

What is Science?

The study of the world around us

Scientists Observe

- the world around them and how it changes
- they notice and wonder why things happen

When scientists observe they write down exactly what they see and are specific about it.

Scientists form questions based on their observations.

Scientists do two main things to answer questions

1. perform experiments-do them over and over again
 2. watch, observe and record data
- not all questions can be answered by performing an experiment

Both things use the scientific method as a procedure for answering questions

After scientists observe and form questions they hypothesis the answer.

A hypothesis is an educated guess about what the answer to a question. This guess is based on observations and reasoning.

All hypotheses are to the point. They are not wordy. They are written in an if/then format.

Example: **If** the microwave is on **then** I do not receive good cell phone reception.

Scientists create a testable experiment based on their observations, and questions to test the hypothesis. *Before experiments and before a hypothesis is formed often times research must be done.

Steps of the Scientific Method

1. **Define a problem or ask a question**-what do you want to know?
* You need to be able to test your question*
2. **Form a hypothesis** (an educated guess)- using your observations and research
3. **Design an experiment to test your hypothesis**-set it up so that you are testing only one thing at a time.
4. **Do the experiment**-more than once-to make sure you get accurate results.
5. **Collect and organize your data** using charts, graphs, and pictures
Bar graphs-mainly used to compare
Pie graphs- used to compare and show the parts out of a whole
Line graphs- Used to show growth over a specific time period
6. **Draw a conclusion** about your data from the experiment-
make inferences about future experiments.

There are two things that all experiments need to have variables and a control (constant).

There are two types of Variables:

Dependent: What you measure. It depends on the independent variable.

Independent: What you are testing. It changes.

Control: What you compare the independent variable to.

Law: A law in science is where a test gets the exact same results every time. It is very difficult for a theory to become a law.

Example: the law of Gravity

Theory: An idea in science that has been tested over and over again with similar results. There isn't 100% proof of the results due to the constant change of knowledge and new discoveries. It is not a fact.

Important Things to Study:

1. All the notes in your science journal (they are also on this page)
2. Be able to put the steps of the scientific method in order.
3. Know why scientists repeat experiments
4. Know the definition of a hypothesis
5. Be able to identify the variables in an experiment
6. Be able to write a hypothesis in the correct format