The
TILIAN PARTNERSHIP
Inspire to achieve

Representation Policy for Whole School Coherence

Cavendish CE Primary

Approved by:	**SGC**	**Date: 3rd February 2026**
Last reviewed on:	**February 2026**	
Next review due by:	**February 2028**	

At **Cavendish CE Primary School**, we are committed to ensuring that all pupils develop secure mathematical understanding through the careful and purposeful use of representations. This policy sets out a consistent whole-school approach, supporting high-quality teaching while allowing teachers the professional autonomy to respond to the needs of their pupils.

Our approach is informed by guidance from the **National Centre for Excellence in the Teaching of Mathematics (NCETM)** and aligns with the **Ready-to-Progress criteria**, which emphasise the importance of representations in securing key mathematical concepts and making the underlying structure of mathematics explicit. Representations are used to support pupils in developing fluency, reasoning, and conceptual understanding, enabling them to make connections and generalise their learning.

At Cavendish CE Primary School, representations are not used as a checklist of resources but are **carefully selected, adapted, and sequenced** to match the mathematical concept being taught and the stage of learning. Teachers make deliberate decisions about when representations are introduced, varied, and gradually withdrawn, ensuring that pupils move towards efficient and abstract thinking without over-reliance on concrete or pictorial models.

This policy reflects our commitment to a coherent, well-sequenced mathematics curriculum in which representations support progression, inclusion, and high expectations for all learners.

<table>
<tr><th>Year 1</th><th>Key representations</th><th>Language focus</th></tr>
<tr>
<td>1NPV 1

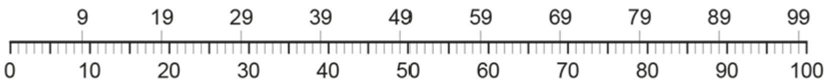
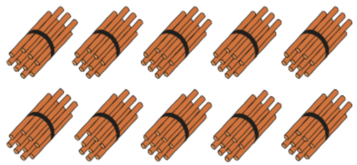
Count forwards and backwards within 100</td>
<td>


Figure 6: 0 to 100 number line to support backwards counting
<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>

<table>
<tr><td>1,000</td><td>2,000</td><td>3,000</td><td>4,000</td><td>5,000</td><td>6,000</td><td>7,000</td><td>8,000</td><td>9,000</td></tr>
<tr><td>100</td><td>200</td><td>300</td><td>400</td><td>500</td><td>600</td><td>700</td><td>800</td><td>900</td></tr>
<tr><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td></tr>
<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></tr>
</table>
Figure 5: Gattegno chart showing multiples of 1, 10, 100 and 1,000
</td>
<td>“…seven, eight, nine, ten, eleven, twelve, thirteen… twenty, twenty-one, twenty-two…”
“…seven, eight, nine, one-ten, one-ten-one, one-ten-two, one-ten-three… two-tens, two-tens-one, two-tens two…”</td>
</tr>
</table>

<table>
<tr>
<td>1NPV 2

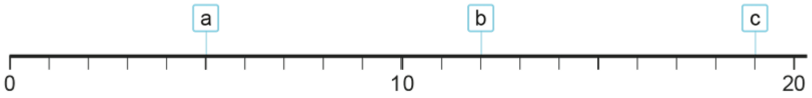
Numbers to 20 in the linear number system</td>
<td>


Figure 7: identifying 5, 12 and 19 on a marked 0 to 20 number line

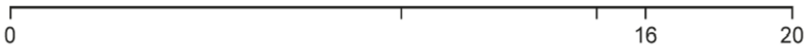


Figure 8: placing 16 on an unmarked 0 to 20 number line

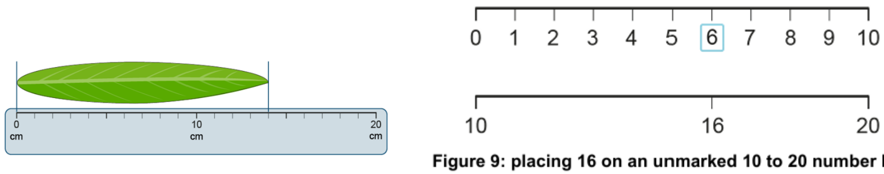


Figure 9: placing 16 on an unmarked 10 to 20 number line
</td>
<td>“a is 5 because it is halfway between 0 and 10.” “b is 12 because it is 2 more than 10.” “c is 19 because it is one less than 20.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1NF-1

Fluently add and subtract within 10</td>
<td>
<table>
<tr><th>+</th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th></tr>
<tr><th>0</th><td>0+0</td><td>0+1</td><td>0+2</td><td>0+3</td><td>0+4</td><td>0+5</td><td>0+6</td><td>0+7</td><td>0+8</td><td>0+9</td><td>0+10</td></tr>
<tr><th>1</th><td>1+0</td><td>1+1</td><td>1+2</td><td>1+3</td><td>1+4</td><td>1+5</td><td>1+6</td><td>1+7</td><td>1+8</td><td>1+9</td><td></td></tr>
<tr><th>2</th><td>2+0</td><td>2+1</td><td>2+2</td><td>2+3</td><td>2+4</td><td>2+5</td><td>2+6</td><td>2+7</td><td>2+8</td><td></td><td></td></tr>
<tr><th>3</th><td>3+0</td><td>3+1</td><td>3+2</td><td>3+3</td><td>3+4</td><td>3+5</td><td>3+6</td><td>3+7</td><td></td><td></td><td></td></tr>
<tr><th>4</th><td>4+0</td><td>4+1</td><td>4+2</td><td>4+3</td><td>4+4</td><td>4+5</td><td>4+6</td><td></td><td></td><td></td><td></td></tr>
<tr><th>5</th><td>5+0</td><td>5+1</td><td>5+2</td><td>5+3</td><td>5+4</td><td>5+5</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><th>6</th><td>6+0</td><td>6+1</td><td>6+2</td><td>6+3</td><td>6+4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><th>7</th><td>7+0</td><td>7+1</td><td>7+2</td><td>7+3</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><th>8</th><td>8+0</td><td>8+1</td><td>8+2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><th>9</th><td>9+0</td><td>9+1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><th>10</th><td>10+0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

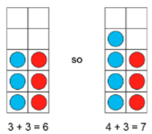


Figure 10: tens frames with counters showing derivation of a ‘near-double’ addition calculation

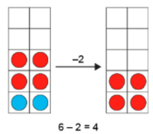
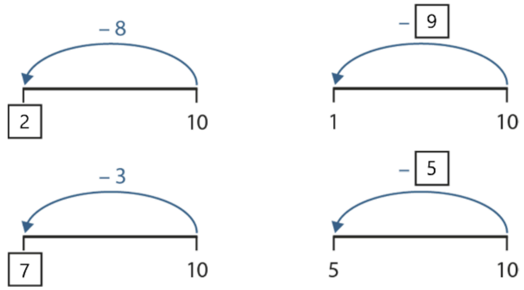
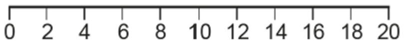
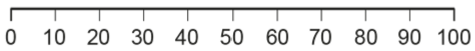
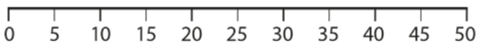
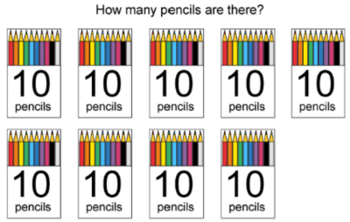
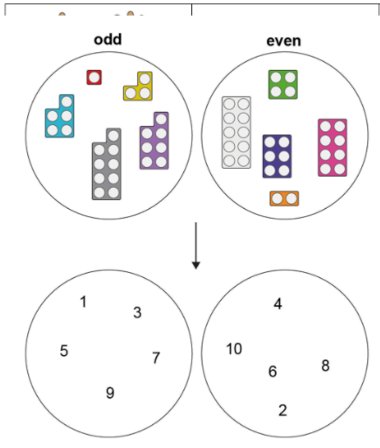
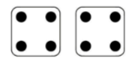
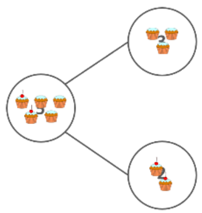
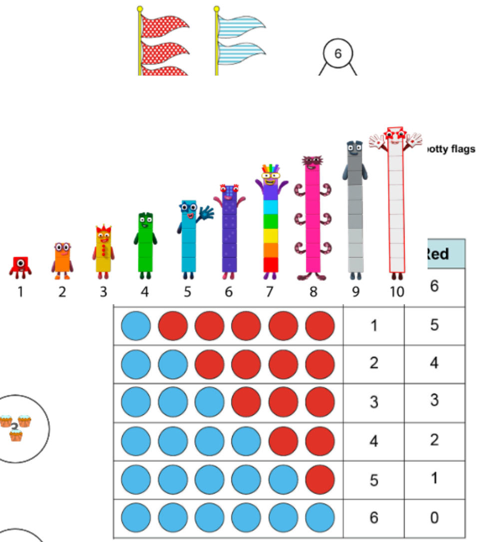


Figure 11: tens frames with counters showing that subtracting 2 from an even number gives the previous even number



I know that 2 + 8 is equal to 10 so I know 10 minus 8 is equal to 2.
</td>
<td>“I know that double 3 is equal to 6, so 4 plus 3 is equal to 7.”

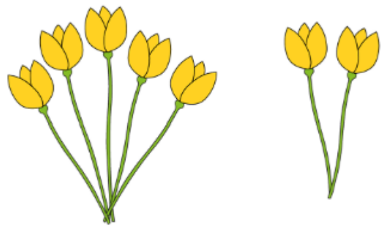
“If I subtract 2 from an even number I get the previous even number, so 6 minus 2 is equal to 4.”</td>
</tr>
</table>

1NF–2 Count forwards and backwards in multiples of 2, 5 and 10	 **Figure 12: number line to support counting in multiples of 2**  **Figure 13: number line to support counting in multiples of 10**  **Figure 14: number line to support counting in multiples of 5**  **Figure 15: counting in tens – 9 packs of 10 pencils**	**"The pencils are in groups of 10, so we will count in tens."** **"Ten, twenty, thirty…" "1 group of 10, 2 groups of 10, 3 groups of 10…" In time, shortened to: "1 ten, 2 tens, 3 tens…"**
1AS–1 Compose and partition numbers to 10	 **Figure 25: odd and even numbers up to 10**  **Figure 19: 8 represented as two 4-value dice**  **Figure 22: 8 represented on a bead string: 7 and 1**   **Figure 24: working systematically to partition 6**	**"There are 6 flags. 4 are spotty and 2 are stripy." "6 is the whole. 4 is a part. 2 is a part."**

1AS–2

Read, write and interpret additive equations

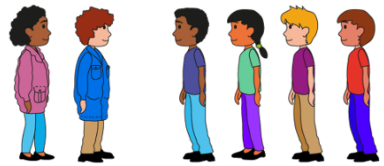
How many flowers are there altogether?



$5 + 2 = 7$

Figure 26: addition as aggregation

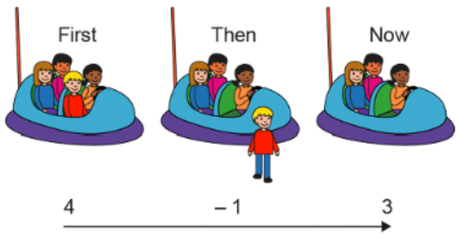
How many children are not wearing coats?



$6 - 2 = 4$

Figure 27: subtraction as partitioning

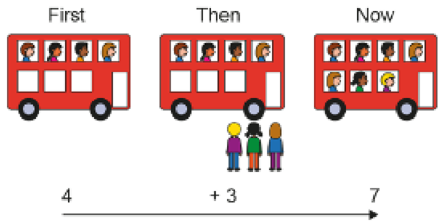
How many children are in the bumper car now?



$4 - 1 = 3$

Figure 29: subtraction as reduction

How many children are on the bus now?



$4 + 3 = 7$

Figure 28: addition as augmentation

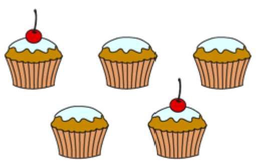
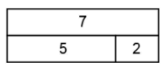
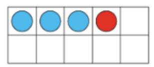


Figure 30: aggregation or partitioning context: 5 cakes altogether, 2 with cherries and 3 without



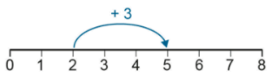
$7 - 2 = 5$

Figure 31: bar model and subtraction equation ($7 - 2 = 5$)



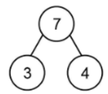
$3 + 1 = 4$

Figure 33: tens frame with counters and addition equation ($3 + 1 = 4$)



$2 + 3 = 5$

Figure 32: number line and addition equation ($2 + 3 = 5$)



$7 - 3 = 4$

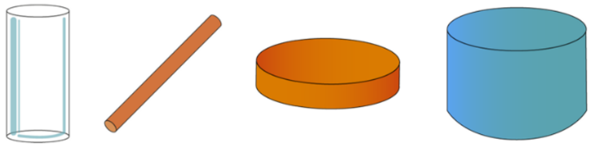
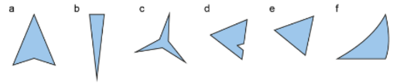
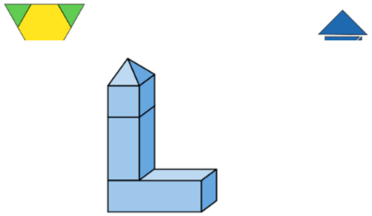
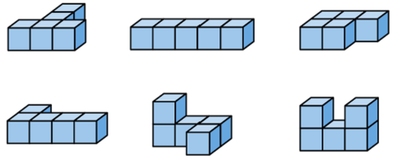
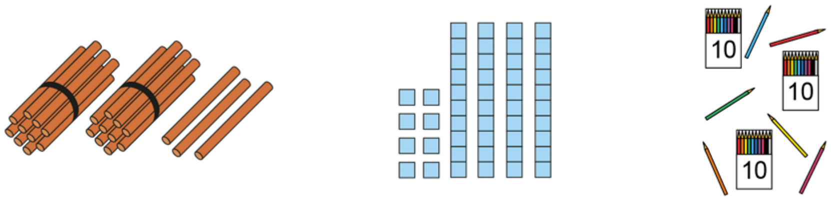
Figure 34: cherry partitioning model and subtraction equation ($7 - 3 = 4$)

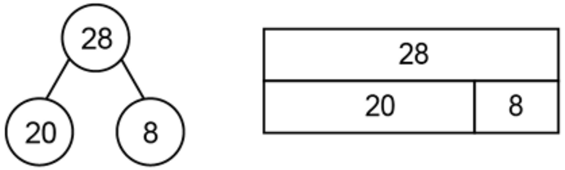
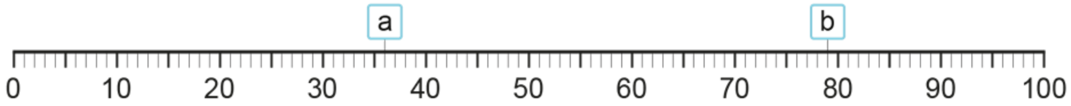
“There are 5 flowers in one bunch. There are 2 flowers in the other bunch. There are 7 flowers altogether.” “We can write this as 5 plus 2 is equal to 7.” “The 5 represents the number of flowers in 1 bunch.“ “The 2 represents the number of flowers in the other bunch.” “The 7 represents the total number of flowers.”

“There are 6 children altogether. 2 children are wearing coats. 4 children are not wearing coats.” “We can write this as 6 minus 2 is equal to 4.” “The 6 represents the total number of children.” “The 2 represents the number of children that are wearing coats.” “The 4 represents the number of children that are not wearing coats.”

“First 4 children were sitting on the bus. Then 3 more children got on the bus. Now 7 children are sitting on the bus.” “We can write this as 4 plus 3 is equal to 7.” “The 4 represents the number of children that were on the bus at the start.” “The 3 represents the number of children that got on the bus.” “The 7 represents the number of children that are on the bus now.”

“First there were 4 children in the bumper car. Then 1 child got out. Now there are 3 children in the bumper car.” “We can write this as 4 minus 1 is equal to 3.” “The 4 represents the number of children that were in the car at the start.” “The 1 represents the number of children that got out of the car.” “The 3 represents the number of children that are in the car now.”

1G–1 Recognise common 2D and 3D shapes	 Figure 35: non-similar cylinders  Figure 36: distinguishing triangles from plausible distractors	**Shape a: "This is not a triangle because it has 4 sides." Shape b or e: "This is a triangle because it has 3 straight sides." Shape c or d: "This is not a triangle because it has 6 sides." Shape f: "This is not a triangle because some sides are curved."**
1G–2 Compose 2D and 3D shapes from smaller shapes	 n picture Figure 40: example compound shape composed of 4 different 3D shapes  Figure 39: example compound 3D shapes composed of cubes	
	Year 2	
Ready to Progress	**Representations**	**Language Focus**
2NPV–1 Place value in two-digit numbers	**Varied representations - include straws, base 10 and obvious representations showing clear groups of 10 and additional ones**  Figure 41: varied representations of two-digit numbers as groups of ten and additional ones	**This is the number 42. The 4 shows we have 4 groups of ten. The 2 shows we have 2 extra ones."**

	Developed into partitioning - Part Whole models  **Figure 42: partitioning 28 into 20 and 8** $20+8=28$ $28-20=8$ $8+20=28$ $28-8=20$ $28=20+8$ $8=28-20$ $28=8+20$ $20=28-8$	
2NPV–2 Two-digit numbers in the linear number system	**Number lines - Marked and unmarked**  **Figure 43: identifying 36 and 79 on a marked 0 to 100 number line**  **Figure 44: placing 60 on an unmarked 0 to 100 number line**	**“a is 36 because it is one more than the midpoint of 35.” “b is 79 because it is one less than 80.”**
2NF–1 Fluently add and subtract within 10	**Addition facts - grid**	

+	0	1	2	3	4	5	6	7	8	9	10
0	0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9	0+10
1	1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9	
2	2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8		
3	3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7			
4	4+0	4+1	4+2	4+3	4+4	4+5	4+6				
5	5+0	5+1	5+2	5+3	5+4	5+5					
6	6+0	6+1	6+2	6+3	6+4						
7	7+0	7+1	7+2	7+3							
8	8+0	8+1	8+2								
9	9+0	9+1									
10	10+0										

2AS–1 Add and subtract across 10

Tens frames and partitioning diagram

Addition

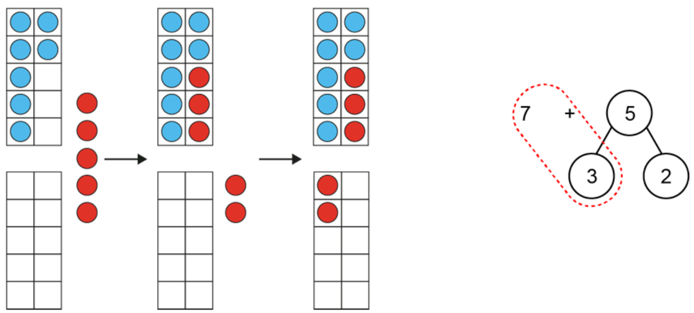


Figure 45: tens frames with counters, and a partitioning diagram, showing $7+5=12$

Subtraction

First, pupils should learn to add three one-digit numbers by making 10, for example, 7 3 2 10 2 . They can then relate this to addition of two numbers across 10, by partitioning one of the addends, for example 7 5 7 3 2 .

the ‘subtracting through 10’ strategy (partitioning the subtrahend) – part of the subtrahend is subtracted to reach 10, then the rest of the subtrahend is subtracted from 10
the ‘subtracting from 10’ strategy (partitioning the minuend) – the subtrahend is subtracted from 10, then

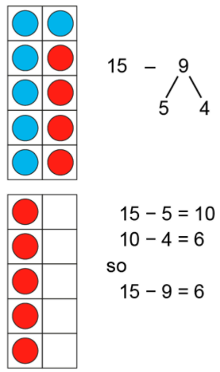
<table>
<tr>
<td></td>
<td>


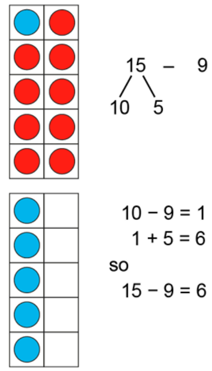
Figure 46: using the 'subtracting through 10' strategy to calculate 15 minus 9


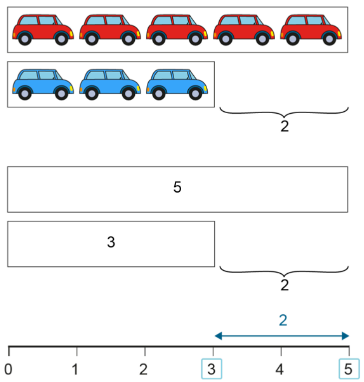
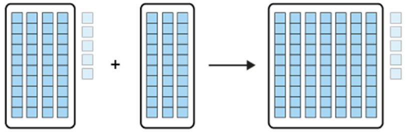
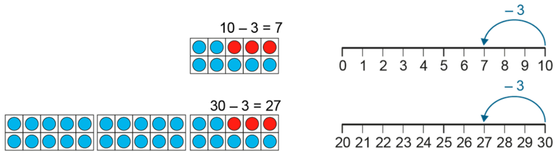
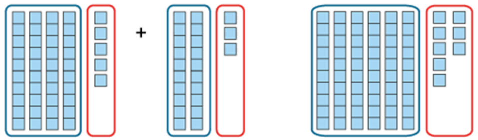
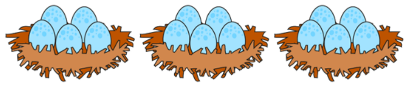
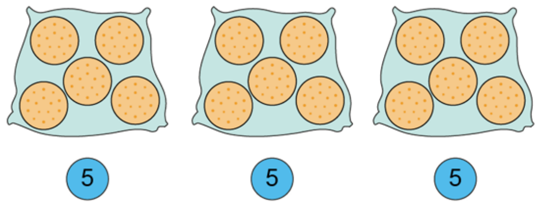
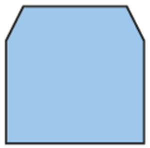
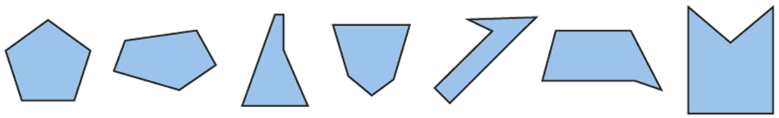
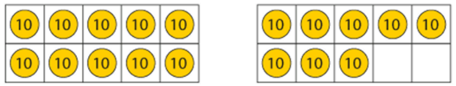
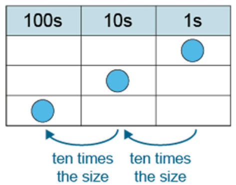
Figure 47: using the 'subtracting from 10' strategy to calculate 15 minus 9
</td>
<td>the difference between the minuend and 10 is added</td>
</tr>
<tr>
<td>2AS–2 Solve comparative addition and difference problems</td>
<td>
Bar models and numberlines


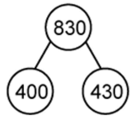
Figure 48: finding the difference – bar model and number line
</td>
<td>Pupils should be able to recognise contextual problems involving finding a difference, phrased as 'find the difference', 'how many more' and 'how many fewer',</td>
</tr>
<tr>
<td>2AS–3 Add and subtract within 100 – part 1</td>
<td>Tens frames/Dienes</td>
<td>"4 plus 3 is equal to 7. So 4 tens and plus 3 tens is equal to 7 tens." "10 minus 3 is equal to 7. So 30 minus 3 is equal to 27."</td>
</tr>
</table>

	 4 + 3 = 7 so 40 + 30 = 70 45 + 30 = 75 Figure 49: Dienes and equations to support adding a multiple of 10 to a two-digit number **Tens Frames and Number lines**  Figure 50: tens frames with counters, and number lines, to support subtracting ones from a multiple of 10	**"I know that 2 plus 5 is equal to 7, so 20 plus 50 is equal to 70. There are 9 ones as well, so 20 plus 59 is equal to 79."**
2AS–4 Add and subtract within 100 – part 2	**Base 10 (dienes)** • $40+20+5+3=60+8=68$ • $40+5+20+3=60+8=68$ • $45+23=60+8=68$ 45 + 23 = 60 + 8 = 68  Figure 51: Dienes and an equation to support adding 2 two-digit numbers	**"First I partition both numbers. Then I add the tens. Then I add the ones. Then I combine all of the tens and all of the ones."**
2MD–1 Multiplication as repeated addition	**Explore equal and unequal groups in a "real life" context**	**"There are 3 equal groups of eggs." "There are 5 eggs in each group." "There are 3 groups of 5." "The 3 represents the number of groups." "The 5 represents the number of eggs in**

	 Figure 52: recognising equal groups – 3 groups of 5 eggs **Place value counters** **Pupils should be able to relate multiplication to situations where the total number of items cannot be seen, for example by representing 3 5 with three 5-value counters.**	**each group." "The 15 represents the total number of eggs."**
2MD–2 Grouping problems: missing factors and division	**Real life representations alongside unitised counters**  Figure 53: three 5-value counters  Figure 54: 3 bags of 5 biscuits alongside three 5-value counters	**"The 15 represents the total number of biscuits." "The 5 represents the number of biscuits in each bag." "The 3 represents the number of bags." "15 divided into groups of 5 is equal to 3."**
2G–1 Describe and compare 2D and 3D shapes	**Regular and irregular shapes** **Because it has 6 sides it is a hexagon**  Figure 55: an irregular hexagon  Figure 56: a variety of different pentagons (regular and irregular)	**Language focus "These shapes are all pentagons because they all have exactly 5 straight sides."**
Year 3		

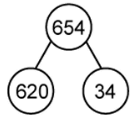
Ready to progress	Representations	Language focus
3NPV–1 Equivalence of 10 hundreds and 1 thousand	**Unitised place value counters/Tens Frame**  **Figure 62: ten 10-value place-value counters in a tens frame** Pupils must then be able to work out how many tens there are in other three-digit multiples of 10.  **Figure 63: eighteen 10-value place-value counters in 2 tens frames** **Place value chart**  **Figure 64: place-value chart illustrating the scaling relationship between ones, tens and hundreds**	**Language focus "10 tens is equal to 1 hundred."** **"18 tens is equal to 10 tens and 8 more tens." "10 tens is equal to 100." "So 18 tens is equal to 100 and 8 more tens, which is 180."** **"100 is 10 times the size of 10."**
3NPV–2 Place value in three-digit numbers	**Place value - unitised counters and part whole model comparison**  **Figure 65: two representations of the place-value composition of 342**	

Place value/equation relationship



830 – 400 = 430

Figure 66: partitioning 830 into 430 and 400



620 + 34 = 654

Figure 67: partitioning 654 into 620 and 34

3NPV–3 Three-digit numbers in the linear number system

Number lines

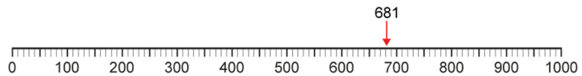


Figure 68: using a number line to identify the next and previous multiple of 100

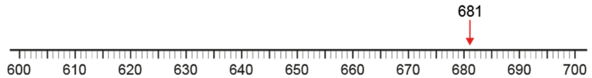


Figure 69: using a number line to identify the next and previous multiple of 10

Developing onto the use of inequality symbols

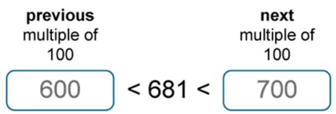


Figure 70: identifying the nearest multiple of 100

"The previous multiple of 100 is 600. The next multiple of 100 is 700." "The previous multiple of 10 is 680. The next multiple of 10 is 690."

3NPV–4 Reading scales with 2, 4, 5 or 10 intervals	**Bar models - show comparison** (see below)	**“Twenty-five, fifty, seventy-five, one hundred” needs to be a fluent spoken language pattern, which pupils can continue over 100.**
3NF–1 Fluently add and subtract within and across 10	(see below)	

Bar models - show comparison

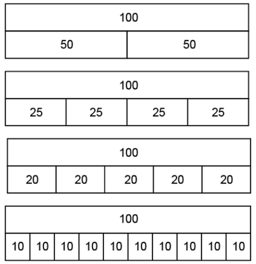


Figure 71: Bar models showing 100 partitioned into 2, 4, 5 and 10 equal parts

3NF–1

Identifying core number facts: columnar addition	Identifying core number facts: columnar subtraction
$\begin{array}{r} 4\ 6\ 5 \\ +\ 4\ 2\ 9 \\ \hline 8\ 9\ 4 \\ {\scriptstyle 1} \end{array}$ **Figure 72: columnar addition of 465 and 429**	$\begin{array}{r} \overset{6}{\cancel{7}}\ {}^{1}4\ 9 \\ -\ 2\ 8\ 6 \\ \hline 4\ 6\ 3 \end{array}$ **Figure 73: columnar subtraction of 286 from 749**
Within-column calculations: 5 + 9 = 14 6 + 2 + 1 = 9 4 + 4 = 8	Within-column calculations: 9 – 6 = 3 7 – 1 = 6 14 – 8 = 6 6 – 2 = 4

Learning addition facts

+	0	1	2	3	4	5	6	7	8	9	10
0	0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9	0+10
1	1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9	1+10
2	2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8	2+9	2+10
3	3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7	3+8	3+9	3+10
4	4+0	4+1	4+2	4+3	4+4	4+5	4+6	4+7	4+8	4+9	4+10
5	5+0	5+1	5+2	5+3	5+4	5+5	5+6	5+7	5+8	5+9	5+10
6	6+0	6+1	6+2	6+3	6+4	6+5	6+6	6+7	6+8	6+9	6+10
7	7+0	7+1	7+2	7+3	7+4	7+5	7+6	7+7	7+8	7+9	7+10
8	8+0	8+1	8+2	8+3	8+4	8+5	8+6	8+7	8+8	8+9	8+10
9	9+0	9+1	9+2	9+3	9+4	9+5	9+6	9+7	9+8	9+9	9+10
10	10+0	10+1	10+2	10+3	10+4	10+5	10+6	10+7	10+8	10+9	10+10

<table>
<tr>
<td>3NF–2 Recall of multiplication tables</td>
<td>

Number line and array

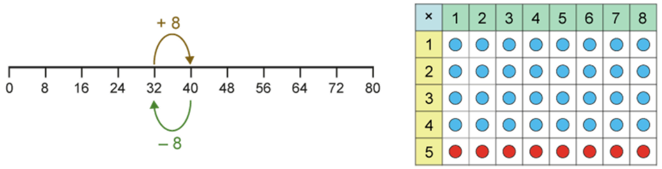


Figure 74: number line and array showing that adjacent multiples of 8 (32 and 40) have a difference of 8

</td>
<td>

When pupils commit multiplication table facts to memory, they do so using a verbal sound pattern to associate the 3 relevant numbers, for example, “six fours are twenty four”. It is important to provide opportunities for pupils to verbalise each multiplication fact as part of the process of developing fluency.

