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# St George's Central CE Primary School and Nursery

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## Maths Fraction Policy

At St. George's Central CE Primary School and Nursery, children are introduced to the processes of calculation by building a sequence following a C-P-A approach. The C-P-A approach stands for Concrete - Pictorial – Abstract. This means that throughout the school, we see children using concrete equipment and pictures to support their understanding of more abstract concepts.

Over time children learn how to use *models and images*, such as Dienes, place value counters, bar models and tens frames, to support their mental and informal written methods of calculation. As children's mental methods are strengthened and refined, so too are their informal written methods. These methods become more efficient and succinct and lead to efficient written methods that can be used more generally. By the end of Year 6, children are equipped with mental and written methods that they understand and can use correctly.

**When faced with a calculation, children are able to decide which method is most appropriate and have strategies to check its accuracy.** They will do this by asking themselves:

- Can I do this in my head?
- Can I do this in my head using drawing or jottings?
- Do I need to use a pencil and paper procedure?



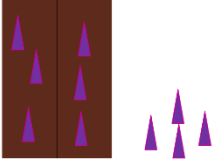
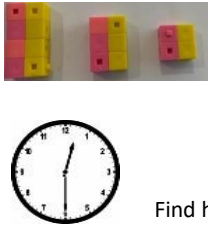

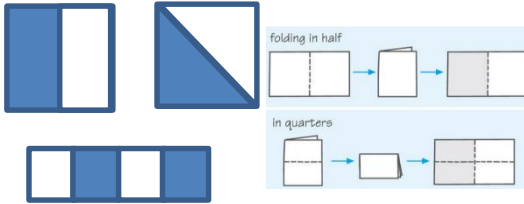
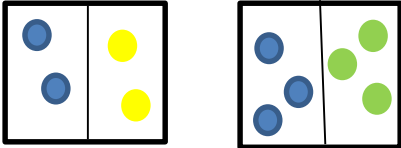
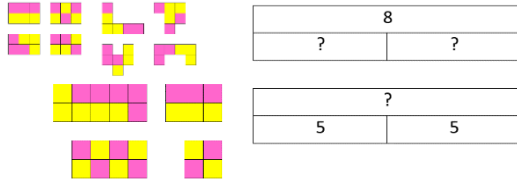
At whatever stage in their learning, and whatever method is being used, it must still be underpinned by a secure and appropriate knowledge of number facts, along with those mental skills that are needed to carry out the process and judge if it was successful.

The overall aim is that when children leave primary school they:

- have a secure knowledge of number facts and a good understanding of the four operations;
- are able to use this knowledge and understanding to carry out calculations mentally and to apply general strategies when using one-digit and two-digit numbers and particular strategies to special cases involving bigger numbers;
- make use of diagrams and informal notes to help record steps and part answers when using mental methods that generate more information than can be kept in their heads;
- have an efficient and reliable written method of calculation for each operation that children can apply with confidence when undertaking calculations that they cannot carry out mentally, which leads to a formal written method.

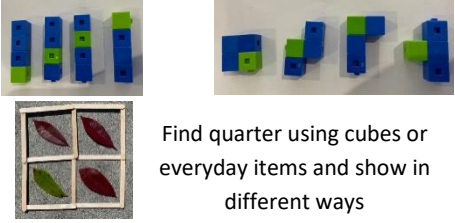

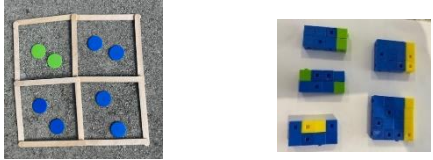
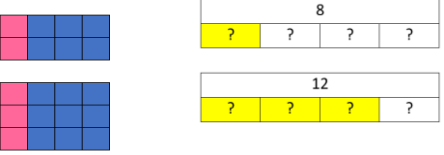
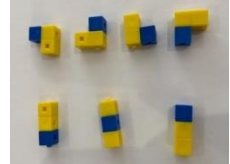
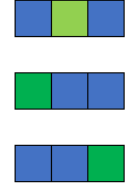

