



The Scientific Method

Problem: Will a Tootsie Roll Pop dissolve faster at room temperature than when refrigerated?

Based on this, how is a problem phrased?

Hypothesis: The Tootsie Roll Pops at room temperature will dissolve faster than those that are refrigerated.

Based on this, how is a hypothesis phrased?

*Always start with IT IS HYPOTHESIZED THAT!!

In a controlled experiment only ONE variable (independent) is tested at a time.

What would be the independent variable in this experiment?

The **experimental group** receives the variable being tested, while the **control group** does not.

Why is a control group necessary?

How would the experimental group differ from the control group in this experiment?

All other factors remain constant between the experimental and control group (**constants**).

Identify four constants for this experiment:

The dependent variable is the one that results from the independent variable being tested, and should be something that can be measured.

Identify the dependent variable in this experiment:

Remember it is always: The effect of the INDEPENDENT variable on the DEPENDENT variable

Data consists of measurable observations collected from a controlled experiment, and when applicable should be in metric units (cm, mm, g, L etc.).

What kind of data should be collected from this experiment?

Provide a title for the data table below and head the applicable columns with units

***From here, data should be arranged into a graph to observe trends**

Conclusions are statements regarding whether or not the data supported the hypothesis. Conclusions should be reinforced with actual data.

What kind of data would support the hypothesis for this experiment?

Improving validity: This is where suggestions are made regarding how to make the experiment more reliable. Scientists should be able to repeat the experiment and obtain similar results.

Identify two ways this experiment could be improved: