

Activity sheet

Graphing in science

Name: _____

Class: _____

In science, graphs are used to visually display data gained through experimentation. There are a number of different types of graphs, and it is important that you choose the right one to display your data.

Although software is available for creating graphs, drawing your own graphs is a useful skill to develop.

Line graph

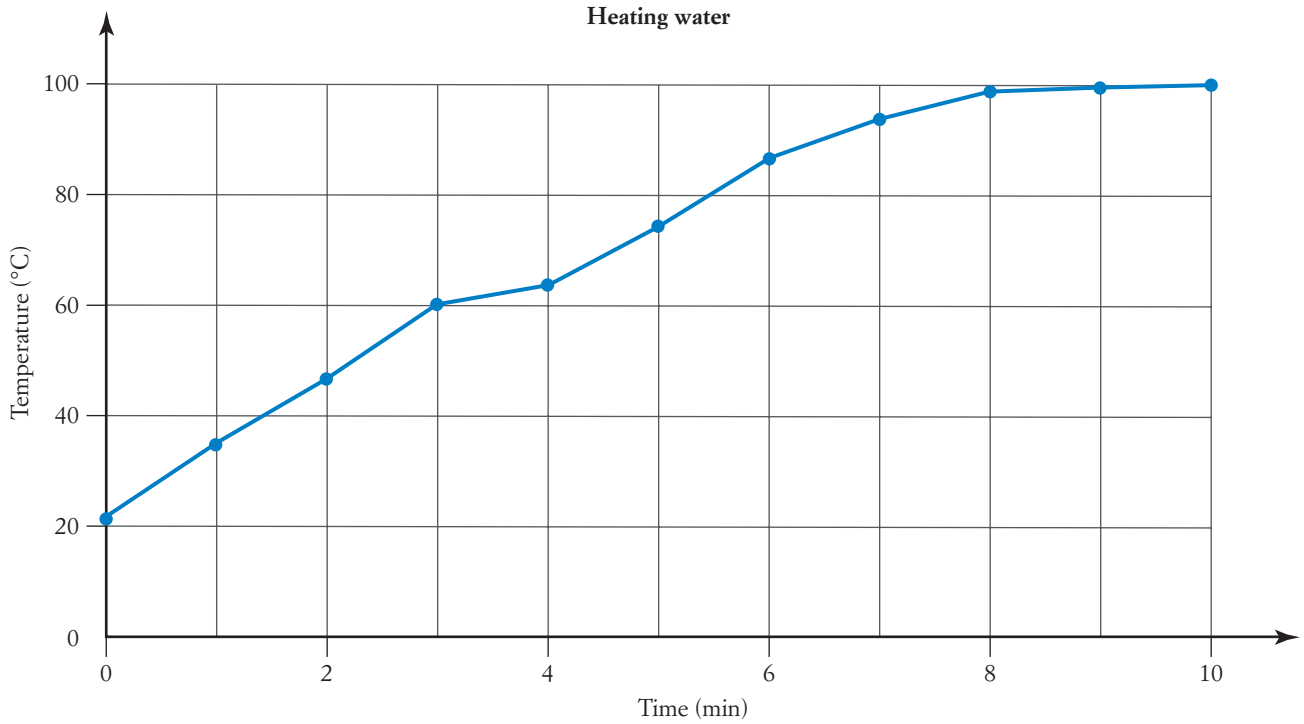
A line graph is used to display data that is continuous. That is, each point is related to the one before and the one after. Examples of continuous data are length, weight and temperature. For example, suppose that you measured the temperature in a beaker of water while it is being heated over a Bunsen burner for a period of 10 minutes. The data you collected is shown in the following table.

Time (min)	Temperature (°C)
0	23
1	35
2	46
3	59
4	63
5	72
6	86
7	92
8	98
9	99
10	100

When drawing a line graph, you need to use the following steps.

- 1 Draw two axes at right angles to each other.
- 2 Make sure the axes are long enough to show all of the information, with an arrow on the end of each.
- 3 Mark each axis with a suitable scale; for example, 1 cm = 10°C.
- 4 Name each axis to show what it represents.