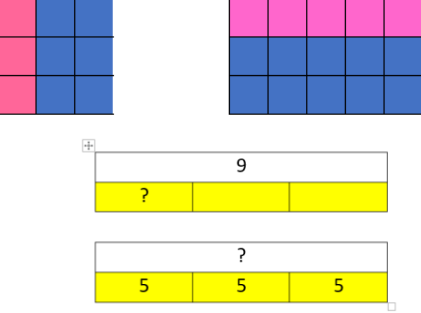
***'Never settle for less than your best'***

*Jesus said, 'I am the light of the world. Whoever follows Me will not walk in darkness, but will have the light of life.' John 8:12*

	Concrete	Pictorial	Abstract
<b>EYFS</b>			
To solve problems including halves	  <p>Halves of fruit or drinks and other common items</p>	 <p>Half and share images E.g. put half of the purple spikes on the Gruffalo</p>	
<b>Key Stage 1</b>			
To find $\frac{1}{2}$ of a shape	  <p>Find half using cubes or everyday items</p>	 <p>Find half of variety shapes in different ways including folding of paper.</p>	
To find $\frac{1}{2}$ of a number	 <p>Find half using cubes or counters</p>	 <p>Find half using cubes or counters. Use of bar models.</p>	$\frac{1}{2}$ of 8 = 4  $\frac{1}{2}$ of 10 = 5

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<p>To find <math>\frac{1}{4}</math> of a shape</p> <p>To find <math>\frac{3}{4}</math> of a shape</p>	 <p>Find quarter using cubes or everyday items and show in different ways</p>	 <p>Find quarter using pictures and show in different ways (including folding paper).</p>	
<p>To find <math>\frac{1}{4}</math> of a number</p> <p>To find <math>\frac{3}{4}</math> of a number</p>	 <p>Find quarter using cubes or everyday items and show in different ways</p>	 <p>Find quarter using pictures and show in different ways including bar models.</p>	<p><math>\frac{1}{4}</math> of 8 = 2 Find quarter using abstract form.</p> <p><math>\frac{1}{4}</math> of 12 = 3 Make division/ times table link.</p>
<p>To find <math>\frac{1}{3}</math> of a shape</p>	 <p>Find third using cubes or everyday items and show in different ways</p>	 <p>Find third using pictures and show in different ways</p>	
<p>To find <math>\frac{1}{3}</math> of a number</p>	 <p>Find third using cubes and show in different ways</p>	 <p>Find third using pictures and show in different ways including use of bar models.</p>	<p><math>\frac{1}{3}</math> of 9 = 3</p> <p><math>\frac{1}{3}</math> of 15 = 5</p> <p>Find third using abstract form</p>

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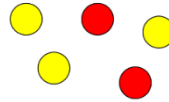
**Key Stage 2**

Recognise, find, and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators



What fraction are apples? Pears? Limes?

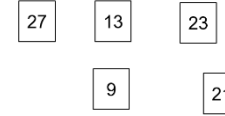
What fraction is red?



What fraction are square? Circles?



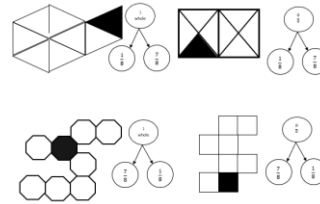
What fraction are multiples of 3?



