

Scientific Method

How do we come to conclusions?

The air you are breathing on an airplane is recycled from directly outside of your window. That means you are breathing everything that the airplanes gives off and is flying through. The air that is pumped in isn't pure oxygen either, it's mixed with nitrogen, sometimes almost at 50%. To pump a greater amount of oxygen in costs money in terms of fuel and the airlines know this! The nitrogen may affect the times and dosages of medications, make you feel bloated and cause your ankles and joints swell.

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Parts of an Experiment: The Scientific Method

1) Ask a question that can be tested. Your question should not be too vague or general.

Example: *Does attendance in class improve your grade?*

2) Restate the question as a purpose

Example: *To determine whether high attendance in class leads to a high grade*

3) Make a hypothesis - a suggested answer to your question. A hypothesis makes a good guess (prediction) at how one variable might affect another. It is often written using an IF, THEN statement

Example:

IF a student attends more classes, THEN the student will achieve a higher mark in the course BECAUSE the student will have learned all course material

Parts of an Experiment: The Scientific Method

4) Determine your variables - something that can change in an investigation.

Example:

Three types of variables:

1) independent: the "cause" variable. It is the one thing in the experiment that you purposely change.

Example: *number of classes attended*

2) dependent: the "effect" variable. It is what you measure in your experiment. It depends on the variable that you purposely change (the independent variable)

Example: *overall grade in class*

3) control: Variable that are NOT allowed to change during an experiment. This keeps the experiment fair and reliable.

Example: *same teacher, classroom, semester,*

NOTE: Where does the IV appear in your hypothesis? after the "if"

Where does the DV appear in your hypothesis? after the "Then"

Parts of an Experiment: The Scientific Method

- 5) Gather materials - something that can change in an investigation.
- 6) Design a procedure and carry it out.
- 7) Record your observations. Observations may be:
 - a) qualitative - describes how an object looks, feels, smells, etc, without using numbers.
 - b) quantitative describes an object using numbers and units (measurements). These observations are often given in chart/graph form.
- 8) repeat your experiment and DISCUSS the observations explain what they mean.
- 9) Write a conclusion to summarize your findings.

Experiment: Drops on a penny

- 1) Question: _____
- 2) Purpose: _____
- 3) Hypothesis: _____
- 4) Variables:
 - a) Independent: _____
 - b) Dependent: _____
 - c) Control: _____
- 5) Materials
- 6) Procedure
- 7) Observation
- 8) Conclusion