The scientific method is a way to ask and answer scientific questions by making observations and doing experiments.

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Ask a Question

Find a general topic that interests you and write down the question that you want to answer.

The scientific method starts when you ask a question about something that you observe: **How, What, When, Who, Which, Why, or Where?**

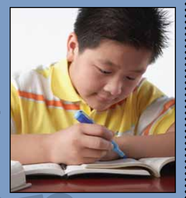


And, in order for the scientific method to answer the question, it must be about something that you can measure, preferably with a number.

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- > Topic Selection Wizard
- > Science Fair Project Ideas
- > Your Question
- > Engineering & Invention Project Template

Do Background Research



Learn from the experience of others.

So that you can design an experiment, you need to research what techniques and equipment might be best for investigating your topic. Rather than starting from scratch, savvy investigators want to use their **library** and **Internet** research to help them find the best way to do things.

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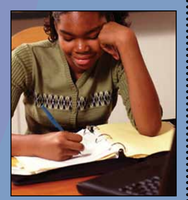
- > Background Research Plan
- > Finding Information
- > Bibliography
- > Research Paper

Construct a Hypothesis

"If [I do this], then [this] will happen."

Quantities whose values can change are called variables.

A hypothesis is an educated guess about how things work: **"If ___[I do this]___, then ___[this]___ will happen."** You must state your hypothesis in a way that you can easily measure, and, of course, your hypothesis should be constructed in a way to help you answer your original question.



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- > Variables for Beginners
- > Variables
- > Hypothesis

Test with an Experiment



Your experiment tests how accurate your hypothesis is. It is important for your experiment to be a **fair test.** You conduct a fair test by making sure that you change only one factor at a time while keeping all other conditions the same.

You should also repeat your experiment several times to make sure that the first results weren't just an accident.

Your experimental procedure is like a step-by-step recipe for your science experiment.

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- > Experimental Procedure
- > Materials List
- > Conducting an Experiment
- > Laboratory Notebook

Analyze Data



Look at the results of your experiment with a critical eye.

If Supported

If Not (or Partially) Supported

Once your experiment is complete, collect your measurements and analyze them to see if your hypothesis is **supported or not.**

Revise & Re-test

Scientists often find that their hypothesis was not fully supported by the data, and, if so, they will construct a new one for additional experimentation. Even if the hypothesis was supported by the data, they may want to test it in a new way.

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- > Data Analysis & Graphs
- > Summarizing Your Data
- > Sample Spreadsheet
- > Conclusions

Communicate Results

A picture speaks a thousand words!



To complete your science project, you will communicate your results to others in a **final report and/or a display board.** Professional scientists do almost exactly the same thing by publishing their final report in a scientific journal or by presenting their results on a poster at a scientific meeting.

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- > Final Report
- > Science Fair Project Abstract
- > Display Board Design, Tips, and Samples
- > Science Fair Judging

THE SCIENTIFIC METHOD

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