

The Scientific Method Sample

1. Chose a Topic and Category

Ask yourself "What am I interested in?" or "What subject do I want to learn about?".

Examples:

Example topics are plants, solar electricity, and Mars.

2. Identify a Problem or Question

What questions do you have about your topic? What do you want to know? State the problem as a question.

In some cases you may want to research your topic before you identify an exact problem.

Examples:

How does amount of water effect plant growth?

Can solar panels supply electricity to anything?

How fast does Mars orbit the Sun?

3. Research the Problem and your Topic

What do you need to learn about so that you can solve your problem or answer your question? Where can you search for information?

Learn as much as you can about your topic and problem. Research can be from many different sources including people, books, magazines, the internet, or your own experience.

After you do your research you may want to restate your question in a better way.

Examples:

Does the amount of food given to a certain plant effect the growth of that plant?

Can one size solar panel do the work of any batteries?

4. Develop a Hypothesis

Now that you have done your research, develop a hypothesis.

A hypothesis is a prediction. What is your prediction of the answer to your question? What do you think will happen?

Guess at what the answer to your question will be. This is not a mystery. You have educated yourself on the topic and by now you should be able to make a guess at the answer based on your learning. This is also called an "Educated Guess".

Examples of hypothesis statements:

I predict that a plant that does not get enough water will die.

I predict that one solar panel can be used to replace AA and C cell batteries but not D cell batteries.

5. Design the Experiments

How will you test your hypothesis? What tests will answer your question? You must test enough samples to prove your point.

Define the variables that will change from one experiment to the next. Amount of water? Amount of plant food?

Plan the tests you want to perform so that you have a good idea how much time you will need to complete them in the time allotted for your project. How long will you have to grow your plants to get good data?

Example experiments:

9 plants total
3 tested with low amount of water
3 tested with the recommended amount of water (control group)
3 tested with too much water

9 battery operated items total tested with a solar panel
3 that use 2 AA cell batteries
3 that use 2 C cell batteries
3 that use 2 D cell batteries

6. Test your hypothesis

Test your hypothesis by executing your experiments. Be sure to keep good records of your experiments so that you can analyze your results and present your data to others. Ask your teacher about the format for a journal or data collection.

7. Analyze the data and results

What do your results tell you? Look at your experimental data. Organize it. Do you see any trends or information that proves or disproves your hypothesis?

Graphs are a big help. Graphs not only help you understand your data but they will also help others to quickly understand what you did.

8. Formulate and Report your Conclusions and make recommendations.

Was your hypothesis right or wrong? It is OK to be wrong. The objective of the scientific method is to investigate a problem and work toward a solution. Sometimes you will end an experiment and have new questions. If so, those new questions are part of your conclusions. Sometimes a conclusion proposes a new hypothesis and new experiments with recommendations for further study.

Even if you have disproved your hypothesis you have still done a good job if you correctly applied the scientific method.