As outcomes, Year 8 pupils should, for example:

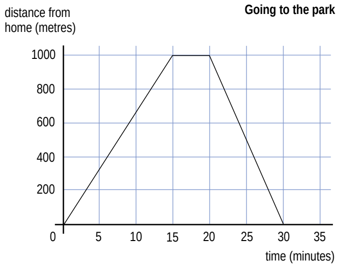
Construct linear functions arising from real-life problems and plot their corresponding graphs.

In plotting such graphs:

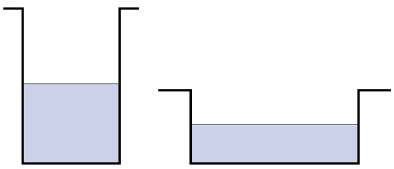
- write the appropriate formula;
- decide how many points to plot;
- construct a table of values;
- choose suitable scales for the axes;
- draw the graph with suitable accuracy;
- provide a title and label the axes.

For example:

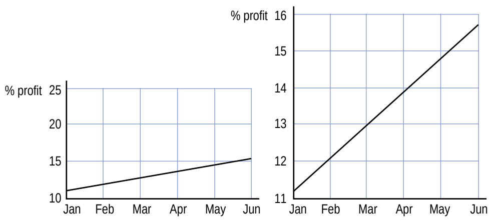
- Plot a simple distance–time graph.



- Sketch a line graph to show the depth of water against time when water runs steadily from a tap into these jars.

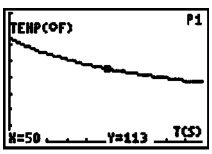


Begin to recognise that the choice of different scales and starting points can have a significant effect on the appearance of a graph, and can mislead or leave data open to misinterpretation. For example:



Use **ICT** to generate graphs of real data. For example:

- Use a **temperature probe** and **graphical calculator** to plot a cooling curve.



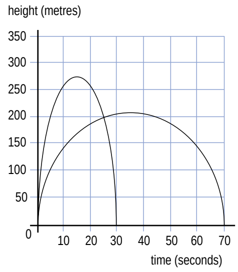
Link to line graphs (pages 264–5).

As outcomes, Year 9 pupils should, for example:

Construct functions arising from real-life problems and plot their corresponding graphs.

Draw and use graphs to solve distance–time problems. For example:

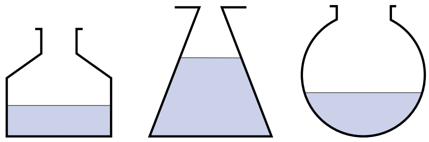
- This graph shows how high two rockets went during a flight. Rocket A reached a greater height than rocket B.



  Estimate how much higher rocket A reached than rocket B.
  Estimate the time after the start when the two rockets were at the same height.
  Estimate the number of seconds that rocket A was more than 200 m above the ground.

Sketch a line graph for the approximate relationship between two variables, relating to a familiar situation. For example:

- Sketch a graph of the depth of water against time when water drips steadily from a tap into these bottles.

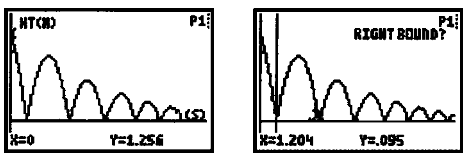


  Sketch graphs for other shapes of bottle.
  Predict the bottle shape from the shape of a graph.

- Sketch a graph of the number of hours of daylight at different times of the year.

Use **ICT** to generate graphs of real data. For example:

- Use a **motion detector** and **graphical calculator** to plot the distance–time graph of a bouncing ball.



Link to line graphs (pages 264–5).

