***Variation in Leaf Size***

**Purpose:**

To practice metric measurement

To calculate summary statistics (mean, median, mode)

To organize and graph data

To determine the relation between leaf length, width, and area

**Materials:** metric ruler and leaves

**Procedure:**

1. Measure the length and width of 20 leaves (nearest .01 cm)
2. Record in data chart
3. Calculate leaf area
4. Determine range, mean, median, mode for each measurement set
5. Construct a scatterplot of length vs width   
   Construct a line of best fit *if appropriate*
6. Construct a scatterplot of length vs area  
   Construct a line of best fit or *if appropriate*

**Results:**

data chart for 20 leaves

length vs width graph for 20 leaves

length vs area graph

**Discussion:** *Remember to use data from your charts and graphs to support your statements.*

1. Briefly summarize what you did.
2. Describe the shape and other characteristics of the leaves you measured.
3. Were the leaves you measured all about the same length or did they differ?  
   *(Hint: What does the range value indicate?)*
4. Describe the summary statistics for your set of 20 leaves.   
   *How close were the mean and median for length, for width, for area?*  
   *Which measurement had the larger range? The smaller range?*
5. Compare your statistics to those of another group*.   
   Do you see any patterns? Are they similar to yours, close enough, or very different?*
6. Describe the graph patterns for your set of 20 leaves.  
   *Does the graph represent a direct, moderately direct, slightly direct, indirect, negative, or no relation?  
   Does the length vs width or the length vs area graph show a more distinct pattern or do they show similar patterns?*
7. Were your area calculations accurate\*? Explain   
   *(Hint: What formula did you use to calculate area? Were the leaves rectangular?)*
8. For the purposes of this lab, is it better to measure leaves that are similar in length or leaves that are more dissimilar in length? Is it better to measure more leaves or fewer leaves? Explain.
9. Indicate at least 3 sources of error in this activity.
10. Suggest improvements for this activity.

**Conclusion:**

*A testable statement about the relation of leaf length and width*

*A testable statement about the relation of leaf length and area*

*What would be your prediction about the relation of leaf width and area?*

**Reflection:** *(A personal statement about what you learned from the activity)*

\* Accuracy is defined as closeness of a measured value to the actual value.   
Precision is defined as closeness of a series of values to each other.