5 Make sure your graph has a title that describes what the graph is showing.



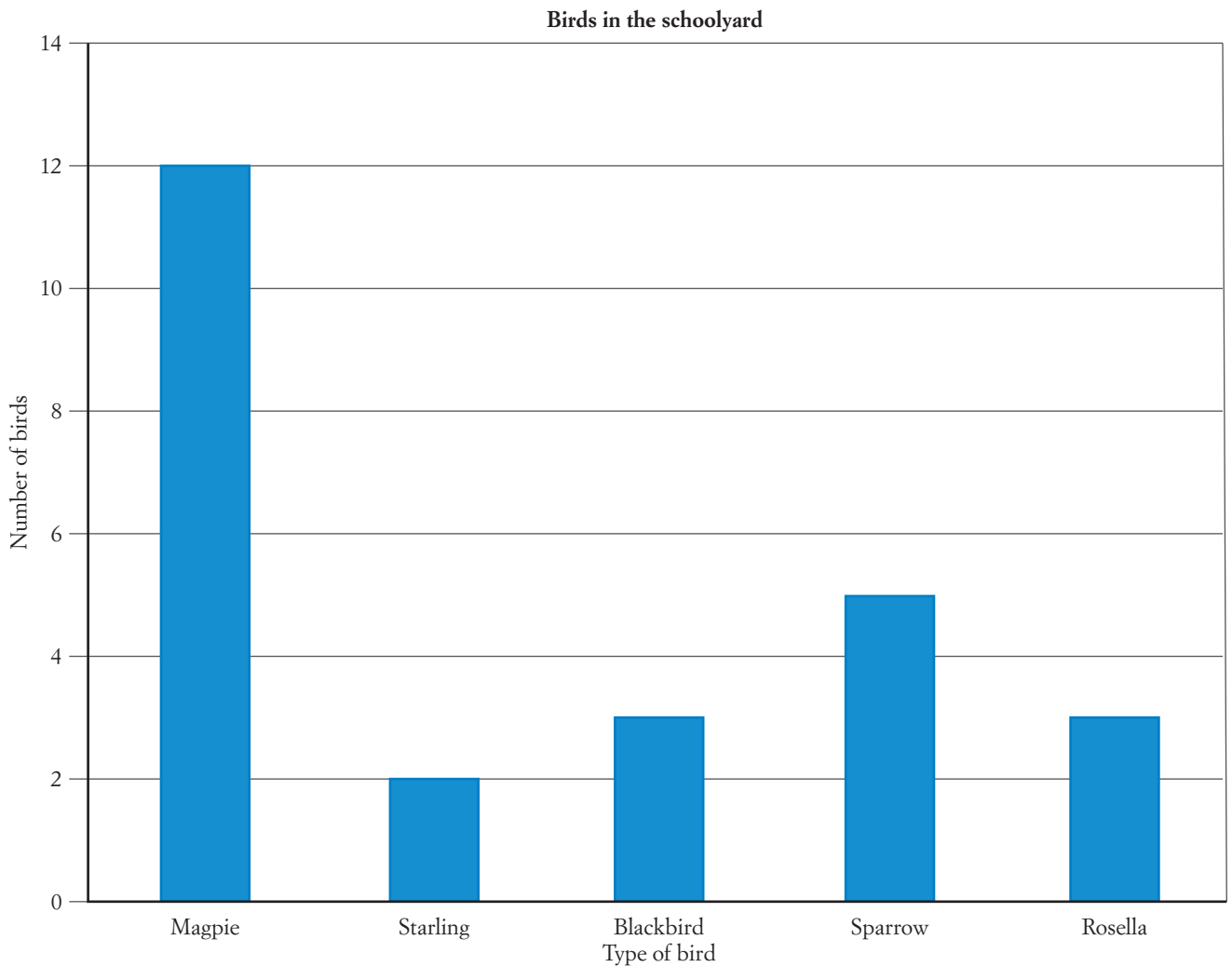
Column graph

A column (or bar) graph is used to display the number or amount in different categories or groups. For example, suppose that you collected the following data about the number of birds in the schoolyard at lunchtime.