Find unitary fractions of shapes

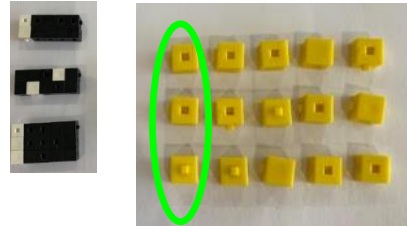


Find unitary fractions using cubes or everyday items and show in different ways

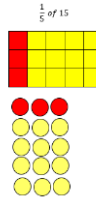


Find unitary fractions using pictures and show in different ways

Find unitary fractions of numbers



Find unitary fractions using cubes



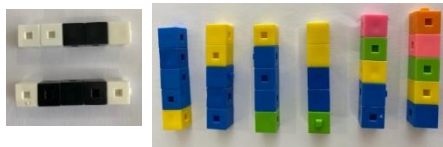
Find unitary fractions using pictures

$$\frac{1}{5} \text{ of } 25 = 25 \div 5 = 5$$

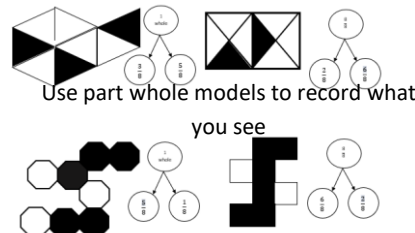
$$\frac{1}{9} \text{ of } 27 = 3$$

$$\frac{1}{6} \text{ of } 18$$

Find Non-unitary fractions of shapes

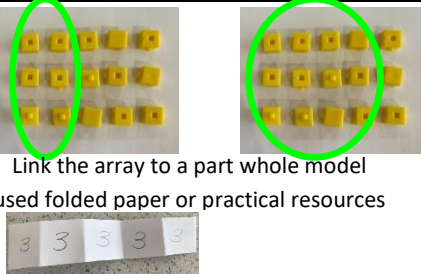
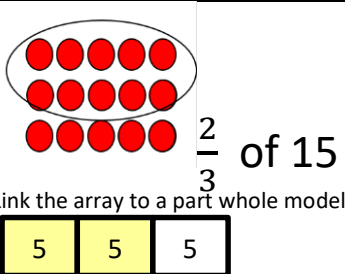
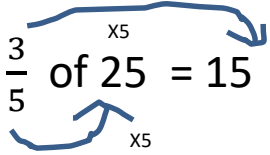

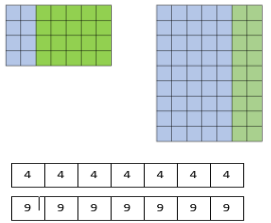
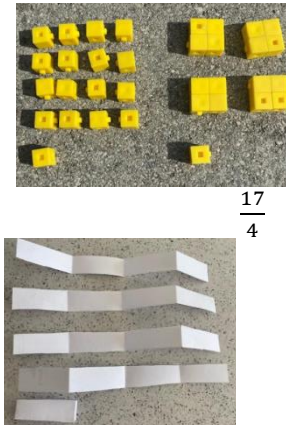
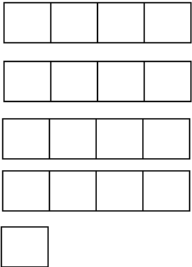


Use part whole models to record what you see



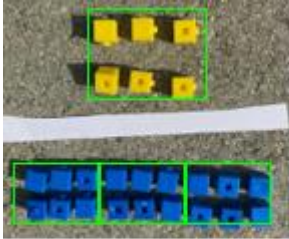
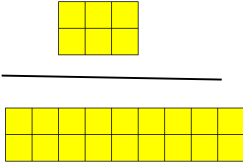
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<p>Find Non-unitary fractions of numbers</p>	 <p>Link the array to a part whole model used folded paper or practical resources</p>	 <p>Link the array to a part whole model</p>	<p><math>\frac{2}{3}</math> of 15</p> 												
<p>Find increasingly difficult non unitary fractions</p>	<p>Find <math>\frac{3}{7}</math> of 42 and <math>\frac{5}{6}</math> of 42 Compare fraction of same number</p> 	<p>Find <math>\frac{2}{7}</math> of 28 and <math>\frac{5}{7}</math> of 63 Compare fractions using same denominator</p> 	<p>Compare fractions</p> <table border="0"> <tr> <td><math>\frac{3}{7}</math> of 49</td> <td>○</td> <td><math>\frac{8}{28} \times 21</math></td> </tr> <tr> <td><math>\frac{2}{5}</math> of 45</td> <td>○</td> <td><math>\frac{3}{5} \times 30</math></td> </tr> <tr> <td><math>\frac{3}{8}</math> of 72</td> <td>○</td> <td><math>\frac{18}{24} \times 32</math></td> </tr> <tr> <td><math>\frac{1}{6}</math> of 24</td> <td>○</td> <td><math>\frac{12}{18} \times 36</math></td> </tr> </table>	$\frac{3}{7}$ of 49	○	$\frac{8}{28} \times 21$	$\frac{2}{5}$ of 45	○	$\frac{3}{5} \times 30$	$\frac{3}{8}$ of 72	○	$\frac{18}{24} \times 32$	$\frac{1}{6}$ of 24	○	$\frac{12}{18} \times 36$
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<p>Recognise mixed numbers and improper fractions</p>	 <p><math>\frac{17}{4}</math></p>		<p><math>\frac{17}{4} = 4\frac{1}{4}</math></p> <p><math>17 \div 4 = 4r1 = 4\frac{1}{4}</math></p>												


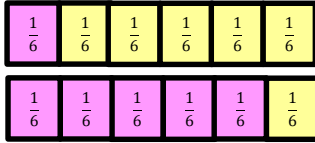
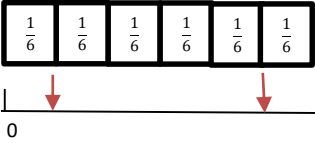
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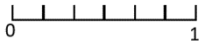
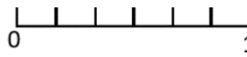
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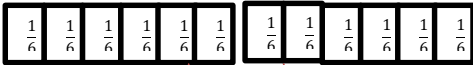
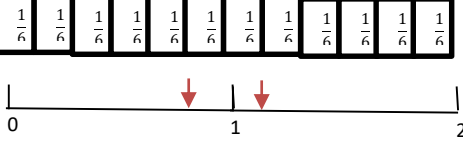
Use common factors to simplify fractions			$\frac{6}{18} \stackrel{\div 2}{=} \frac{3}{9} \stackrel{\div 3}{=} \frac{1}{3}$ $\frac{6}{18} \stackrel{\div 6}{=} \frac{1}{3}$ <p>Find largest common factor of 6 &amp; simplify to <math>\frac{1}{3}</math></p>
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**Compare and Order fractions**

Compare and order unit fractions			
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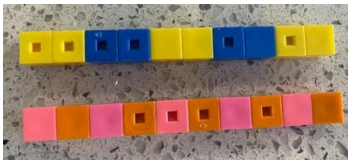
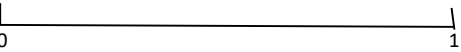


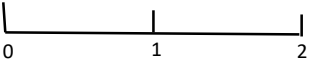
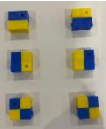



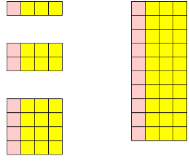
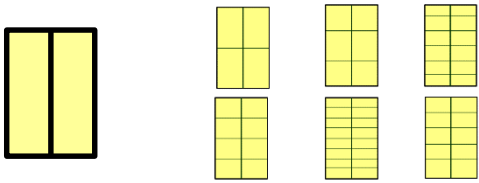
Compare and order fractions of the same denominator	<p>Compare <math>\frac{1}{6}</math> and <math>\frac{5}{6}</math></p> 	<p>Compare <math>\frac{1}{6}</math> and <math>\frac{5}{6}</math></p> 	<p>Compare <math>\frac{1}{6}</math> and <math>\frac{5}{6}</math></p> 
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  <p>Show both fractions (<math>\frac{1}{6}</math> and <math>\frac{5}{6}</math>) on the number line</p>	
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Compare and order fractions of the same denominator	<p>Compare <math>\frac{5}{6}</math> and <math>\frac{7}{6}</math></p> 	<p>Compare <math>\frac{5}{6}</math> and <math>\frac{7}{6}</math></p> 	
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**'Never settle for less than your best'**

