

Analysing data

Setting the scene

Scientists design experiments to answer a question. Once they have the data, they must analyse it to see if there is a pattern. If so, they can explain if there is a relationship. In this activity you will find out how to analyse data from experiments.

Aims

In this activity you will be using **enquiry processes** to:

- **Analyse:** plot graphs to look for patterns in data
- **Analyse:** use graphs to describe a relationship
- **Analyse:** describe the stages you must follow before stating a relationship between variables.

Task

Plot a graph for each table of data using the grids provided.

- A scatter graph or line graph are best when variables are continuous (can have any value).
- Choose the scale so the numbers go up in equal steps.
- The independent variable is in the first column and goes on the x-axis (horizontal axis).
- Plan ahead so the numbers you plot fit on the graph's axes.
- Don't forget labels and units for both axes.
- Plot the points on the graph.
- Draw a straight line that goes as close to all the points as possible.

Table 1

Volume of water (cm³)	Height of water in measuring cylinder (cm)
20	2
40	4
60	6
80	8
100	10

Graph 1

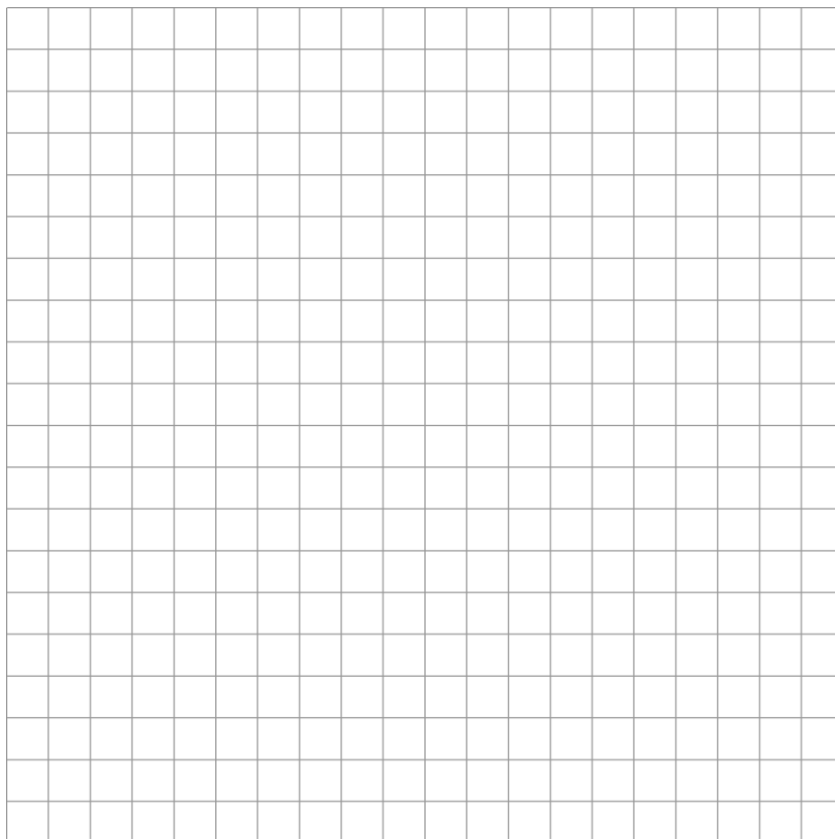


Table 2

Angle of incident light ray (°)	Angle of reflected light ray (°)
10	12
20	20
30	28
40	42
50	50