“4 times 5 is 20, so 20 divided by 5 is 4.”

</td>
</tr>
<tr>
<td>3NF–3 Scaling number facts by 10</td>
<td>

Tens frame with 10 value counters

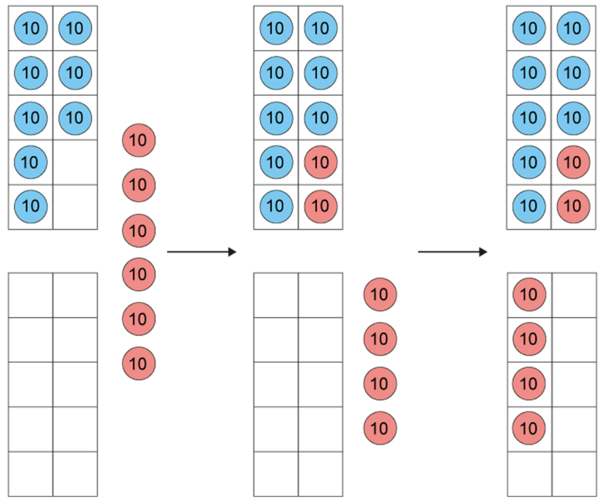


Figure 75: tens frames with 10-value counters showing 80 + 60 = 140

Array of 10 value counters

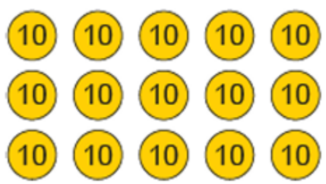


Figure 76: 3-by-5 array of 10-value place-value counters

</td>
<td>

“3 times 5 is equal to 15.” “3 times 5 tens is equal to 15 tens.” “15 tens is equal to 150.”
“3 times 5 is equal to 15.” “3 tens times 5 is equal to 15 tens.” “15 tens is equal to 150.”

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

<table>
<tr>
<td>3AS–1 Calculate complement s to 100</td>
<td>

Partitioning

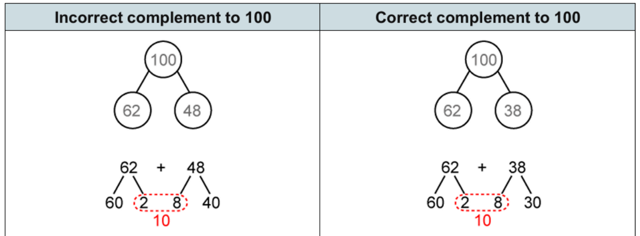


Figure 77: partitioning diagram and calculation showing incorrect complement to 100: 62 and 48

Figure 78: partitioning diagram and calculation showing correct complement to 100: 62 and 38

100 square grid

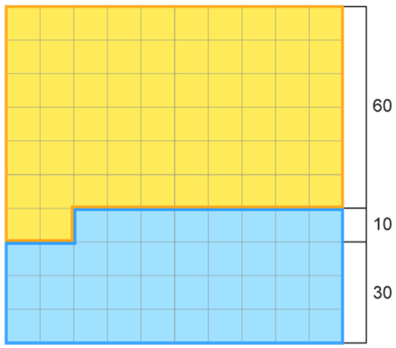


Figure 79: a 100 grid shaded in 2 colours to represent 62 and 38 as a complement to 100

Partitioning - calculating a complement

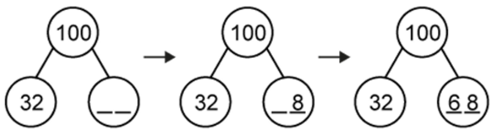


Figure 80: calculating a complement to 100

</td>
<td>“First we make 10 ones. The ones digits add up to 1 ten, so we need 9 more tens.”</td>
</tr>
<tr>
<td>3AS–2 Columnar addition and subtraction</td>
<td>Column subtraction (dienes)</td>
<td>“3 ones plus 5 ones is equal to 8 ones.” “4 tens plus 2 tens is equal to 6 tens.” “5 ones minus 3 ones is equal to 2 ones.” “6 tens minus 2 tens is equal to 4 tens.”</td>
</tr>
</table>

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

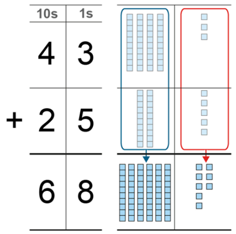


Figure 81: columnar addition with no regrouping: calculation and Dienes representation

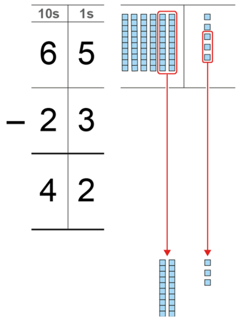


Figure 82: columnar subtraction with no exchange: calculation and Dienes representation

Modelling making efficient choices

Figure 83: making efficient choices for within-column calculations when adding 3 addends

Bar modelling

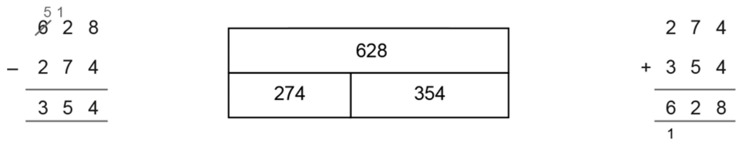


Figure 84: using addition to check a subtraction calculation

</td>
<td></td>
</tr>
<tr>
<td>3AS–3 Manipulate the additive relationship</td>
<td>

Partitioning diagrams - Bar model/part whole “cherry”

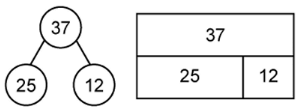


Figure 85: partitioning diagrams showing the additive relationship between 25, 12 and 37

$25 + 12 = 37$ $\quad$ $37 - 12 = 25$
$12 + 25 = 37$ $\quad$ $37 - 25 = 12$
$37 = 25 + 12$ $\quad$ $25 = 37 - 12$
$37 = 12 + 25$ $\quad$ $12 = 37 - 25$

Figure 86: connecting the terms in addition and subtraction equations to the part-part-whole structure

</td>
<td>“If we swap the values of the subtrahend and difference, the minuend remains the same.”</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td>
<table>
<tr>
<td>Missing-addend problems</td>
<td>Type of problem: missing part

Rewrite the addition equation as a subtraction equation, for example:

$329 + \square = 743 \rightarrow 743 - 329 = \square$

Language focus

“There is a missing part. To find the missing part, we subtract the other part from the whole.”</td>
</tr>
<tr>
<td>Missing-subtrahend problems</td>
<td>Type of problem: missing part

Rewrite the subtraction equation by swapping the subtrahend and the difference, for example:

$477 - \square = 285 \rightarrow 477 - 285 = \square$

Language focus

“There is a missing part. To find the missing part, we subtract the other part from the whole.”</td>
</tr>
<tr>
<td>Missing-minuend problems</td>
<td>Type of problem: missing whole

Rewrite the subtraction equation as an addition equation, for example:

$\square - 527 = 87 \rightarrow 527 + 87 = \square$

Language focus

“There is a missing whole. To find the missing whole, we add the 2 parts.”</td>
</tr>
</table>
</td>
<td>“There is a missing part. To find the missing part, we subtract the other part from the whole.”

“There is a missing part. To find the missing part, we subtract the other part from the whole.”

“There is a missing whole. To find the missing whole, we add the 2 parts.”</td>
</tr>
<tr>
<td>3MD–1 Multiplication and division structures</td>
<td>Commutitive property - Array

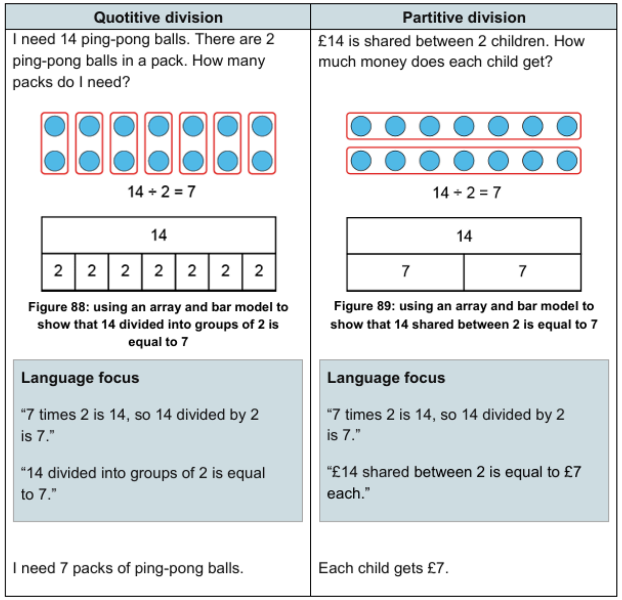
7 groups of 2
$7 \times 2 = 14$

2 groups of 7
$2 \times 7 = 14$

$7 \times 2 = 2 \times 7$

Figure 87: using an array to show that 7 groups of 2 and 2 groups of 7 both correspond to the same total quantity

Bar model</td>
<td>“factor times factor is equal to product”
“The order of the factors does not affect the product.”</td>
</tr>
</table>



Quotitive division	Partitive division
I need 14 ping-pong balls. There are 2 ping-pong balls in a pack. How many packs do I need?	£14 is shared between 2 children. How much money does each child get?
14 ÷ 2 = 7	14 ÷ 2 = 7
14 / 2 2 2 2 2 2 2	14 / 7 7
Figure 88: using an array and bar model to show that 14 divided into groups of 2 is equal to 7	**Figure 89: using an array and bar model to show that 14 shared between 2 is equal to 7**
Language focus “7 times 2 is 14, so 14 divided by 2 is 7.” “14 divided into groups of 2 is equal to 7.”	**Language focus** “7 times 2 is 14, so 14 divided by 2 is 7.” “£14 shared between 2 is equal to £7 each.”
I need 7 packs of ping-pong balls.	Each child gets £7.

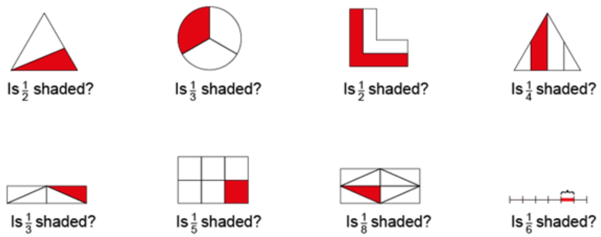
“7 times 2 is 14, so 14 divided by 2 is 7.” “14 divided into groups of 2 is equal to 7.”

“7 times 2 is 14, so 14 divided by 2 is 7.” “£14 shared between 2 is equal to £7 each.”

3F–1 Use and understand fraction notation

Concrete examples and diagrams such as:

Figure 90: a circle divided into 3 equal parts, with one part shaded



“The whole is divided into 3 equal parts. 1 of these parts is shaded.”

“The whole is divided into 3 equal parts. Each part is one-third of the whole.”

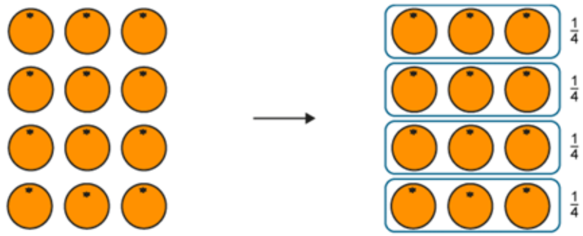
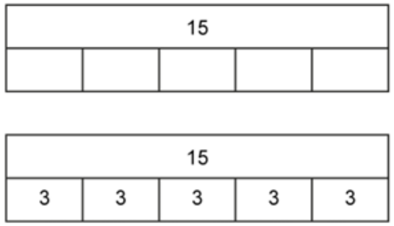
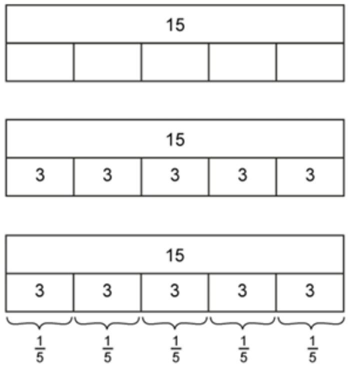
Say	Write
“The whole has been divided…”	The fraction bar: –
“…into 3 equal parts.”	The denominator: **3**
“1 of these parts is shaded.”	The numerator: **1**

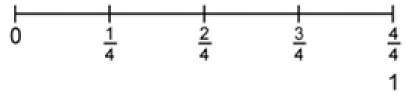
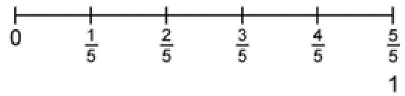
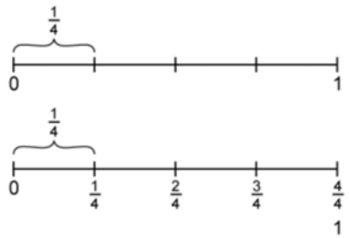
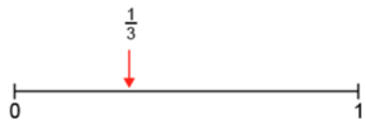
“The whole is divided into 8 equal parts and 5 of those parts are shaded. $\frac{5}{8}$ of the shape is shaded. $\frac{5}{8}$ is 5 one-eighths.”

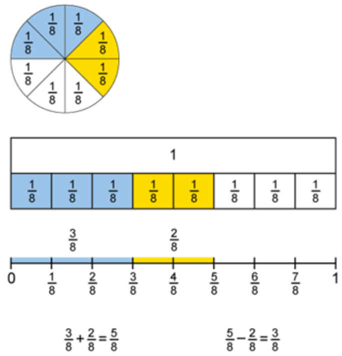
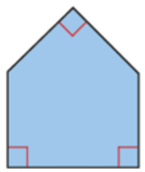
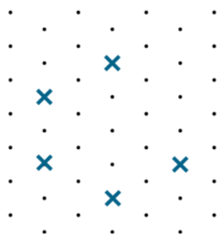
3F–2 Find unit

Array into equal parts

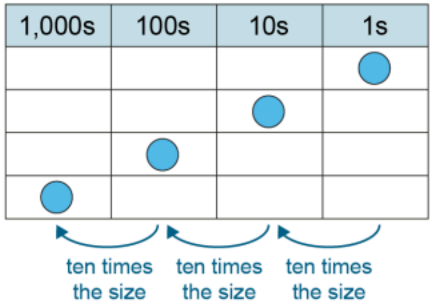
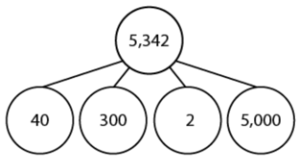
“The whole is 12 oranges. The whole is divided into 4 equal parts.” “Each part is of the whole. of 12 oranges is 3 oranges.”

fractions of quantities	 Figure 91: 12 oranges divided into 4 equal parts **Bar model**  Figure 92: using a bar model to represent 15 divided into 5 equal parts  Figure 93: using a bar model to represent one-fifth of 15	"To find $\frac{1}{5}$ of 15, we divide 15 into 5 equal parts." "15 divided by 5 is equal to 3, so $\frac{1}{5}$ of 15 is equal to 3."
3F–3 Fractions within 1 in the linear number system	**Number lines**	**"One fifth, two fifths, three fifths…" "1 one-fifth, 2 one-fifths, 3 one-fifths…"** **"Each whole-number interval is divided into 4 equal parts, so we count in quarters."**

