

## Key vocabulary

equivalent fraction, numerator, denominator, common denominator, multiple, common multiple, ascending, descending, simplified fraction, highest common factor, integer, mixed number, improper fraction

## Add and subtract fractions

If the denominators are the same, simply add or subtract the numerators.

e.g.  $\frac{2}{3} + \frac{2}{3} = \frac{4}{3}$  or  $\frac{11}{3}$

If the denominators are different, firstly find a common denominator by using a common multiple, then create equivalent fractions using the new denominator to make the fractions easier to add or subtract.

e.g.  $\frac{2}{3} - \frac{1}{2} = \frac{4}{6} - \frac{3}{6} = \frac{1}{6}$



## Fractions as decimals

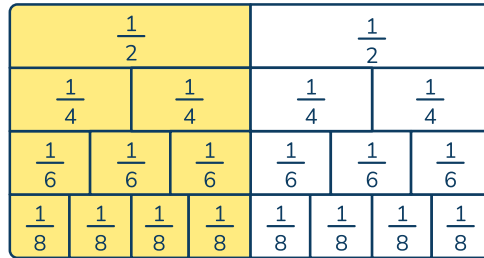
$\frac{1}{100}$	0.01	÷ 100
$\frac{1}{20}$	0.05	÷ 20
$\frac{1}{10}$	0.1	÷ 10
$\frac{1}{5}$	0.2	÷ 5
$\frac{1}{4}$	0.25	÷ 4
$\frac{1}{2}$	0.5	÷ 2
$\frac{3}{4}$	0.75	÷ 4, × 3
1	1	÷ 1

## Equivalent fractions

Equivalent fractions are two or more fractions that are all equal even though they have different numerators and denominators.

To find an equivalent fraction, multiply or divide both the numerator and denominator by the same number.

e.g.  $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$



## Multiply mixed numbers by whole numbers

To multiply mixed numbers by whole numbers, you can either:

- a) partition the mixed number and multiply each part by the whole number
- b) convert it into an improper fraction first and then multiply it.

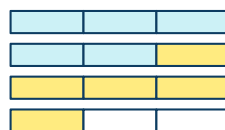
e.g.  $1\frac{2}{3} \times 2$

a)  $1 \times 2 = 2$  and  $\frac{2}{3} \times 2 = \frac{4}{3}$ , or  $1\frac{1}{3}$ .

Add each part to make  $3\frac{1}{3}$ .

b)  $1\frac{2}{3} = \frac{5}{3}$  and  $\frac{5}{3} \times 2 = \frac{10}{3}$ , or  $3\frac{1}{3}$  as

a mixed number.



## Compare and order fractions

Same denominators: the bigger the numerator, the bigger the fraction.

e.g.  $\frac{2}{5} < \frac{3}{5}$

Different denominators: find a common denominator by using a common multiple and create equivalent fractions. This makes the fractions easier to compare.

e.g. Place  $\frac{5}{8}$ ,  $\frac{3}{4}$ , and  $\frac{7}{16}$  in ascending order. A common multiple for 8, 4 and 16 is 16.

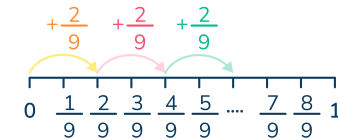
$\frac{5}{8} = \frac{10}{16}$ ,  $\frac{3}{4} = \frac{12}{16}$ , and  $\frac{7}{16}$  is already in 16ths. Now we can more easily order them by numerator from smallest to biggest:  $\frac{7}{16}$ ,  $\frac{10}{16}$ , and  $\frac{12}{16}$ , or:  $\frac{7}{16}$ ,  $\frac{5}{8}$  and  $\frac{3}{4}$ .

## Multiply fractions by whole numbers

To multiply fractions by integers, multiply the numerator by the integer.

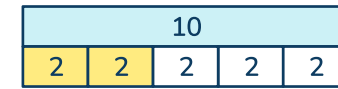
e.g.  $3 \times \frac{2}{9} = \frac{3 \times 2}{9} = \frac{6}{9}$

$3 \times \frac{2}{9}$  is the same as 3 groups of  $\frac{2}{9}$ , or  $\frac{2}{9} + \frac{2}{9} + \frac{2}{9}$



'x' can also mean 'of', so  $3 \times \frac{2}{9}$  also means  $\frac{2}{9}$  of 3.

e.g.  $10 \times \frac{2}{5} = \frac{2}{5} \times 10 = \frac{2}{5}$  of 10 = 4



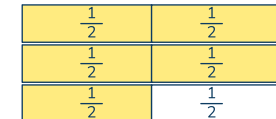
## Mixed numbers and improper fractions

A mixed number is a combination of an integer and a fraction,

e.g.  $2\frac{1}{2}$  is the same as 2 and  $\frac{1}{2}$ .

An improper fraction is a number greater than one whole. The numerator is greater than the denominator, e.g.  $\frac{5}{2}$ .

The bar models show both  $2\frac{1}{2}$  and  $\frac{5}{2}$  (five halves).



To convert from a mixed number to an improper fraction, multiply the denominator by the integer and add the numerator – this then becomes the numerator. The denominator stays the same because this represents the size of the fraction.

To convert from an improper fraction to a mixed number, divide the numerator by the denominator – this then becomes the integer. The remainder becomes the numerator. The denominator stays the same because this represents the size of the fraction.