



The Scientific Method



OSU EXTENSION
4-H YOUTH DEVELOPMENT

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How do you answer a question?



Question Image: Image by [Tumisu](#), please consider ☕ Thank you! 😊 from [Pixabay](#)

**What is the
scientific method?**



**A series of steps
that are used to
investigate a natural
occurrence**

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1. Make an observation and ask a question.

Ask a question about something you observe.

What? How? Why? Which? When? Where?

Note: Your question should be testable.



2. Conduct Research

Research your topic!
See what information already exists.



3. Construct a Hypothesis*

Predict a possible answer to your problem or question.
Try formatting your hypothesis as an
“If... then... will happen...” statement

*The hypothesis is an educated guess about the relationship between your independent and dependent variables.

Two Main Variables

Independent

The factor that is intentionally manipulated by the experimenter

Hint:

The one YOU change on purpose

Dependent

The factor that may change as a result of changes to the independent variable

Hint:

The one YOU measure



4. Test Your Hypothesis

Conduct an experiment and collect data to test your hypothesis.

Make sure to follow a detailed procedure during your experiment so that others can replicate it!

Experimental Design

Procedure	Materials	Constants "Controlled Variables"
Write out step by step how you will complete your experiment.	Provide a detailed list of materials.	These are factors that the experimenter intentionally keeps the same so that any changes can be attributed to the independent variable.



5. Analyze Your Data and Draw Conclusions

Review your data and determine if it supports your hypothesis.

It is okay if your hypothesis wasn't correct! You have still learned something!



6. Communicate Your Results

Share your results!

By sharing your results, you are helping others if they have the same question or want to replicate your experiment.

Why is the scientific method important?



The scientific method is a way to answer questions!
By following the steps, we ensure more accurate results because the experiment is done the same way every time resulting in less bias and human error.

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