

A step-by-step guide to the scientific method

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A bioengineer using the scientific method to learn what's inside a water sample. Photo by Grace Nichols/U.S. Air Force.

When you have a question, how do you answer it? Do you think of a possible answer and then try to prove it? If this is what you do, you're using the scientific method.

The scientific method is a way to prove our ideas about the world. It helps us find out if our ideas are right or wrong. Here's how it works.

What Are The Steps In The Scientific Method?

The scientific method has six steps. They will help you solve all kinds of problems.



1. Ask a question.
2. Find background information.
3. Make a hypothesis.
4. Do an experiment.
5. Draw a conclusion.
6. Report the results.

Step 1: State A Problem Or Ask A Question

The scientific method begins with a question. For example, you might notice your sandwich sometimes dries out before lunch. Ask yourself: Why does this happen?

Step 2: Gather Background Information

Now, find more information about your question. Study the problem closely.

Step 3: Form A Hypothesis

Use what you know to think of a possible answer to your question. This answer is called your hypothesis. A hypothesis is an idea that can be tested. Here is a possible hypothesis: Bags that seal shut stop bread from getting dry. Bags without seals do not.

Step 4: Design And Perform An Experiment

In this step, you find out if your hypothesis is right or wrong. You do this through an experiment.

An experiment is a controlled test. We change one thing at a time to see what happens. The parts of an experiment that we change are called variables. In our example, one variable is the type of bread. Another is the type of sandwich bag.



We only change one variable at a time. We call this the independent variable. Changing the independent variable will cause another part of the experiment to change. This other part is called the dependent variable. In our example, the dependent variable is how dry the bread is.

The driest bread will have the least water. There is an easy way to measure this. We can weigh the bread before and after the experiment. Then we can find the difference in weight. This is how much water has dried up.

Step 5: Draw A Conclusion

The next step is to study our results. This is how we see if our hypothesis was right. For our experiment, we compare the weight of the bread from before and after. We see which bag kept the bread from getting dry. Did the results prove our hypothesis?

Step 6: Report The Results

The last step is to report our results. This allows other scientists to learn about our work. Now you know how to think like a scientist!