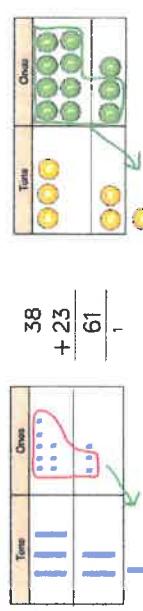
Skill: Add two 2-digit numbers to 100

Year: 2/3

At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.



Children can also use a blank number line to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient.



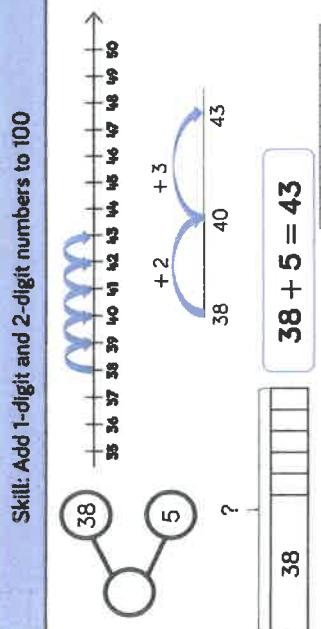
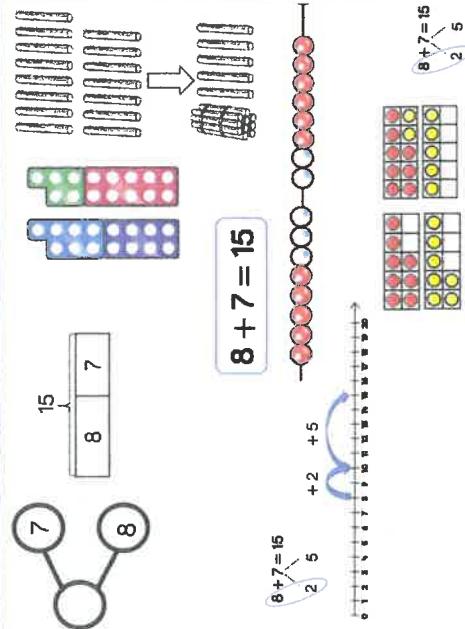
Skill: Add 1-digit and 2-digit numbers to 100

Year: 2/3

When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

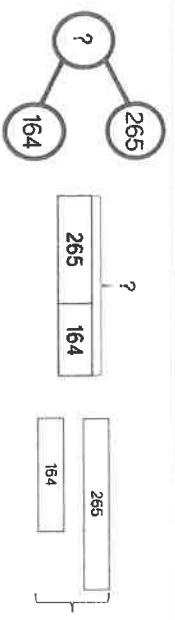
They should also apply their knowledge of number bonds to add more efficiently e.g. $8 + 5 = 13$ so $38 + 5 = 43$.

Hundred squares and straws can support children to find the number bond to 10.

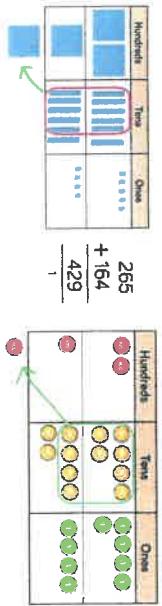


Skill: Add numbers with up to 3 digits

Year: 3



$$265 + 164 = 429$$

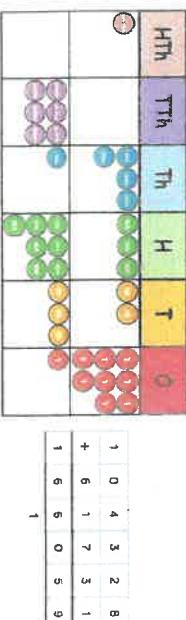


Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

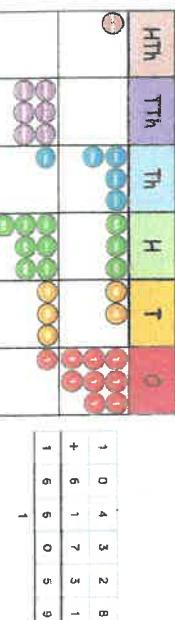
Plain counters on a place value grid can also be used to support learning.

Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits.

$$104,328 + 61,731 = 166,059$$

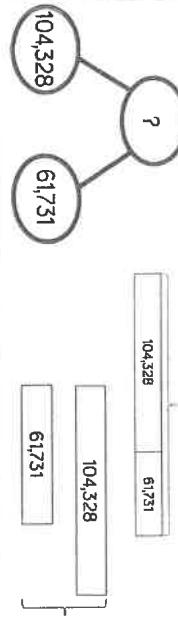


At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.



