**The Art of the Controlled Experiment:**

(Adapted from Sarah Talle, Lakewood High School)

Directions: Answer the following questions in your lab notebook. Please tape this sheet right next to your answers OR restate the question in your answers.

Independent Variable (“IV”):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dependent Variable (“DV”):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Controlled Variable (“Constant”):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Control or (“Control group”):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 (“Experimental group”):\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**For each of the following experiments, identify:**

1. **IV**
2. **DV**
3. **At least three controlled variables they do or should have.**
4. **Control group (if applicable)**
5. **Experimental group (if applicable)**
6. **The best data table to use for this potential data**
7. A scientist wants to measure the amount of bacteria production (in part per million) found during different months of the year in Lake Powell.
8. Guinea pigs are kept at different temperature for 6 weeks. Percent weight gain (in grams) is measured.
9. The diversity of different algae species is calculated for a coastal area before and after a crude oil spill.
10. Batches of seeds are soaked in saltwater solutions of different concentrations and how many seeds sprouted (germinated) is counted for each batch.
11. A geologist hypothesizes that there may be a relationship between permeability of a sedimentary rock layer and the grain size of the rock.
12. In an experiment to test the effect of light on plant growth, a student used three marigold plants of the same age. The plants were grown in separate pots. One pot was exposed to sunlight, the other to artificial light and the other to no light. All other conditions were kept the same. The height of each plant was measured (in cm) at the start and at the end of the experiment.
13. A scientist observed that a culture of bacterial cells died when placed into ampicillin (type of antibiotic) solution. He wondered if the concentration of ampicillin had an effect of the death rate of bacterial cells. He hypothesized that a minimum of 50% ampicillin would be needed to kill off bacterial cells. To conduct his experiment he placed a culture of E. coli bacteria into 10 different test tubes and observed the death rate over one hour. The temperature of the solutions, the amount of E. coli, and time exposed to the ampicillin solution were held constant. Each test tube contained a different concentration of ampicillin solution.