Pupils should be taught to:

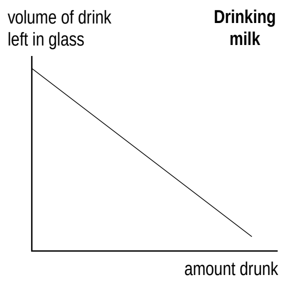
Construct linear functions arising from real-life problems, and plot and interpret their corresponding graphs (continued)

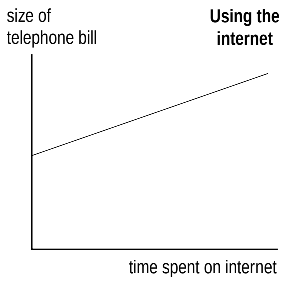
As outcomes, Year 7 pupils should, for example:

Discuss and begin to interpret graphs of linear functions, including some drawn by themselves and some gathered from other sources, such as a newspaper or the **Internet**.

For example:

Explain graphs such as:





In interpreting the graphs of functions:

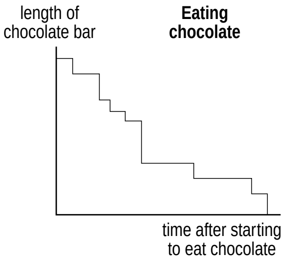
- read values from a graph;
- say whether intermediate points have any practical significance;
- say how the variables are related, e.g. they increase together.

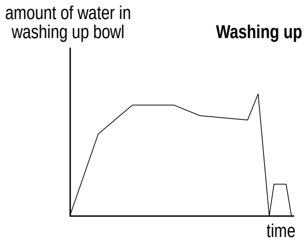
As outcomes, Year 8 pupils should, for example:

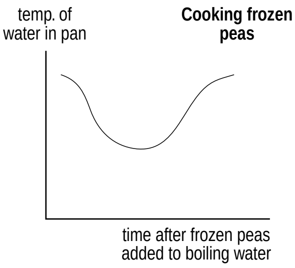
Discuss and interpret graphs of functions from a range of sources.

For example:

Give plausible explanations for the shape of graphs such as:







In interpreting the graphs of functions:

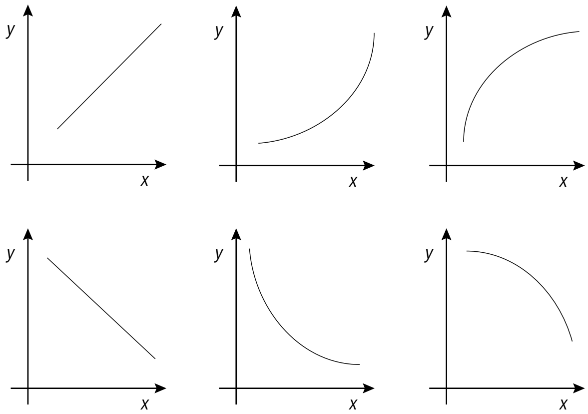
- read values from a graph;
- discuss trends, the shape of the graph and how it is related to the variables and the context represented.

As outcomes, Year 9 pupils should, for example:

Discuss and interpret a range of graphs arising from real situations.

For example:

For each of the situations below, suggest which sketch graph has a shape that most accurately describes it:



- the distance (y) travelled by a car moving at constant speed on a motorway, plotted against time (x);
- the number (y) of litres of fuel left in the tank of a car moving at constant speed, plotted against time (x);
- the distance (y) travelled by an accelerating racing car, plotted against time (x);
- the number (y) of dollars you can purchase for a given amount in pounds sterling (x);
- the temperature (y) of a cup of tea left to cool to room temperature, plotted against time (x);
- the distance (y) you run, plotted against time (x), if you start by running flat out, gradually slowing down until you collapse from exhaustion;
- the amount (y) of an infection left in the body as it responds to treatment, slowly at first, then more rapidly, plotted against time (x).

Choose phrases from these lists to describe graphs such as those above.

a. When x is large:
   y is large;
   y is small;
   y becomes zero.

b. When x is small:
   y is large;
   y is small;
   y becomes zero.

c. As x increases by equal amounts:
   y increases by equal amounts;
   y increases by increasing amounts;
   y increases by decreasing amounts;
   y decreases by equal amounts;
   y decreases by increasing amounts;
   y decreases by decreasing amounts.