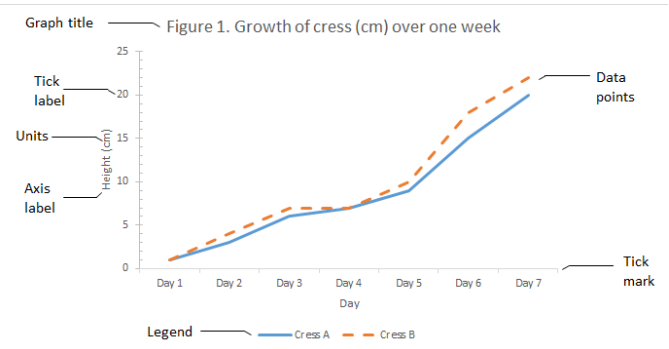
VISUALISING DATA: GRAPHS

What is a graph?
Graphs are a visual communication tool that can help consolidate large amounts of data. Graphs can be included in reports, presentations, posters or articles to help communicate the key findings of your research.

Common features of graphs.

- **Titles**: include descriptive titles for the graph and each axis.
- **Units**: include units of measurement for each axis (if appropriate).
- **Labels**: use tick marks on the axes and the corresponding numbers.
- **Legend**: include a legend that explains the symbols or colours used. Use different shapes so it can be printed in black and white.



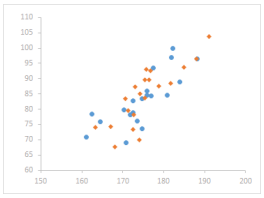
TIP
The dependent variable is usually plotted on the y-axis (vertical) and the independent variable on the x-axis (horizontal).

Dependent: what is being measured or studied e.g. growth/height
Independent: input or reason for variation, e.g. time

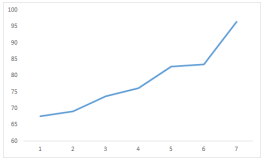
Choosing which graph to use.
It is essential to choose the right type of graph to display your data. Your data might work with multiple graph types—choose the most clear and accurate.

Relationships between two variables

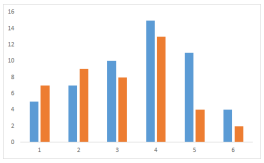
Scatter plot
Identifying relationships between 2 quantitative variables, e.g. correlation between age and height.



Line graph
Identifying trends over time or comparing categories over time, e.g. growth of plant (y) over time (x)

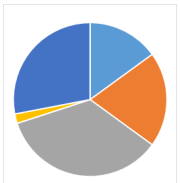


Bar graph
Presenting categorical data e.g. number of seed types.

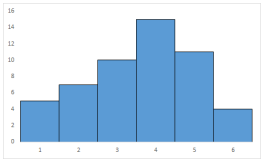


Distribution of one variable

Pie chart
Percentages or parts of a whole, e.g. nationalities of study participants.

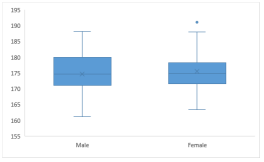


Histogram
Displays frequency distribution of continuous data, e.g. distribution of blood pressure.



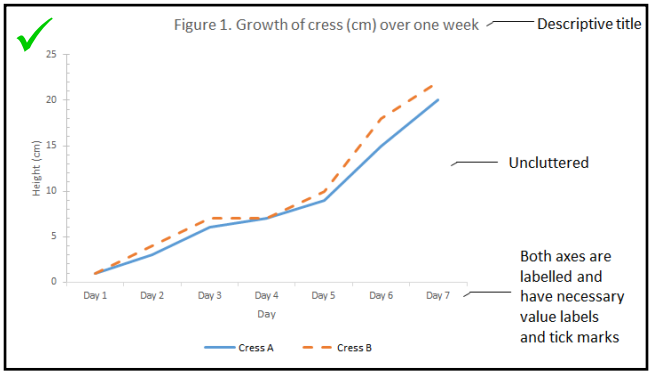
Distribution of two or more variables

Boxplot
Comparing categories or displaying distribution, e.g. comparing heights of males and females.

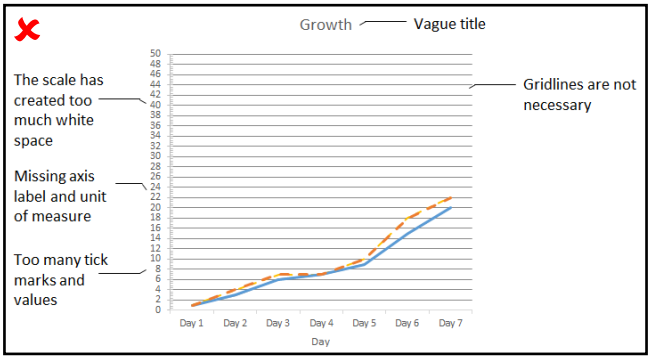


Making good graphs.

Example of a good graph.



Example of a poor graph.



TIPS FOR SCALING

- Scales should be easy to interpret
- Scales should NOT change along an axis
- Data should not be clumped in one region of the graph
- Leave room for axis titles, numbers, legends, etc.
- Shorten labels by using the correct unit of measure, e.g. Weight (tonnes) instead of Weight (kg)

How to include graphs in your work.

Follow these tips for including graphs in your assignment:

- Tell the reader when to look at a figure (reference should appear in the text before the graph).
- Number your graphs for easy referencing within the text and to help the reader easily find the graph.
- Introduce or explain the contents of the graph.
- Point out any key features or trends.
- Draw a conclusion from the chart.

Example: Figure 1 shows the correlation between height and weight of study participants. The graph shows a positive correlation between height and weight, with no differences between males and females.

Four ways to refer to your graphs in text.

1. As shown in Fig. X / As can be seen in Fig. X / As indicated in Fig. X ...
2. The data in Fig. X show that...
3. The seed counts for experiment X are given in Fig. X
4. As hypothesised, height and weight were positively correlated (see Fig. X)

TIP
If a graph is not your original creation, you must cite its source. If you change the original graph in some way, use “adapted from” when referencing.

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