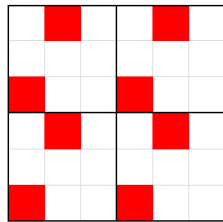
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<p>Compare and order fractions of the whose denominators are all multiples of the same number</p>		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td> </tr> <tr> <td><math>\frac{1}{5}</math></td><td><math>\frac{1}{5}</math></td><td><math>\frac{1}{5}</math></td><td><math>\frac{1}{5}</math></td><td><math>\frac{1}{5}</math></td> </tr> </table>	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td> </tr> <tr> <td><math>\frac{1}{5}</math></td><td><math>\frac{1}{5}</math></td><td><math>\frac{1}{5}</math></td><td><math>\frac{1}{5}</math></td><td><math>\frac{1}{5}</math></td> </tr> </table> 	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$
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$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$																														
<p>Compare and order fractions including fractions &gt; 1</p>		<p>Compare <math>\frac{6}{8}</math> and <math>\frac{7}{9}</math></p> 	 <p>Compare <math>\frac{11}{9}</math> and <math>\frac{13}{8}</math></p>  <p>Use common denominator  <math>\frac{11}{9}</math> and <math>\frac{13}{8} = \frac{88}{72}</math> and <math>\frac{107}{72}</math></p>																															
<p><b>Equivalent Fractions</b></p>																																		
<p>Recognise the equivalence of <math>\frac{2}{4}</math> and <math>\frac{1}{2}</math></p>			$\frac{2}{4} = \frac{1}{2}$																															
<p>Recognise and show, using diagrams, families of common equivalent fractions with small denominators</p>																																		
	 <p style="text-align: center;">Family of <math>\frac{1}{4}</math> and <math>\frac{3}{4}</math></p>	 <p style="text-align: center;">Find a fraction of a shape and cut into equal groups in different ways</p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <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> </tr> <tr> <td>5</td><td>10</td><td>15</td><td>20</td><td>25</td><td>30</td><td>35</td><td>40</td> </tr> </table> <p style="text-align: center;">Use double number line</p>	1	2	3	4	5	6	7	8	5	10	15	20	25	30	35	40															
1	2	3	4	5	6	7	8																											
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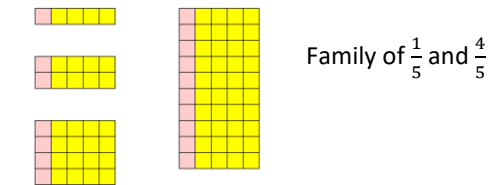
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Recognise and show, using diagrams, families of common equivalent fractions



$$\frac{2}{9} = \frac{4}{18} = \frac{6}{27} = \frac{8}{36}$$



Family of  $\frac{1}{5}$  and  $\frac{4}{5}$

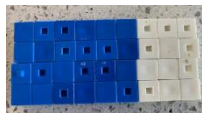


Family of  $\frac{2}{3}$  and  $\frac{1}{3}$

1	2	3	4	5	6	7	8
2	4	6	8	10	12	14	16
3	6	9	12	15	18	21	24
4	8	12	16	20	24	28	32
5	10	15	20	25	30	35	40
6	12	18	24	30	36	42	48
7	14	21	28	35	42	49	56
8	16	24	32	40	48	56	64

