

Investigation

Use this sheet to help you plan and carry out your investigation.

Before starting the investigation identify the variables, write a method, make a prediction and identify the risks.

Plan your table of results before you start the experiment.

What will you measure?
What intervals will you use?
Is it appropriate to repeat your measurements?

1. Identifying variables



Can you identify the independent, dependent and control variables?



Silver

Can you identify two of the variables?



Bronze

Can you identify one of the variables?

2. Method



Gold

Can you explain in detail how you will carry out the investigation?
Can you define the variables by name or by giving values?



Silver

Can you briefly describe how you will carry out the investigation?



Bronze

Can you list the equipment you will use?

3. Identifying risks

Make a prediction

Can you predict what your results will show?

CHALLENGE

Can you use a scientific idea to support your prediction?



Gold

Can you identify more than one hazard associated with this experiment, explain why they could be a danger and describe how you will minimise the risk?



Silver

Can you identify a hazard associated with this experiment, explain why it could be a danger and describe how you will minimise the risk?



Bronze

Can you identify a hazard associated with this experiment?

4. Collecting results



Can you collect a set of results, record them in a table and show the correct units? If appropriate make repeat measurements and calculate an average.



Can you collect a set of results and record them in a table?



Can you collect a set of results?

6. Interpreting results



Diamond

If possible, can you use your results to make a prediction?



Can you use numbers when describing your results or comparing sets of results?



If you've got more than one set of results, can you compare them?



Can you describe what your results show?

Choosing the right graph

If the independent variable isn't a number value then you should draw a **bar graph**.

If both the independent and dependent variables are number values then you should plot a **line graph**.

If you've drawn a line graph, then it needs a **line of best fit**. These lines pass through, or near as many data points as possible. It can either be a straight line, or a smooth curve. Look at the pattern to decide which is most appropriate.

Remember, plot the independent variable on the x-axis (horizontal) and plot the dependent variable on the y-axis (vertical).

7. Conclusions



Gold

Can you explain your results using scientific ideas and use the results you have collected to support your conclusion?



Silver

Can you explain your results using scientific ideas?



Bronze

Can you explain your results?

5. Presenting results



Diamond

If you've drawn a line graph can you draw a line of best fit? Can you circle any outliers that do not fit the trend?



Gold

Can you display your results as an appropriate graph drawn neatly with a sharp pencil and a ruler? Can you label the axes with titles and units? Are different sets of data clearly labelled?



Silver

Can you display your results as an appropriate graph drawn in pencil using a ruler?



Bronze

Can you display your results as a graph?

8. Making improvements



Gold

Can you also suggest a way of taking the investigation further? If you had any outliers, can you discuss what caused them?



Silver

Can you evaluate how effective the method was in giving reliable results and give practical suggestions for improving accuracy and reliability?



Bronze

Can you suggest an improvement to the experiment and give a reason?