What are scales?

Scales are number lines that are used for measurement. They can be vertical, horizontal or even circular. The number line is split into divisions (marked by a short line) **and** intervals (the space between each division).

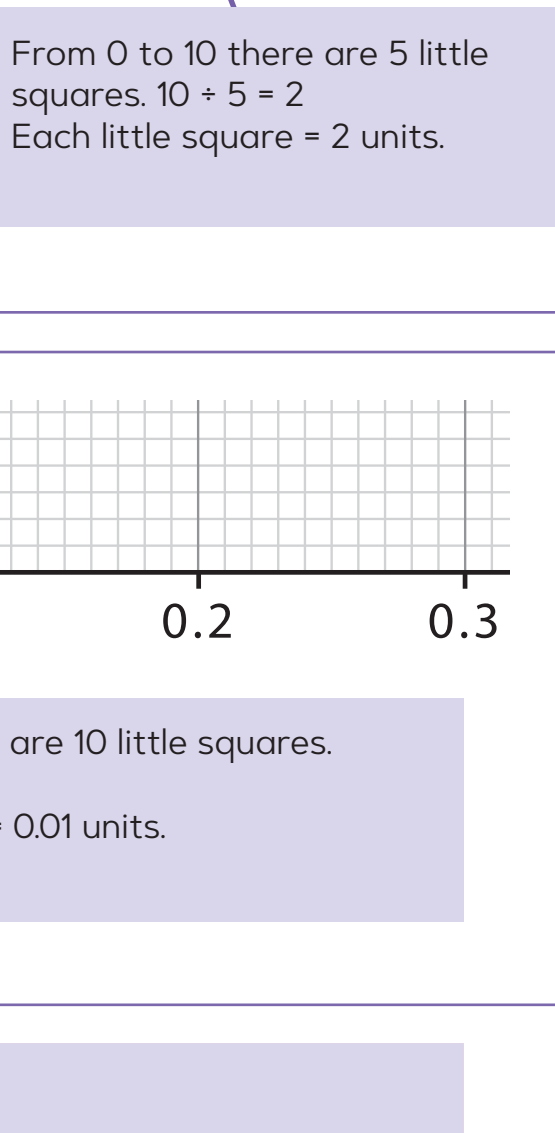
Scales on graphs

Scales are on the axes of graphs. The scale on each axis is important when you are drawing or interpreting a graph. To be able to read any marked position, it is important to work out what each interval on the scale is worth.

Rewarding Learning

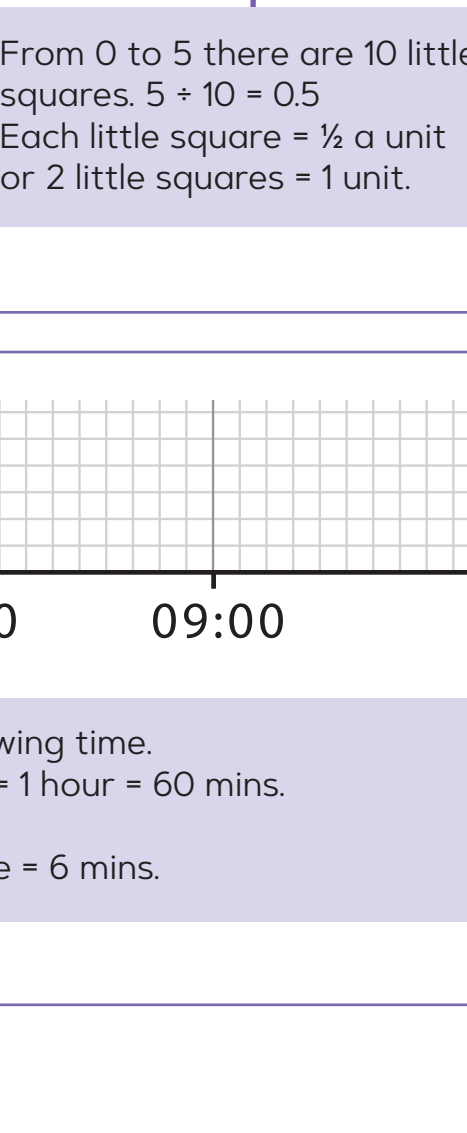
Reading a scale

When interpreting a graph, first look at the scale on each axis. The numbers marked may have divisions marked between them. Work out what each interval is worth by dividing the steps the scale is going up in by the number of intervals between.



From 0 to 10 there are 10 little squares.
Each little square = 1 unit.

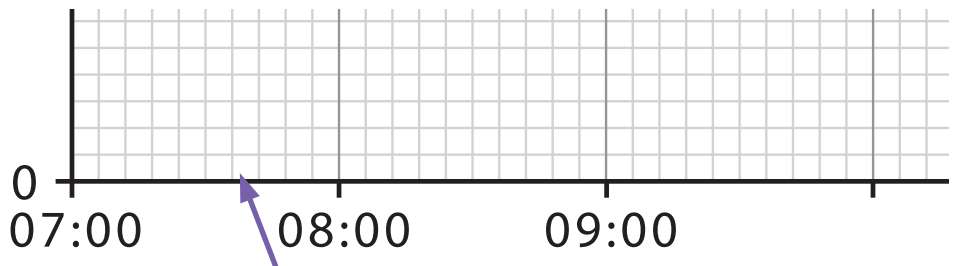
From 0 to 10 there are 5 little squares. 10 ÷ 5 = 2
Each little square = 2 units.



