

Steps of the Scientific Method

1. **Problem/Question:** Develop a question or problem that you would like to solve.

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2. **Observation/Research:** Make observations and research the topic (if necessary).

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3. **Formulate a Hypothesis:** Predict a possible answer to the problem or question.
 Example: If soil temperatures rise, then plant growth will increase.

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4. **Experiment:** Develop and follow a **procedure**.
Included in the experiment are ... independent variable, dependent variable, control group and constants.

Independent Variable

The independent, or *manipulated variable*, is a factor that's intentionally varied by the experimenter.

Dependent Variable

The dependent, or *responding variable*, is the factor that may change as a result of changes made in the independent variable.

Control Group

In a scientific experiment, the control is the group that serves as the standard of comparison.

The control group may be a "no treatment" or an "experimenter selected" group.

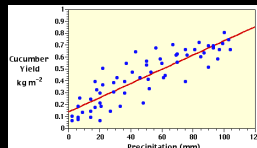
Constants

Factors in an experiment that do not change. *Constants need to remain unchanged for the experiment to be reliable.*

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5. Collect and Analyze Results:
Modify the procedure if needed.

Include tables, graphs and drawings if applicable.



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6. Conclusion: Include a statement that accepts or rejects the hypothesis.
Make recommendations for further study and possible improvements to the procedure.

Let's put our knowledge of the Scientific Method to an example that includes some of the terms you'll be needing to use and understand.

Problem/Question



I break out every time I eat a Big Mac from McDonalds.

Observations/Research

- I broke out in a rash within 15 minutes of eating a Big Mac.
- Research the ingredients of a Big Mac.



Formulate a Hypothesis

I think I break out when I eat a Big Mac because I am allergic to the *special sauce*.



Experiment

I will order a Big Mac without the Special Sauce.

Independent Variable -The Big Mac w/o the special sauce. As an experimenter I am removing the special sauce.

Dependent Variable -The result...Did I break out?

Constants -Other factors...like fries and coke, eating at the same McDonalds. Keep everything else the same as before.

Control Group -There really isn't a control group unless you eat other Big Mac later with the Special Sauce.

Collect the Data.

Data Table

Big Mac without special sauce	No Rash
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Conclusion

When I removed the special sauce from the Big Mac I did not break out, therefore I can conclude the Special Sauce was causing an allergic rash.

Assignment

Its your turn.
Use the steps
of the
Scientific
Method to
solve a
problem.

The Scientific Method