	 Figure 94: number line to support counting to 1 in multiples of one quarter  Figure 95: number line to support counting to 1 in multiples of one fifth  Figure 96: labelling a 0 to 1 number line marked in quarters  Figure 97: estimating the position of a fraction on a 0 to 1 number line  Figure 98: estimating the relative positions of one quarter and one third on a 0 to 1 number line	
3F–4 Add and subtract fractions within 1	**Pie model, Bar model, Number line**	**“3 one-eighths plus 2 one-eighths is equal to 5 one-eighths.” “5 one-eighths minus 2 one-eighths is equal to 3 one-eighths.”** **“When adding fractions with the same denominators, just add the numerators.” “When subtracting fractions with the**

	 Figure 99: adding and subtracting fractions with the same denominator: pie model, bar model and number line	same denominators, just subtract the numerators.”
3G–1 Recognise right angles	**Shapes to demonstrate standard convention of right angle**  Figure 100: irregular pentagon with 3 right angles marked using standard convention	
3G–2 Draw polygons and identify parallel and perpendicular sides	**Spotted paper for accurate drawing** 	**“These 2 lines are parallel because they are always the same distance apart. They will never meet no matter how far we extend them.” “These 2 lines are perpendicular because they are at right angles to each other.”**

Year 4		
	Representations	**Language Focus**

Ready to Progress		
4NPV–1 Equivalence of 10 hundreds and 1 thousand	• **Place value counters and tens frames:**  **Figure 104: eighteen 100-value place-value counters in 2 tens frames**	**“18 hundreds is equal to 10 hundreds and 8 more hundreds.”** **“10 hundreds is equal to 1,000.”** **“So 18 hundreds is equal to 1,000 and 8 more hundreds, which is 1,800.**
	• **Place value charts:**  **Figure 105: place-value chart illustrating the scaling relationship between ones, tens, hundreds and thousands**	**“1000 is 10 times the size of 100.”** **“1,800 is 10 times the size of 180.”**
4NPV–2 Place value in four-digit numbers	• **Plave value counters, part-whole models and number sentences:**   $5{,}342 - 300 = \square$ $5{,}342 - \square = 5{,}302$	

<table>
<tr>
<td rowspan="2">4NPV–3 Four-digit numbers in the linear number system</td>
<td>

- **Number lines:**

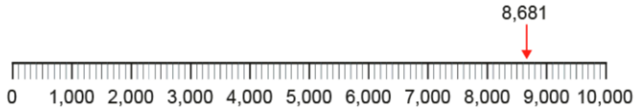


Figure 109: using a number line to identify the previous and next multiple of 1,000

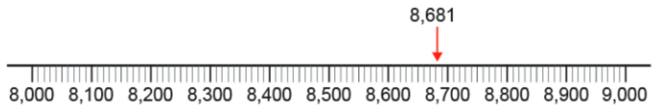


Figure 110: using a number line to identify the previous and next multiple of 100

</td>
<td>

“The previous multiple of 1,000 is 8,000. The next multiple of 1,000 is 9,000.”

“The previous multiple of 100 is 8,600. The next multiple of 100 is 8,700.”

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

- **Inequality symbols:**

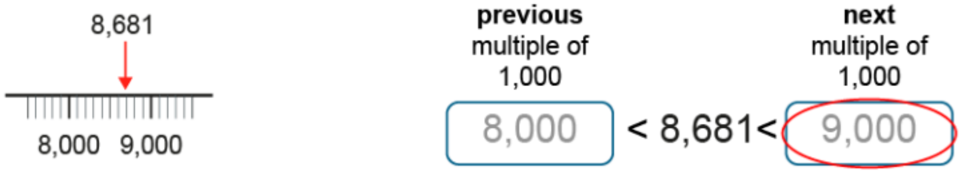


Figure 111: identifying the nearest multiple of 1,000 with a number line for support

</td>
<td>

“The closest multiple of 1,000 is 9,000.”

“8,681 rounded to the nearest thousand is 9,000.”

</td>
</tr>
<tr>
<td>4NPV–4 Reading scales with 2, 4, 5 or 10 intervals</td>
<td>

- **Bar models:**

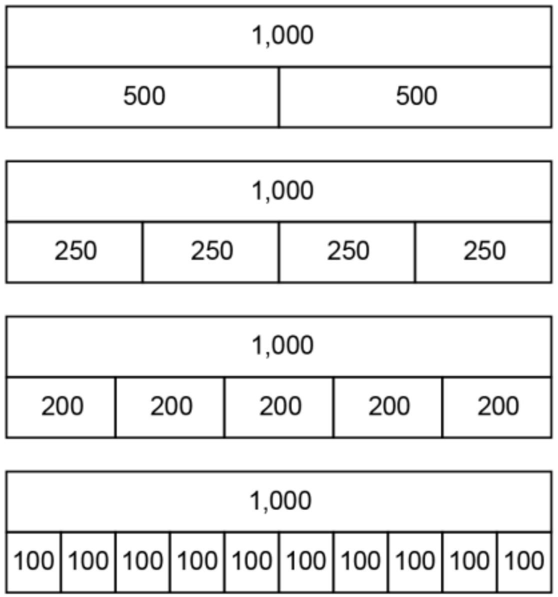


Figure 112: bar models showing 1,000 partitioned into 2, 4, 5 and 10 equal parts

</td>
<td>

“Twenty-five, fifty, seventy-five, one hundred” needs to be a fluent spoken language pattern. Fluency in this language pattern provides the basis to count in multiples of 250.

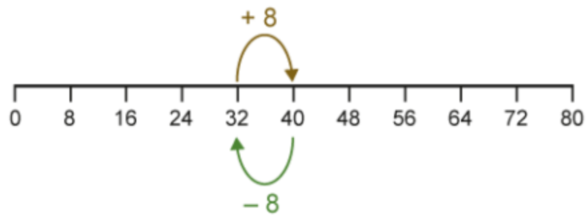
</td>
</tr>
</table>

4NF–1 Recall of multiplication tables

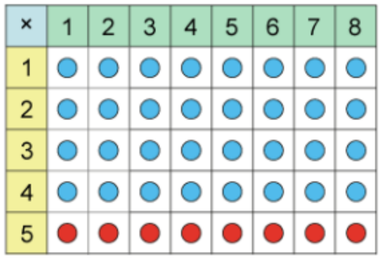
- **Expressions:**

2×2							
3×2	3×3						
4×2	4×3	4×4					
5×2	5×3	5×4	5×5				
6×2	6×3	6×4	6×5	6×6			
7×2	7×3	7×4	7×5	7×6	7×7		
8×2	8×3	8×4	8×5	8×6	8×7	8×8	
9×2	9×3	9×4	9×5	9×6	9×7	9×8	9×9

- **Number lines:**



- **Arrays:**



When pupils commit multiplication table facts to memory, they do so using a verbal sound pattern to associate the 3 relevant numbers, for example, "nine sevens are sixtythree". It is important to provide opportunities for pupils to verbalise each multiplication fact as part of the process of developing fluency.

4NF–2 Division problems with remainders

- **Patterns:**

"If the dividend is a multiple of the divisor there is no remainder."

"If the dividend is not a multiple of the divisor, there is a remainder."

"The remainder is always less than the divisor."

Total number of apples (dividend)	Number of apples in each tray (divisor)	Number of trays (quotient)	Number of apples left over (remainder)	Equation
12	**4**	3	**0**	$12 \div 4 = 3$
13	**4**	3	**1**	$13 \div 4 = 3 \text{ r } 1$
14	**4**	3	**2**	$14 \div 4 = 3 \text{ r } 2$
15	**4**	3	**3**	$15 \div 4 = 3 \text{ r } 3$
16	**4**	4	**0**	$16 \div 4 = 4$
17	**4**	4	**1**	$17 \div 4 = 4 \text{ r } 1$
18	**4**	4	**2**	$18 \div 4 = 4 \text{ r } 2$
19	**4**	4	**3**	$19 \div 4 = 4 \text{ r } 3$
20	**4**	5	**0**	$20 \div 4 = 5$

- **Unitised counters:**

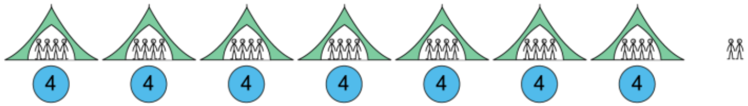


Figure 114: pictorial representation and counters: with 30 scouts and 4 per tent, 7 tents are insufficient

$30 \div 4 = 7 \text{ r } 2$

"The 30 represents the total number of scouts."
"The 4 represents the number of scouts in each tent."
"The 7 represents the number of full tents."
"The 2 represents the number of scouts left over."
"We need another tent for the 2 left-over scouts. 8 tents are needed."

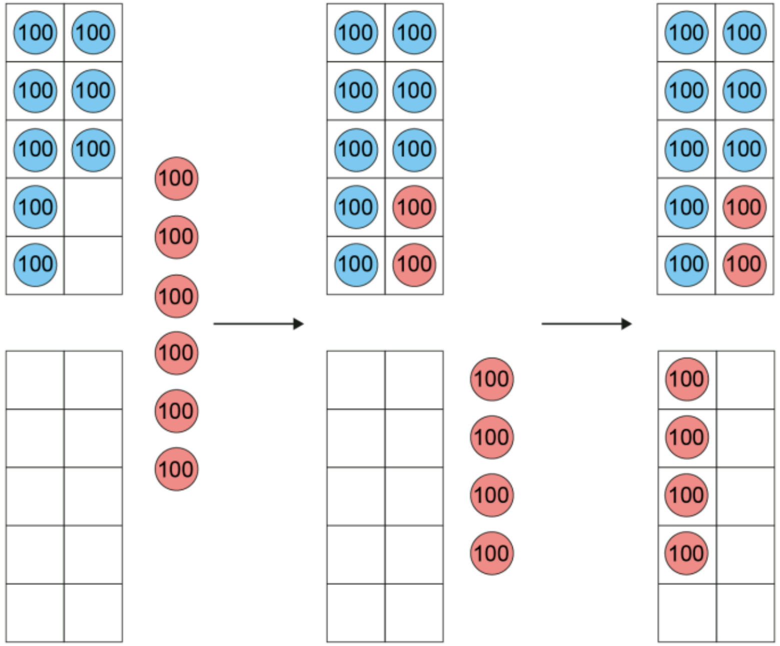
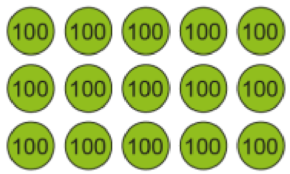
4NF–3 Scaling number facts by 100

- **Equations:**

$8+6=14$ and $14-6=8$
so
$800+600=1{,}400$ and $1{,}400-600=800$

$3\times 4=12$ and $12\div 4=3$
so
$300\times 4=1{,}200$ and $1{,}200\div 4=300$

- **Place value counters and tens frames:**

	 Figure 116: tens frames with 100-value counters showing 800 + 600 = 1,400 $8 + 6 = 14$ $800 + 600 = 1{,}400$ $14 - 6 = 8$ $1{,}400 - 600 = 800$ $14 - 8 = 6$ $1{,}400 - 800 = 600$	
	• **Place value counters:**  **Figure 117: 3-by-5 array of 100-value place-value counters**	**"3 times 5 is equal to 15."** **"3 times 5 hundreds is equal to 15 hundreds."** **"15 hundreds is equal to 1,500."** **"3 times 5 is equal to 15."** **"3 hundreds times 5 is equal to 15 hundreds."** **"15 hundreds is equal to 1,500."**
4MD–1 Multiplying and dividing by 10 and 100	• **Equations:** $3 \times 5 = 15$ $3 \times 500 = 1{,}500$ $3 \times 5 = 15$ $300 \times 5 = 1{,}500$ $15 \div 3 = 5$ $1{,}500 \div 300 = 5$ $1{,}500 \div 3 = 500$	**"If I multiply one factor by 100, I must multiply the product by 100."** **"If I multiply the dividend by 100 and the divisor by 100, the quotient remains the same."**

<table>
<tr>
<td rowspan="4"></td>
<td></td>
<td>“If I multiply the dividend by 100 and keep the divisor the same, I must multiply the quotient by 100.”</td>
</tr>
<tr>
<td>

- **Gattegno charts:**

1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9

× 10

÷ 10

$80 \times 10 = 800$ $80 \div 10 = 8$

Figure 118: using the Gattegno chart to multiply and divide by 10

</td>
<td rowspan="3">

“23, made 100 times the size, is 2,300.”

“23 multiplied by 100 is equal to 2,300.”

“First, we had 23 ones. Now we have 23 hundreds.”

“1,450 is 10 times the size of 145.”

“1,450 divided by 10 is equal to 145.”

“First, we had 145 tens. Now we have 145 ones.”

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

- **Place value charts:**

×100

1,000s	100s	10s	1s
			8
	8	0	0

÷ 100

$8 \times 100 = 800$ $800 \div 100 = 8$

Figure 119: using a place-value chart to multiply and divide by 100

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

- **Equations:**

$13 \times 10 = 130$ $130 \div 10 = 13$

$130 \times 10 = 1{,}300$ $1{,}300 \div 10 = 130$

$13 \times 100 = 1{,}300$ $1{,}300 \div 100 = 13$

</td>
</tr>
<tr>
<td>4MD–2 Manipulating the multiplicative relationship</td>
<td>

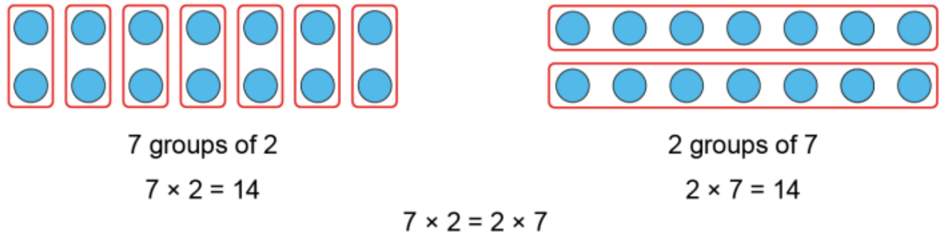
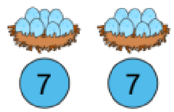
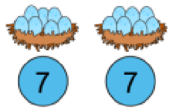
- **Arrays:**

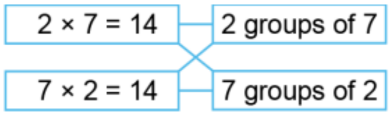
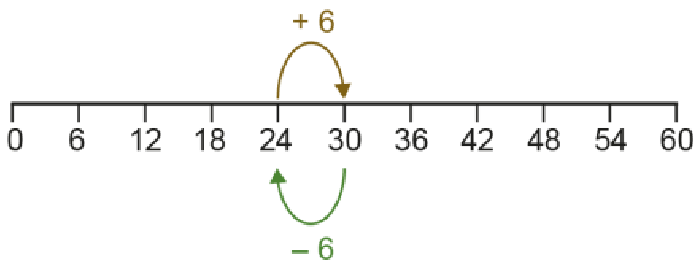
</td>
<td>

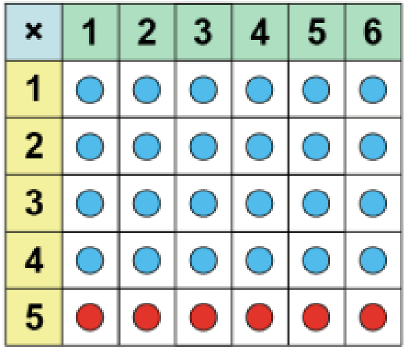
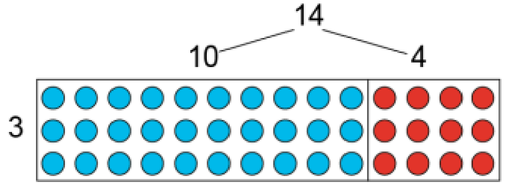
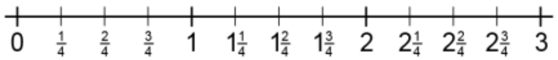
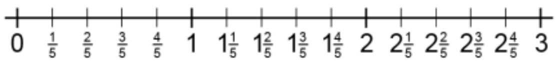
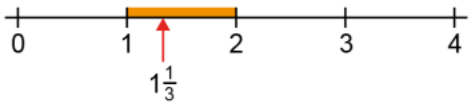
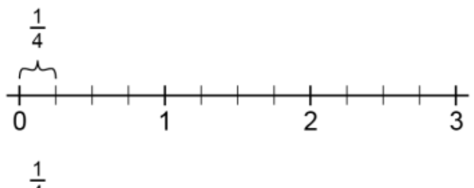
“2 groups of 3 is equal to 6.”
“3, two times is equal to 6.”
“2 groups of 3 is equal to 3, two times.”

