Experimental Design/Identifying Variables – STUDY GUIDE

Name:____________________________________________________ Date:_________________ Block:_____

Fill in the blank with the correct term from the word bank.

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1. The **TITLE** is a statement about your experiment.

2. The factor that is measured in the experiment is called the **DEPENDENT VARIABLE**.

3. A **HYPOTHESIS** is what you think is going to happen in the experiment.

4. The **PROCEDURES** outlines the sequence of steps to perform and complete the experiment.

5. Any factor that is not allowed to change is called a **CONSTANT**.

6. The **CONTROL** is the part of an experiment that is used as a standard for comparison.

7. The summary of the purpose, major findings and support of the hypothesis is the **CONCLUSION**.

8. The **INDEPENDENT VARIABLE** is the factor that you purposely change or manipulate.

For each of the following statements of an experiment, write a proper hypothesis, identify the variables, the control group, and write a proper title (start with “The Effect of…” or “The Relationship Between…”).

1) Cigarette smoking increases the risk of lung cancer.
   
   Hypothesis: If __a person smokes cigarettes__, then __they increase their risk of lung cancer__.
   
   Independent Variable: __Amount of cigarette smoking__
   
   Dependent Variable: __Risk of lung cancer__
   
   Control Group: __People who don’t smoke cigarettes__
   
   Title: “The Effect of Cigarette Smoking on the Risk of Lung Cancer” OR “The Relationship Between Cigarette Smoking and Risk of Lung Cancer”

2) Eating breakfast increases academic performance in school.
   
   Hypothesis: If __a student eats breakfast__, then __their academic performance in school will increase__.
Independent Variable:  __Eating breakfast__  
Dependent Variable:  __Academic performance in school__  
Control Group:  __Students that do not eat breakfast__  

Title:  “The Effect of Eating Breakfast on Academic Performance in School”  OR  “The Relationship Between Eating Breakfast and Academic Performance in School”

3) Hummingbirds are attracted to birdfeeders that are painted red.
   
   Hypothesis:  If __a birdfeeder is painted red__,  
   then __hummingbirds will be attracted to it__.  

Independent Variable:  __Color of the Birdfeeder__  
Dependent Variable:  __How many hummingbirds are attracted to it__  
Control Group:  __A birdfeeder that is not painted at all__  

Title:  “The Effect of the Color of a Birdfeeder on the Number of Hummingbirds that are Attracted to it”  OR  “The Relationship Between the Color of a Birdfeeder and the Number of Hummingbirds Attracted to it”

Read the following situation and answer the following questions.

Suzie wants to know the effect of different colors of light on the growth of plants. She believes that plants can survive best in white light. She buys 5 ferns of the same species, which are all approximately the same age and height. She places one in white light, one in blue light, one in green light, one in red light and one in the closet. All of the ferns are planted in Miracle-Grow and given 20 mL of water once a day for 2 weeks. After the two weeks, Suzie observes the plants and makes measurements.

Hypothesis:  If __a fern receives white light__,  
then __it will survive best__.  

Independent Variable:  __The different colors of light__  
Dependent Variable:  __The growth of the ferns__  
Control Group:  __The fern placed in the closet (no light)__  

Constants:  __Same species of Fern, Miracle-Grow, 20 ml of water once a day__  

Title for the Experiment:  “The Effect of Different Colors of Light on the Growth of Ferns”  OR  “The Relationship Between Different Colors of Light and the Growth of Ferns”