

Framing a hypothesis is one of the more difficult tasks associated with a science fair project. Step 3 is intended to review and reinforce the most important concepts.

Also, many science teachers are eager for students to differentiate the independent and dependent variables when conducting experiments and graphing data. This section also reviews these important terms.

3. Framing your Hypothesis

There are several good ways to frame a hypothesis. Here is one:

“If the **INDEPENDENT VARIABLE** changes, then the **DEPENDENT VARIABLE** changes because **REASON**.”

The thing you plan to change in your experiment is called the INDEPENDENT variable. The thing you measure is called the DEPENDENT variable.

*For example, if you want to know if salt water boils faster than fresh water, you would boil a pot of fresh water and then boil a pot of salt water. The **saltiness** of the water is the INDEPENDENT variable because it is the thing you changed.*

*To do this experiment, you would need to time how long each pot took to boil. Then **length of time** until boiling is the DEPENDENT variable.*

It's also important that you think about other variables for this to be a fair test. For example, were the starting temperatures of the pot and the water the same both times? Did you use the same amount of water? Was the heat source the same? Is “boiling” defined as when you see bubbles? How many?

For the boiling water example above, you could frame a hypothesis this way:

→ If the SALTINESS OF THE WATER changes, then the TIME IT TAKES TO BOIL changes because it takes more energy to heat water than salt.

- ☐ Reread pages 18-19.
- ☐ Consider all the variables involved in your investigation.
- ☐ Determine the independent and dependent variables.
- ☐ Write a hypothesis.

Notes: