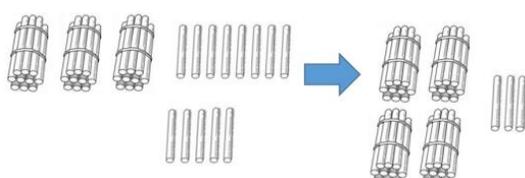
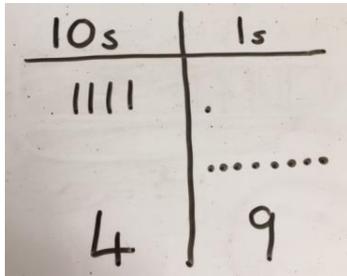
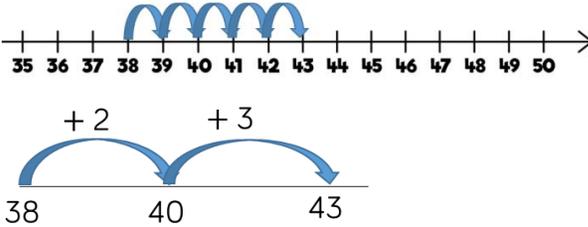
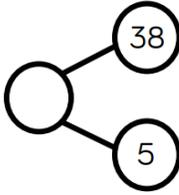
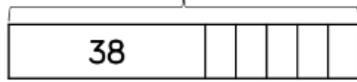


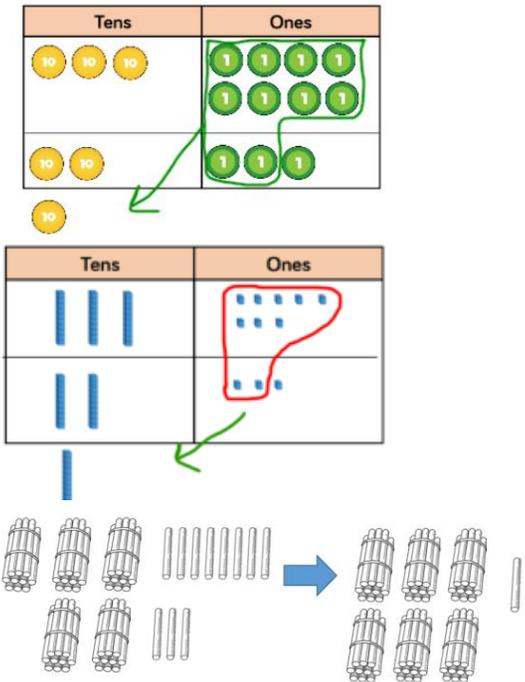
Year 3 and Year 4 Calculation Policy

Addition and Subtraction

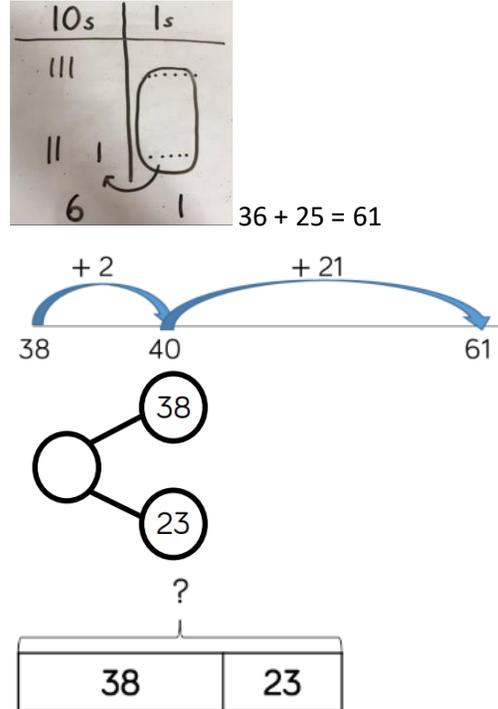
Objective and strategy	Concrete	Pictorial	Abstract																																																																																																				
<p>Y3 Add 1- and 2-digit numbers to 100</p>	<p>BUILDING ON Y2. When adding single digits to a 2-digit number, students should be encouraged to count on from the larger number.</p> <p>They should also apply their knowledge of number bonds to add more efficiently.</p> <p>TO + O using a range of resources, such as, but not limited to, base 10 equipment (such as place value counters or Dienes), bead strings, tens frames and Numicon: continue to develop understanding of partitioning and place value.</p> 	<p>Students represent base 10, using lines and dots.</p>  <p>Annotated number lines, part-whole models and other pictorial representations can support students' understanding.</p>    <table border="1" data-bbox="892 1266 1144 1510"> <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>	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	<div style="border: 1px solid black; padding: 10px; text-align: center; font-size: 24px; font-weight: bold;"> $38 + 5 = 43$ </div> <p>Bridging multiples of 10:</p> $38 + 5 = 38 + 2 + 3 = 40 + 3 = 43$
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Y3
Add two 2-
digit numbers
to 100.

