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The Scientific Method

What is science? Chances are you have been studying science for a few years now. But science is more than just a few chapters in a textbook. Science is a process. It is a constant search for information about our universe.

The word science comes from the Latin word, "scire," meaning "to know." Scientists are like police investigators. They use a process to solve a mystery. The process they use is called the scientific method.

Scientists begin this method by making an observation or stating a problem. This becomes the purpose of their study. Have you ever wondered why the sky is blue? Or how your skin heals when you cut it? If so, you have taken the first step of the scientific method.



To focus their purpose, a scientist has to clearly define the problem. Usually they pose a question. For example, they might say, "Which warms faster, water or land?"

Another step in the scientific method is gathering information. The scientist might study a body of water and an area of land. She would write notes about what she sees. She might read books and scientific papers written by others who have studied this topic.

After all the information is gathered, the scientist gives a possible solution to the problem. This is called a hypothesis. For example, she might say, "Water warms faster than land."

Next, the scientist will test the hypothesis by doing experiments. An experiment has to be set up carefully. Every good experiment has at least one variable. A variable is the factor that is being tested. Experiments should also have a control. In a control experiment, everything is set up the same, but the variable is missing.

The next step in the scientific method is to record and analyze data. Data includes any measurements taken. Often the data is recorded in a table. Then it might be graphed. This helps the scientist to compare the measurements. Experiments must be run many times before the scientist can come to a conclusion. It also includes observations made during the experiment.

The steps in the scientific method do not have to be done in a certain order. They might be performed differently, depending on the problem. After a conclusion is formed, a theory may be developed. A theory is a logical explanation for events in nature.

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After the theory is tested many times, it could become a law. A law is a theory that has been accepted as true. However, even laws can be changed if different findings are obtained by other experiments. This is the spirit of science: questions can always be asked. New explanations can always be considered in any event.

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Questions

_____ 1. A problem is usually posed in the form of a _____.

- A. experiment
- B. method
- C. question

_____ 2. A hypothesis is a _____.

- A. theory
- B. law
- C. possible solution

3. How is a hypothesis tested?

_____ 4. The factor being tested is called a _____.

- A. hypothesis
- B. control
- C. variable

5. What is a theory?

_____ 6. Observations and measurements are called _____.

- A. law
- B. control
- C. data