

Making a Hypothesis

Scientific research and discovery happens as a result of a long process of collecting data from experiments and observations. This has to start with an idea, however, and that idea has to be developed into a hypothesis. Remember that a hypothesis must be able to be tested and you must be able to prove it false. In this activity, you will get some practice writing a hypothesis.

1. Start with a general idea

Example: I think that not getting enough sleep will affect the ability of students to study.

2. Work out your hypothesis

a) Decide which specific things might have a relationship.

Example: amount of sleep and study effectiveness

b) Predict the specific effect a change in one factor will have on the other. The effect could be positive, negative, or neutral (in other words it will have no effect)

Example: Less sleep will decrease the student's study effectiveness (this is a negative relationship)

c) Predict a **specific** change that you will be able to measure during the experiment.

Example: When I deprive students of sleep, they will not be able to remember as many words from a list.

d) Restate your idea as a hypothesis. The hypothesis must be a specific prediction and be able to be tested. Some people find it easier to phrase it in an "If..., then..." format.

Example: **If** there is a negative relationship between the amount of sleep a person gets and their study ability, **then** a person who gets less sleep will be able to remember fewer words in a given length of time.

3. Figure out your experimental design

e) Identify the dependent variable. This is the one you will measure.

Example: The number of words memorized. This is variable you will measure.

f) Identify the independent variable. This is one you will change. Sometimes, this is called the manipulated variable.

Example: The amount of sleep. This is the variable you will change in order to measure the effect.

g) Identify the variables you should control. Remember you have to make sure you change only one thing so that you can isolate the variable you are investigating.

Example: Length of the list of words, length of each word, age of students, grade of students. Maybe you can think of others.

h) Describe the experimental groups for your experiment. The description should include your sample size. Remember a sample size of one is no good because that individual might not represent the group.

Example: A group of 10 students is asked to sleep for 4 hours a night for three nights.

i) Describe the control group for your experiment. The control group is the group you will compare the experimental group to.

Example: A group of 10 students is asked to sleep for 8 hours a night for three nights.

j) State the result that would allow you to conclude that your hypothesis is supported. We would never say

“proved” here because this is only one experiment so it alone could never be seen as proving your hypothesis.

Example: The students who slept only 4 hours per night remembered fewer words in a given time than the students who slept 8 hours.

k) State the result that would cause you to conclude that your hypothesis is NOT supported. Again, we would never say “disproved.”

Example: The students who slept only 4 hours per night did NOT remember fewer words in a given time than the students who slept 8 hours.

l) Figure out how you will collect and record your data.

Example: The number of words correctly recalled will be recorded.