

Lab 7: Can Crusher and Balloon In A Bottle
Boink! Experimental Lab
3/3/2021

Part 1. Can Crusher

Materials

- Empty soda can
- Water
- Stove/Pan (With Parent's Help)
- Tongs
- Bowl of Cold Water

Procedure

Fill your soda can with about half an ounce of water. Boil the can in a pan of water for about a minute, and you will notice vapor steaming from the opening of the soda can. Using tongs, grab the can and place it upside down in a bowl of cold water. What do you observe?

What do you think caused this to happen?

Explanation: The water vapor exits the can immediately, and cold water condenses the vapor, leaving the can at very low pressure inside. It happens so quickly that the normal air pressure outside the can crushes the exterior of the can.

Part 2. The Balloon in the Bottle

Materials

- Glass bottle
- Balloons
- Stove/Pan (With Parent's Help)
- Tongs

Try putting a balloon inside a glass bottle and blowing into it to inflate the balloon inside the bottle. What happens?

Fill your glass bottle with about an ounce of water. In a pan of water, heat the bottle until the water inside reaches a boil. Stretch your balloon over the mouth of the bottle and then set everything aside to cool using tongs if needed. As the bottle cools, what happens?

What do you think caused this to happen?

Explanation: The gas sucked the balloon into the bottle and it will begin to inflate inside the bottle. What is happening is that the balloon trapped the water vapor in the bottle and as it cools the outside air pressure replaces the water vapor that is now condensing and emptying the inside of the bottle. Gas expands as it heats, and shrinks as it cools, making the bottle “empty” compared to the exterior air pressure. The balloon expands inside the bottle to allow the exterior air pressure inward.