**Variables**

One of the most important parts of your lab experiments will be the variables. These are the things that **can change your experiment** in ANY way. They can vary the outcome of your experiment. **It is critical to test only ONE variable at a time so you know what caused the change that you see.**

There are three kinds of variables:

1**. Independent** (manipulated) Variable (IV). It is the ONE that you change.

2**. Dependent** (responding) Variable (DV). It is the one that changes as a result of your changed variable (IV). This is the one you measure or observe for changes.

3**. Controlled** (constant) variables (CV). These are all the other factors that must be kept the same in an experiment.

**Imagine that you are investigating this question**: *Will the color of an M&M dissolve faster in water or in another clear liquid?*

The three variables would be:

**Independent (IV):** Type of liquid **Dependent (DV):**  Time it takes for the color to dissolve **Control (CV):** color of M&M, amount of liquid, type of M&M, type of container, etc.

**Read each question below. Identify the IV, DV, and CV of each experiment**:

1. What amount of sunlight makes pea plants grow tallest?

 IV\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 DV\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 CV\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Which paper airplane flies the farthest?: Plane A, Plane B or Plane C?

 IV\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 DV\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 CV\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Is the height of a ball’s bounce affected by the height from which the ball is dropped?

 IV\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 DV\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 CV\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Carefully read each of the experiments below. Then examine the IV, DV and CV that are listed. ONE of these variables is incorrect. Identify which variable is incorrect AND write the correct variable on the line provided.**

4. Two groups of students were timed to compare how fast they could finish a set of math problems. Each group was given the same problems. One group used calculators. The other group did not use calculators.

 IV: Using or not using calculators DV: Amount of problems solved correctly CV: Same math problems

The \_\_\_\_\_\_ is wrong. Here is what it should be:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Students of different ages were given the same puzzle to put together. The time it took each student to complete the puzzle was compared.

 IV: Boy or girl students DV: Time to complete the puzzle CV: same puzzle

The \_\_\_\_\_\_ is wrong. Here is what it should be:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Amy wants to find out if Retro nail polish will last longer than Viva nail polish. She put one coat of Viva on the nails on her left hand and one coat of Retro on the nails on her right hand.

 IV: brand of nail polish DV: time the nail polish lasts CV: Which hand she puts the nail polish on

The \_\_\_\_\_\_ is wrong. Here is what it should be:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_