Type of bird	Number of birds
Magpie	12
Starling	2
Blackbird	3
Sparrow	5
Rosella	3

When drawing a column graph, you need to use the following steps.

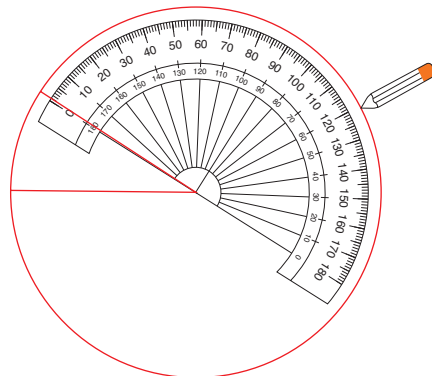
- 1 Draw two axes at right angles to each other.
- 2 Make sure the axes are long enough to show the information.
- 3 Mark each axis with a suitable scale.
- 4 Label the horizontal axis with the name of each category.
- 5 Label the vertical axis with the amount or number that occurs in each category. Make sure the scale is suitable.
- 6 Make sure your graph has a title that conveys the meaning about what the graph is showing.



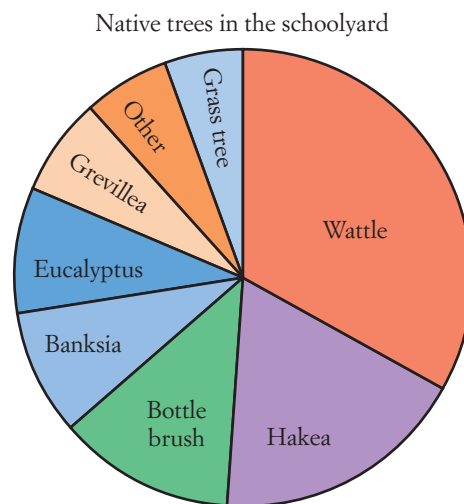
Pie graph

A pie (or circle) graph is used to show the parts of a total amount. When drawing a pie graph, you need to use the following steps.

- 1 Work out the total of all the measurements (the data that you gathered).
- 2 Make a table with the measurements in one column.
- 3 Change each measurement to a fraction or percentage of the total.
- 4 Calculate the angle for each measurement as a fraction or percentage of 360°.
- 5 Draw a circle, marking the centre and a starting radius. Use a protractor to mark each angle.



6 Make sure your graph has a title that shows what the graph is about.



For example, your class has completed a survey of all the native trees in your school ground. You have transferred this data into the following table.

Type of tree	Number of trees	Percentage (%)*	Angle(°)**
Eucalyptus	15	8.9	32
Wattle	56	33.3	120
Bottle brush	21	12.5	45
Hakea	30	17.9	64
Grass trees	9	5.4	19
Grevillea	12	7.1	26
Banksia	15	8.9	32
Other	10	6.0	22
Total	168	100.0	360

$$*Percentage = \frac{\text{number of trees}}{\text{total number of trees}} \times 100\%$$

For instance, for eucalyptus trees:

$$\frac{15}{168} \times 100\% = 8.9\%$$

$$** Angle = \frac{\text{percentage}}{100} \times 360^\circ$$

$$\frac{8.9}{100} \times 360^\circ = 32^\circ$$

Questions

Native trees in the schoolyard

For each question, which type of graph – line, column or pie – do you think would be the best way to display the data? Would any of those graph types be inappropriate? Explain your answers.

- 1 Jason asked 100 people if they believed that human activity is causing climate change. The possible responses were 'yes', 'no' or 'not sure'.
- 2 Maria hung six different weights from a rubber band and measured how much the band stretched each time.
- 3 At football training, Marco recorded how long it took each team member to run 10 laps of the oval.
- 4 On a fun run, Olivia wore a heart-rate monitor and recorded her heart rate every minute.

5 Paddy surveyed the class to find out each person's blood group.