**Graphing**

While there are several variations of each, the two basic types of graphs that you will use to record and display data in science are **column graphs and line graphs.**

**For each type of graph, you must place the independent variable on the horizontal axis and the dependent variable on the vertical axis.**

The type of graph appropriate for your data depends upon the type of observations and measurements recorded.

**Column Graphs**

**Column graphs** are the most appropriate graphs to use when the **independent variable** is **discrete data.** *Discrete data* are categorical (descriptions) or counted (for example – gender, months of the year, brands of soccer ball, the count of people in a room).

**Test for discrete data:** If the intervals between values on the horizontal axis **cannot** be logically divided then the data is generally discrete; for example, you can’t have 1.33 people in a room and you don’t normally say that the current month is 1.5 Februaries.

**Line Graphs**

**Line graphs** are generally used to plot ***continuous data***(measurements associated with a standard scale or continuum).

The lines on scientific graphs are usually drawn either **straight** or **curved**. These "smoothed" lines do not have to touch all the data points, but they should at least get close to most of them. They are called **lines of best fit**.

**In general, scientific graphs are not drawn in connect-the-dot fashion.**

**Test for continuous data:** If the intervals between values on the horizontal axis **can** be logically divided then the data is generally continuous; for example, you can have 1.33 degrees Celsius measured on a digital thermometer and it is possible to measure 1.5 centimetres on a ruler.

**The parts of a line graph include:**

1. **Data pairs:** Graphs are made using pairs of numbers. Each pair of numbers represents one data point on a graph. The first number in the pair represents the independent variable and is plotted on the *x axis*. The second number represents the dependent variable and is plotted on the *y axis*.
2. **Axis labels:** The label on the *x axis* is the name of the independent variable. The label on the *y axis* is the name of the dependent variable. Be sure to write the units of each variable in parentheses after its label.
3. **Scale:** The scale is the quantity represented per line on the graph. The scale of the graph depends on the number of lines available on your graph paper or grid and the range of the data. Divide the range by the number of lines. To make the calculated scale easy-to-use, round the value to a whole number.
4. **Title:** The title on the graph should have a meaning that allows the viewer to instantly know what the graph is about without the viewer having to read any other text.

**Graph Checklist**

|  |  |
| --- | --- |
| **What makes for a good graph?** | **For a good graph, you should answer "yes" with a tick to every question** |
| Have you selected the appropriate graph type for the data you are displaying? | 🞏 |
| Does your graph have a title? | 🞏 |
| Have you placed the independent variable on the x axis and the dependent variable on the y axis? | 🞏 |
| Have you labelled the axes correctly and specified the units of measurement? | 🞏 |
| Does your graph have the proper scale (the appropriate high and low values on the axes)? | 🞏 |
| Is your data plotted correctly and clearly? | 🞏 |
| If your graph is a line graph, have you drawn a line of best fit? | 🞏 |