TABLES and FIGURES

Visual support may be used throughout a scientific paper and is most commonly seen as a **table** or **figure**. **Tables** are arranged in rows and columns with the table number and legend **above** the table (Table 1). **Figures** may be graphs, pictures, maps, or any other similar type of visual aid that is not a table. Figures are also numbered and have legends **below** the figure (Figure 1). Tables and figures are numbered independently of each other and are numbered in the order they appear in the paper. Typically tables and figures are associated with the results section of a paper; however, tables such as those provided for clarity (Table 1) and figures provided for visual understanding (Figure 1) may be provided in any section of a paper.

If a table or figure is provided in a paper, **it must be referred to in the corresponding paragraphs of the appropriate section or sections of the writing**. An example of the wording that would go along with Table 1 is shown below. In this example, the table would initially be cited in the methods portion of the paper, as it provides the names of the nine treatments used in this experiment, as well as the final concentration of each variable.

EXAMPLE: How to describe and refer to a table in a lab report

To quantify the impacts of glucose and ethanol on yeast growth over time, nine treatments, each with five replicates, were created (Table 1). Yeast growth media (1% yeast extract, 2% peptone in distilled water and autoclaved) was added to each test tube followed by the additions of glucose and ethanol to reach the appropriate final concentrations. *S. cerevisiae* cells were added to create a final concentration of 0.0035% per tube. An initial absorbance reading for each sample was taken at 550 nm, and then all replicates were incubated in a shaking water bath at 37^{o}C.

Table 1. Abbreviations for nine treatments of yeast growth media with final concentrations of glucose and ethanol noted for each.

Treatment	Glucose Concentration	Ethanol Concentration
NG NE	No glucose (0%)	No ethanol (0%)
LG NE	0.5% final concentration	No ethanol (0%)
HG NE	1.0% final concentration	No ethanol (0%)
NG LE	No glucose (0%)	4.75% final concentration
LG LE	0.5% final concentration	4.75% final concentration
HG LE	1.0% final concentration	4.75% final concentration
NG HE	No glucose (0%)	9.5% final concentration
LG HE	0.5% final concentration	9.5% final concentration
HG HE	1.0% final concentration	9.5% final concentration

While **graphs** are typically the most used figure, items such as **pictures** and **maps** may be useful to orient the reader. It is imperative to label and refer to these items as figures in your paper. If you **did not** create these items, you must also **cite the source** of the work. See the wording to refer to Figure 1 below, which would most likely appear in the introduction portion of a paper.

EXAMPLE: How to describe and refer to a <u>figure</u> in a lab report

Manduca secta (tobacco hornworm) larvae often blend in with the stems and leaves of the plants they consume, which protects them from avian predators (Figure 1).

Figure 1. *Manduca sexta* larva nearing pupation. The horn is located on the posterior, dorsal region of the organism.

Graphs are the most common type of figure and are typically found in the Results section of a lab report (Figure 2 and Figure 3). The type of graph used will depend on the type of data. (See Chapter 3 - Results for more details on data types.)

