Name: Key Date: _____ Period: _____

SS1 Experimental Design

For each item below, specify the independent(I) and dependent(D) variables, as well as constants(C).

1. A study was done to find if different tire treads affect the braking distance of a car.

I: Tire tread D: Braking distance C: Type of car

2. The time it takes to run a mile depends on the person's running speed.

I: Running speed D: Time to run a mile C: Terrain

3. The height of bean plants depends on the amount of water they receive.

I: Amount of water D: Height plants grow C: Sunlight, soil

4. The higher the temperature of the air in the oven, the faster a cake will bake.

I: Oven temp. D: Speed cake bakes C: Type of pan

5. Lemon trees receiving the most water produced the most lemons.

I: Water given D: lemons produced C: Sunlight, soil

6. An investigation found that more bushels of potatoes were produced when the soil was fertilized more.

I: Fertilizer used D: Potatoes grown C: Sunlight, type of fert.

7. Students measured the temperature of the water at different depths in Lake Skywalker and found that the temperature varied.

I: Depth measured D: Temp of water C: Location of msmt.

8. The amount of pollution produced by cars was measured for cars using gasoline containing different amounts of lead.

I: Type of gasoline D: Amount of pollution C: Type of car

9. Four groups of rats are first massed and then fed identical diets except for the amount of Vitamin A they receive. Each group gets a different amount. After 3 weeks on the diet, the rats' masses are measured again to see if there has been a decrease.

I: Amount of food (Vit A) D: Mass of rat C: Food consumed, Cage size

For each experiment below, specify the independent variable, dependent variable, control group and any constants.

1. A student wanted to test how the mass of a paper airplane affected the distance it would fly. Paper clips were added before each test flight. As each paper clip was added, the plane was tested to determine how far it would fly.

Independent variable Mass of plane

Dependent variable Distance plane flies

Control Plane w/o paper clips

Constant type of paper, how it is thrown

2. Two groups of students were tested to compare their speed working math problems. Each group was given the same problems. One group used calculators and the other group computed without calculators.

Independent variable Use of calculators

Dependent variable How fast student worked math problems

Control Group not using calculators

Constant Same problem

3. Students of different ages were given the same puzzle to assemble. The puzzle assembly time was measured.

Independent variable Age of student

Dependent variable How fast puzzle is assembled

Constant Same puzzle

There can be several controlled variables. If an experiment is to be useful, only one variable at a time can be manipulated intentionally. All other variables must be controlled throughout all parts of the experiment. If more than one variable is altered (changed), the results of an experiment cannot be interpreted with any validity.

4. An experiment was performed to determine how the amount of coffee grounds could affect the taste of coffee. The same kind of coffee, the same percolator, the same amount and type of water, the same perking time, and the same electrical sources were used.

Independent variable Amount of coffee used

Dependent variable Taste of coffee.

Constants (3) Type of coffee, type of water
time of percolation
amount of water
percolator used
electrical source