

Investigation and Experimentation

9. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:
- Plan and conduct a scientific investigation to test a hypothesis.
 - Evaluate the accuracy and reproducibility of data.
 - Distinguish between variable and controlled parameters in a test.
 - Recognize the slope of the linear graph as the constant in the relationship $y = kx$ and apply this principle in interpreting graphs constructed from data.

The scientific method is a series of steps that scientists use to answer questions and solve problems. Any information you gather through your senses is an observation. Observations often lead to questions or problems. A hypothesis is a possible explanation or answer to a question. A good hypothesis is testable. After you test a hypothesis, you should analyze your results and draw conclusions about whether your hypothesis was supported. Communicating your finding(data) allows others to certify your results or continue to investigate your problem. A scientific theory is the result of many investigations and many hypotheses that have been supported over time. Scientific models are representatives of objects or systems. Models make difficult concepts easier to understand. Models can represent things too small to see or too large to observe directly. Models can be used to test hypotheses and illustrate theories.

Definitions to know:

_____ : a series of steps that scientists use to answer questions and solve problems

_____ : a possible explanation or answer to a question

_____ : any information that results from experimentation

_____ : any use of the senses to gather information

_____ : the amount of surface an object has

_____ : the amount of matter in a given space; mass per unit volume (density = mass/volume)

_____ : the amount of space that something occupies or the amount of space that something contains

_____ ; the amount of matter that something is made of; does not change with the objects location

_____ : the basic unit of length in the SI system

_____ : the measure of how hot (or cold) something is

_____ : the part of a controlled experiment that contains all of the same variable and constants as the experimental group but the independent variable is NOT changed

_____ : any factor in a scientific investigation that can have more than one value. In an experiment it is what is being tested AND measured

_____ : a number describing how steep a plotted line on a graph is; equal to the rise divided by the run.