Graph 2

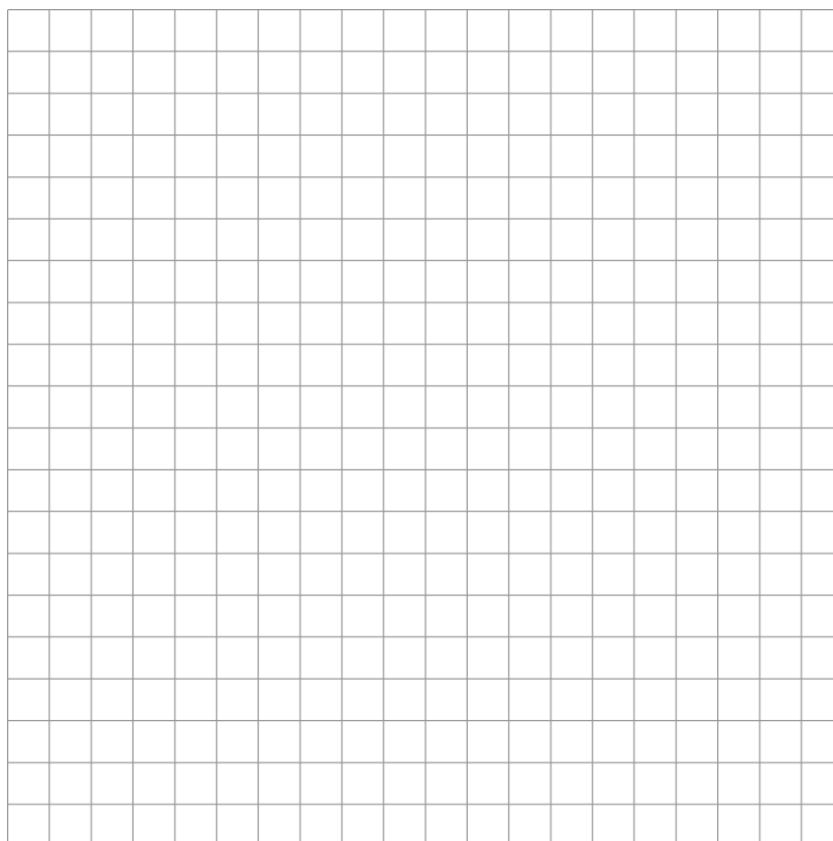
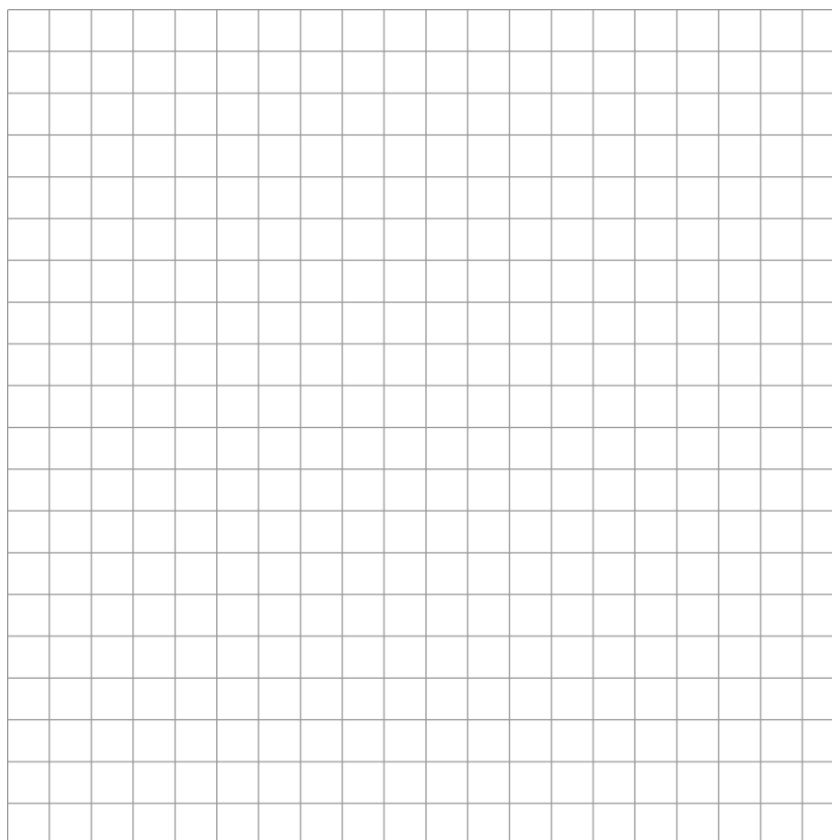


Table 3

Force used (N)	Length of rubber band (cm)
1	10.0
2	11.1
3	12.0
4	12.8
5	14.2
6	15.8
7	17.1
8	18.0

Graph 3



Describe the relationship each graph shows in as much detail as possible.

Graph 1 _____

Graph 2 _____

Graph 3 _____

Questions

1 Give another example of data you could plot on a line graph or a scatter graph.

2 Give an example of data you could plot on a bar graph.

3 Describe the stages you must follow to analyse data and describe a relationship.

Extension

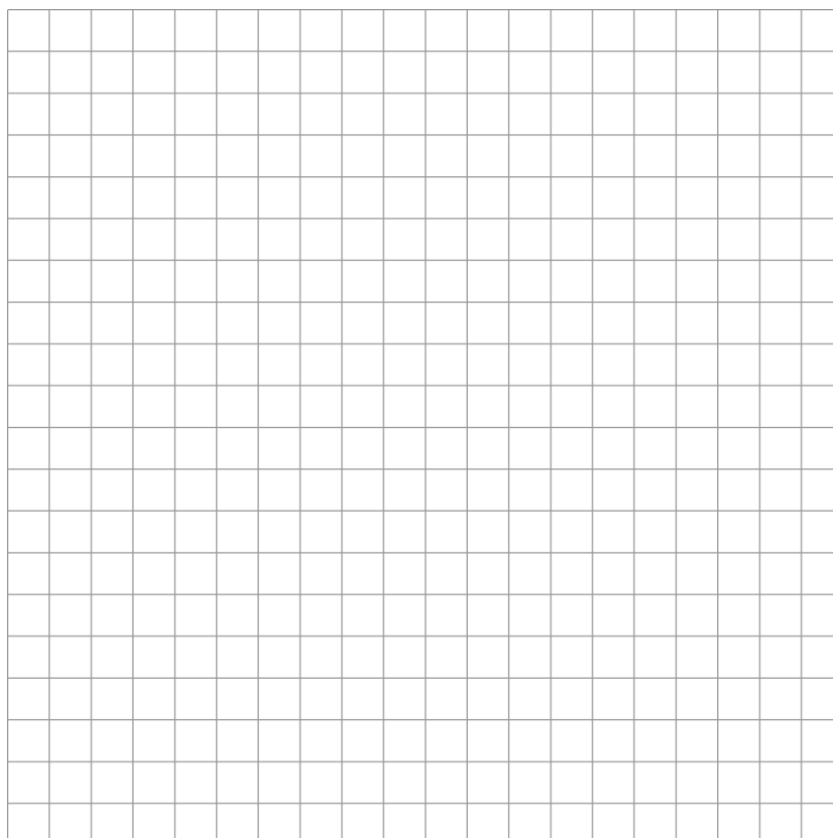
1 Plot this data on a scatter graph using the grid provided.

You do not need to start the scale for the y-axis at zero.

Table 4

Cooling time (s)	Water temperature (°C)
0	80
60	71
60	66
90	63
120	57
150	55
180	53
210	51
240	50

Graph 5



2 You cannot draw a straight line of best fit for this data. Explain how you choose the line of best fit.

3 Describe the relationship this graph shows. Use numbers to support your answer.