Skill: Add numbers with more than 4 digits

Year: 5/6

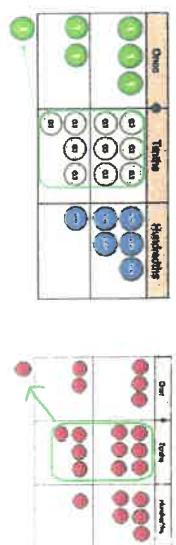


Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.

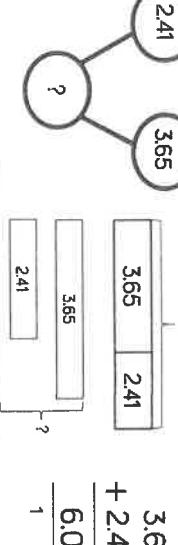
Plain counters on a place value grid can also be used to support learning.

Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits.

$$3.65 + 2.41 = 6.06$$

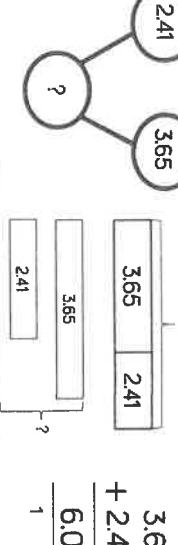


At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.



Skill: Add with up to 3 decimal places

Year: 5

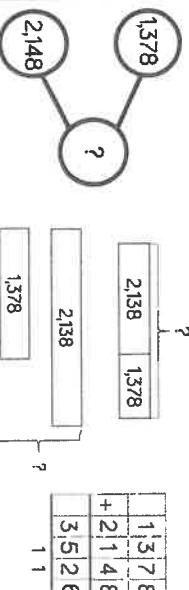


Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2, and then 3 decimal places.

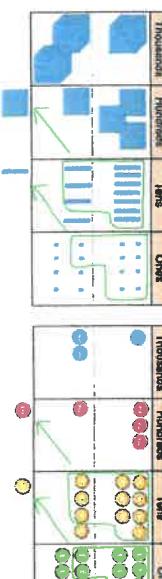
Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.

Skill: Add numbers with up to 4 digits

Year: 4



$$1,378 + 2,148 = 3,526$$



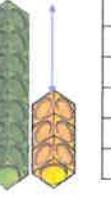
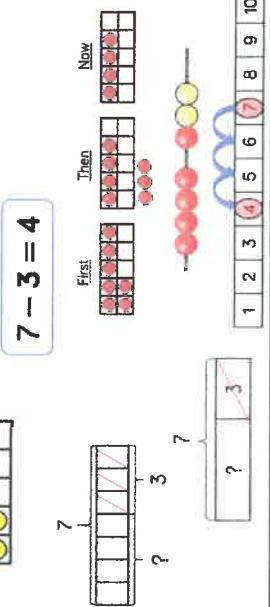
Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Subtraction

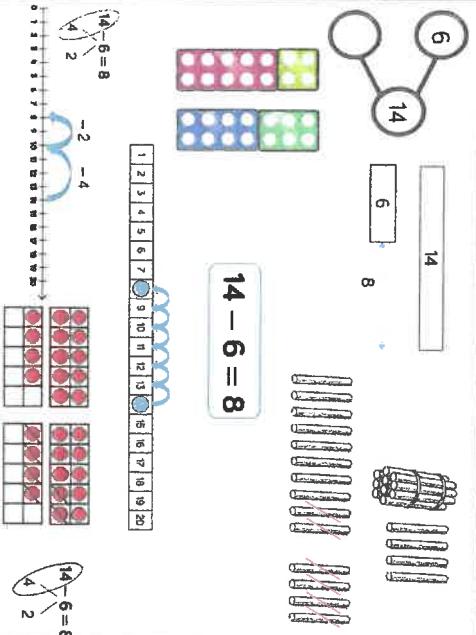
Representations and models		
Skill	Year	
Subtract two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes
Subtract 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)
Subtract 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled) Straws
Subtract two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws

Year: 1		
Skill: Subtract 1-digit numbers within 10		
Part-whole models, bar models, ten frames and number shapes support partitioning.		
Ten frames, number tracks, single bar models and bead strings support reduction.		
Cubes and bar models with two bars can support finding the difference.		