BUILDING ON Y2.
 TO + TO using a range of resources, such as, but not limited to, Dienes, place value counters, bead strings, and Numicon. Continue to develop understanding of partitioning and place value.



Students can use a blank number line and other representations to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient. Students can represent base 10 resources in a place value chart with lines and dots.



From Y3, encourage students to use the formal written method alongside place value resources such as Dienes and place value counters.

One digit per square to encourage place value reinforcement.

Note that exchanges must be underneath and written smaller.

$$\begin{array}{r}
 38 \\
 + 23 \\
 \hline
 61 \\
 1
 \end{array}$$

Y3
Add numbers with up to 3 digits (column addition – no exchanging)

Encourage students to use the formal column method when calculating alongside Dienes or place value counters.

Adding HTO + TO, HTO + HTO etc.

Model column addition using concrete resources. Students should first add *without* an exchange before moving on to exchanging. When adding, always start with the smallest place value column (ones, then tens, etc.)

Students progress to draw addition calculations using number lines, counter visuals, bar models and part-whole models to add up to 3 digits.

Students can draw counters on place value charts and write out calculations alongside pictorial representations:

Students use column addition to demonstrate abstract representation of addition. They add the ones column, then the tens and then the hundreds.

One digit per square.

Make links through live modelling. e.g I know that 7 ones + 1 ones = 8 ones. there are no tens to add, and 1 hundred + 4 hundreds = 5 hundreds. Model mental strategies to enhance fluency. Refer to the place value when modelling.

	H	T	O
	1	0	7
+	4	0	1

107 + 401 = 508

Y3
Add numbers with up to 3 digits. Column addition (with exchanging)

Students use column addition to demonstrate addition. They should make both numbers on a place value grid using base 10. Use practical resources before moving to pictorial representations to reinforce the formal method. Add the ones column, then the tens and then the hundreds.

Practise exchanging 10 ones for 1 ten and 10 tens for 1 hundred and so on. Teacher models using Dienes or place value counters on a place value chart.

e.g.

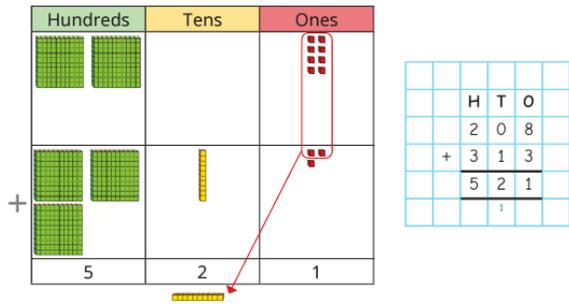
Students draw representations, circling the counters when they make an exchange. Students write the exchanged ten or hundred under the correct column.

Students can partition numbers before moving on to clearly show the exchange below the addition.

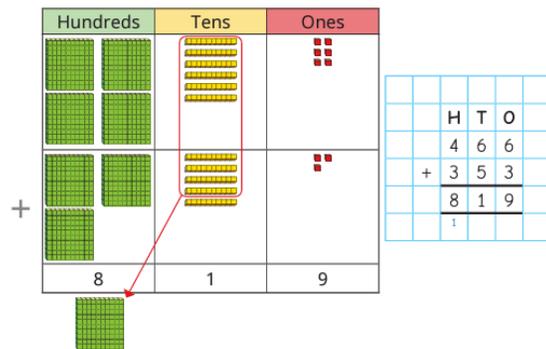
One digit per square.

Students represent column addition with exchanging. Note that exchanges are underneath and written smaller.

