



Interpreting graphs

There are many advantages to using graphs in chemistry.

Spot patterns and trends

It can be hard to see the pattern or trend when there are lots of numbers in a table. A graph makes the data visual, so it is easier to see if a reaction is speeding up, slowing down or progressing at a constant rate.

Make predictions

Once we have plotted points and drawn a line of best fit, we can predict what might happen at values we didn't test.

Compare different conditions

We can plot multiple lines on the same graph axes to compare how different conditions (e.g. temperature or concentrations) affect a reaction. The steeper the line, the faster the reaction.

Identify anomalies

We can spot any odd or anomalous results more easily on a graph as they don't fit the pattern.

In this worksheet you will focus on the key skills needed to effectively interpret data in graphs and tables.

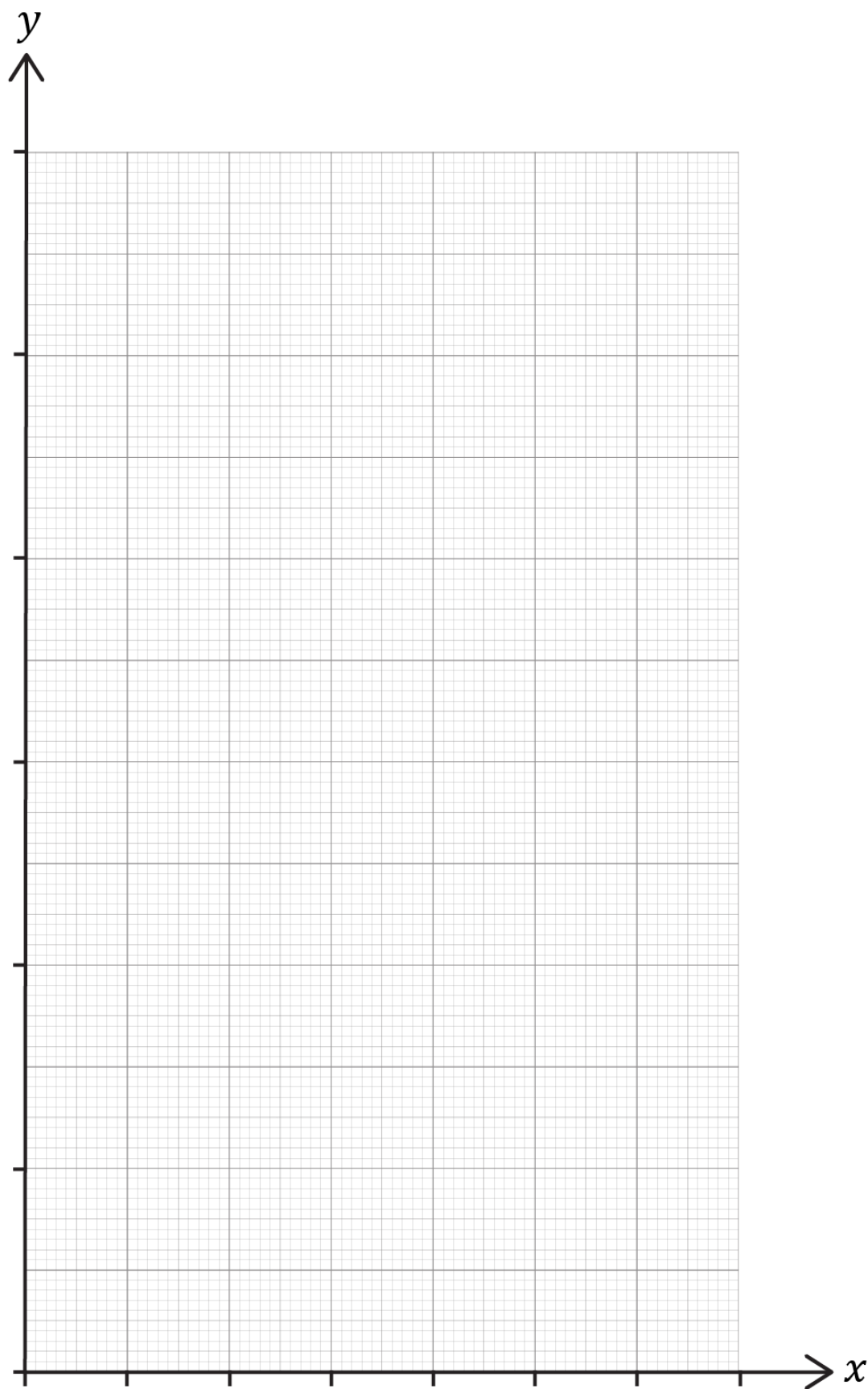
Questions

1. A learner investigated how much potassium nitrate dissolves in 100 g of water at different temperatures.

(a) Plot the graph on the graph paper provided.
Follow this approach:

- **Decide** which is the independent variable and plot this on the x -axis.
- **Identify** the range of each variable and choose a suitable interval for both axes.
- **Label** the axes with a title and unit.
- **Plot** the points with a sharp pencil.
- **Draw** a line of best fit.

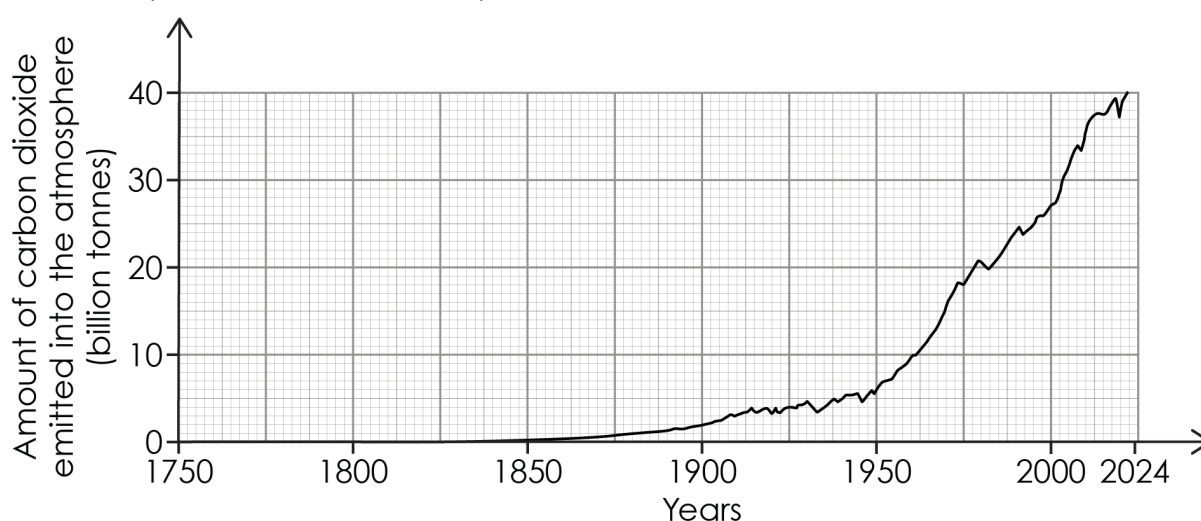
Temperature (°C)	Mass of potassium nitrate dissolved (g)
20	32
30	46
40	64
50	86
60	110





(b) Describe the relationship between the two variables.

2. This graph shows the amount of carbon dioxide emitted from fossil fuels and industry into the Earth's atmosphere since 1750.



- (a) When did the amount of carbon dioxide emitted into the atmosphere begin to increase?

- (b) Describe the trend shown in the graph.



3. A learner reacted calcium carbonate (marble chips) with hydrochloric acid. They used the same mass of marble chips but changed the surface area by using different sized pieces.

Size of pieces of marble chip	Surface area of marble chip	Time to collect 50 cm ³ of carbon dioxide (s)
1 large chip	small	240
4 medium chips	medium	122
8 small chips	large	58
powder	very large	15

(a) Identify the variables:

independent variable _____

dependent variable _____

control variables _____

(b) Describe what happens as the surface area increases.

(c) What type of relationship can be seen between the variables?



4. A learner investigated how adding salt to water affects the freezing point.

Mass of salt added (g)	Freezing point (°C)
0	0.0
1	-0.6
2	-1.1
3	-1.7
4	-2.2
5	-2.8

Describe the pattern in the data.

Acknowledgements

Graph on page 3 reproduced from: Global Carbon Budget (2025) – with major processing by Our World in Data. 'Annual CO₂ emissions' [dataset]. Global Carbon Project, 'Global Carbon Budget v15' [original data].