

Magical Inflating Balloons

The Action

Differences in temperature and pressure cause a balloon to self inflate inside a plastic bottle.

Grade Level

Grade 9 - Fluids and Pressure

Grade 7 - Temperature and Heat

Materials

- 1 clear plastic bottle
- 1 bowl or pail
- 1 balloon
- hot and cold water

Instructions

- Fill the bottle with hot water and fill the bowl with cold water. Let both sit for 1 minute.
- Empty the bottle and immediately stretch a balloon over the mouth of the bottle.
- Set the bottle in the bowl of cold water. The balloon will be pulled into the bottle and inflate inside.

Safety

The water in the bottle needs to be very hot so use caution to avoid burns. Tongs should be used to handle a beaker if that is the method chosen to heat the water.

Hints

- This works best if VERY hot water is used. Bringing the water close to a boil seems to work the best. The high temperature may cause the plastic bottle to melt slightly but the experiment should still work (provided there are no holes in the bottle).
- Make sure the bowl of cold water is big enough to almost submerge the bottle. Make sure the seal around the opening of the bottle is completely covered by the balloon so there are no air leaks.

Science Principle

The hot water heats the bottle and stretching the balloon over the mouth of the bottle immediately after pouring the water traps this warm air. If a gas is heated in a container that prevents expansion, the pressure of the gas increases. When the bottle is placed in cold water the air in the bottle cools and contracts causing the pressure inside the bottle to be lower than the pressure outside the bottle. This causes outside air to be drawn in, pulling the balloon in and inflating it inside the bottle.