Three Types of Science Investigations

Descriptive Investigation:
Involve describing and/or quantifying parts of a natural system. Example – observing cells under a microscope and diagramming what is seen.

- Has a research question, procedures, and conclusion
- Used when little is known about the topic
- No hypothesis or prediction
- Key words: Observe, describe, list, identify

Comparative Investigation:
Involve collecting data on different populations/organisms, under different conditions (ex. Times of year, locations), to make a comparison.

- Has a research question, possible hypothesis, procedures, and conclusion.
- Can have independent/manipulated and dependent/response variables
- No control / control group
- Key words: Compare/contrast, similarity/difference, categorize

Experimental Investigation:
Involve a process in which a “fair test” is designed in which variables are actively manipulated, controlled, and measured in an effort to gather evidence to support or refute a causal relationship. Example- Testing the height of a ramp to determine how far a marble will roll.

- All known variables have been identified
- Has a research question, hypothesis, procedures, control, and conclusion
- Has independent/manipulated and dependent/response variables
- All factors can be held constant except the manipulated

Vocabulary

Variable: factor or condition in an experiment that change or can be changed

Independent /Manipulated Variable: factor or condition in an experiment that is changed on purpose by you, the scientist; often called the manipulated variable. This goes on the X axis of a graph (bottom).

Dependent / Response Variable: factor or condition in a experiment that changes as a result of the independent variable; often called the responding variable. This is what you measure and goes on the Y axis (side).

Constant: factors or conditions in an experiment that are kept the same in ao trials of the experiment.

Control: a set up without the variable being tested.