

UNIT  
1LESSON  
1.3*Scientific Method Notes***The scientific method is a way of problem solving**

The goal of science is to understand the world around us. However, many other subjects do that as well. What separates science from the other subjects is the \_\_\_\_\_ by which science seeks answers to questions. Science uses the science method as a systematic approach to \_\_\_\_\_.

The basic steps of the scientific method are:

1. State the \_\_\_\_\_
2. Gather \_\_\_\_\_
3. Form a \_\_\_\_\_
4. Design and perform an \_\_\_\_\_
5. Collect and analyze \_\_\_\_\_
6. Form a \_\_\_\_\_

\*Note: not all fields of science use this exact process. However, this is a very common process. Therefore, it is the process we will study.

The first step is to recognize a \_\_\_\_\_ problem. This is important because not all \_\_\_\_\_ can be solved by science. For example, "Are Alabama farmers more frequently visited by aliens than other farmers?" Science has \_\_\_\_\_ on what it can answer. The questions we can answer using the method are the result of our \_\_\_\_\_. Many scientific questions are about comparisons. Ex: "Why are the leaves on top of tree smaller than on the bottom?" "Why do two pools of water freeze at different temperatures?"

The second step is to gather information. A scientist would collect as much \_\_\_\_\_ about what they are observing as possible. \_\_\_\_\_ in the data help them move on to the next step.

The third step is to form the hypothesis. The hypothesis is a \_\_\_\_\_ to the problem. (Please, for my sake, don't call it an educated guess! Hypotheses are far from guesses.) Hypotheses are often written as \_\_\_\_\_ statements. They are usually written as \_\_\_\_\_ and \_\_\_\_\_. Ex: "Because fresh water does not contain salt, it will freeze at a higher temperature than salt water." Can you rewrite this hypothesis as an if-then statement? Try it:

The fourth step is to design an experiment that will \_\_\_\_\_ the \_\_\_\_\_. Experiments are \_\_\_\_\_, or steps, that are very detailed. In an experiment, everything is kept constant, except for one thing. This is called the \_\_\_\_\_. The variable is a result of the hypothesis to see if it is the cause of the differences we notice in our observations. For example, the variable in a lab might be the salt in the water. To ensure that there are no other variables, a scientist will make a \_\_\_\_\_ experiment. A control experiment is set up exactly like the one that contains the variable. The only difference is that the experiment doesn't contain the \_\_\_\_\_.

The fifth step is to collect data from the experiment. Recorded \_\_\_\_\_ and \_\_\_\_\_ are called data. Scientists look for \_\_\_\_\_ in their data and see what they can learn from it.

The last step is to form a conclusion. After analyzing the data, a scientist would form a conclusion based on what the data said. If their conclusion does not match their hypothesis, they must \_\_\_\_\_ the hypothesis and repeat the experiment. If their conclusion does match their data, they \_\_\_\_\_ the hypothesis and repeat the experiment. The experiment must be repeated several times to verify that the \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ are correct.