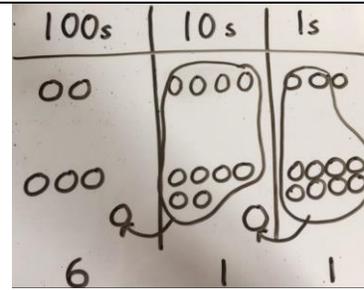
	H	T	O
	4	6	6
+	3	5	3
	8	1	9
	1		

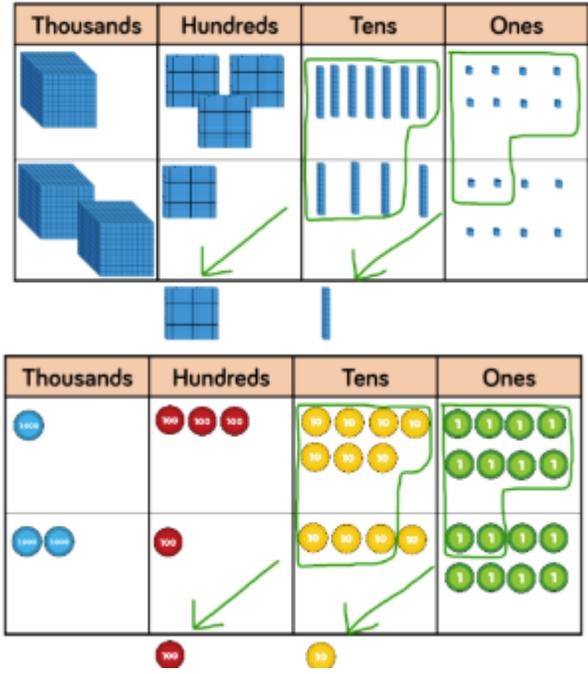
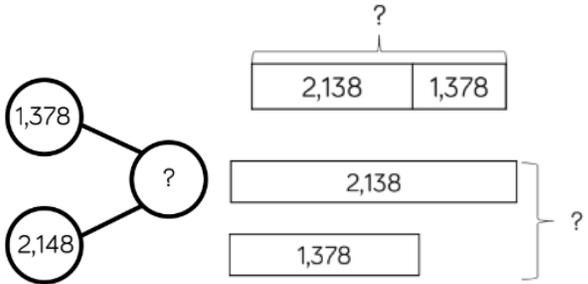


Add up the ones, then exchange 10 Ones for 1 ten. Write the exchanged ten **under** the tens column.

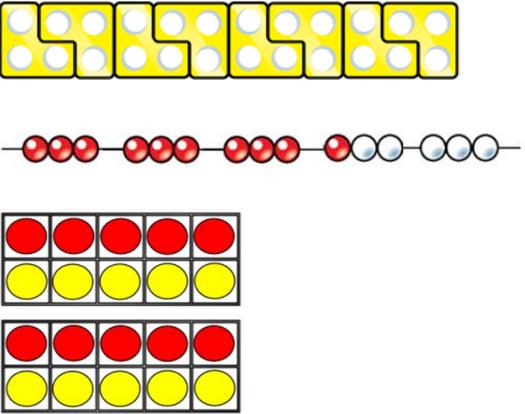
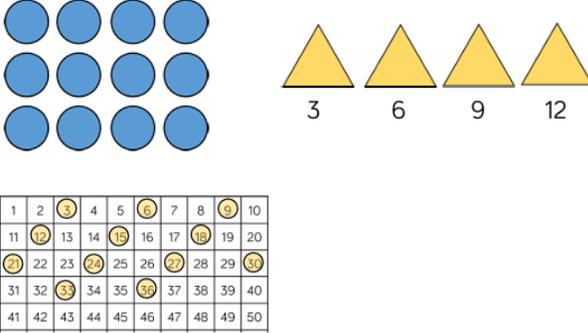
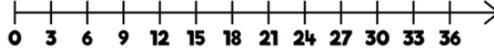
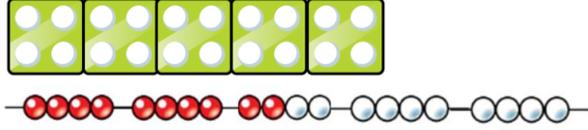
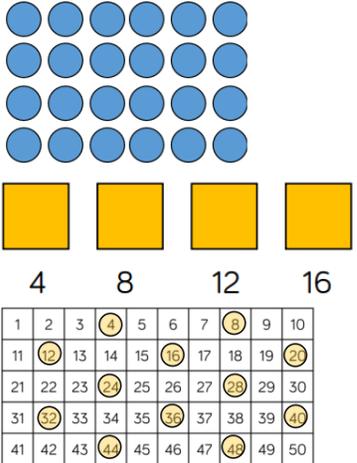
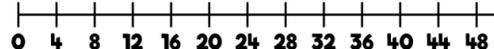


Add the tens, exchanging 10 tens for 1 hundred. Continue until every column has been added. Using base 10 allows children to clearly see that 10 ones equal 1 ten and 10 tens equal 100.