“2 groups of 7 is equal to 14.”
“7 groups of 2 is equal to 14.”

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

	 **Figure 120: using an array to show that 7 groups of 2 and 2 groups of 7 both correspond to the same total quantity**	**“2 groups of 7 is equal to 7 groups of 2.”** **“factor times factor is equal to product”** **“The order of the factors does not alter the product.”**
	• **Unitised counters:**  **Figure 121: 7 groups of 2 – 7 nests of 2 eggs and seven 2-value counters**  **Figure 122: 2 groups of 7 – 2 nests of 7 eggs and two 7-value counters** **Partitive division**  **Figure 121: 7 groups of 2 – 7 nests of 2 eggs and seven 2-value counters** **Quotitive division**  **Figure 122: 2 groups of 7 – 2 nests of 7 eggs and two 7-value counters**	**“The 2 represents number of eggs in each nest/group”.** **“The 7 represents the number of nests/groups.”** **“The 14 represents the total number of eggs/product.”** **“The 2 represents the number of nests/groups.”** **“The 7 represents the number of eggs in each nest/group.”** **“The 14 represents the total number of eggs/product.”** • **Partitive division:** **“14 shared between 7 is equal to 2.”** **“The 14 represents the total number of eggs.”** **“The 7 represents the number of nests/shares.”** **“The 2 represents the number of eggs in each nest/share.”** • **Quotitive division:** **“14 divided into groups of 7 is equal to 2.** **“The 14 represents the total number of eggs.”**

		“The 7 represents the number of eggs in each nest/group.” “The 2 represents the number of nests/groups.”
	• **Schematic diagrams:**  **Figure 123: schematic diagram summarising the commutative property of multiplication and the different grouping interpretations**	
	• **Equations:** $2 \times 7 = 14$ $7 \times 2 = 14$ $14 \div 2 = 7$ $14 \div 7 = 2$	**“If we swap the values of the divisor and quotient, the dividend remains the same.”**
4MD–3 The distributive property of multiplication	• **Number lines:**  	
	• **Arrays:**	

	  Figure 126: array showing the relationship between 14×3, 10×3 and 4×3	
	• **Equations:** $5\times6=4\times6+6$ or $5\times6=4\times6+1\times6$ $4\times6=5\times6-6$ or $4\times6=5\times6-1\times6$	**“5 is equal to 3 plus 2, so 5 times 6 is equal to 3 times 6 plus 2 times 6.”**
4F–1 Mixed numbers in the linear number system	• **Number lines:**  Figure 128: number line to support counting in multiples of one quarter  Figure 129: number line to support counting in multiples of one fifth  Figure 131: placing a mixed number on a number line with no fractional marks 	**“Each interval is divided into 4 equal parts, so we count in quarters.”** **“ is between 1 and 2.”** **“The previous whole number is 1.”** **“The next whole number is 2.”**

<table>
<tr><td></td><td></td><td></td></tr>
<tr><td rowspan="2">4F–2 Convert between mixed numbers and improper fractions</td><td>

- **Number lines:**

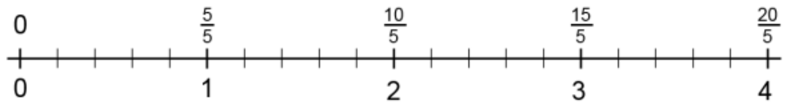


Figure 132: number line showing integers expressed as fractions

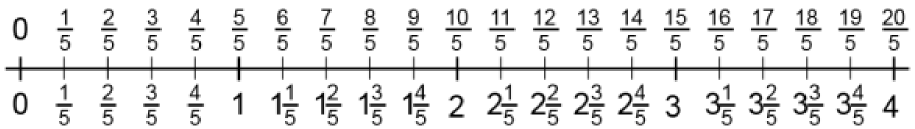
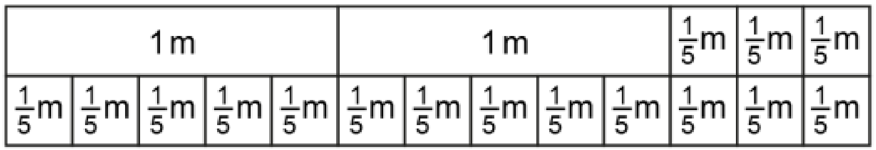


Figure 133: number line showing mixed number–improper fraction equivalence

</td><td>“When the numerator is a multiple of the denominator, the fraction is equivalent to a whole number.”</td></tr>
<tr><td>

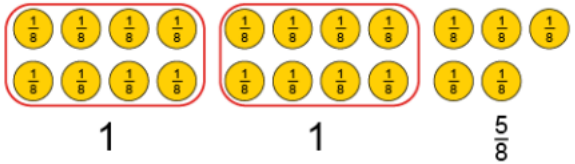
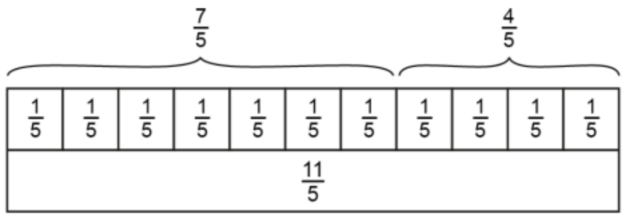
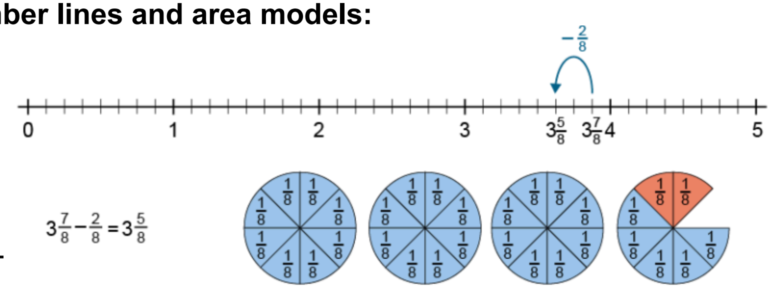
- **Bar models:**

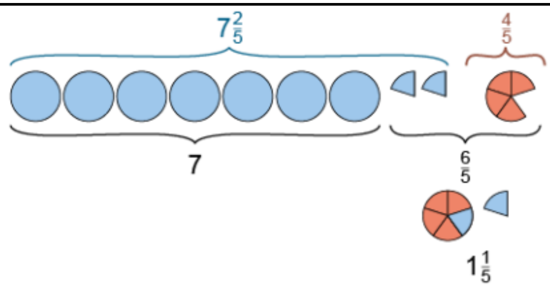
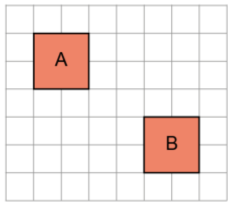
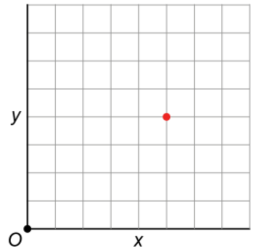
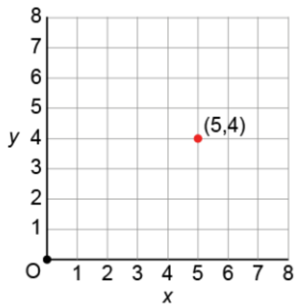


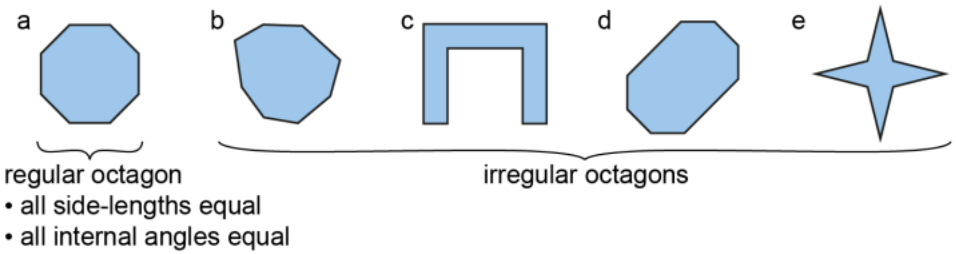
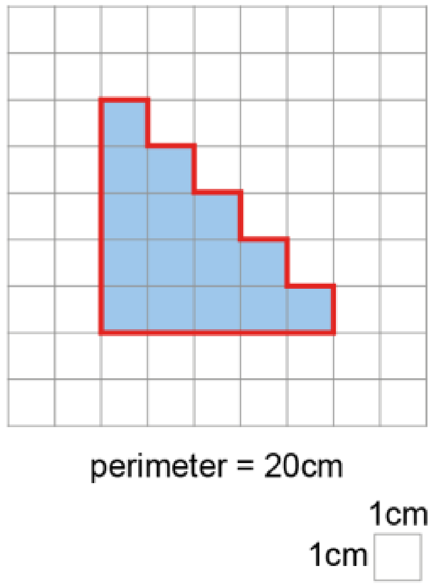
$2\frac{3}{5}\text{m} = \frac{13}{5}\text{m}$

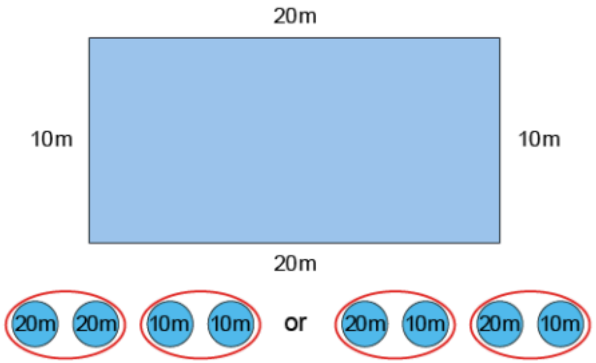
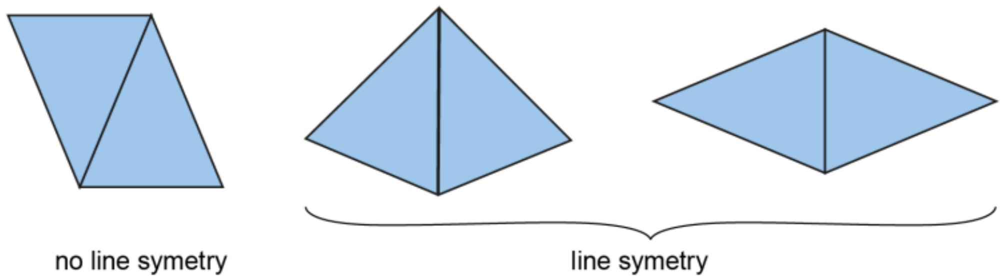
Figure 134: bar model showing mixed number–improper fraction equivalence

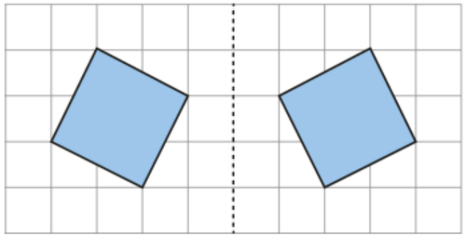
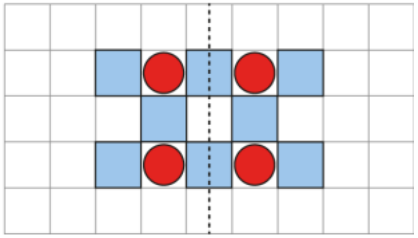
</td><td>“There are 2 groups of five-fifths, which is 10 fifths and 3 more fifths. This is 13 fifths.”</td></tr>
</table>

	• **Unitised counters:**  $\frac{21}{8} = 2\frac{5}{8}$ **Figure 135: using unit fraction counters to support conversion from an improper fraction to a mixed number**	**"We have 21 eighths. 8 eighths is equal to 1 (whole)."** **"21 eighths is equal to 2 groups of 8 eighths, and 5 more eighths. This is 2 and 5 eighths."**
4F–3 Add and subtract improper and mixed fractions (same denominator)	• **Equations:** $\frac{7}{5}+\frac{4}{5}=\frac{11}{5}$ $3\frac{7}{8}-\frac{2}{8}=3\frac{5}{8}$ $7\frac{2}{5}+\frac{4}{5}=8\frac{1}{5}$ $8\frac{1}{5}-\frac{4}{5}=7\frac{2}{5}$	**"7 one-fifths plus 4 one-fifths is equal to 11 one-fifths."**
	• **Bar models:**  $\frac{7}{5}+\frac{4}{5}=\frac{11}{5}$ **Figure 136: bar model showing addition of improper fractions with the same denominator**	**"7 one-fifths plus 4 one-fifths is equal to 11 one-fifths."**
	• **Number lines and area models:**  **Figure 137: number line and pie model showing subtraction of a fraction from a mixed number (same denominator)**	**"When adding fractions with the same denominators, just add the numerators."**

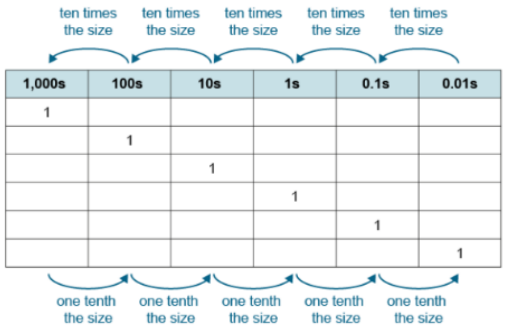
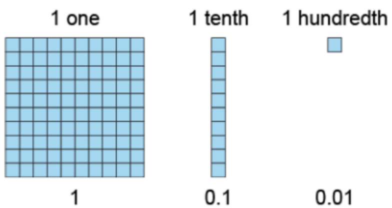
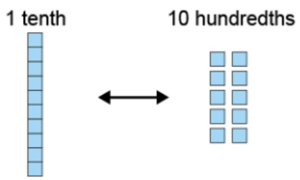
	 	**"When subtracting fractions with the same denominators, just subtract the numerators."**
4G–1 Draw polygons specified by coordinates or by Translation **"First count along the x-axis, then count along the y-axis."**	● **Polygons and points on square grids:**  **Figure 141: translation of a polygon on a square grid**  **Figure 142: marking a point relative to the origin (*O*) on a grid with no number labels**  **Figure 143: marking a point on a grid with number labels**	**"The polygon has been translated 4 squares to the right and 3 squares down."** **"First count along the x-axis, then count along the y-axis."**

	• **Polygons:**  **Figure 144: a regular octagon and 4 irregular octagons**	**“This is a regular polygon, because all of the sides are the same length, and all of the interior angles are equal.”**
	• **Rectilinear shapes and grids:** 	
	• **Formulas and unitised counters:**	

	use doubling and addition: $$\text{perimeter} = 2 \times (\text{length} + \text{width})$$ or $$\text{perimeter} = (2 \times \text{length}) + (2 \times \text{width})$$  **Figure 146: 2 strategies for calculating the perimeter of a rectangle** *Drawn to scale.*	
4G–3 Identify line symmetry in 2D shapes	● **Polygons:**  **Figure 147: composing shapes from two identical isosceles triangles** ● **Patterns and grids**	**“This is a line of symmetry because it splits the shape into two equal parts which are mirror images.”**

	 Figure 148: reflecting a shape in a line of symmetry  Figure 149: a symmetrical pattern	

Year 5

Ready to Progress	Representation	Language Focus
5NPV–1 Tenths and hundredths	• **Place value cha**  Figure 153: place-value chart illustrating the scaling relationship between adjacent positions, including tenths and hundredths	**"1 is 10 times the size of one-tenth."** **"One-tenth is 10 times the size of one-hundredth."** **"1 is 100 times the size of one-hundredth."**
	• **Base-10:**  Figure 154: using Dienes to represent 1, one-tenth and one-hundredth  Figure 155: using Dienes to represent the equivalence of 1 tenth and 10 hundredths	**"10 tenths is equal to 1 one."** **"10 hundredths is equal to 1 tenth."** **"100 hundredths is equal to 1 one."**

- **Tens frames and place-value counters:**

Figure 156: eighteen 0.01-value place-value counters in 2 tens frames

"18 hundredths is equal to 10 hundredths and 8 more hundredths."

"10 hundredths is equal to 1 tenth."

"So 18 hundredths is equal to 1 tenth and 8 more hundredths, which is 0.18."

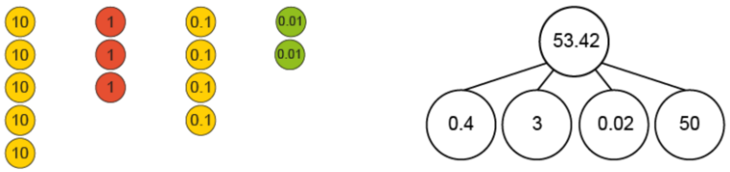
5NPV–2 Place value in decimal fractions

- **Gattegno charts:**

1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

Figure 157: Gattegno chart showing thousands, hundreds, tens, ones, tenths and hundredths

- **Place-value counters, part-whole models and number sentences.**



$53.42 - 3 = \square$

$53.42 - \square = 53.02$

Figure 159: 2 representations of the place-value composition of 53.42

- **Digits and words:**

0.03 is zero-point-zero-three

"Three hundredths is zero-point-zero-three."

<table>
<tr>
<td rowspan="2">5NPV–3 Decimal fractions in the linear number system</td>
<td>

● Number lines:

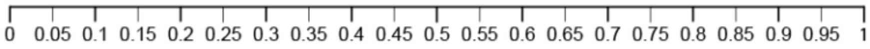


Figure 162: 0 to 1 number line marked and labelled in intervals of 5 hundredths

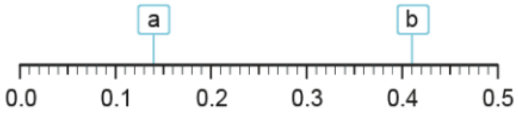


Figure 163: identifying 0.14 and 0.41 on a 0 to 0.5 number line marked with intervals of hundredths

Figure 164: placing 8.6 on an unmarked 8 to 9 number line

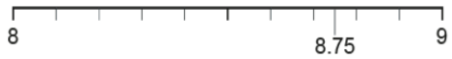


Figure 165: placing 8.75 on an 8 to 9 number line marked only in tenths

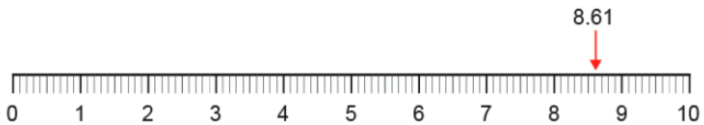


Figure 166: using a number line to identify the previous and next whole number

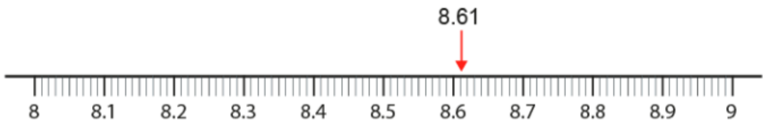


Figure 167: using a number line to identify the previous and next multiple of 0.1

</td>
<td>

“a is 0.14 because it is 1 hundredth less than the midpoint of 0.1 and 0.2, which is 0.15.”

“b is 0.41 because it is 1 hundredth more than 0.4.”

“The previous whole number is 8. The next whole number is 9.” “The previous multiple of 0.1 is 8.6. The next multiple of 0.1 is 8.7.”

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

● Inequality expressions:

</td>
<td>

“The closest whole number is 9.” “8.61 rounded to the nearest whole number is 9.”

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

Figure 168: identifying the nearest whole number with a number line for support

5NPV–4 Reading scales with 2, 4, 5 or 10 intervals

- **Bar models:**

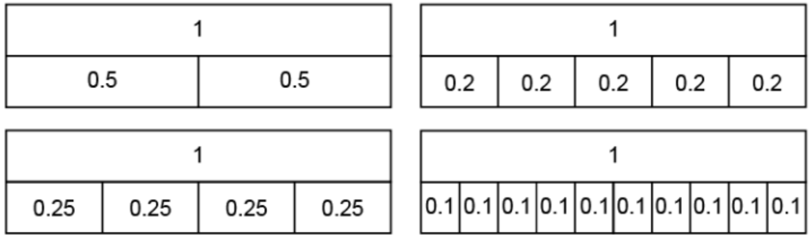


Figure 169: bar models showing 1 partitioned into 2, 4, 5 and 10 equal parts

"Twenty-five, fifty, seventy-five, one hundred" needs to be a fluent spoken language pattern. Fluency in this language pattern provides the basis to count in multiples of 0.25.

5NPV–5 Convert between units of measure

- **Conversion charts:**

Distance in km expressed as a fraction	Distance in km expressed as a decimal fraction	Distance in metres
$\frac{1}{5}$km	0.2km	200m
$\frac{1}{4}$km	0.25km	250m
$\frac{1}{2}$km	0.5km	500m
$\frac{3}{4}$km	0.75m	750m
$\frac{1}{10}$km	0.1km	100m
all other multiples of $\frac{1}{10}$km, for example, $\frac{7}{10}$km	0.7km	700m

"1m is 100cm." "So is 75cm."

"1,000ml is 1 litre."
"So, 3,000ml is 3 litres, and 3,700ml is 3.7 litres."
"100p is £1."
"So 50p is £0.50, and 52p is £0.52."

- **Ratio tables:**

1m	100cm
$\frac{3}{4}$m	75cm

1,000ml	1 litre
3,700ml	3.7 litres

100p	£1
52p	£0.52

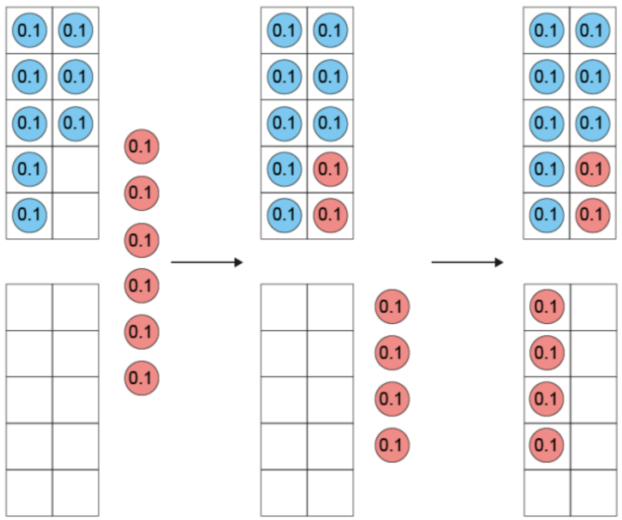
5NF–1 Secure fluency in multiplication and division facts

- **Written short multiplication and division:**

Identifying core number facts: short multiplication	Identifying core number facts: short division
$\begin{array}{r} 3\ 4\ 2 \\ \times\quad 7 \\ \hline 2,3\ 9\ 4 \\ {\scriptstyle 2\ 1} \end{array}$ Figure 170: short multiplication of 342 by 7	$\begin{array}{r} 6\ 1\ 9 \\ 8\,\overline{)\,4,{}^{4}9\ {}^{1}5\ {}^{7}2} \end{array}$ Figure 171: short division of 4,952 by 8
Within-column calculations: 7 × 2 = 14 7 × 4 + 1 = 28 + 1 7 × 3 + 2 = 21 + 2	Within-column calculations: 4 ÷ 8 = 0 r 4 49 ÷ 8 = 6 r 1 15 ÷ 8 = 1 r 7 72 ÷ 8 = 9

- **Equations:**

$2\times2=4$							
$3\times2=6$	$3\times3=9$						
$4\times2=8$	$4\times3=12$	$4\times4=16$					
$5\times2=10$	$5\times3=15$	$5\times4=20$	$5\times5=25$				
$6\times2=12$	$6\times3=18$	$6\times4=24$	$6\times5=30$	$6\times6=36$			
$7\times2=14$	$7\times3=21$	$7\times4=28$	$7\times5=35$	$7\times6=42$	$7\times7=49$		
$8\times2=16$	$8\times3=24$	$8\times4=32$	$8\times5=40$	$8\times6=48$	$8\times7=56$	$8\times8=64$	
$9\times2=18$	$9\times3=27$	$9\times4=36$	$9\times5=45$	$9\times6=54$	$9\times7=63$	$9\times8=72$	$9\times9=81$

5NF–2 Scaling number facts by 0.1 or 0.01	• **Equations:** $8 + 6 = 14$ $0.8 + 0.6 = 1.4$ $0.08 + 0.06 = 0.14$ $3 \times 4 = 12$ $0.3 \times 4 = 1.2$ $0.03 \times 4 = 0.12$	**"8 plus 6 is equal to 14, so 8 tenths plus 6 tenths is equal to 14 tenths." "14 tenths is equal to 1 one and 4 tenths."**
	• **Tens frames and place-value counters:**  **Figure 172: tens frames with 0.1-value counters showing $0.8+0.6=1.4$** $8+6=14$ $\quad$ $14-6=8$ $\quad$ $14-8=6$ $0.8+0.6=1.4$ $\quad$ $1.4-0.6=0.8$ $\quad$ $1.4-0.8=0.6$	**"8 plus 6 is equal to 14, so 8 tenths plus 6 tenths is equal to 14 tenths." "14 tenths is equal to 1 one and 4 tenths."**
	• **100 grids:**	

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

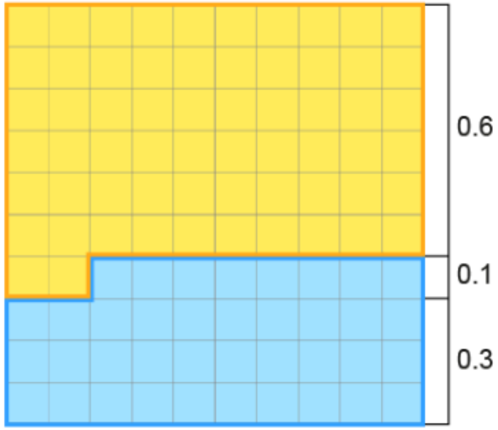


Figure 173: a 100 grid shaded in 2 colours to represent 0.62 and 0.38 as a complement to 1

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

- **Place-value counters and equations:**

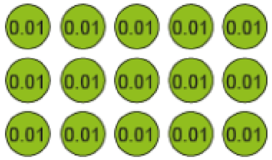


Figure 174: 3-by-5 array of 0.01-value place-value counters

$$3 \times 5 = 15$$
$$3 \times 0.05 = 0.15$$

$$3 \times 5 = 15$$
$$0.03 \times 5 = 0.15$$

$$15 \div 3 = 5$$
$$0.15 \div 0.03 = 5$$
$$0.15 \div 3 = 0.05$$

</td>
<td>

“3 times 5 is equal to 15.”
“3 times 5 hundredths is equal to 15 hundredths.”
“15 hundredths is equal to 0.15.”

“3 times 5 is equal to 15.”
“3 hundredths times 5 is equal to 15 hundredths.”
“15 hundredths is equal to 0.15.”
If I make one factor one-hundredth times the size, I must make the product one hundredth times the size.”

“If I make the dividend one-hundredth times the size and the divisor one-hundredth
times the size, the quotient remains the same.”

“If I make the dividend one-hundredth times the size and keep the divisor the same, I
must make the quotient one-hundredth times the size.”

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

5MD–1 Multiplying and dividing by 10 and 100

- **Multiplicative and division chains:**

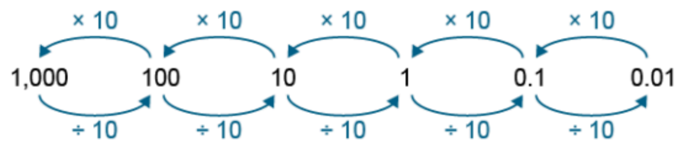


Figure 175: multiplicative relationships between powers of 10: 10 times the size and one-tenth times the size

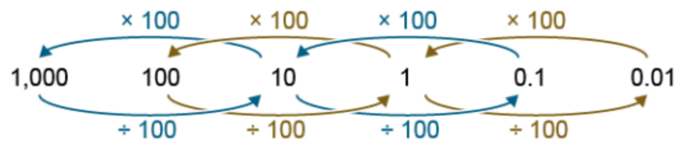


Figure 176: multiplicative relationships between powers of 10: 100 times the size and one-hundredth times the size

Gattegno charts:

1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

× 10 ÷ 10

$8 \div 10 = 0.8$ $0.8 \times 10 = 8$

Figure 177: using the Gattegno chart to multiply and divide by 10, crossing 1

“8, made one-tenth of the size, is 0.8.”

“8 divided by 10 is equal to 0.8.”

“First, we had 8 ones. Now we have 8 tenths.”

“0.8, made 10 times the size, is 8.”

“0.8 multiplied by 10 is equal to 8.”

“First, we had 8 tenths. Now we have 8 ones.”

- **Place-value charts:**

× 10

1,000s	100s	10s	1s	0.1s	0.01s
			8		
			0	8	

÷ 10

$8 \div 10 = 0.8$ $\quad$ $0.8 \times 10 = 8$

Figure 178: using a place-value chart to multiply and divide by 10, crossing 1

"8, made one-tenth of the size, is 0.8."

"8 divided by 10 is equal to 0.8."

"First we had 8 ones. Now we have 8 tenths."

"0.8, made 10 times the size, is 8."

"0.8 multiplied by 10 is equal to 8."

"First we had 8 tenths. Now we have 8 ones."

- **Equations:**

$13 \div 100 = 0.13$ $\quad$ $0.13 \times 100 = 13$

$26.5 \div 10 = 2.65$ $\quad$ $2.65 \times 10 = 26.5$

$4{,}710 \div 100 = 47.1$ $\quad$ $47.1 \times 100 = 4{,}710$

"8cm is 10 times the length of 0.8cm."

"0.25kg is one-hundredth times the mass of 25kg."

"150 pencils is 10 times as many as 15 pencils."

5MD–2 Find factors and multiples

- **Equations:**

$7 \times 3 = 21$ $\quad$ $7 \times 300 = 2{,}100$ $\quad$ $700 \times 3 = 2{,}100$

Applying commutativity		Applying associativity (example)
$3 \times 7 \times 10 = 210$	$3 \times 10 \times 7 = 210$	$3 \times 7 \times 10 = 210$
$7 \times 3 \times 10 = 210$	$7 \times 10 \times 3 = 210$	$(3 \times 7) \times 10 = 21 \times 10 = 210$
$10 \times 3 \times 7 = 210$	$10 \times 7 \times 3 = 210$	$3 \times (7 \times 10) = 3 \times 70 = 210$

"A multiple of a given number is the product of the given number and any whole
number."
"A factor of a given number is a whole number that the given number can be divided by
without giving a remainder."
"21 is a multiple of 3. 3 is a factor of 21."

