

II. The Scientific Method

In order to pursue the study of matter and the changes it undergoes, or to solve other problems in science, it is important to use a logical and predictable technique. The Scientific Method is one such technique. It is a common sense approach applicable to not only scientific questions, but many other, everyday quandaries as well.

There are variations on the Scientific Method, but most of them contain the following steps:

1. Observations: Something needs explanation – a problem, a question, an issue.
2. Hypothesis: A suggestion which solves the problem, answers the question, explains the issue is offered. It may be termed an “educated guess” because it is based on some logical explanation or suggestion of cause. Often stated as “If _____, then _____.”
3. Experimentation: The testing of the hypothesis, usually repeated trials are necessary to assure that the results of the tests can be accepted as genuine.
4. Theory: A theory, or explanation of the results of the experiment is offered. The theory is a possible answer, it cannot be proven to be true; it is possible to disprove a theory.

Some sources will list a fifth step to the Scientific Method:

5. Scientific Law: A statement is offered which summarizes the results of experiments and observations. A scientific law does not try to explain the results, it merely states what the results are.

Questions:

1. Given the following five statements, identify which of the five parts of the Scientific Method they describe.
 - A) Ash trees infested with ash borer insects die.
 - B) Leaves are falling off my ash trees and there are areas of bark which are destroyed.
 - C) Ash trees are infested by ash borer insects in Oakland County. It is possible that my trees are also.
 - D) I will remove the bark in areas of my trees and look for characteristic signs of ash borer disease. I will look at each tree in several spots.
 - E) If my trees have ash borer disease, they would lose their leaves and their bark would be damaged.
2. Write your own example of an observation or problem, and use the five steps of the Scientific Method to solve it.