

I. Scientific Inquiry

- A. Scientific inquiry refers to the different ways scientists study the natural world; It is the ongoing process of discovery in science.
- B. Scientific Attitudes: Scientists have certain attitudes that help them through scientific inquiry.
1. curiosity: the eagerness to learn more about the topics they study.
 2. honesty: report observations & results truthfully.
 3. open-mindedness: capable of accepting new & different ideas.
 4. skepticism: being doubtful about information that is presented without evidence.
 5. creativity: coming up with new ways to solve problems.

C₂ The Process of Inquiry: Scientific inquiry does not always occur in the same way, but certain processes are often involved.

The processes that scientists use in inquiry include

1. Posing questions
2. Developing hypotheses
3. Designing experiments
4. Collecting and interpreting data
5. Drawing conclusions
6. Communicate ideas and results

Step 1: pose a Question: What do you want to learn? Your question must be scientific, able to be answered or tested through observations or experiments; not based on opinions.
Research information to help you better understand your topic.

Step 2: Develop a hypothesis:

A hypothesis is a possible answer to a scientific question; educated guess

A hypothesis is NOT a fact; it is only one possible way to answer a question. It must be testable by observation or experiment. Many trials are needed before a hypothesis can be accepted as true.

Step 3: Design & Conduct an Experiment. Scientists

test a hypothesis by designing an experiment. They begin by first examining all of the variables.

variables: any factors that can change in an experiment.

independent variable: (manipulated variable): the one factor that a scientist changes during an experiment

dependent variable: (responding variable): the factor that changes as a result of changes to the independent variable in an experiment.

To make sure that changes in the independent variable are causing the changes in the dependent variable, scientists change only 1 variable at a time; all other variables must be controlled or kept constant.

controlled experiment: an experiment in which only 1 variable is changed at a time.

Step 4: Collect and Interpret Data Scientists

create a table to record data.

data: facts, figures & other evidence gathered through observations.

All scientists use the same quantitative measurement;

The International System of Units (SI)

After the data is collected, they need to be interpreted or explained.

This is often done using graphs or charts

Step 5: Draw a Conclusion : A

conclusion states whether or not the data support the hypothesis.

Step 6: Communicating Results

Communicating: sharing ideas and conclusions with others through writing & speaking.

(This often leads to new questions, hypotheses, and investigations)