**Standard ESS Unit 1: Nature of Science Variables Practice**

**Vocabulary**

* **Independent Variable = changing**
* **Dependent Variable = responds to the change (is being measured)**
* **Control= No change done to this**
* **Constant= consistency or keeping things the same in the experiment**

**Practice Example:**

Mr Lanik wants to test if a new dog treat called Flower Power (made from sunflowers) will increase his dog Ouzel’s energy level and distance she will go on walks before laying down for a nap.

Without the treats, for 7 days Mr L takes Ouzel for a walk on Popham Beach and records how long (in minutes) they walk before Ouzel lies down. Ouzel walks for an average of 30 minutes before lying down without the treats.

Then Mr L gives Ouzel the recommended amount of 5 treats a day. He takes Ouzel for a walk on Popham Beach for 7 days and records how long (in minutes) they walk before Ouzel lies down. Ouzel walks for an average of 60 minutes before lying down while eating 5 treats a day.

1. What is/are example(s) of a constant in this experiment?

1. Walking for 7 days and on the same beach
2. Interpreting when Ouzel lays down
3. Ouzel eating seaweed while walking

2. What is the control?

1. The 5 treats given to Ouzel
2. Walking Ouzel without treats for 7 days
3. Walking Ouzel with treats for 7 days

3. What is the independent variable?

1. The 5 treats given to Ouzel each day.
2. When Ouzel lays down
3. If Ouzel eats seaweed

4. What is the dependent variable?

1. Ouzel eating seaweed
2. Ouzel walking without treats
3. How long it takes Ouzel to lay down

5. From the experiment, Mr Lanik should conclude that the treats do not work.

1. True
2. False

**Directions:**

**For each item below, specify the independent variables and dependent variables, as well as constants.**

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

Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Constant: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Constant: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

Independent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dependent Variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Constant: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Directions:**

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

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

Independent variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dependent variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Control \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Constant \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

Independent variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dependent variable \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Constant \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_