

# Y7 Maths Knowledge Organiser Topic 9: Fractions 1

What must I be able to do?	Key vocabulary
<ul style="list-style-type: none"> <li><input type="checkbox"/> Represent fractions using area diagrams, bar models and number lines</li> <li><input type="checkbox"/> Recognise and name equivalent fractions</li> <li><input type="checkbox"/> Use equivalent fractions                             <ul style="list-style-type: none"> <li>➤ Sparx M410, M671</li> </ul> </li> <li><input type="checkbox"/> Compare and order numbers involving fractions                             <ul style="list-style-type: none"> <li>➤ Sparx M335</li> </ul> </li> <li><input type="checkbox"/> Express one quantity as a fraction of another</li> <li><input type="checkbox"/> Find a fraction of a set of objects or quantity                             <ul style="list-style-type: none"> <li>➤ Sparx M158, M695, M684</li> </ul> </li> <li><input type="checkbox"/> Find the whole given a fraction</li> <li><input type="checkbox"/> Multiply a whole number or fraction by a whole number or fraction                             <ul style="list-style-type: none"> <li>➤ Sparx M157</li> </ul> </li> <li><input type="checkbox"/> Divide a whole number or proper fraction by a whole number or proper fraction                             <ul style="list-style-type: none"> <li>➤ Sparx M110</li> </ul> </li> <li><input type="checkbox"/> Add and subtract fractions with like and unlike denominators                             <ul style="list-style-type: none"> <li>➤ Sparx M335</li> </ul> </li> </ul>	<p><b>Fraction</b> A fraction is a <u>part of a whole</u>. It is also a ratio between two numbers separated by a vinculum (<math>\frac{\quad}{\quad}</math>). It is represented by the <u>division</u> of one number by another.</p> <p><b>Numerator</b> The '<u>top</u>' part of a <u>fraction</u> - it tells us how many parts we are dealing with.</p> <p><b>Denominator</b> The '<u>bottom</u>' part of a <u>fraction</u> - it tells us how many parts the whole is divided into.</p> <p><b>Equivalent</b> Equivalent fractions represent the <u>same value</u>.</p> <p><b>Reciprocal</b> The reciprocal of a number is <u>1 divided by the number</u>.</p> <p><b>Unit fraction</b> A fraction where the <u>numerator is 1</u> and denominator is a positive integer.</p>

### Equivalent fractions

Found by multiplying or dividing the numerator and denominator by the same value

e.g.

$$\frac{3}{8} \xrightarrow{\times 2} \frac{6}{16} \xrightarrow{\times 4} \frac{24}{64}$$

$$\frac{3}{8} \xrightarrow{\div 2} \frac{1.5}{4} \xrightarrow{\div 4} \frac{0.75}{1}$$

### Compare/Order fractions

You need to first of all rewrite all fractions with equivalent fractions that all have the same denominator. Then you can compare/order the numerators.

e.g.  $\frac{5}{8}$  vs  $\frac{7}{11} \rightarrow \frac{5}{8} = \frac{55}{88}$  and  $\frac{7}{11} = \frac{56}{88}$

$55 < 56$  so  $\frac{5}{8} < \frac{7}{11}$       The lowest multiple of 8 and 11 is 88

### Reciprocals

Reciprocal of an integer is  $\frac{1}{\text{integer}}$  e.g.  $5 \leftrightarrow \frac{1}{5}$

Reciprocal of a fraction "flips" it e.g.  $\frac{3}{5} \leftrightarrow \frac{5}{3}$

- Dividing by any number is the same as multiplying by its reciprocal.
- Multiplying by any number is the same as dividing by its reciprocal.

### Fraction of a quantity

To find a fraction of a number (an integer multiplied by a fraction), divide the number by the denominator and multiply by the numerator

e.g.  $45 \times \frac{3}{5} = 45 \div 5 \times 3 = 9 \times 3 = 27$

### Multiplying two fractions

Just multiply numerators and multiply denominators

e.g.  $\frac{3}{7} \times \frac{2}{5} = \frac{3 \times 2}{7 \times 5} = \frac{6}{35}$

### Dividing by a fraction

Instead of dividing by a fraction, multiply by its reciprocal

e.g.  $\frac{4}{9} \div \frac{4}{5} = \frac{4}{9} \times \frac{5}{4} = \frac{4 \times 5}{9 \times 4} = \frac{20}{36} = \frac{5}{9}$

Simplify your final answer if possible

### Adding and subtracting fractions

When the denominators are the same you just add or subtract the numerators

e.g.  $\frac{3}{7} + \frac{2}{7} = \frac{5}{7}$

and  $\frac{7}{9} - \frac{3}{9} = \frac{4}{9}$

If the denominators are different we use equivalent fractions to write them with the same denominator first. Then add or subtract as normal.

e.g.  $\frac{1}{3} + \frac{3}{5}$

Smallest common multiple of 3 and 5 is 15

$$\frac{1}{3} \xrightarrow{\times 5} \frac{5}{15} \quad \frac{3}{5} \xrightarrow{\times 3} \frac{9}{15}$$

$$\frac{5}{15} + \frac{9}{15} = \frac{14}{15}$$