Name_____

Post-Experimental Stage:
Data Analysis & Drawing Conclusions

SAFETY: Use care handling the tubes; they will break!

Background Information: After data is recorded it must be analyzed. Often scientists have so many numbers, that the data needs to be **REDUCED** to make sense. Reducing data often includes finding a measure of central tendency, or one number that can represent many numbers. The mean, median, and mode are measures of central tendency.

Graphing the reduced data helps scientists observe patterns and relationships between variables quickly. Bar graphs allow scientists to compare data, line graphs show trends – especially over time, and scatter plots show correlations between variables.

1. Reduce your data to find the means, and then graph the means in a line graph.
2. Graph your data from the red tube. Use a red map pencil.
   a. Plot the angles on the X-axis. Why? _____
   b. Plot the time on the Y-axis. Why? _____
   c. Connect the dots with the map pencil.
3. Graph your data from the blue tube on the same graph. Use a blue map pencil.
4. Graph your data from the green tube on the same graph. Use a green map pencil.

Why is a line graph the best type of graph for this data?

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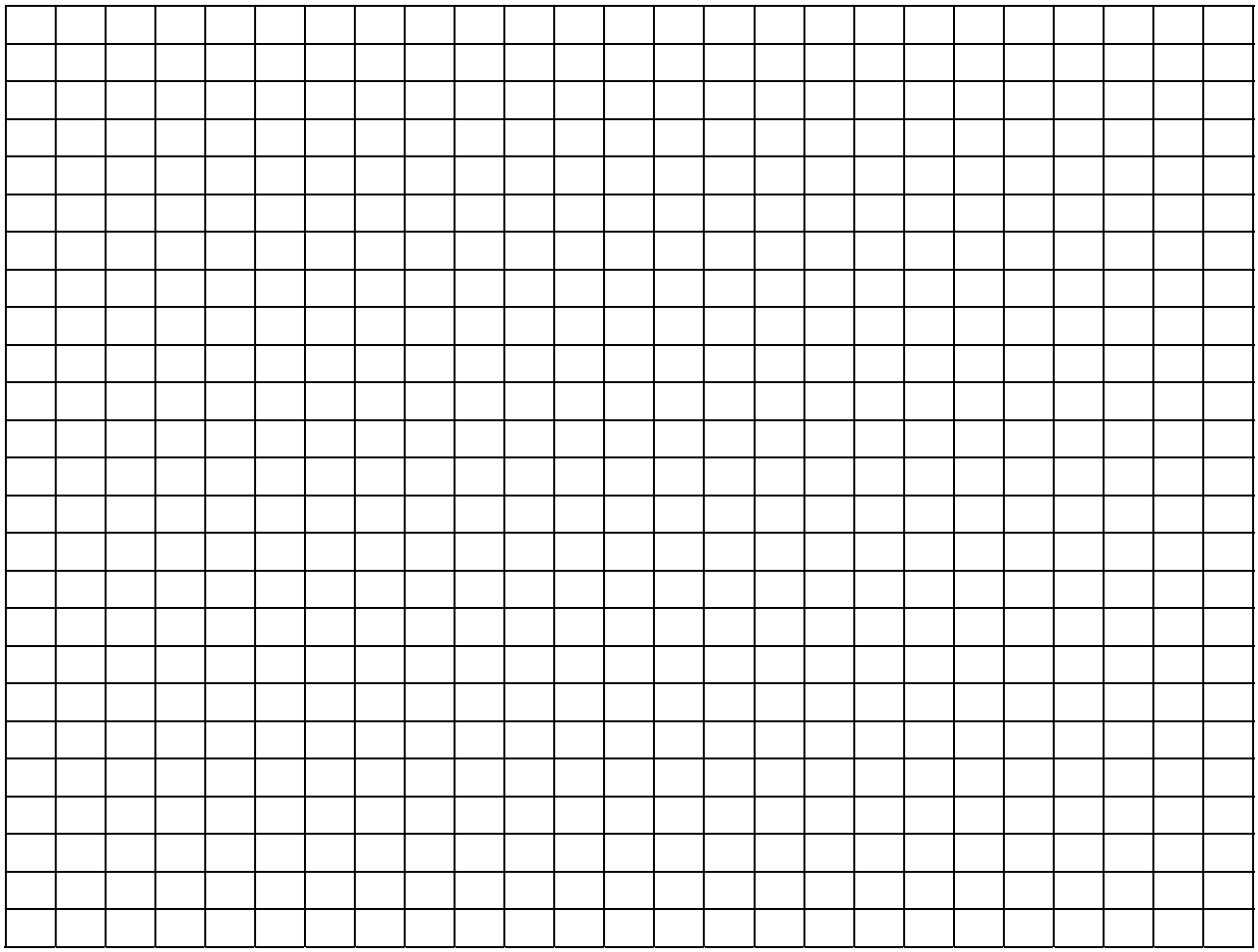
T – Title	**D** – Dependent
A – Axis	**R** – Responding
I – Intervals	**Y** – Y-axis
L – Labels	
S – Scale	**M** – Manipulated
	I – Independent
	X – X-axis



Look for **RELATIONSHIPS** - two variables are related if one of them changes whenever the other one changes. There are two kinds of relationships:
DIRECT RELATIONSHIP: When one variable increases the other variable increases.
INDIRECT RELATIONSHIP: When one variable decreases the other variable increases.

What relationship(s) do you see?

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After the data have been analyzed, a **CONCLUSION** is written. A conclusion is a written answer to the question. Sometimes the answer is "I don't know." Sometimes a conclusion is an inference.
Whatever conclusion is drawn it is **always, always** supported by actual data from the experiment. An answer without evidence is meaningless.

Write a conclusion for your experiment below.

1. Restate the question and your hypothesis.
2. Explain whether or not the data supported your hypothesis. Remember a hypothesis never right or wrong, just supported or not supported. You can learn as much when your hypothesis is not supported as you do when it is!
3. You must give actual data [evidence] from your experiment to back up what you say.
4. Describe the relationship(s) in the data.
5. Explain any inferences.
6. Describe any sources of error and explain how to correct them.