# **Properties of Air**

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## **1. Air Occupies Space**

#### **Apparatus Required:**

- Glass
- Bowl of water
- Cotton wool

## Steps:

- i. Press a piece of cotton wool into the bottom of the glass.
- ii. Put the glass upside down into the bowl of water. When you take the glass out, the cotton wool remains dry.
- iii. Now, tilt the glass slightly and place it into the bowl of water. Air bubbles are seen escaping, and water enters the glass.

## **Observation and Result:**

- In step 2, the cotton wool remains dry because air is present in the glass, preventing water from entering.
- In step 3, air bubbles emerge as air escapes, allowing water to enter the glass. This confirms that air occupies space.

# 2. Air Has Weight

## **Apparatus Required:**

- Two balloons
- A 1-meter-long stick with a string tied at the center

## Steps:

- i. Fill both balloons with approximately equal amounts of air.
- ii. Tie each balloon to opposite ends of the stick.
- iii. Deflate one of the balloons and observe what happens.

## **Observation and Result:**

• Initially, the stick remains balanced in a horizontal position.

• When one balloon is deflated, the side with the air-filled balloon moves downward, proving that air has weight.

#### 3. Air is Colourless and Invisible

- Air has no colour or visible form.
- If air appears coloured, it is due to the presence of dust, smoke, or pollution.

## 4. Air Does Not Have a Definite Shape or Volume

- When air is blown into a balloon, it takes the shape of the balloon.
- If the air is released into a room, it spreads everywhere, taking up more space.
- This proves that air does not have a fixed shape or volume.

## 5. Air Takes Up Space

- Blowing air into a balloon causes the balloon to expand, showing that air occupies space.
- When a pump is used to fill a football, the air inside expands the football, proving that air takes up space.

## 6. Air Has Mass

#### **Experiment:**

- Weigh an empty balloon on a scale.
- Inflate the balloon and weigh it again.
- The inflated balloon weighs more, proving that air has mass.

#### **Alternative Experiment:**

- Suspend a stick or coat hanger with a string at the center.
- Tie empty balloons to both ends to balance it.
- Inflate one balloon and observe the change.
- The side with the inflated balloon becomes heavier, further proving that air has mass.

## 7. Air Exerts Pressure

#### **Experiment:**

1. Fill a glass with water up to the brim.

- 2. Cover the opening with a cardboard piece.
- 3. Turn the glass upside down and slowly remove your hand.

#### **Observation and Result:**

- The cardboard remains in place, and the water does not spill.
- This happens because air exerts pressure, pushing the cardboard upward and preventing water from falling.

## Conclusion

Through these experiments, we can conclude the following properties of air:

- Air occupies space
- Air has weight
- Air is colourless and invisible
- Air does not have a definite shape or volume
- Air takes up space
- Air has mass
- Air exerts pressure