

COLD/HOT AIR BALLOON

Perfect for curious kids and an exciting way to explore how temperature affects air, this simple experiment brings science concepts to life right before your eyes!

INSTRUCTIONS:

STEP 1: Fill one bowl with hot water from the tap. Fill the second bowl with cold water and add ice cubes to chill it.

STEP 2: Add red food coloring to the warm water and blue food coloring to the cold water.

STEP 3: Stretch the balloon carefully over the mouth of the empty plastic bottle.

STEP 4: Submerge the bottle in the bowl of hot water and observe as the balloon inflates!

STEP 5: After a few minutes, transfer the bottle to the cold water bowl and watch the balloon slowly deflate.

Materials

Water
Two bowls
Empty plastic bottle
Ice cubes
Spoon
Balloon
Blue/red food coloring
(optional)



THE SCIENCE

When the plastic bottle sits in the warm water, the air molecules inside the bottle absorb heat energy. As the molecules gain energy, they move faster, spread farther apart, and take up more space. This causes the air to expand, pushing into the balloon and making it inflate. This is known as thermal expansion.

When the bottle is placed in the cold water, the air molecules lose energy and slow down. As they move less and crowd closer together, the air inside the bottle takes up less space. The result is thermal contraction, causing the balloon to shrink as the air inside it contracts.

Hot/Cold Air Balloon Observations

Use this worksheet to process and evaluate your work.



How do air molecules behave when they are heated or cooled?

Did the balloon behave the way you predicted?

Did it start to inflate right away, or does it take some time?

Did the balloon deflate slowly or quickly?

Can you see or feel any air leaving the balloon?
