

INTO Y7 — MEASUREMENT...

Converting Units

@whisto_maths

What do I need to be able to do?

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

- Recognise metric measures
- Convert metric measures
- Calculate with metric measures
- Understand Miles and Kilometre relationships
- Recognise Imperial measures and conversions

Keywords

Length: the distance from one point to another

Mass: a measure of how much matter is in an object

Capacity: the amount an object can contain (normally liquids)

Volume: the amount of 3-dimensional space an object takes up (units of length cubed)

Convert: to change a value or expression from one value to another.

Imperial: a system of weights and measures originally developed in England

Metric: a system of measuring that replaced the imperial system to fall in line with the rest of Europe.

Proportion: values of two items that increase in the same ratio

Metric measures

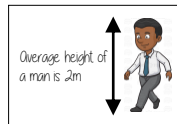
Length Common units of length or distance are

Millimetres (mm) – "Milli" prefix means one thousandth or $\div 1000$

Centimetres (cm) – "Centi" prefix means one hundredth or $\div 100$

Metres (m)

Kilometres (km) – "Kilo" prefix means a thousand $\times 1000$



Mass (Weight)

Grams (g)

Kilograms (kg) – "Kilo" prefix means a thousand $\times 1000$

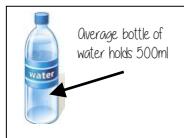
Tonnes (t)



Capacity

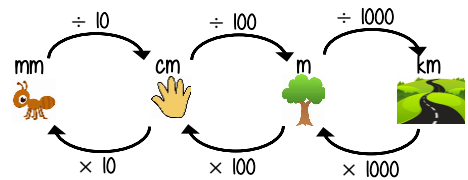
Millilitre (ml) – "Milli" prefix means one thousandth or $\div 1000$

Litre (l)

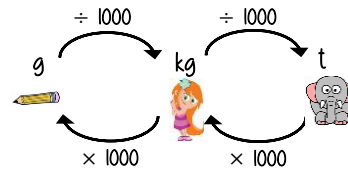


Metric conversions

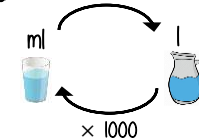
Length



Mass



Capacity



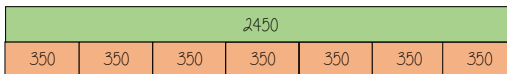
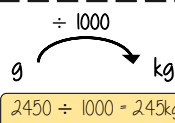
Milli – thousandth
Centi – hundredth
Kilo – thousand

Metric calculations

A package weighs 350g. How much will 7 packages weigh?
Give your answers in kilograms.



The final weight is in grams



Calculations tips:

- Do all calculations in the same unit (often the smaller measurement)
- Read for the units of your answer
- Do all conversions of units at the same time
- Represent your image pictorially where possible

Miles and Kilometres

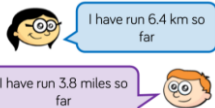
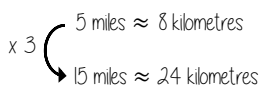
Miles and kilometres are normally used as measures of distance

≈ symbol represents "is approximately equal to"

5 miles ≈ 8 kilometres

Conversion calculations

How many kilometres is 15 miles?



Ron and Onnie are running a 5-mile race.
Who has run the furthest?

5 miles ≈ 8 kilometres $\div 8$
0.625 mile ≈ 1 kilometre $\times 64$
4 miles ≈ 64 kilometre

Ron has 1.2 miles left to run
Onnie has 1 mile left to run
Onnie has run the furthest

Imperial measures

Length

2.5 cm ≈ 1 inch

1 foot = 12 inches

Mass

1 pound (lb) = 16 ounces

1 stone = 14 pounds (lbs)

Capacity

1 gallon = 8 pints



In 1965 Britain converted to the metric system for measurement to fall in line with the rest of Europe. We still use an imperial measurement of miles for distance and speed on our roads.

YEAR 7 — ALGEBRAIC THINKING. Sequences

@whisto_maths



What do I need to be able to do?

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

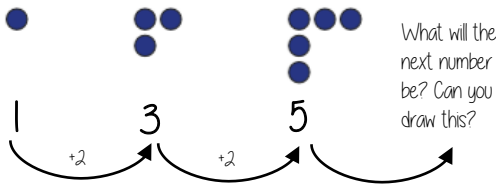
- Describe and continue both linear and non-linear sequences
- Explain term rules for linear sequence
- Find missing terms in a linear sequence

Keywords

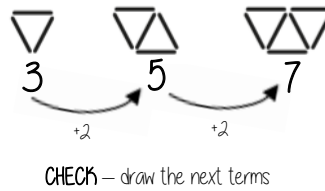
- Sequence:** items or numbers put in a pre-decided order
- Term:** a single number or variable
- Position:** the place something is located
- Rule:** instructions that relate two variables
- Linear:** the difference between terms increases or decreases by the same value each time
- Non-linear:** the difference between terms increases or decreases in different amounts
- Difference:** the gap between two terms
- Arithmetic:** a sequence where the difference between the terms is constant
- Geometric:** a sequence where each term is found by multiplying the previous one by a fixed non zero number

Describe and continue a sequence diagrammatically

Count the number of circles or lines in each image



Predict and check terms



Predictions:

Look at your pattern and consider how it will increase.

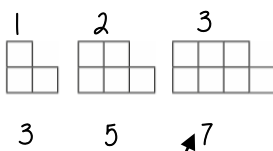
e.g How many lines in pattern 6?

Prediction - 13

If it is increasing by 2 each time - in 3 more patterns there will be 6 more lines

Sequence in a table and graphically

Position: the place in the sequence

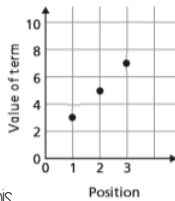


Term: the number or variable (the number of squares in each image)

Position	1	2	3
Term	3	5	7

Because the terms increase by the same addition each time this is **linear** - as seen in the graph

Graphically



"The term in position 3 has 7 squares"



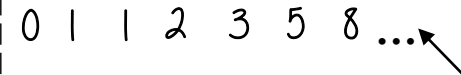
Linear and Non Linear Sequences

Linear Sequences - increase by addition or subtraction and the same amount each time

Non-linear Sequences - do not increase by a constant amount - quadratic, geometric and Fibonacci

- Do not plot as straight lines when modelled graphically
- The differences between terms can be found by addition, subtraction, multiplication or division

Fibonacci Sequence - look out for this type of sequence



Each term is the sum of the previous two terms

Continue Linear Sequences

7, 11, 15, 19...

How do I know this is a linear sequence?

It increases by adding 4 to each term

How many terms do I need to make this conclusion?

At least 4 terms - two terms only shows one difference not if this difference is constant (a common difference)

How do I continue the sequence?

You continue to repeat the same difference through the next positions in the sequence.

Continue non-linear Sequences

1, 2, 4, 8, 16 ...

How do I know this is a non-linear sequence?

It increases by multiplying the previous term by 2 - this is a geometric sequence because the constant is multiply by 2

How many terms do I need to make this conclusion?

At least 4 terms - two terms only shows one difference not if this difference is constant (a common difference)

How do I continue the sequence?

You continue to repeat the same difference through the next positions in the sequence.

Explain term-to-term rule

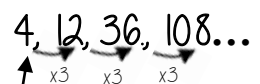
How you get from term to term

Try to explain this in full sentences not just with mathematical notation

Use key maths language - doubles, halves, multiply by two, add four to the previous term etc

To explain a whole sequence you need to include a term to begin at ...

The next term is found by tripling the previous term. The sequence begins at 4.



First term