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meworks Code)

Introduction: An experiment is a sequence of steps used to help understand a particular idea. In many experiments, a certain factor will be controlled by the experimenter. This is called the **manipulated variable**. The **responding variable** is the factor that changes as a result of a change in the manipulated variable.

Example: In an experiment to see how far birds can fly in a given amount of time, you may measure the distance a bird flies in ten minutes, in twenty minutes, and in thirty minutes. With all other factors kept constant (such as speed and wind conditions), common sense would tell you that the bird would fly the farthest in the greatest amount of time (30) minutes. In this case, you controlled the amount of flying time (manipulated variable) which affected the distance the bird could fly (responding variable).

Directions: For each of the following situations, determine which is the manipulated variable and which is the responding variable. Once you have determined the two variables, *circle* the manipulated variable and *underline* the responding variable.

1. You are measuring how far a car can travel in different lengths of time.
2. You do an experiment with microwave popcorn. You find that the more you pay at the store for the popcorn, the greater the number of kernels popped in the microwave.
3. You are testing the amount of effort needed to push a rock up inclines of different slopes (some more steep than others).
4. You are testing to see whether the amount of time running will affect how healthy you are.
5. You are testing to see how tall plants will grow when exposed to different amounts of sunlight.
6. You are measuring how the temperature of a beaker of water changes over time as it is being heated.
7. You do an experiment and find that body temperature increases the longer you exercise.
8. You are measuring how well you do on tests based on how long you study.
9. You are measuring to see if the length of stay in a hospital affects your insurance bill.
10. You are testing the durability of cars made from materials with various strengths.

Worksheet: Manipulated and Responding Variables

(Frameworks Code)

11. You are experimenting to see if the type of water (salt water or fresh water) has an affect on the health of a goldfish.
12. You are experimenting to see if the weight of an object changes as it is heated to different temperatures.
13. You are measuring how far you can drive on a single tank of gas when using different speeds.
14. You are observing how the quality of cars changes based on their price.
15. You find that as you increase the temperature, chemical reactions take place at a faster rate.
16. You are trying to determine if body odor increases as you increase the amount of time you exercise.
17. You find that changing the intensity of your workouts affects your heart rate.
18. You are curious to see whether you, or your friend, can last longer on eight (8) hours of sleep.
19. You want to determine which brand of foot powder will make your feet smell the least.
20. You conduct an experiment to find out if listening to classical music before taking tests improves your scores.