

The Scientific Method

By Patti Hutchison

¹ 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.

² The word science comes from the Latin word, "scire," meaning "to know." Scientists are like crime scene investigators. They use a process to solve a mystery. The process they use is called the scientific method.



³ Scientists begin this method by stating a problem. This is a question he or she wants answered. 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.

⁴ Before they study it, scientists have to clearly define the problem. Usually they pose a question. For example, they might say, "Which warms faster, water or land?"

⁵ Another step in the scientific method is to gather information. The scientist might study a body of water and an area of land. She would use instruments to take measurements. She would write notes about what she sees.

⁶ 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."

⁷ Next, the scientist will test the hypothesis by doing an experiment. An experiment has to be set up carefully. First, she would pour a measured amount of water into a container. Then she would put the same amount of soil into another container.

⁸ She would put the containers under a heat source such as a light. She would put a thermometer in each container. At certain intervals, the scientist would read each thermometer.

⁹ This is a simple version of an experiment. 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.

¹⁰ The next step in the scientific method is to record and analyze data. Data includes any measurements taken. It also includes observations made during the experiment.

¹¹ In the soil and water experiment, data would include the temperatures of each container and the times that they were taken. Usually the data is recorded in a table. Then

it might be graphed. This helps the scientist to compare the measurements.

¹² This experiment would be run many times before the scientist could come to a conclusion. If the water heats up faster during each experiment, the scientist could conclude that water heats faster than land.

¹³ 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.

¹⁴ 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.

Name _____

Science Pd: _____

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<p>1. A problem is usually posed in the form of a _____.</p> <p><input type="radio"/> A Question</p> <p><input type="radio"/> B Experiment</p> <p><input type="radio"/> C Method</p>	<p>2. A hypothesis is a _____.</p> <p><input type="radio"/> A Possible solution</p> <p><input type="radio"/> B Law</p> <p><input type="radio"/> C Theory</p>
<p>3. How is a hypothesis tested?</p> <p>_____</p> <p>_____</p>	<p>4. The factor being tested is called a _____.</p> <p><input type="radio"/> A Control</p> <p><input type="radio"/> B Variable</p> <p><input type="radio"/> C Hypothesis</p>
<p>5. What is a theory?</p> <p>_____</p> <p>_____</p>	<p>6. Observations and measurements are called _____.</p> <p><input type="radio"/> A Control</p> <p><input type="radio"/> B Law</p> <p><input type="radio"/> C Data</p>