

DIY Can Crush



FUN FACT

Implode is the opposite of explode. When something implodes, it quickly collapses inward. Buildings are often imploded when they need to be demolished so that the destruction doesn't hurt nearby buildings or surroundings.

MATERIALS

- An adult helper
- Stovetop or burner
- Empty soda cans
- Large bowl of ice
- Water
- Tongs

DIFFICULTY



AIR PRESSURE

Air is EVERYWHERE! Air is the invisible gaseous substance that surrounds all of the Earth. There are five layers to Earth's atmosphere and gravity is pulling down on the air molecules in each layer. That pulling is what creates atmospheric pressure.

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What do you call the study of soft drinks?

*Answer on the next page

*Joke Answer -
Fizz-ics!

DIY Can Crush

EXPERIMENT

Step 1: Gather materials.

Step 2: Fill a large bowl halfway with ice water.

Step 3: Add an 1/8 cup of water to the bottom of the can (just enough to cover the bottom).

Step 4: Place the can on the center of the burner. Once it's stable, turn the burner on high until it has steamed for at least 1 minute.

Step 5: Use your tongs to grasp the can so that you can safely flip the can over and into the ice water.

Step 6: Quickly flip the can over and place into the ice water so that the opening is submerged. Be careful to not splash hot water as you flip the can.



WHY IT WORKS

As the water in the can heats up, it changes from a liquid to a gas, making water vapor. The water vapor pushes the air out of the can. Once the can is upside down in the ice water, the hot water vapor is trapped inside and quickly cools after it's submerged in the ice water. The water vapor condenses leaving empty space in the can. The air outside of the can has pressure, exerting 14.7 pounds of pressure per square inch on the can! Without the air inside of the can, the air pressure is unequal and the outside air easily crushes the can.

EXTEND YOUR LEARNING

- What would happen if you used room temperature water instead of ice water?
- What happens if you use a different sized can?
- What happens if you don't heat your can up before turning over into the ice water?
- Does the size of your ice impact the experiment?

WORKFORCE CONNECTION

Aerospace engineers have to understand how pressure and a lack of pressure (vacuum) both affect the performance of aircraft and spacecraft inside and outside of the Earth's atmosphere. Aerospace engineers design and test aircraft and spacecraft as well as missiles and satellites to learn how air impacts flight. Aerospace engineers recently were able to test how the air pressure on Mars affects the flight of a drone!