

Three Hole Bottle Demo Report: Making Predictions and Hypothesis Writing

*Look carefully at the set-up. Listen as your teacher describes **the** bottle and its contents.*

Today you will practice hypothesis writing. This **specialized form** of prediction follows some **rules**—most hypotheses are written using an *if...then* format. For example, if a bull dog growls, **then** it will bite within one minute. Hypotheses can be supported or not supported by doing experiments.

1. Sketch the bottle and show the approximate location of the holes & tape. **Make** any other observations about the bottle now.
2. Make a hypothesis about what will happen when your science teacher pulls the tape from the **first** hole. Use the *if...then* format. **Then sketch** how the bottle will look and the path you think the water will take.
IF:
THEN:
3. Record the experimental results - sketch how the bottle actually looked. Include the actual path of the water also.
4. Make a hypothesis about what will happen when your science teacher pulls the tape from the **SECOND** hole. Sketch how the bottle will look and the path of the water
IF:
THEN:
5. Record the experimental results - sketch how the bottle actually looked.
6. Make a hypothesis about what will happen when your science teacher pulls the tape from the **THIRD** hole. Sketch how the bottle will look.
IF:
THEN:
7. Record the experimental results - sketch how the bottle actually looked.

8. What surprised you about the results? How has your mental model changed? Did your hypotheses become increasingly more specific? Describe the thinking process you went through. What would you need to know more about to explain the bottle phenomena?

Now we will shift the bottle to the horizontal, with the holes facing down, and the tape in place.

What will happen when the holes are uncovered in sequence? **Make** the hypotheses and sketch the bottles below.

- 1st Hole uncovered:
If _____ then _____

- 2nd Hole uncovered:
If _____ then _____

- 3rd Hole uncovered:
If _____ then _____

9. What surprised you about the results? How has your mental model changed? Did your hypotheses become increasingly more specific? Describe the thinking process you went through. What would you need to know more about now in order to explain the bottle phenomena?

Optional Bottle Activity:

Now your task is to develop a hypothesis regarding some phenomena associated with the bottle. Test it by building your own bottle and performing your own experiments. After thinking about what you'd like to test, make a hypothesis using the if...then format. Imagine someone else wanting to follow your experiment exactly. Be sure to clearly document all procedures, to sketch the beginning set-up, to collect accurate data and to carefully record all observations. Don't forget to make sketches during the experiment itself. Write up your results using the lab report format. Make a poster describing your experiment and your findings. Your fellow bottle experimenters will critique your work in the class bottle symposium.