"21 is a multiple of 3, so…
"2,100 is a multiple of 300"
"2,100 is a multiple of 3"

<table>
<tr>
<td>5MD–3 Multiply using a formal written method</td>
<td>

● Place-value counters:

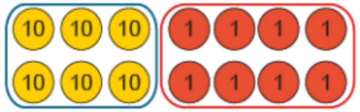


Figure 179: place-value counters showing 34×2

248

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

● Wriiten methods:

<table>
<tr><th>Informal written method</th><th>Expanded multiplication algorithm</th><th>Short multiplication</th></tr>
<tr>
<td>

$34 \times 2 = 30 \times 2 + 4 \times 2$
$= 60 + 8$
$= 68$

</td>
<td>

$$\begin{array}{r|r|l} & 10s & 1s & \\ & 3 & 4 & \\ \times & & 2 & \\ \hline & & 8 & 2 \times 4 \text{ ones} = 8 \text{ ones} \\ & 6 & 0 & 2 \times 3 \text{ tens} = 6 \text{ tens} \\ \hline & 6 & 8 & \end{array}$$

</td>
<td>

$$\begin{array}{r|r|r} & 10s & 1s \\ & 3 & 4 \\ \times & & 2 \\ \hline & 6 & 8 \end{array}$$

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

$$\begin{array}{rccc} & 3 & 6 & 7 \\ \times & & & 4 \\ \hline & 1,4 & 6 & 8 \\ \hline & & 2 & 2 \end{array}$$

Figure 180: multiplying 367 by 4 using short multiplication

4×7 ones $= 28$ ones
$= 2$ tens $+ 8$ ones
4×6 tens $= 24$ tens
$= 2$ hundreds $+ 4$ tens
plus 2 more tens $= 2$ hundreds $+ 6$ tens
4×3 hundreds $= 12$ hundreds
$= 1$ thousand $+ 2$ hundreds
plus 2 more hundreds $= 1$ thousand $+ 4$ hundreds

</td>
<td>

“2 times 4 ones is equal to 8 ones: write 8 in the ones column.”

“2 times 3 tens = 6 tens: write 6 in the tens column.”

</td>
</tr>
<tr>
<td>5MD–4 Divide using a formal written method</td>
<td>

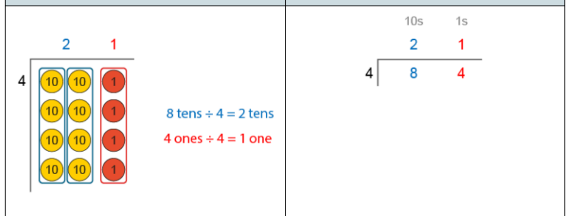
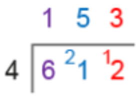
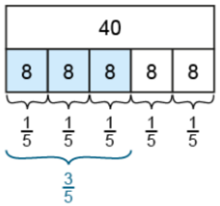
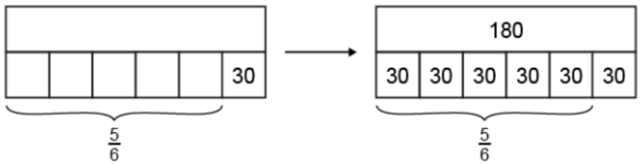
● Place-value counters and written methods:

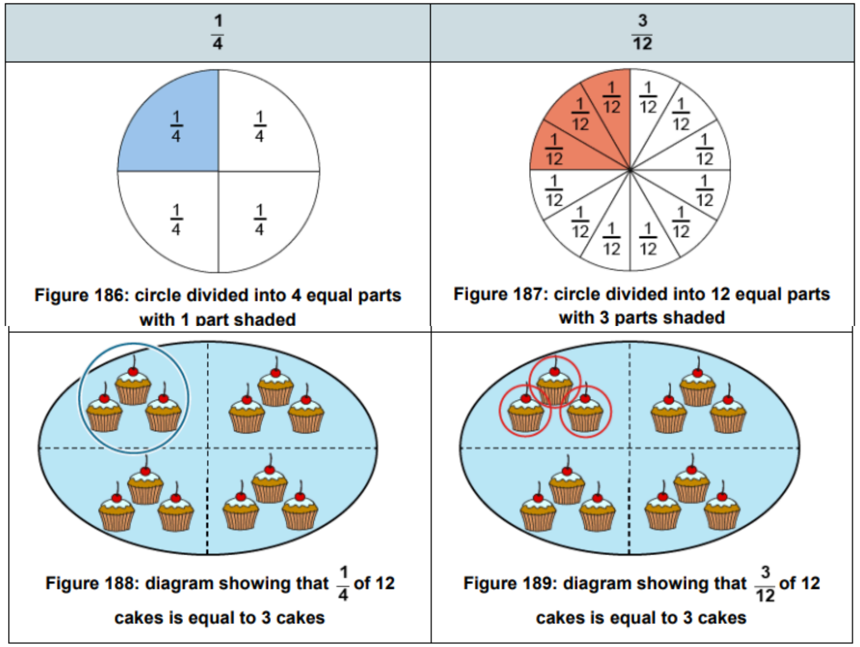
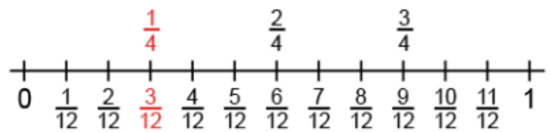
</td>
<td>

“8 tens divided by 4 is equal to 2 tens: write 2 in the tens column.”

“4 ones divided by 4 is equal to 1 one: write 1 in the ones column.”

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

	Short division with place-value counters / **Short division**  **Figure 181: dividing 84 by 4 using short division with place-value counters** **Figure 182: dividing 84 by 4 using short division with place-value headings**  **Figure 183: dividing 612 by 4 using short division** 6 hundreds ÷ 4 = 1 hundred remainder 2 hundreds 2 hundreds = 20 tens plus 1 more ten = 21 tens 21 tens ÷ 4 = 5 tens remainder 1 ten 1 ten = 10 ones plus 2 more ones = 12 ones 12 ones ÷ 4 = 3 ones	
5F–1 Find non-unit fractions of quantities	● **Bar models and equations:**  **Figure 184: bar model to support finding three-fifths of 40** $40 \div 5 = 8$ So, $\frac{1}{5}$ of $40 = 8$ $8 \times 3 = 24$ So, $\frac{3}{5}$ of $40 = 24$  **Figure 185: using a bar model to solve more complex problems related to fractions of quantities**	**“To find of 15, we divide 15 into 5 equal parts.”** **“15 divided by 5 is equal to 3, so of 15 is equal to 3.”** **“Three-fifths is equal to 3 one-fifths.”** **“To find 3 one-fifths of 40, first find one-fifth of 40 by dividing by 5, and then multiply by 3.”**

5F–2 Find equivalent fractions	• **Area models:**  Figure 186: circle divided into 4 equal parts with 1 part shaded Figure 187: circle divided into 12 equal parts with 3 parts shaded Figure 188: diagram showing that $\frac{1}{4}$ of 12 cakes is equal to 3 cakes Figure 189: diagram showing that $\frac{3}{12}$ of 12 cakes is equal to 3 cakes • **Number lines:**  Figure 190: number line showing that $\frac{1}{4}$ and $\frac{3}{12}$ are equivalent	**“The whole is divided into 4 equal parts and 1 of those parts is shaded.”** **“The whole is divided into 12 equal parts and 3 of those parts is shaded.”** **“ and are equivalent because 1 is the same portion of 4 as 3 is of 12.**

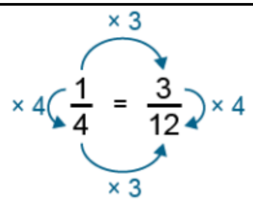


Figure 191: diagram showing the multiplicative relationships between the numerators and denominators in $\frac{1}{4}$ and $\frac{3}{12}$

5F–3 Recall decimal equivalents for common fractions

- **Conversions charts:**

Unit fraction	Decimal fraction
$\frac{1}{2}$	0.5
$\frac{1}{4}$	0.25
$\frac{1}{5}$	0.2
$\frac{1}{10}$	0.1

- **Hundred grids:**

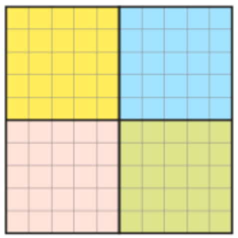
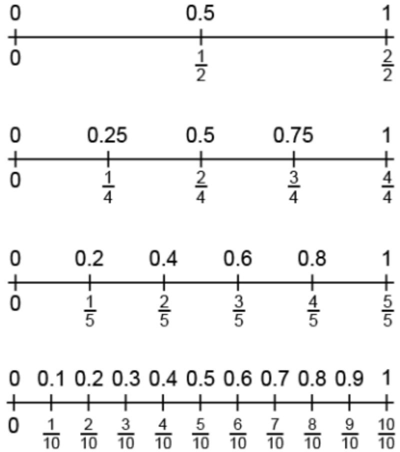
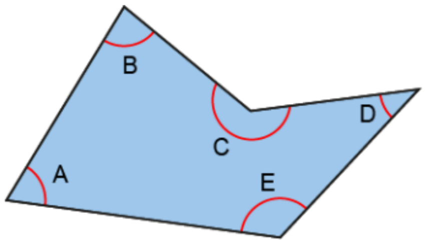
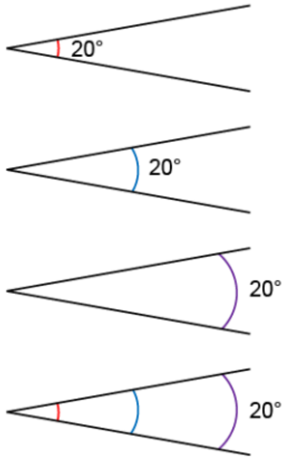
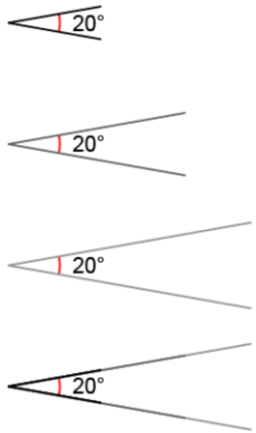
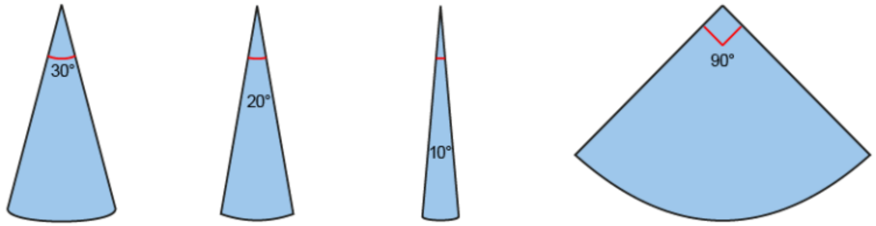


Figure 192: hundred grid divided into 4 equal parts: $\frac{1}{4}$ is equal to 25 hundredths

$$\frac{1}{4} = \frac{25}{100} = 0.25$$

- **Number lines:**

	 Figure 193: 0 to 1 number lines illustrating common proper fraction – decimal fraction equivalents	
5G–1 Compare, estimate, measure and draw angles	• **Shapes:**  Figure 194: irregular pentagon with 3 acute internal angles, 1 obtuse internal angle and 1 reflex internal angle • **Angles:**	**"An acute angle is smaller than a right angle."** **"An obtuse angle is larger than a right angle but less than the angle on a straight line."** **"A reflex angle is larger than the angle on a straight line, but less than the angle for a full turn."** **"D is the smallest angle. It is an acute angle."** **"C is the largest angle. It is a reflex angle."** **"An acute angle is less than 90°."** **"An obtuse angle is greater than 90° but less than 180°."**

	 Figure 195: the position of the arc indicating an angle does not affect the size of the angle  Figure 196: the length of the lines does not affect the size of the angle between them  Figure 197: a selection of ‘standard angle’ measuring tools	**“A reflex angle is greater than 180° but less than 360°.”**
5G–2 Compare and calculate areas	• **Shapes:**	**“To find the area of a rectangle, multiply the length by the width.”**

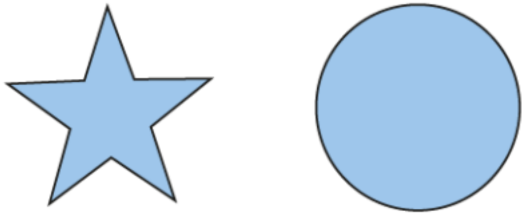


Figure 198: a decagon and a circle with a clear visual difference in area

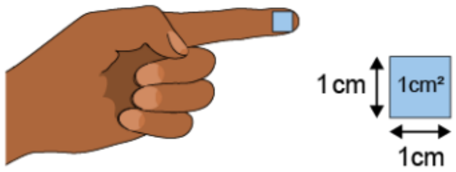


Figure 199: a square centimetre

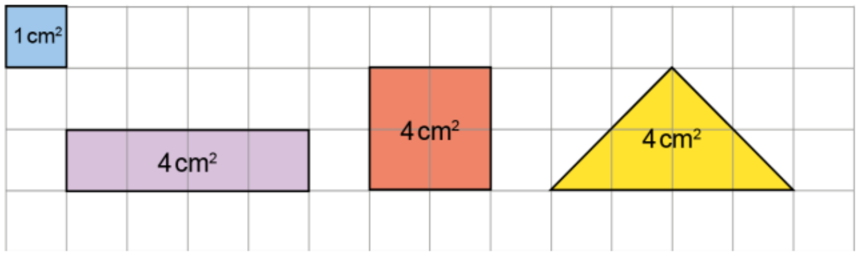


Figure 200: a rectangle, square and triangle with equal areas

Drawn to actual size.

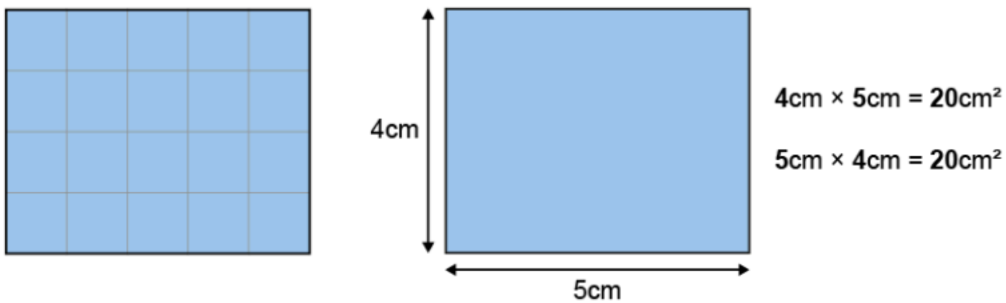


Figure 201: the area of a rectangle can be calculated by multiplying the length by the width

Drawn to actual size.

