

Scientific Method I

Name:

Date:

Block:

What is science?

Science is a way of studying the natural world through a structure of questioning and experimenting. It is not static, meaning that as new facts and studies arise, our understanding of the world begins to change.

The Scientific Method

The steps to the scientific method are as follows:

What is a **hypothesis**?

A hypothesis is an _____ about how things work. It makes a _____ about an _____ and attempts to answer a question.

E.g.:

What is a **conclusion**?

A conclusion is a summary of the _____. It will *either* _____ or _____ the _____.

Types of Data

Qualitative:

Qualitative data is used to describe _____.

E.g.:

Quantitative:

Quantitative data is used to describe the _____ (the _____) of something.

E.g.:

Types of Variables

E.g.: Two brands of paper towels are compared to see which one holds the most liquid. 50 mL of water is placed into two beakers. One paper towel from the brand, Cleans-a-Lot, is placed into Beaker 1 while one paper towel from another brand, Good-at-Cleaning, is placed into Beaker 2. When the paper towels are removed from the two beakers, it was discovered that Beaker 1 contained 15 mL of water while Beaker 2 contained 5 mL of water.

Independent:

An independent variable is _____ by the experimenter.

E.g.:

Dependent:

A dependent variable changes with _____ to the _____.

E.g.:

Controlled:

A controlled variable _____ within the _____.
These variables are quantities that the experimenter wants to _____.

E.g.:

2. What can be concluded if a study discovered that those who drank 8 cups of water a day tended to be more awake during the day? Explain your answer.

3. Chelsey wants to know why sea water freezes at a lower temperature than fresh water. She goes to the library and conducts some research about the properties and composition of fresh water and sea water. She goes back home and takes out a notebook and writes “If sea water has salt in it, then it will freeze at a lower temperature than regular fresh water.” Chelsey then goes to her lab and does the following:
 - a. Fills 2 beakers with water.
 - b. Dissolves 20g of salt into one beaker.
 - c. Places both beakers into the freezer at -1.5°C for 2.0 hours.

Chelsey takes out both the beakers at the same time and notes that the beaker containing salt water is a liquid and the beaker that has no salt in it has frozen.

- a. Which statement would be the hypothesis?

- b. What conclusion could Chelsey make based on her observations?

- c. What is the independent variable in this experiment?

- d. What is the dependent variable in this experiment?

- e. What are 2 controls in this experiment?