The Use of Tables and Figures

When a researcher presents his data to the scientific world, he tries to make that data as easily understandable as possible. Two widely used methods for doing this are tables and graphs. Whenever these methods are used in a scientific paper, however, certain requirements must be adhered to.

- Tables are referred to as **tables**: all other items (graphs, drawings, maps, etc.) are referred to as **figures**.
- Whenever a table and/or figure is included in the scientific paper, there **must** be some reference to that table or figure in the text of the paper. For example, “The results of the temperature experiment are shown in Figure 1”. This tells the reader that all the data have been put together in one part of the paper known as Figure 1 – a graph, perhaps – and that the reader should refer to that figure to see what results were obtained and what patterns were discerned.

- Tables and figures are numbered independently of each other. For example, assume that your paper contains three tables and two figures. The tables would be numbered Table 1, Table 2 and Table 3. The figures would be numbered Figure 1 and Figure 2, **not** Figure 4 and Figure 5.
- Place the tables and figures as close as possible to the actual page where the table or figure is mentioned in the text. This makes it easier for the reader to refer to the table or figure when it is mentioned in the paper.
- All tables and figures should include the units of measurement involved (grams, meters, seconds, etc.). Otherwise, the data will mean nothing to the reader. All columns and rows in a table should have separate legends, and both axes (X-axis and Y-axis) of a graph must have separate legends. All legends for axes that display numbers must tell: **1.** What is measured (e.g., mass) and, **2.** The units of measurement (e.g., grams).
- The increments of measure need to be consistent along each axis. Eg. 5 graph boxes cannot equal one gram on one part of the axis and 10 grams on another part of the same axis.
- Except for a scatter plot, all plotted points on a graph must include **error bars** to show either the range of the data or standard deviation.
- All tables and figures must be numbered and must have **self-explanatory** titles. In other words, the reader should be able to look at a table or figure and, simply by reading the title, know exactly what was done in that part of the experiment without having to read the text of the paper for explanation.

- When showing the results of an independent variable’s influence on a dependent variable’s, there are three things that need to be included in the title: **1.** What the dependent variable is; **2.** What the independent variable is and, **3.** What the subjects are.  
  - Here’s a good title: Table 1. The Effect of Temperature on the Change in Height of Apple Trees Over a Ten Year Period  
  - And here’s a bad one: Figure 1. Results of Apple Tree Experiment
- The title of a table goes on **top** of the table and the title of a figure goes **underneath** the figure.
- A **straightedge** must be used for all lines drawn. These include axes lines, bar graph boxes, etc.
- If applicable, the dependent variable goes on the **y** axis and the independent variable on the **x** axis.
- **DO NOT** write in the margins of composition paper, except for your name, date, etc.
- **DO NOT** crowd words so that they are hard to read.
- Graphs MUST be on graph paper or computer generated.
- NEVER put the title on a different page than the table or figure.

**Checklist:**
- Did you refer to each table and figure in the text (if they are part of a lab report)?
- Is the title on the same page as the table or figure?
- Are tables and/or figures numbered independently & in the order that they appear in the text?
- Is the table or figure close to the place in the lab report where it is mentioned?
- Does the title of the table or figure have the required things (ind. var., dep. var., subjects) to make it self-explanatory? Can the table or figure “stand by itself” without needing further explanation?
- Does the legend of each axis include: 1) what is measured and; 2) the units of measurement?
- Did you place the title in the right place (below the figure, at the top of the table)?
- Did you use a **straightedge** to draw your lines?
- Are all graphs done on graph paper or computer generated?
- Do all plotted points have error bars?