Year 6

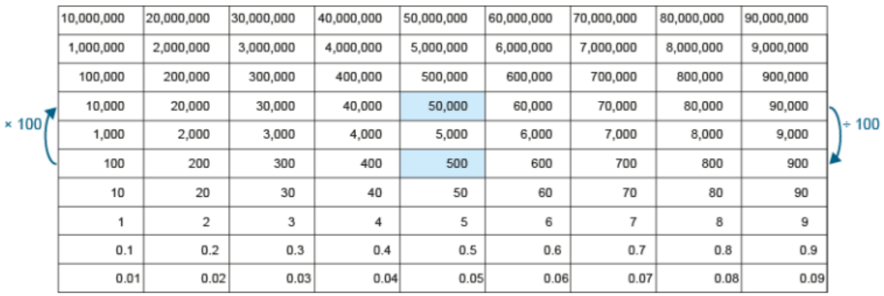
Ready to Progress	Representations	Language Focus

6NPV–1 Powers of 10

- **Digits and words:**

0 . 0 1	one hundredth
0 . 1	one tenth
1	one
1 0	ten
1 0 0	one hundred
1 , 0 0 0	one thousand
1 0 , 0 0 0	ten thousand
1 0 0 , 0 0 0	one hundred thousand
1 , 0 0 0 , 0 0 0	one million
1 0 , 0 0 0 , 0 0 0	ten million

- **Gattegno charts:**



10,000,000	20,000,000	30,000,000	40,000,000	50,000,000	60,000,000	70,000,000	80,000,000	90,000,000
1,000,000	2,000,000	3,000,000	4,000,000	5,000,000	6,000,000	7,000,000	8,000,000	9,000,000
100,000	200,000	300,000	400,000	500,000	600,000	700,000	800,000	900,000
10,000	20,000	30,000	40,000	50,000	60,000	70,000	80,000	90,000
1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9
0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

Figure 207: using the Gattegno chart to multiply and divide by 100

Language Focus:

"10 hundred-thousands is equal to 1 million."
"1,000,000 is 10 times the size of 100,000."
"100,000 is one-tenth times the size of 1,000,000."
"10 thousands is equal to 10,000."
"10,000 is 10 times the size of 1,000."
"1,000 is one-tenth times the size of 10,000."
"50,000 is 100 times the size of 500."
"500 multiplied by 100 is equal to 50,000."
"500 is one-hundredth times the size of 50,000."
"50,000 divided by 100 is equal to 500."

- **Place value counters and tens frames:**

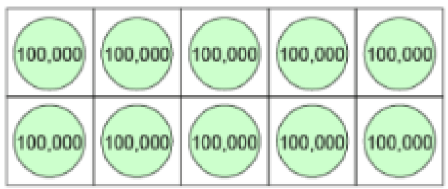


Figure 206: ten 100,000-value place-value counters in a tens frame

<table>
<tr><th></th><th></th><th></th></tr>
<tr><td>6NPV–2 Place value in numbers up to 10,000,000</td><td>

- Equations:

$$518.32 + 30 = 548.32$$

$$381{,}920 - 60{,}000 = 321{,}920$$

</td><td>

“In 67,000.4…

- the 6 represents 6 ten-thousands; the value of the 6 is 60,000
- the 7 represents 7 thousands; the value of the 7 is 7,000
- the 4 represents 4 tenths; the value of the 4 is 0.4”

</td></tr>
<tr><td>6NPV–3 Numbers up to 10 million in the linear number system</td><td>

- Number lines:

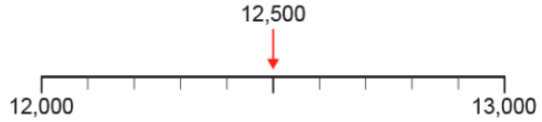


Figure 208: placing 12,500 on a 12,000 to 13,000 number line marked, but not labelled, in multiples of 100

Figure 209: placing 12,500 on a 10,000 to 20,000 number line marked, but not labelled, in multiples of 1,000

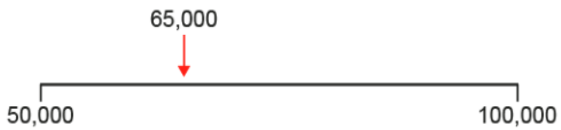


Figure 210: estimating the position of 65,000 on an unmarked 50,000 to 100,00 number line

Figure 211: identifying 875,000 on a 800,00 to 900,000 number line marked only with a midpoint

</td><td>

“The previous multiple of 1 million is 5 million. The next multiple of 1 million is 6 million.”

“The previous multiple of 100,000 is 5,100,000. The next multiple of 100,000 is 5,200,000.”

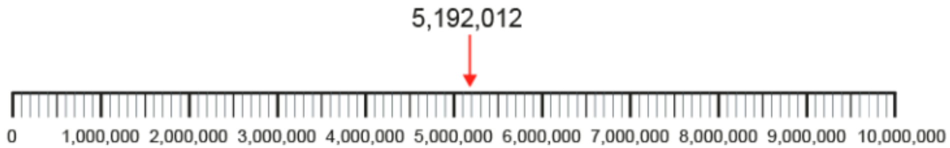
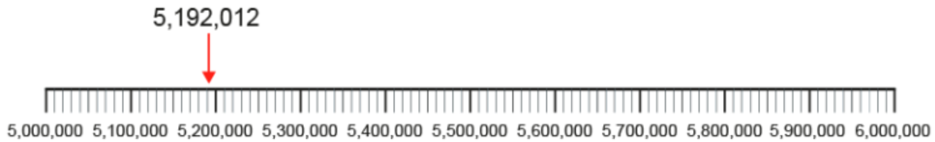
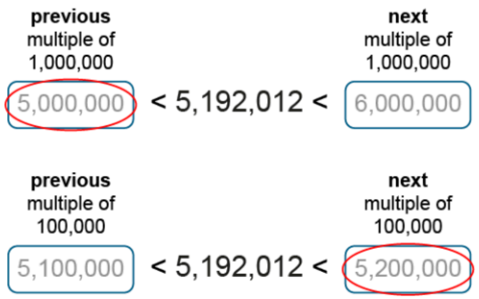
“The closest multiple of 1 million is 5 million.”

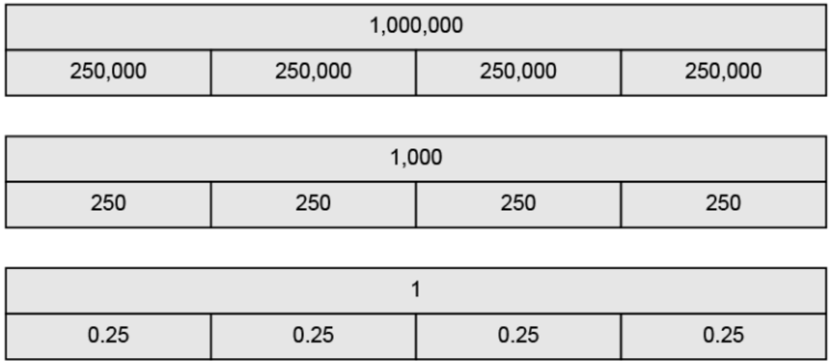
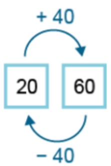
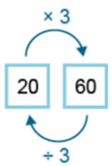
“5,192,012 rounded to the nearest million is 5 million.”

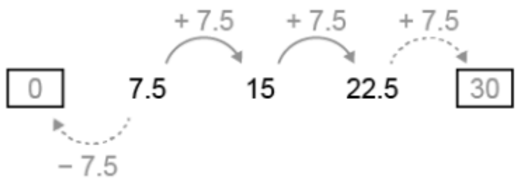
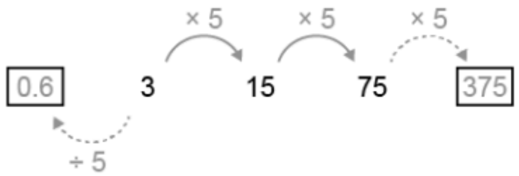
“The closest multiple of 100,000 is 5,200,000.”

“5,192,012 rounded to the nearest 100,000 is 5,200,000.”

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

	 **Figure 212: using a number line to identify the previous and next multiple of 1 million**  **Figure 213: using a number line to identify the previous and next multiple of 100,000**	
	• **Inequality expressions:**  **Figure 214: identifying the nearest multiple of 1 million and the nearest multiple of 100,000**	
6NPV–4 Reading scales with 2, 4, 5 or 10 intervals	• **Bar models:**	

	 **Figure 215: bar models showing 1 million, 1,000 and 1 partitioned into 4 equal parts**	
	● **Equations:** $750{,}000 + 250{,}000 = 1{,}000{,}000$ $1{,}000{,}000 - 250{,}000 = 750{,}000$ $\quad$ $1{,}000{,}000 - 750{,}000 = 250{,}000$ $1{,}000{,}000 \div 4 = 250{,}000$ $\quad$ $1{,}000{,}000 \div 250{,}000 = 4$ $4 \times 250{,}000 = 1{,}000{,}000$ $\quad$ $250{,}000 \times 4 = 1{,}000{,}000$ $\frac{1}{4}$ of $1{,}000{,}000 = 250{,}000$	
6AS/MD–1 Quantify additive and multiplicative relationships	● **Diagrams:**  **Figure 216: additive relationship between 20 and 60**  **Figure 217: multiplicative relationship between 20 and 60**	**"The relationship between 2 numbers can be expressed additively or multiplicatively."**

	 **Figure 218: completing a sequence where the difference between adjacent terms is 7.5**  **Figure 219: completing a sequence where each term is 5 times the previous**	
6AS/MD–2 Derive related calculations	• **Equations:** $70 + 2 = 72$ $\quad$ $60 + 12 = 72$ $5 \times 8 = 10 \times 4$	**"If one addend is increased and the other is decreased by the same amount, the sum stays the same."** **"If I multiply one factor by a number, I must divide the other factor by the same number** **for the product to stay the same"** **"If I multiply one factor by a number, and keep the other factor the same, I must multiply the product by the same number."**
6AS/MD–3 Solve problems involving ratio relationships	• **Ratio tables:**	**"For every 1 cup of rice you cook, you need 2 cups of water."** **"For every 10 children on the school trip, there must be 1 adult."**

cups of rice	1	2	3	4	5	6
cups of water	2	4	6	8	10	12

number of children	10	20	30	40	50	60
number of adults	1	2	3	4	5	6

"For every 2 yellow beads there are 3 green beads".

- **Bead strings:**

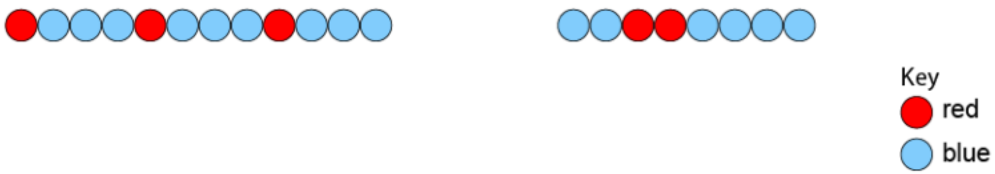


Figure 220: bead strings, each with the structure 'for every 1 red bead, there are 3 blue beads'

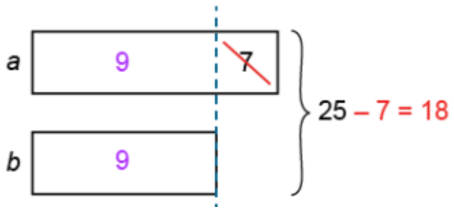
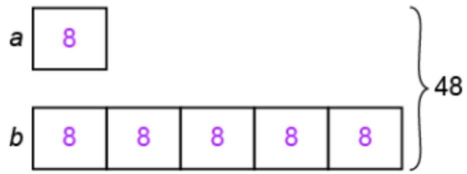
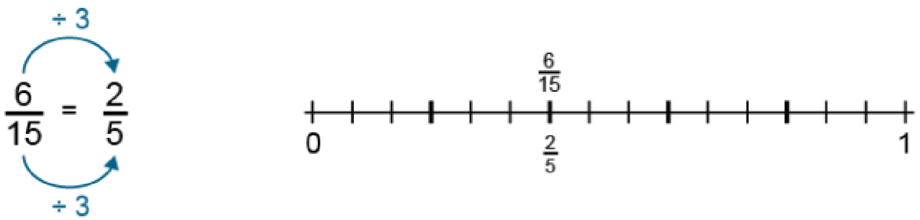
"For every 3 blue beads there is 1 red bead"

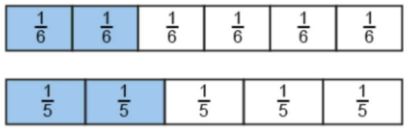
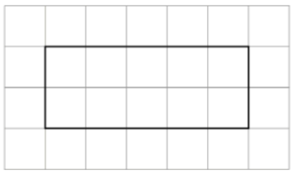
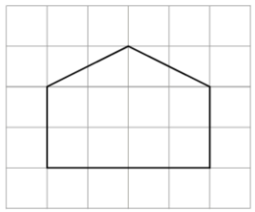
6AS/MD–4 Solve problems with 2 unknowns

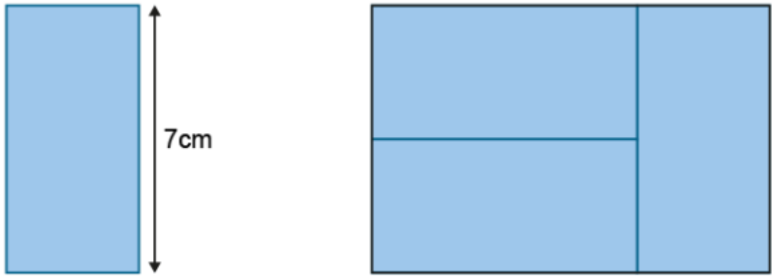
- **Patterns:**

Number of coins	Quantity in 50p coins	Quantity in 20p coins
1	50p	20p
2	£1	40p
3	£1.50	60p
4		80p
5		£1
6		£1.20
7		£1.40
8		£1.60

Figure 221: finding the 2 solutions to the coin problem: one 50p coin and six 20p coins, or three 50p coins and one 20p coin

	• **Bar models:**  	
6F–1 Simplify fractions	• **Number lines and schematic diagrams:**  **Figure 225: simplifying $\frac{6}{15}$ by dividing the numerator and denominator by the common factor of 3**	**"A fraction can be simplified when the numerator and denominator have a common factor other than 1."** **"To convert a fraction to its simplest form, divide both the numerator and the denominator by their highest common factor."**
6F–2 Express fractions in a common denomination	• **Diagrams:**	**"We need to compare the denominators of and ." "15 is a multiple of 5." "We can use 15 as the common denominator." "We need to express both fractions in fifteenths."** **"We need to compare the denominators of and ." "8 is not a multiple of 3." "24 is a multiple of both 3 and 8." "We can use 24 as the common denominator." "We need to express both fractions in twenty-fourths." "If one denominator is**

	$$\frac{1}{3} \xrightarrow{\times 8} \frac{8}{24} \qquad \frac{3}{8} \xrightarrow{\times 3} \frac{9}{24}$$ $\frac{1}{3} = \frac{8}{24}$ $\frac{3}{8} = \frac{9}{24}$ **Figure 231: expressing $\frac{1}{5}$ and $\frac{3}{8}$ in twenty-fourths**	**not a multiple of the other, we can multiply the two denominators to find a common denominator." "If the denominators are the same, then the larger the numerator, the larger the fraction."**
6F–3 Compare fractions with different denominators	• **Bar models and inequality expressions:**  $\frac{2}{5} > \frac{2}{6}$ **Figure 232: bar models to compare $\frac{2}{5}$ and $\frac{2}{6}$**	**"If the numerators are both 1, then the larger the denominator, the smaller the fraction."** **"If the numerators are the same, then the larger the denominator, the smaller the fraction."**
6G–1 Draw, compose and decompose shapes	• **Polygons and grids**  **Figure 233: a 5cm by 2cm rectangle on a squared-centimetre grid** *Drawn to actual size.*  **Figure 234: an irregular pentagon with an area of 10cm^2** *Drawn to actual size.*	

	 **Figure 235: problem involving a compound shape made from 3 identical rectangles**	