Name: _____
Mr. Willis
Biology: _____
Date: _____

Unit I
Biology – The Nature of Science
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I

Question and Hypothesis Worksheet

A student is interested in designing several experiments to test the factors that effect how quickly an Alka-Seltzer® tablet dissolves in water (solution rate). For each question, write an appropriate hypothesis that could be tested with an experiment. Be sure each hypothesis is in the proper *"If…, then… , because…"* format.

Example:
Question: What effect does stirring have on solution rate?
Hypothesis: If the water is stirred, then the tablet will dissolve faster because stirring increases solution rate.

Part 1

1. Question: What effect does the water temperature have on solution rate?

Hypothesis: _____

_____

2. Question: What effect does crushing the tablet have on solution rate?

Hypothesis: _____

_____

3. Question: What effect does adding soda to the water have on solution rate?

Hypothesis: _____

_____

Part 2

The next three questions are about factors affecting plant growth. For each question, write an appropriate hypothesis that could be tested with an experiment. Be sure each hypothesis is in the proper *"If…, then…, because…"* format.

4. Question: What effect does the amount of light have on plant growth?

Hypothesis: _____

_____

5. Question: What effect does the amount of water have on plant growth?

Hypothesis: _____

_____

6. Question: What effect does using plant food (Miracle Grow®) have on plant growth?

Hypothesis: _____

_____

Experimental Design

Select one of the questions from Part 1 above to test the effect of one variable on the solution rate of Alka-Seltzer®. Apply the steps of the Scientific Method to test the validity of your hypothesis. Once the plan is complete, follow the steps to conduct the experiment.

Question: Copy the question that you have selected from page 1. _____

_____

Hypothesis: Copy the hypothesis (remember to use the proper format – *"If…, then… because…"*): ____

_____

_____

Experiment: Plan your experiment by following the steps below.

What is the independent variable (manipulated variable) that you are testing? _____

What is the dependent variable (responding variable)? _____

What variables must be kept constant for this to be considered a "controlled experiment?" _____

_____

List the materials you will need to perform this experiment. _____

_____

_____

Outline the procedure you will follow as you conduct this experiment. Be specific. Include a control group and allow for adequate time to repeat the experiment to verify your results.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Create a data table to show your results.

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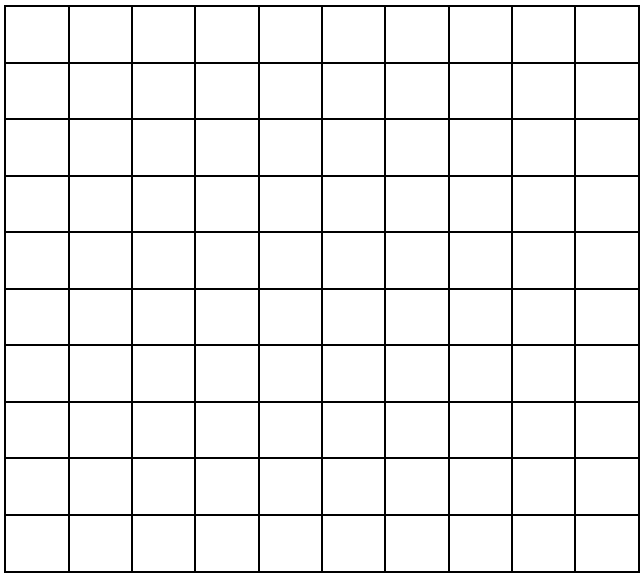
Use the data that you have collected to create an appropriate graph. Include an appropriate title, labels including units, and scale.



Interpret the Data: What does your data show? Be specific and descriptive. _____

_____

_____

_____

Conclusion: Did the results of your experiment validate your hypothesis? _____

If your hypothesis appears to be true, restate your hypothesis below, otherwise, revise your hypothesis so that it is consistent with the interpretation of the data that you have made from your results.

_____

_____

_____

What other variables might you test that would effect the solution rate of Alka-Seltzer®?

_____

_____

_____