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.
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®?
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________