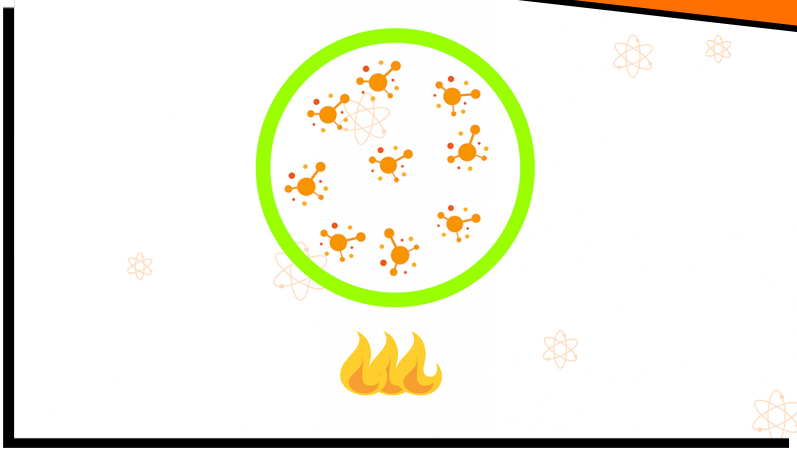
CHARLES' LAW AND THE VOLUME OF GASES!

Did you know that steam engines, hot air balloons, car tires, and even baking have something in common?

Around 1787, Jacques Charles, a French inventor and scientist, used his observations on gases to come up with Charles' Law, which affects so much of the world around us!



Charles' Law states that the volume of a gas is directly proportional to its temperature as it heats up and cools down. We have a simple experiment to show these effects!

MATERIALS

- *BALLOON*
- *EMPTY GLASS BOTTLE*
- *2 BOWLS OR TRAYS THAT ARE A COUPLE INCHES DEEP*
- *A KETTLE*
- *SOME ICE*
- *WATER*

PROCEDURE

1. START BY PUTTING THE BALLOON AROUND THE TOP OF THE BOTTLE.
2. START BOILING WATER IN THE KETTLE (OR ON THE STOVE), ENOUGH TO FILL ONE OF YOUR BOWLS, AND PUT ICE AND WATER IN THE OTHER BOWL. ONCE YOUR WATER IS BOILED, PUT IT IN THE BOWL.
3. STAND THE BOTTLE IN THE BOWL AND OBSERVE THE BALLOON. THE ATOMS OF AIR INSIDE THE BALLOON ARE GETTING EXCITED, MOVING APART, AND BLOWING UP THE BALLOON. IT WILL EXPAND EVEN THOUGH THERE ISN'T ANY NEW AIR BEING ADDED, IT'S SIMPLY THAT THE VOLUME IS INCREASING AND THE AIR IS TAKING UP MORE SPACE.
4. SIMILARLY, TAKE THE BOTTLE OUT OF THE HOT WATER AND PUT IT INTO THE ICE WATER. THE COLD TEMPERATURE WILL SLOW DOWN THE ATOMS AND THEY'LL COME BACK TOGETHER, DECREASING THE VOLUME OF THE AIR AND DEFLATING THE BALLOON.

CLAYTON'S EXPLORATION STATION

THIS EXPERIMENT IS GREAT FOR BEGINNER EXPLORERS, USES HOUSEHOLD ITEMS, AND REQUIRES ADULT SUPERVISION FOR USE OF THE STOVE OR KETTLE.