NAME: Paul Gerald D. Pare LAS Q2W1-Research Quiz: 14/15

**Activity 2: Problem, Hypothesis & Experimental Design**

Read and follow the step-by-step procedures in designing a simple experiment.

**PROBLEM:** Write the problem (in the form of a question) that your science experiment will seek to answer. (The problem can become the title)

**A problem is a question** for which you do not have an answer, but that may be answered by experimentation.

Here is an example: *Does the amount of time an ice cube is left out of the freezer have a direct relationship to the amount of water that drips from it?*

**HYPOTHESIS:** You must write the hypothesis for your simple experiment.

The hypothesis is an educated guess written as a declarative statement.

It is an idea that can be tested to see how good it may be.

It is usually based on your information search (research paper).

It is *a possible solution* or answer to the problem.

It may or may not be the true answer. It is only a possible solution.

A common way of stating the hypothesis is in the form of an **“If , then AND because” statement**.

Example: *If an ice cube is left out of the freezer for increasingly longer periods of time, then more water will be collected the longer the ice cube is exposed to warm air because ice melts at a temperature above 0oC*

**EXPERIMENTAL DESIGN:**

The experiment is a way of testing the hypothesis.

The experiment is a way of seeing if the hypothesis is a good solution to the problem.

**Test one variable**; all other factors must be controlled. (*time ice is left out of freezer*)

**Identify the test subjects** (plants?, people?, soil?, speaker wires?, etc.) What are you testing / experimenting on? (*ice*)

**Describe the control group.** The part of the experiment that remains the same. Use it as a constant with which you compare the results of the dependent variable. (*ice in freezer*)

**Describe the experimental group.** The group that is being experimented on. (*ice out of freezer*)

**Describe the dependent variable.** *The result that occurred from the experimentation.* (This depends on the independent variable: For example, the amount of water dripping from an ice cube depends on the amount of time you let the ice cube melt. The dependent variable is the *amount of water.*)

**Describe the independent variable.** *This is the change you are making to the experimental group.* For example, the amount of water dripping from an ice cube depends on the amount of time you let the ice cube melt. The independent variable is *time.*

**Describe the methods you will use to control the variables.** (*same size ice cube used each time, same air temperature outside the freezer*, etc.)

**What test equipment are you going to use?** (*graduated cylinder*)

**Direction:** You must write your procedure step-by-step.

*(Anyone should be able to completely duplicate this experiment from your detailed step-by-step procedure.)*

Problem, Hypothesis & Experimental Design

PROBLEM: Does the amount of time an ice cube is left out of the freezer have a direct relationship to the amount of water that drips from it?

HYPOTHESIS: If an ice cube is left out of the freezer for increasingly longer periods of time, then more water will be collected the longer the ice cube is exposed to warm air.



EXPERIMENTAL DESIGN:

Identify the test subjects: Ice  
Describe the control group: Ice

Describe the experimental groups: Ice out of the freezer. 

Describe the dependent variable: Amount of water from melted ice.

Describe the independent variable: Amount of time. 

Describe the methods you will use to control the variables: same size of ice cubes, same temperature outside the freezer.

What test equipment are you going to use? 

Graduated Cylinder, Ice tray cube, Coco cloth/Fabric.

**Experimental Procedure:**

Write your procedure step-by-step. Be detailed in exactly how you are going to do your experiment. Anyone should be able to duplicate your experiment from this detailed description.

Step 1:

Get an ice tray cube, fill it with clean water. Leave it for 24 hours. Make sure every spot is fill in completely.

Step 2:

After 24 hours, preferrably get 3 graduated cylinder and put coco cloth on top of each Graduated Cylinder. Put one ice cube above the coco cloth to each graduated cylinder. (This is to avoid unmelted ice increases the amount of water and also to avoid the water becoming catalyst or boosting up of melting to ice).

Step 3:

Leave one of them for 10 min, the second one for 25 min and the last one for 40 min.

Step 4:

Remove unmelted ice. Squeeze the coco cloths if necessary. Measure each of them by looking to each graduated cylinder.

Step 5:

Observe the amount of water in each graduated cylinder. Make a hypothesis and conclusion about the conducted experiment.