

Experimental Design

The Scientific Method

1. Identify the problem
2. Make observations
3. State the hypothesis
4. Test the hypothesis, in other words: set up an experiment:
 - *materials*
 - *procedure*
 - *experiment*
5. Collect data
6. Analyze the data
7. Form conclusions
8. Write and present your research.

VOCABULARY

Variable – *vari-* means “different” ... *-able* means “capable of” ... SO, **variable** is capable of being different

Independent Variable (IV) – the variable that is being tested – what is changed by the scientist

Example:

Dependent Variable (DV) – the measured response to the independent variable; the DATA being collected

Example:

Hypothesis (H) – a statement you can prove true or false that shows the relationship between the independent variable and the dependent variable

Equation for writing a Hypothesis: H = IV + DV (the + is a verb)

Example:

Constants – all other possible variables that are **kept the SAME**, so that only the independent variable is being tested

Example:

Control – a set-up of the experiment that does NOT get the independent variable; NO IV OR “normal”

Example:

Replicates – to increase the statistical significance of the experiment, it is repeated at least 5 (or more) times; *more than one set of data!*

Example: