Scientific Method

**Important Vocabulary Words:**

In order to form theories and explore the science world we must ask questions and form \_\_\_\_\_\_\_\_\_\_\_ (backed by facts).

What is a ***testable*** hypothesis?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

**Types of Data:**

 Qualitative Data involves \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Quantitative Data involves \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Variables:**

 Independent\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Dependent Variables\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**The Steps of the Scientific Method:**

After you have formed a conclusion, you must \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to verify/make sure your conclusion is correct.

Amanda is testing how different amounts of caffeine affects the heart rate of rats. Below is the data she collected.

|  |  |  |
| --- | --- | --- |
| Group  | Amount of caffeine  | Heart rate (bpm)  |
| A  | 0 mg  | 190  |
| B  | 50 mg  | 225  |
| C  | 100 mg  | 260  |

**Identify each of the following:**

**1**. Control group – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Experimental groups – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Independent variable – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Dependent variable – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



Practice  **EOC** Questions:

1. Which experimental procedure would ***best*** determine the effectiveness of a medicine forpreventing a certain disease in mice?

A Treat 50 mice with the medicine and 50 mice with a harmless substance and then expose all 100 mice to the disease.

B Expose 100 mice to the disease and then treat all 100 mice with the medicine.

C Expose 100 mice to the disease and then treat 50 of these mice with the medicine.

D Treat 10 mice with the medicine and 90 mice with a harmless substance and then expose all 100 mice to the disease.

1. A student conducted an original, well-designed experiment, carefully following proper scientific procedure. What must happen next, in order for the conclusions to be generally accepted?

A The experiment must be conducted by a scientist.

B The experiment must support the original hypothesis.

C The experiment must contain several experimental variables.

D The experiment must be repeated to verify the reliability of the data.

1. A student heats crushed liver in a test tube with a hot water bath. What type of safety equipment

***must be used*** to do this activity?

A safety goggles B fire extinguisher C plastic gloves D a rubber stopper on the test tube