Names Period Date

**Grab Bag – Conservation of Mass**

Have you ever played a gift giving game where the packages were wrapped and everyone took turns choosing a present, sight unseen? This is similar to what you are doing today. There will be bags of lab materials for your group to choose from, but you won’t know what is inside until you start the lab. Depending on the bag you choose, you will be asked to either design an experiment to determine the effect on mass when a substance undergoes a *physical* change or to design an experiment to determine the effect on mass when a substance undergoes a *chemical* change. Once your group has come up with an experimental plan, you will be performing your experiment in front of the class.

**Experimental Plan**

**Statement of the Problem/Purpose:** What is the question that the experiment is trying to answer, or the problem it is trying to solve. Also, give a brief description of why the question is scientifically important (purpose of research).

**Hypothesis:** What is the prediction about the outcome of the experiment? This statement should be written in future tense using an "If/then" or prediction format.

**Test Variable (Independent Variable):** What will be purposely changed in the experiment?

**Outcome Variable (Dependent Variable):** What will be measured? Include how the dependent variable will be measured (including what instrument or tool will be used) and in what metric units.

**Control Group:** Will your experiment have a control group? Is a control group necessary for your type of experiment? If so, what will be used as a standard for comparison? The control is the standard to which all experimental groups are compared.

**Constants:** What things in the testing environment will stay the same for all parts of the experiment?

**Materials:** Which bag did you end up with? List any additional equipment needed to conduct this experiment.

**Procedures:** Using numerical steps, write detailed procedures for conducting this experiment. Try to write the procedure as though someone was going to perform this experiment for the first time. How many trials will be conducted in this experiment?

**Safety Issues:** List any safety issues that should be considered when conducting this experiment.

**Data:** Construct a data table in which you would record measurements collected during the experiment. Don't forget to give your data table a title. Where will observations made during the experiment be recorded?

**Conclusion:** This is where you will discuss whether or not the results of this experiment support the original hypothesis. If they did not, discuss why not. In this section, you may discuss the possibility of using a different experimental design in the future, and how the experiment can be improved in future replications.

All student Experimental Design Proposals will go through a peer review in which each proposal will be scored based upon the following rubric:

Scoring Items - The following items will be checked during the peer review process:

1. Hypothesis/Prediction Statement
2. List of materials and equipment needed
3. Procedure (listed numerically and well written with logical steps)
4. Variable(s) kept the same
5. Variable Changed (Test Variable)
6. Variable Measured (Outcome Variable)
7. Created a data table to record measurements
8. Trials are repeated

Total Possible Score: 16 Points