From 0 to 50 there are 10 little squares.
50 ÷ 10 = 5
Each little square = 5 units.

From 0 to 5 there are 10 little squares. 5 ÷ 10 = 0.5
Each little square = ½ a unit
or 2 little squares = 1 unit.

From 0 to 0.1 there are 10 little squares.
0.1 ÷ 10 = 0.01
Each little square = 0.01 units.



This scale is showing time.
10 little squares = 1 hour = 60 mins.
60 ÷ 10 = 6
Each little square = 6 mins.

Level 5

Construct, label and interpret a range of graphs.

What are scales?

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Scales on graphs

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Rewarding Learning

Choosing a scale

Scales should be carefully chosen as they affect the whole look of the graph. A good scale will illustrate the data clearly, be easy to interpret and make good use of the graph paper.

Follow these steps to choose a scale that works

1 Identify the largest and smallest values to be plotted on each axis.
2 Count the squares across the graph paper.
3 Decide how many units each interval represents on each axis.
4 Label divisions along each axis at regular intervals.

Example

The table shows data collected from an experiment on springs.

Mass/g	Extension/mm
0	0
100	24
200	57
300	92
400	131
500	172
600	215

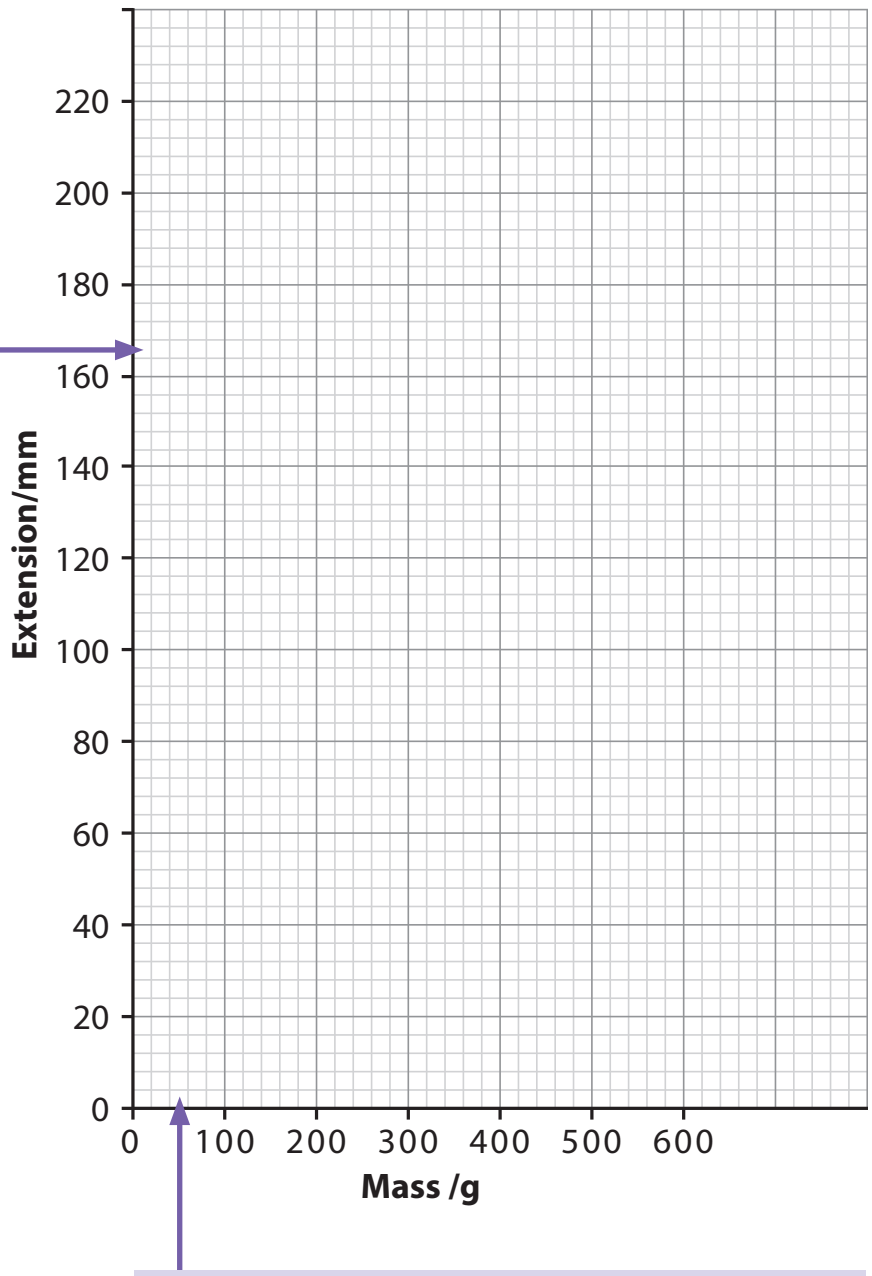
From the table we can see that the smallest and largest values for **Extension** are **0** and **215**

The smallest and largest values for **Mass** are **0** and **600**

Some of the points on the vertical scale will need to be estimated.

That is normal for real experimental data.

There are 12 bigger squares going up the side of the graph paper.
Going up in 10s will not fit.
Going up in 50s will only go halfway up.
Going up in 20s will be a better use of the graph paper.
Each small square will be worth 4 mm.



There are 8 bigger squares across the graph paper.
Going up in 50s will not fit.
One big square for each hundred will fit.
Each small square will be worth 20 g.

Level 5

Construct, label and interpret a range of graphs.