Use multiplication table

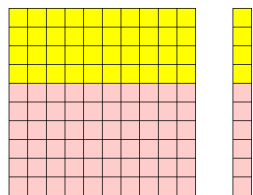
Identify name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths



$$\frac{12}{36} = \frac{1}{3}$$



$$\frac{24}{36} = \frac{2}{3}$$



$$\frac{40}{100} = \frac{4}{10} = \frac{2}{5}$$

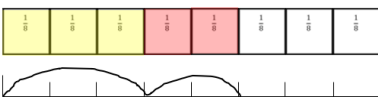
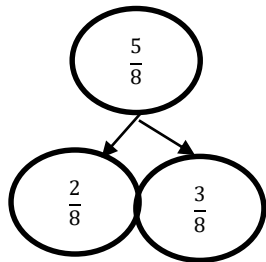
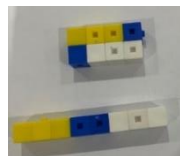
Write fractions that are equivalent to  $\frac{3}{5}$

$$\frac{30}{50} \quad \frac{60}{100} \quad \frac{120}{200}$$

$$\frac{15}{25} \quad \frac{21}{35} \quad \frac{27}{45}$$

**Calculation**  
**Addition and Subtraction of fractions**

Add and subtract fractions with the same denominator within one whole



$$\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$$

$$\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$$

$$\frac{2}{8} + \frac{3}{8} + \frac{3}{8} = \frac{8}{8}$$

**'Never settle for less than your best'**

*Jesus said, 'I am the light of the world. Whoever follows Me will not walk in darkness, but will have the light of life.' John 8:12*



Add and subtract fractions with the same denominator

$$\frac{6}{12} + \frac{10}{12} = 1\frac{4}{12}$$

$$1\frac{4}{12} = 1\frac{1}{3}$$

Add and subtract fractions with denominators that are multiples of the same number

(This a remodel to show  $\frac{3}{4}$ )

$$\frac{5}{12} + \frac{1}{3} = \frac{3}{4}$$

Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

$\frac{1}{3} + \frac{1}{4}$

Find  $\frac{1}{3}$       Find  $\frac{1}{4}$  by turning paper

Show  $\frac{1}{3}$       Show  $\frac{1}{4}$

Answer =  $\frac{7}{12}$

$$\frac{1}{3} + \frac{1}{4}$$

$$\frac{4}{12} + \frac{3}{12} = \frac{7}{12}$$

**'Never settle for less than your best'**

Jesus said, 'I am the light of the world. Whoever follows Me will not walk in darkness, but will have the light of life.' John 8:12

**Calculation**

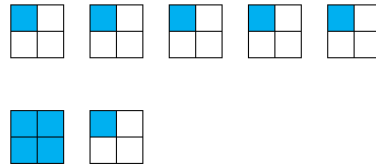
**Multiplication and division**

Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams

$$\frac{1}{4} \times 5$$



$$\frac{1}{4} \times 5$$



$$\frac{1}{4} \times 5$$

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

$$\frac{5}{4} = 1\frac{1}{4}$$

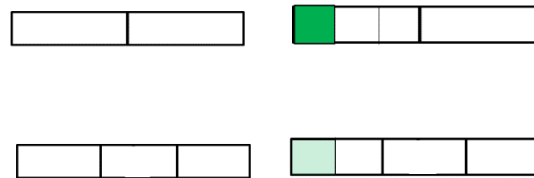
Multiply pairs of proper fractions, writing the answer its simplest form

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

$$\frac{1}{3} \text{ of } \frac{1}{2} \quad \frac{1}{2} \text{ of } \frac{1}{3}$$



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



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

Divide proper fractions by whole numbers

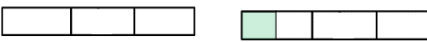
$$\frac{1}{3} \div 2$$



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



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



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



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

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

Divide the numerator by the integer OR multiply the denominator by the integer

***'Never settle for less than your best'***

*Jesus said, 'I am the light of the world. Whoever follows Me will not walk in darkness, but will have the light of life.' John 8:12*