Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_\_

**How do we incorporate good experimental design in investigations?**

* A good experiment is an experiment that tests what you want to test and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for everything else.
* A good experiment allows you to draw conclusions about \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

relationships.

* Good \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ provides enough information to allow others to repeat your experiment to verify your results.

**Experimental Design**

* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is written to express what is trying to be answered by the experiment.
  + It is written in the form of: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(one observed trait) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (a second observed trait)?
  + Research questions only focus on the two traits, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, that will be compared by the experiment
    - Variables are factors or conditions that can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_in an experiment.
    - They may affect the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of an experiment.

**Types of Variables**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_variable
  + The thing that is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by the experimenter
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_variable
  + The thing that will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to determine the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_among variables

\*\*\*The research question is written in the form of: How does (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) affect

(\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)?

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_variables
  + The things that must be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_in order to accurately determine the relationship between the dependent and independent variable.

**Operational Definition**

* The descriptions of how the variables will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Operational definitions tell what type of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_or instruments are used to take the measurements and what \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_the variables are measured in.
  + Including operational definitions in experimental design allows for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_by other scientists

**Hypothesis**

* An educated guess of how the manipulated variable will affect the responding variable is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + A hypothesis must be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + A hypothesis is written in the form: \_\_\_\_\_\_\_\_\_\_(manipulated increases) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ responding (increases/decreases).

**Multiple Trials**

* To better ensure accuracy, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of the experiment should be conducted before data is analyzed.
* For each trial, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_variable should be changed throughout the complete range before the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_begins.
* Completing trials in this manner reduces the chances of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ results.

**Conclusions**

* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is a judgment based on the results of an experiment.
  + It is written to parallel the hypothesis and takes the form: As the “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” INCREASED THE “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” (increased/decreased).
  + If you were correct in your hypothesis then we say: “The experiment \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_the hypothesis.”
  + If you were incorrect in your hypothesis then we say: “The experiment\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_the hypothesis.”