YEAR 7 – APPLICATION OF NUMBER

Fractions and percentages of amounts

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Find a fraction of a given amount
- Use a given fraction to find the whole or other fractions
- Find the percentage of an amount using mental methods
- Find the percentage of a given amount using a calculator

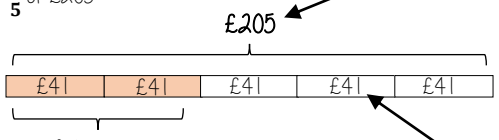
Keywords

Fraction: how many parts of a whole we have
Equivalent: of equal value
Whole: a number with no fractional or decimal part
Percentage: parts per 100 (uses the % symbol)
Place Value: the value of a digit depending on its place in a number. In our decimal number system, each place is 10 times bigger than the place to its right
Convert: change into an equivalent representation, often fraction to decimal to a percentage cycle

Fraction of a given amount

Find $\frac{2}{5}$ of £205

The bar represents the whole amount

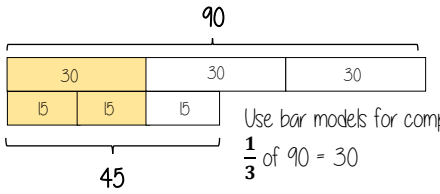


2 out of the 5 equal parts

2 x £41 = **£82**

£205 ÷ 5 = £41

Each part of the bar model represents £41



Use bar models for comparisons

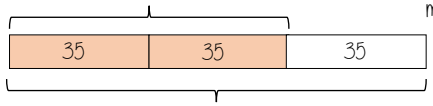
$\frac{1}{3}$ of 90 = 30

$\frac{2}{3}$ of 45 = 30

$\therefore \frac{1}{3}$ of 90 = $\frac{2}{3}$ of 45

Use a fraction of amount

$\frac{2}{3}$ of a value is 70. What is the whole number?



70 ÷ 2 = 35

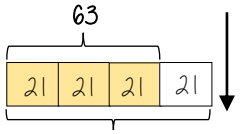
Each part of the bar model represents 35.

35 x 3 = 105

The whole number is 105

The wording of the question is important to setting up the bar model

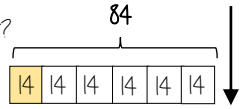
$\frac{3}{4}$ of a number is 63.



Find the whole

What is $\frac{1}{6}$ of the number?

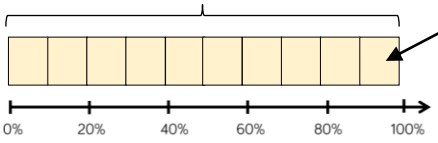
= 14



Use the whole to find a given part

Find the percentage of an amount (Mental methods)

The **whole** represents 100%



10% = $\frac{1}{10}$ of the whole

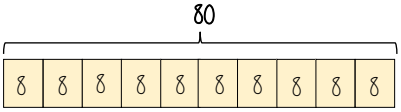
10% = $\frac{1}{10}$ of the whole

50% = $\frac{5}{10}$ = $\frac{1}{2}$ of the whole

20% = $\frac{2}{10}$ = $\frac{1}{5}$ of the whole

5% = $\frac{1}{20}$ of the whole

Find 65% of 80



For bigger percentages it is sometimes easier to take away from 100%

Method 1

65% = 10% x 6 + 5%
= (8 x 6) + 4
= 52

Method 2

65% = 50% + 10% + 5%
= 40 + 8 + 4
= 52

Find the percentage of an amount (Calculator methods)

Using a multiplier

Find 65% of 80

Fraction, decimal, percentage conversion

65% = $\frac{65}{100}$ = 0.65 ← The multiplier

0.65 x 80 = **52**

Using the percent button

Find 65% of 80

This brings up the % button on screen
You will see 65%

Type 65

Press SHIFT ((%)

Press × 80 and then press =

You can also use the calculator to support non calculator methods and find 1% or 10% then add percentages together

"of" can represent 'x' in calculator methods

YEAR 7 – FRACTIONAL THINKING

Addition and subtraction of fractions

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:

- Convert between mixed numbers and fractions
- Add/Subtract unit fractions (same denominator)
- Add/Subtract fractions (same denominator)
- Add/Subtract fractions from integers
- Use equivalent fractions
- Add/Subtract any fractions
- Add/Subtract improper fractions and mixed numbers
- Use fractions in algebraic contexts

Keywords

Numerator : the number above the line on a fraction. The top number. Represents how many parts are taken

Denominator: the number below the line on a fraction. The number represent the total number of parts

Equivalent: of equal value

Mixed numbers: a number with an integer and a proper fraction

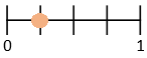
Improper fractions: a fraction with a bigger numerator than denominator

Substitute: replace a variable with a numerical value

Place value: the value of a digit depending on its place in a number. In our decimal number system, each place is 10 times bigger than the place to its right

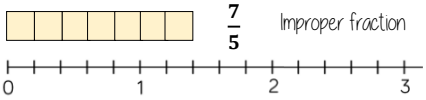
Representing Fractions

$\frac{1}{4}$ is represented in all the images



$1 \div 4$

Mixed numbers and fractions



$\frac{7}{5}$ Improper fraction

$1\frac{2}{5}$ Mixed number

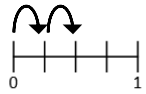
In this model 5 parts make up a whole

Fractions can be bigger than a whole

Add/Subtract unit fractions

Same denominator

$\frac{1}{12} + \frac{1}{12} - \frac{1}{12} = \frac{2}{12}$



$\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$

With the same denominator ONLY the numerator is added or subtracted

Add/Subtract fractions

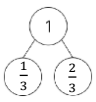
Same denominator

$\frac{2}{7} + \frac{3}{7} = \frac{5}{7}$

Sequences

$\frac{1}{3}, 1, 1\frac{2}{3}, 2\frac{1}{3}, 3, \ldots$

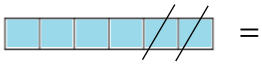
$+\frac{2}{3}$ $+\frac{2}{3}$



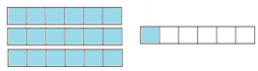
Represent this on a number line to help

Add/Subtract from integers

$1 - \frac{2}{6} = \frac{4}{6}$



$3 + \frac{1}{6} = 3\frac{1}{6}$

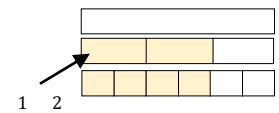


The denominator indicates the number of parts a whole is made up of

Equivalent fractions

Numerator and denominator have the same multiplier

$\frac{2}{3} = \frac{4}{6}$



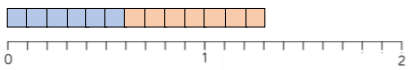
$\frac{1}{3} = \frac{2}{6}$

Add/Subtraction fractions (common multiples)

$\frac{3}{5} + \frac{7}{10}$

$\frac{6}{10} + \frac{7}{10}$

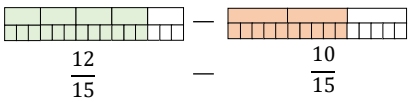
Addition/Subtraction needs a common denominator



$\frac{13}{10}$

Add/Subtraction any fractions

$\frac{4}{5} - \frac{2}{3}$



$\frac{12}{15} - \frac{10}{15} = \frac{2}{15}$

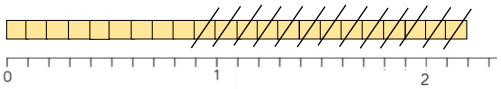
Use equivalent fractions to find a common multiple for both denominators

Add/Subtraction fractions (improper and mixed)

$2\frac{1}{5} - 1\frac{3}{10}$

$2\frac{2}{10}$

$\frac{22}{10} - \frac{13}{10} = \frac{9}{10}$



- Convert to an improper fraction
- Calculate with common denominator

Partitioning method

$2\frac{1}{5} - 1\frac{3}{10} = 2\frac{2}{10} - 1\frac{3}{10} = 2\frac{2}{10} - 1 - \frac{3}{10} = 1\frac{2}{10} - \frac{3}{10} = \frac{9}{10}$

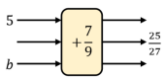
Fractions in algebraic contexts

$p = 5 \quad m = 2$

$k - \frac{5}{8} = 2$

Apply inverse operations

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



Form expressions with fractions

$b + \frac{7}{9} \longrightarrow b + \frac{7}{9}$

$\frac{p}{8} + \frac{1}{m}$

Substitution

$\frac{5}{8} + \frac{1}{2}$

Fractions and decimals

$\frac{1}{10} = 0.1$

$\frac{1}{100} = 0.01$

Example $\frac{6}{10} + 0.3 \longrightarrow 0.6 + 0.3$

$\frac{6}{10} + \frac{3}{10}$

Remember to use equivalent fractions and common denominators