**Name:**

**Date:**

**School:**

**Facilitator:**

1.01 Experiment Identification

**Use what you learned in the lesson on The Scientific Method to complete this assignment. In Part 1, you will read scenarios of different experiments and answer the questions about each experiment. In Part 2, you will design a short experiment based on a problem described.**

# Part 1: Identify Parts of an Experiment

## Plant Growth

Ben and Laura design an experiment to determine where to place a plant in their classroom in order to maximize the growth of the plant. They choose 3 of the same type of houseplant and put them in different locations in the classroom.

* They put Plant A in direct sunlight by the window.
* They place Plant B on a shelf in the teacher’s office which contains windows, but the plant is not in direct sunlight.
* They place Plant C in a cabinet where it will receive no sunlight.

They ensure that each plant is:

* The same height,
* In the same type of pot, and
* Has the same amount of soil.

They plan to check each plant every day at the same time and measure the height of the plant in centimeters each day for a month.

1. Write a hypothesis for Ben and Laura based on what you read about their experimental design.

1. Identify the variables in this experiment.
   1. What is the independent variable?
   2. What is the dependent variable?
2. List at least 3 variables that are being held constant.
3. Laura and Ben realize they did not specify in their plan how they would water the plants.
   1. Do you suggest they water each plant the same or differently?

* 1. Why? Explain your suggestion.

## Ramp Speed

Jack and Jill are designing an experiment to test how the material of a ramp affects the speed of a toy car moving down the ramp. They choose the following three materials:

* A sanded piece of wood
* A metal sheet
* A piece of plastic

They construct a ramp from each material. They ensure that the ramps are all the exact same dimensions including the height, width, and length.

They plan to roll a toy car down each ramp 3 times and use a stopwatch to time how long it takes for the car to reach the bottom of the ramp. They will average the 3 times to get the average time for each ramp.

1. Write a hypothesis for Jack and Jill based on what you read about their experimental design.

1. Identify the variables in this experiment.
   1. What is the independent variable?
   2. What is the dependent variable?
2. List at least 3 variables that are being held constant.
3. After performing the 3 trials for the wooden ramp, Jack picks up a **different** toy car, (instead of the one they used on the wooden ramp) and begins conducting trials for the metal ramp. Jill stops Jack and states that they should use the same toy car for all the ramps.
   1. Who is correct? Jack or Jill?

* 1. Why? Explain your answer.

# Part 2: Design an Experiment

You are tasked with designing an experiment to determine the amount of fertilizer to use to best help plants grow taller. Answer the following questions about how you would go about designing your experiment.

1. What would be your independent variable?

1. What would be your dependent variable?

1. Write an example hypothesis for your experiment.

1. Describe at least 3 variables you would need to hold constant in your experiment.
2. In a brief paragraph, describe your experimental design including what data you would collect.