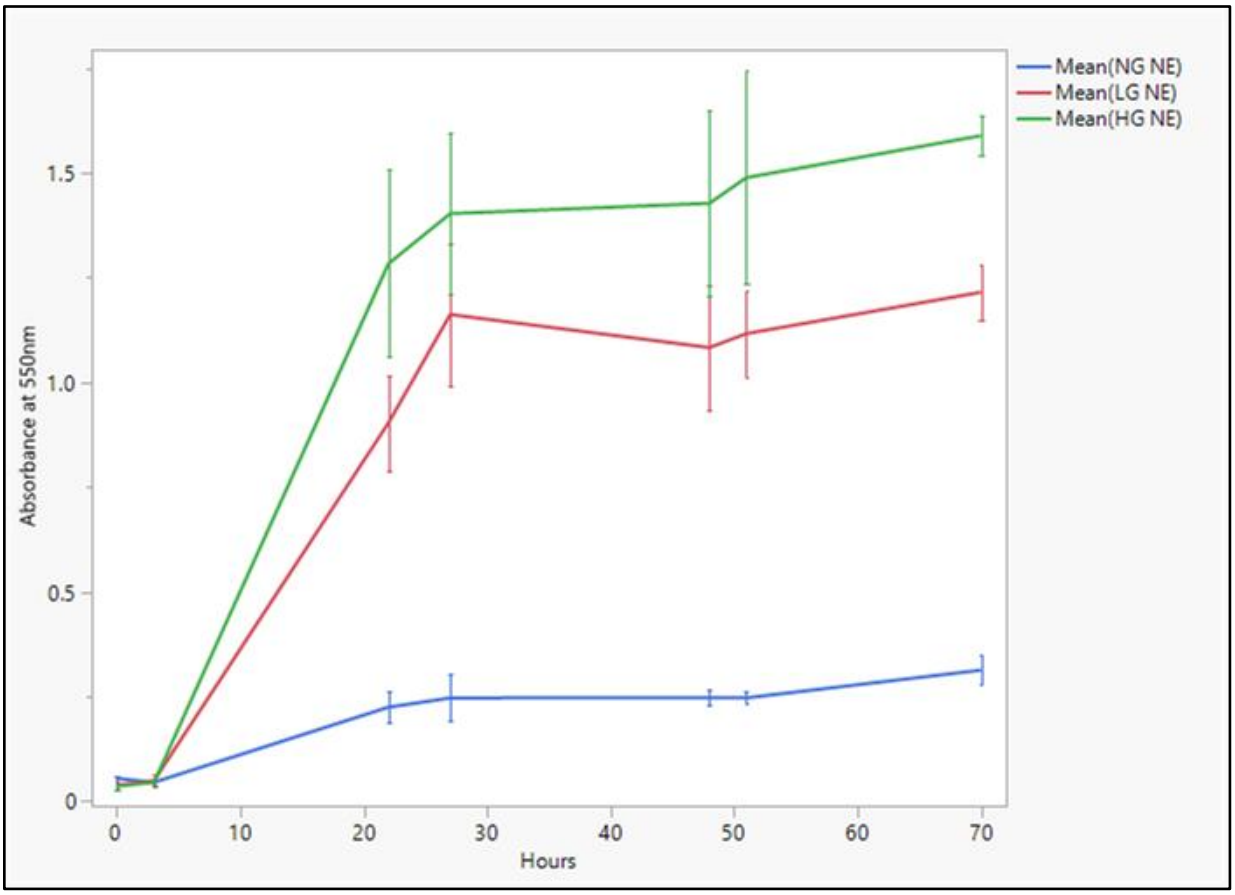

Figure 2. Mean absorbance at 550 nm over 70 hours. Error bars represent one standard deviation from the mean.

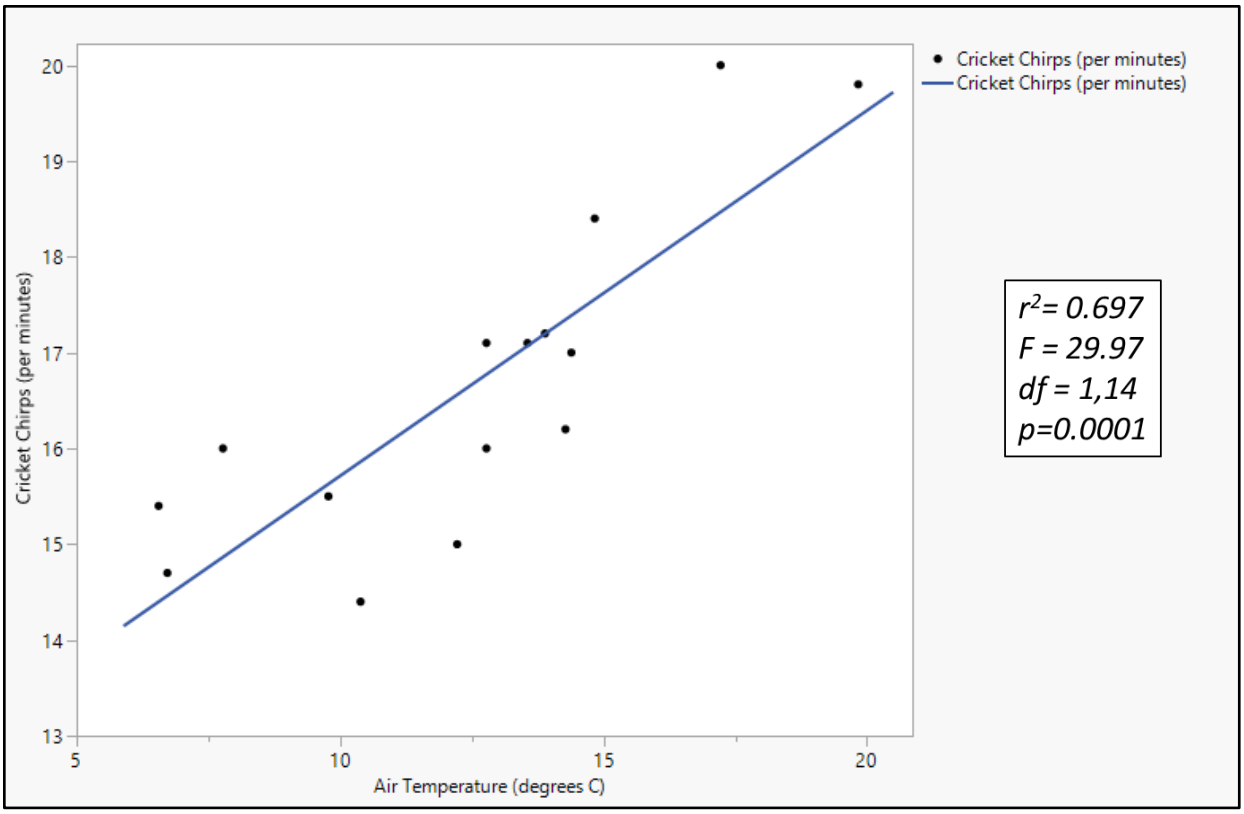

Figure 3. Cricket chirp rate in response to ambient temperature. The blue line represents a linear fit of the data.