Representations and models		
Skill	Year	
Subtract with up to 3-digits	3	Part-whole model Bar model
Subtract with up to 4-digits	4	Part-whole model Bar model
Subtract with more than 4 digits	5	Part-whole model Bar model
Subtract with up to 3 decimal places	5	Part-whole model Bar model

Skill: Subtract 1 and 2-digit numbers to 20

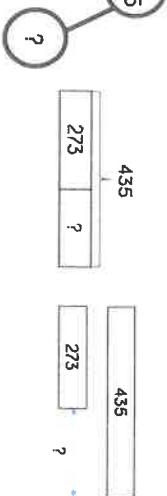
Year: 1/2



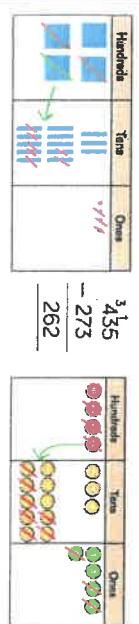
When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

$$14 - 6 = 8$$

Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.



$$435 - 273 = 262$$



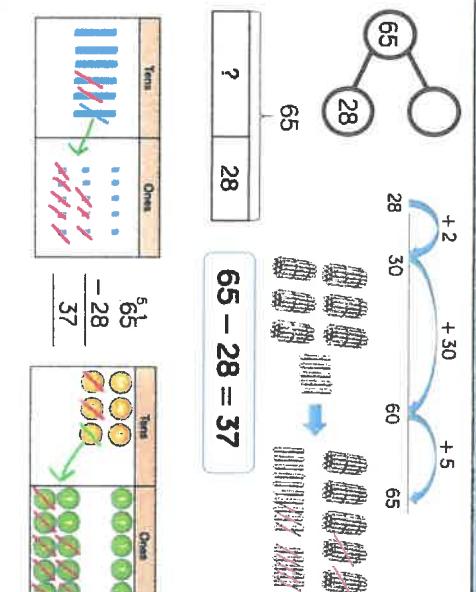
Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. Plain counters on a place value grid can also be used to support learning.

Skill: Subtract numbers with up to 3 digits

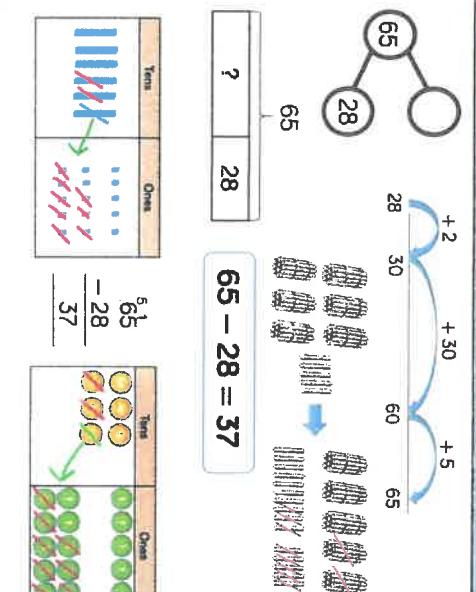
Year: 3

Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits.

$$435 - 273 = 262$$



At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.



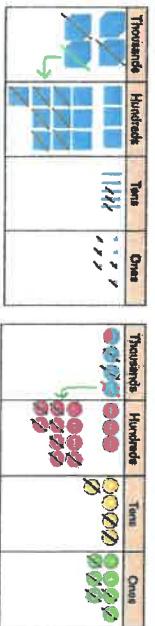
Children can also use a blank number line to count on to find the difference. Encourage them to jump to multiples of 10 to become more efficient.

Skill: Subtract numbers with up to 4 digits

Year: 4

Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.

$$4,357 - 2,735 = 1,622$$



Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. Plain counters on a place value grid can also be used to support learning.

Skill: Subtract numbers with more than 4 digits	Year: 5/6
<p>Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.</p> <p>$294,382 - 182,501 = 111,881$</p>	<p>At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.</p>

Skill: Subtract with up to 3 decimal places	Year: 5
<p>Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places.</p> <p>$5.43 - 2.7 = 2.73$</p>	<p>Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.</p> <p>$5.43 - 2.7 = 2.73$</p>

Glossary

Minuend – A quantity or number from which another is subtracted.

Partitioning – Splitting a number into its component parts.

Reduction – Subtraction as take away.

Subitise – Instantly recognise the number of objects in a small group without needing to count.

Subtrahend – A number to be subtracted from another.

Sum – The result of an addition.

Total – The aggregate or the sum found by addition.

Commutative – numbers can be added in any order.

Complement – in addition, a number and its complement make a total e.g. 300 is the complement to 700 to make 1,000

Difference – the numerical difference between two numbers is found by comparing the quantity in each group.

Exchange – Change a number or expression for another of an equal value.

Addend – A number to be added to another.

Aggregation – combining two or more quantities or measures to find a total.

Augmentation – increasing a quantity or measure by another quantity.

Minuend – A quantity or number from which another is subtracted.

Partitioning – Splitting a number into its component parts.

Reduction – Subtraction as take away.

Subitise – Instantly recognise the number of objects in a small group without needing to count.

Subtrahend – A number to be subtracted from another.

Sum – The result of an addition.

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