

Inquiry Lab: The Candle in the Jar
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The first step in the Cycle of Proof (Scientific Method) is to become familiar with a phenomenon, which is called a **database**. This is not necessarily data from a lab, but information from informal observations, chance occurrences, and/or the context. In this case you should do several trials of lighting the candle in the trough, which has some water in it, and inserting the jar over the candle. The database should unfold in front of you!

- 1) Record your data. Design your own data table if you think it is helpful.

- 2) The database might make you curious about why the phenomenon you observed happened.

Write a question you would like to answer in your inquiry:

- 3) In the process of trying to answer the question, you will develop a **hypothesis**, often in an "If...then...because..." format.

The **If** segment of the hypothesis introduces an explanation of the mechanism involved which should begin to answer your question to the problem: how does this happen? The **then** segment offers a prediction, which you expect to happen if the hypothesis is valid. The **because** segment gives more detail to the explanation.

Write a hypothesis to explain how the question can be answered:

- 4) Test the hypothesis with an **experiment**.

Briefly describe the steps in your experiment:

- 5) Your database will increase.

Describe what is new in your database:

- 6) As a result of your conclusion to the experiment above, your hypothesis will be strengthened or invalidated.

Make your conclusion. Is your hypothesis strengthened or invalidated?

- 7) This leads to a second hypothesis, which might just refine or fine tune your original hypothesis, or consider another variable in the experiment.

Write out your second hypothesis:

- 8) Your second hypothesis will lead to another experimental test.

Write out your experimental procedure:

9) Your database will increase in size again!

How has your database increased?

10) This leads to a second conclusion, which either strengthens your second hypothesis or invalidates it.

What is your conclusion? Is your second hypothesis strengthened or invalidated?

11) And the Cycle of Proof goes on, and on.

What are three other variables in this investigation you might be able to test?

12) What are three changes or additions you might make if you gave this activity to students studying Form III or IV chemistry?