Axis Scales and Tick Marks

It is important that the axes accurately reflect the relationships between the data points. For example, fixed volume micropipettors used at RCBC have volumes that range from 20***µ***l - 1000***µ***l (Table 2), but the difference between the volumes is not consistent. When determining how best to graphically represent Table 2, it is necessary to represent the volumes accurately numerically (Figure 4) instead of distributing the volumes without regard to the numerical value (Figure 5). Note that the inappropriate spacing of the x-axis in Figure 5 changes the shape of the line and therefore analysis of the results.

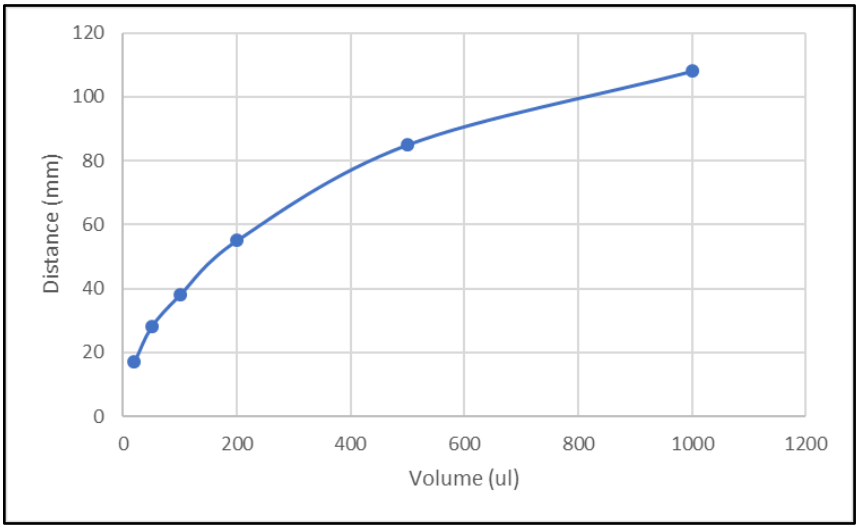

Figure 4. A graph with **numerically appropriate** spaced values along the x-axis.

Table 2. Data table for Figure 4 and Figure 5.

Volume (ul)	Diameter (mm)
20	17
50	28
100	38
200	55
500	85
1000	108

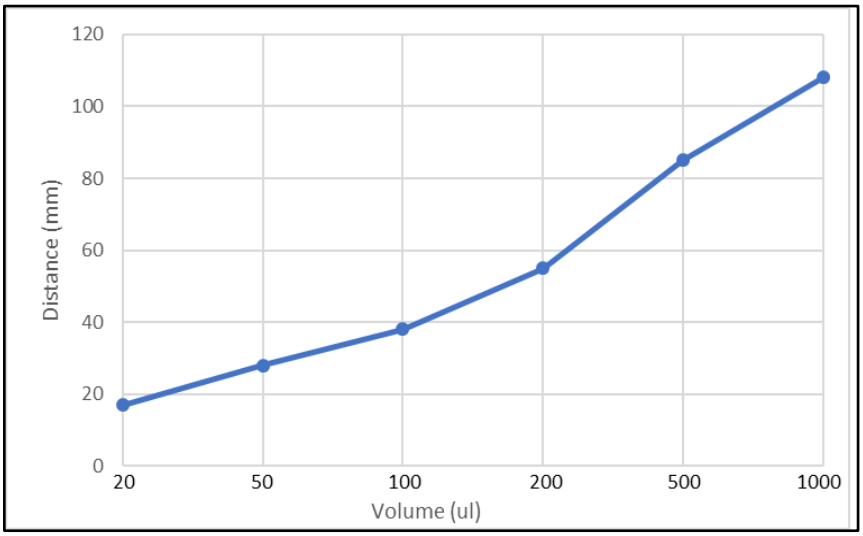

Figure 5. A graph with **even but numerically inappropriate** spaced values along the x-axis. Note that the difference between 50***µ***l and 20***µ***l is **30*µ*l**, while the difference between the 1000***µ***l and 500***µ***l is **500*µ*l**. However, the space between tick marks for each size difference (30***µ***l and 500***µ***l) is represented the same way even thought 500***µ***l is more that 16 times larger than 30***µ***l.

REFERENCES

Hofmann AH. 2022. *Writing in the biological sciences: a comprehensive resource for scientific communication*, 4th ed. New York (NY): Oxford University Press; p. 67-88.

Pechenik JA. 2016. *A short guide to writing about biology*, 9th ed. Boston (MA): Pearson Education, Inc.; p. 159-181.

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