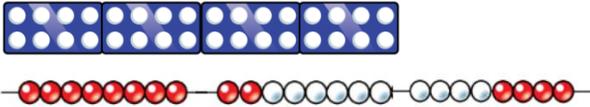


Objective and strategy	Concrete	Pictorial	Abstract																									
<p>Y4 Add numbers with up to 4 digits.</p>	<p>Students continue to use Dienes or place value counters to add, exchanging 10 ones for 1 ten, 10 tens for 1 hundred and 10 hundreds for 1 thousand.</p> 	<p>Students write out calculations alongside pictorial representations to visualise links to written column method. Students to draw representations in place value charts after they gain confidence with concrete resources.</p> 	<p>Continue practising exchanging but progress to exchanging 10 hundreds for 1 thousand, as well as 10 tens for 1 hundred. Relate to money and measures.</p> <p>Reinforce order - start with the ones and work across.</p> <p>One digit per square.</p> <p>Exchanges must be written smaller and underneath.</p> <table border="1" data-bbox="1522 625 1753 901"> <tr><td>1</td><td>3</td><td>7</td><td>8</td></tr> <tr><td>+</td><td>2</td><td>1</td><td>4</td><td>8</td></tr> <tr><td colspan="4"> </td><td>3</td><td>5</td><td>2</td><td>6</td></tr> <tr><td colspan="4"> </td><td>1</td><td>1</td><td colspan="2"> </td></tr> </table> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;"> $1,378 + 2,148 = 3,526$ </div>	1	3	7	8	+	2	1	4	8					3	5	2	6					1	1		
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+	2	1	4	8																								
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				1	1																							

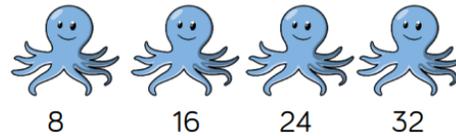
Multiplication and division

Objective and strategies	Concrete	Pictorial	Abstract
<p>Y3 Recall and use multiplication facts for the 3-times table</p>	<p>Use a range of resources to count in 3s.</p> 	<p>Students use arrays, number grids and other pictorial models to recall and use multiplication facts for the 3x table.</p> 	<p>Recall facts for the 3 x tables in and out of order. Look for patterns.</p> <p> $1 \times 3 = 3$ $2 \times 3 = 6$ $3 \times 3 = 9$ $4 \times 3 = 12$ $5 \times 3 = 15$ $6 \times 3 = 18$ $7 \times 3 = 21$ $8 \times 3 = 24$ $9 \times 3 = 27$ $10 \times 3 = 30$ $11 \times 3 = 33$ $12 \times 3 = 36$ </p> 
<p>Y3 Recall and use multiplication facts for the 4-times table</p>	<p>Use a range of resources to count in 4s.</p> 	<p>Students use arrays, number grids and other pictorial models to recall and use multiplication facts for the 4x table.</p> 	<p>Recall facts for the 4 x tables in and out of order. Look for patterns.</p> <p> $1 \times 4 = 4$ $2 \times 4 = 8$ $3 \times 4 = 12$ $4 \times 4 = 16$ $5 \times 4 = 20$ $6 \times 4 = 24$ $7 \times 4 = 28$ $8 \times 4 = 32$ $9 \times 4 = 36$ $10 \times 4 = 40$ $11 \times 4 = 44$ $12 \times 4 = 48$ </p> 
<p>Y3 Recall and use multiplication</p>	<p>Use a range of resources to count in 8s.</p>	<p>Students use arrays, number grids and other pictorial models to recall and use multiplication facts for the 8x table.</p>	<p>Recall facts for the 8 x tables in and out of order. Look for patterns.</p>

