

Canon Paleo Curriculum
Unit: The Nature of Science
Lesson Plan 1

Activity Name: Three Hole Bottle Demo

What is a Hypothesis? (Old answer: Educated guess. New Answer: Best explanation of and observation.) Must be testable and must have a natural explanation.

Supplies:

Two empty 64oz. Plastic Pop bottles
Duct tape
Awl or glass rod
Hot plate
Water
Activity sheet

Preparation:

Heat point of awl on hot plate and poke 3 vertical holes in the side of the bottles
The holes should be 1 inch apart starting from the center of the bottle
Cover the holes securely with duct tape
Fill the bottles to the top, leaving no air space
Tape the top caps of the bottles if the seal is not secure on the caps

Concept:

Students will learn the process of forming a hypothesis and learn how to test it. They will learn how to adjust their initial supposition and determine a natural explanation.

Activity:

Pass out activity sheet, The Three Hole Bottle Demo Report
Follow the steps outlined on the sheet with the class
Ask the class what their hypothesis is according to step 2 (will it do nothing? will it dribble? will it gush?)
Uncover the first hole (no water should flow out)
Step 3 is very important have them record results
Follow though to step 5 (the water will gush and stop above the second)
By step 7 the majority of class should have adjusted their hypothesis and reached the sample conclusion, the third hole will gush

Repeat Experiment with the bottle held horizontally and the hole at a 90-degree angle to the floor.

Result is that none of the holes leak (at this angle air can not escape)

Discussions

The top hole did not leak, because air needs to fill the space in the absence of water, with no source of air the water will not leak out of the hole. The second and third hole flowed, because the water now has a source of air from the top hole.

Time: 20-25 minutes