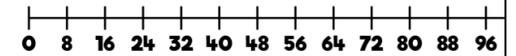
facts for the 8-times table



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

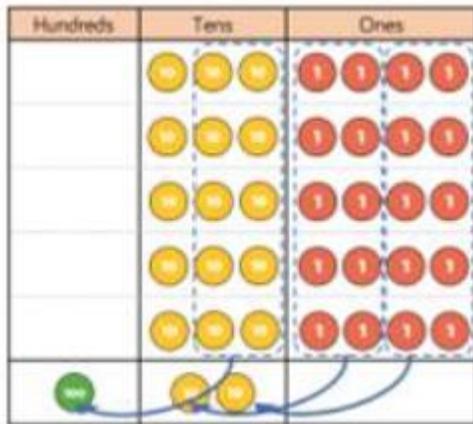


$$\begin{aligned}
 1 \times 8 &= 8 \\
 2 \times 8 &= 16 \\
 3 \times 8 &= 24 \\
 4 \times 8 &= 32 \\
 5 \times 8 &= 40 \\
 6 \times 8 &= 48 \\
 7 \times 8 &= 56 \\
 8 \times 8 &= 64 \\
 9 \times 8 &= 72 \\
 10 \times 8 &= 80 \\
 11 \times 8 &= 88 \\
 12 \times 8 &= 96
 \end{aligned}$$



Y3
Multiply 2-digit by 1-digit numbers

Students solve problems practically using resources such as place value counters or Dienes. Note the physical exchange of ten 10s for one 100.



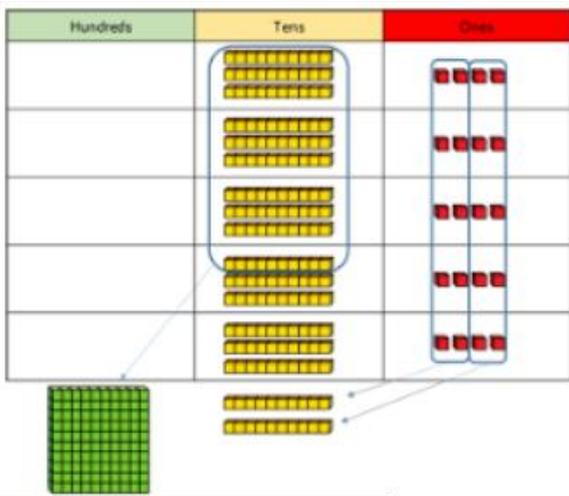
Students to draw place value counters or Dienes to represent multiplications and show exchanges.

Students may use this expanded method before moving to the short formal method. Note that the ones are multiplied first.

Note the place value and one digit per square.

	H	T	O	
		3	4	
x			5	
		2	0	(5 × 4)
+	1	5	0	(5 × 30)
	1	7	0	

Avoid using any other expanded models. Move straight to the short method. Note that all exchanges must be underneath for multiplication.



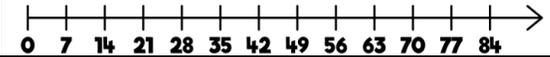
	H	T	O
		3	4
x			5
	1	7	0
	1	2	

If students are not fluent with their times tables, encourage use of multiplication grids to enable them to focus on the formal process and recording.

Objective and strategy	Concrete	Pictorial	Abstract																																																																																																				
Y4 Recall and use multiplication facts for the 6-times table	Use a range of resources to count in 6s. 	Students use arrays, number grids and other pictorial models to recall and use multiplication facts for the 6x table. <table border="1"> <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>	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	Recall facts for the 6 x tables in and out of order. Look for patterns. $1 \times 6 = 6$ $2 \times 6 = 12$ $3 \times 6 = 18$ $4 \times 6 = 24$ $5 \times 6 = 30$ $6 \times 6 = 36$ $7 \times 6 = 42$ $8 \times 6 = 48$ $9 \times 6 = 54$ $10 \times 6 = 60$ $11 \times 6 = 66$ $12 \times 6 = 72$
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Y4 Recall and use multiplication facts for the 7-times table	Use a range of resources to count in 7s. 	Students use arrays, number grids and other pictorial models to recall and use multiplication facts for the 7x table.	Recall facts for the 7 x tables in and out of order.																																																																																																				

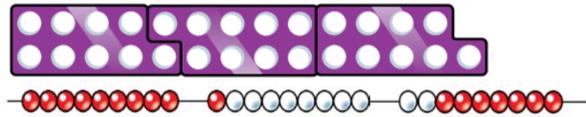
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

$$\begin{aligned}
 1 \times 7 &= 7 \\
 2 \times 7 &= 14 \\
 3 \times 7 &= 21 \\
 4 \times 7 &= 28 \\
 5 \times 7 &= 35 \\
 6 \times 7 &= 42 \\
 7 \times 7 &= 49 \\
 8 \times 7 &= 56 \\
 9 \times 7 &= 63 \\
 10 \times 7 &= 70 \\
 11 \times 7 &= 77 \\
 12 \times 7 &= 84
 \end{aligned}$$



Y4
Recall and use multiplication facts for the 9-times table

Use a range of resources to count in 9s.

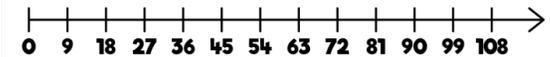


Students use arrays, number grids and other pictorial models to recall and use multiplication facts for the 9x table.

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

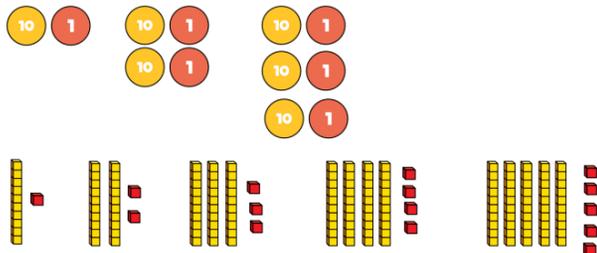
Recall facts for the 9 x tables in and out of order. Look for patterns.

$$\begin{aligned}
 1 \times 9 &= 9 \\
 2 \times 9 &= 18 \\
 3 \times 9 &= 27 \\
 4 \times 9 &= 36 \\
 5 \times 9 &= 45 \\
 6 \times 9 &= 54 \\
 7 \times 9 &= 63 \\
 8 \times 9 &= 72 \\
 9 \times 9 &= 81 \\
 10 \times 9 &= 90 \\
 11 \times 9 &= 99 \\
 12 \times 9 &= 108
 \end{aligned}$$



Y4
Recall and use multiplication facts for the 11-times table

Use a range of resources to count in 11s.

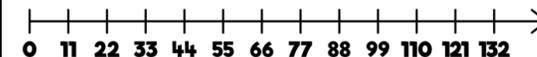


Students use arrays, number grids and other pictorial models to recall and use multiplication facts for the 11x table.

Recall facts for the 11 x tables in and out of order. Look for patterns.

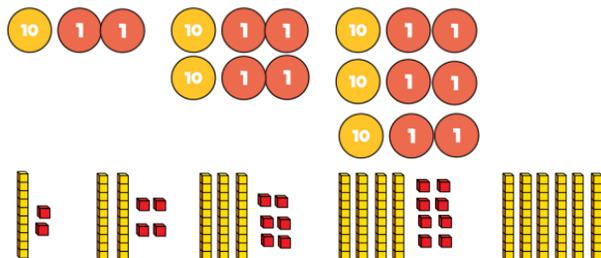
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

$$\begin{aligned}
 1 \times 11 &= 11 \\
 2 \times 11 &= 22 \\
 3 \times 11 &= 33 \\
 4 \times 11 &= 44 \\
 5 \times 11 &= 55 \\
 6 \times 11 &= 66 \\
 7 \times 11 &= 77 \\
 8 \times 11 &= 88 \\
 9 \times 11 &= 99 \\
 10 \times 11 &= 110 \\
 11 \times 11 &= 121 \\
 12 \times 11 &= 132
 \end{aligned}$$



Y4
Recall and use multiplication facts for the 12-times table

Use a range of resources to count in 12s.



Students use arrays, number grids and other pictorial models to recall and use multiplication facts for the 12x 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

Recall facts for the 12 x tables in and out of order. Look for patterns.

$$\begin{aligned}
 1 \times 12 &= 12 \\
 2 \times 12 &= 24 \\
 3 \times 12 &= 36 \\
 4 \times 12 &= 48 \\
 5 \times 12 &= 60 \\
 6 \times 12 &= 72 \\
 7 \times 12 &= 84 \\
 8 \times 12 &= 96 \\
 9 \times 12 &= 108 \\
 10 \times 12 &= 120 \\
 11 \times 12 &= 132 \\
 12 \times 12 &= 144
 \end{aligned}$$



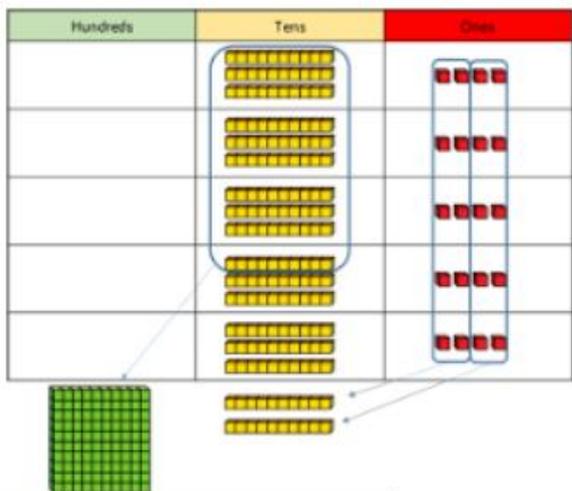
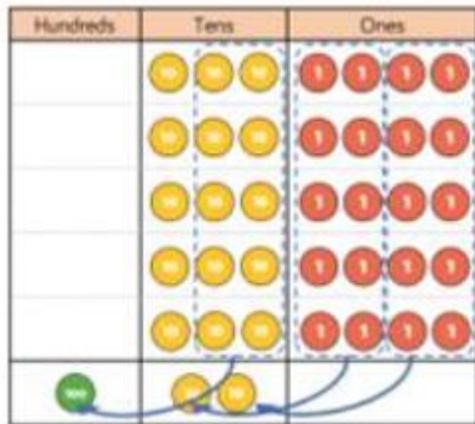
Y4
Multiply 2-digit by 1-digit numbers

NOTE - REINFORCING FROM Y3.
Students solve problems practically using resources such as place value counters or Dienes. Note the physical exchange of ten 10s for one 100.

Students to draw place value counters or Dienes to represent multiplications and show exchanges.

Students may use this expanded method before moving to the short formal method. Note that the ones are multiplied first.

Note the place value and one digit per square.



	H	T	O	
		3	4	
x			5	
		2	0	(5 × 4)
+	1	5	0	(5 × 30)
	1	7	0	

Avoid using any other expanded models. Move straight to the short method.

Note that all exchanges must be underneath for multiplication. Exchange numbers should be written smaller.

	H	T	O
		3	4
x			5
	1	7	0
	1	2	

If students are not fluent with their times tables, encourage use of multiplication grids to enable them to focus on the formal process and recording.

Y4
Multiply 3-digit by 1-digit numbers

Students to use Dienes and place value counters to work out multiplication calculations. Physically carry out the exchanges (1s to 10s, 10s to 100s) to reinforce what is happening.

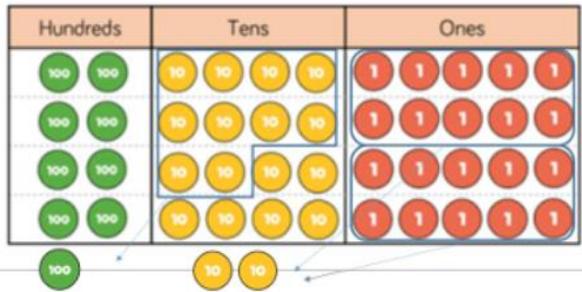
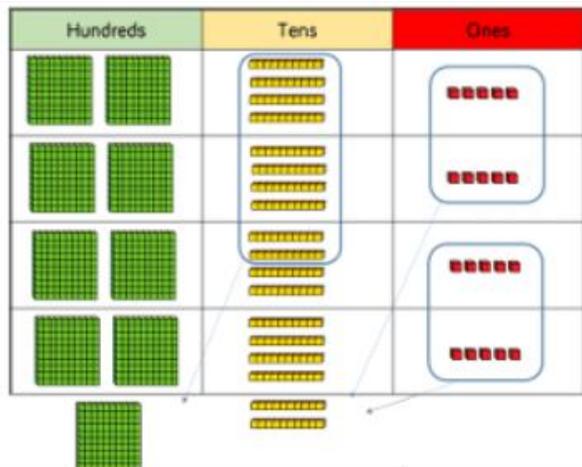
Students to represent calculations using drawings of Dienes or place value counters.

Encourage students to move to the short formal method of multiplication.

Note the place value and one digit per square.

Note that exchanges must be underneath.

Limit the number of exchanges to begin. Start with one exchange from ones to tens.



Then one exchange tens to hundreds. Finally, use two exchanges as below.

	H	T	O
	2	4	5
x			4
<hr/>			
	9	8	0
	1	2	

$$245 \times 4 = 980$$

If students are not fluent with their times tables, encourage use of multiplication grids to enable them to focus on the formal process and recording.