

# Chapter 15

## Air Around Us

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### Introduction to Air

All living things on Earth need air to survive. It is present everywhere around us.

#### Properties of Air:

- Air is a mixture of gases.
- Air is colourless, tasteless and odourless.
- Air is present in the soil as well as in the water of ponds, rivers, lakes, oceans, etc.

#### Uses of Air:

- Air helps in breathing.
- Air is used for burning fuels.
- Air helps the birds and insects in flying.
- Air helps in the dispersal of seeds.
- Air plays an important role in the water cycle.
- Compressed air is used to fill the tyres of vehicles.

### Is Air Present Everywhere Around Us?

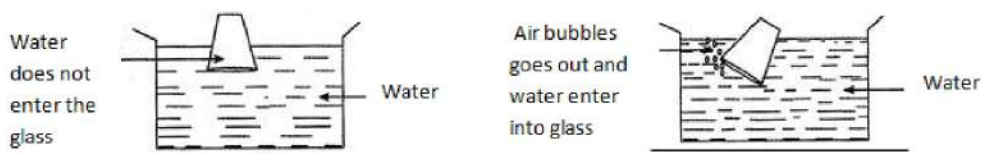


The device weathercock is used to show the direction in which air is moving at that place. In this device a cock is fixed on an arrow which is attached to a rotating axis. When air pushes the cock, the cock and its arrow rotate and align in the direction of moving air.

### **Air Occupies Space:**

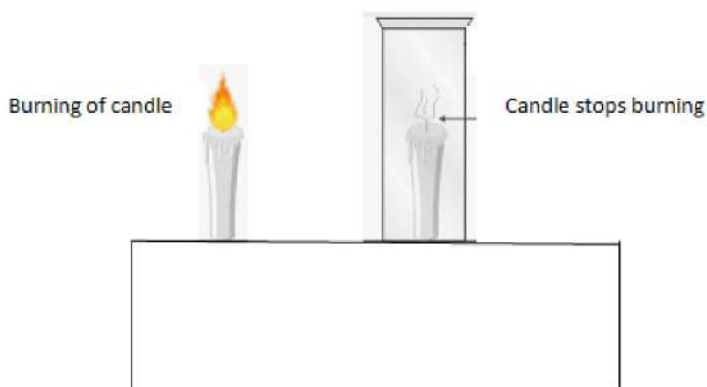
If an empty glass is dipped in a tub filled with water. The water does not enter into the glass because the glass is filled with air. The air present in the empty glass prevents the water from entering it. We know that the air is present everywhere and it is present in the empty glass even when it is upside down.

When we tilt the glass, the air present in the glass comes out in the form of bubbles and water enters into the glass.



### **Air Support Burning:**

A lighted candle is kept on the table. When the candle is covered with a glass after some time the candle gets extinguished. The amount of oxygen present in the glass is used for burning. When most of the oxygen is used by the candle, it stops burning. This shows that air support burning.



### **Atmosphere:**

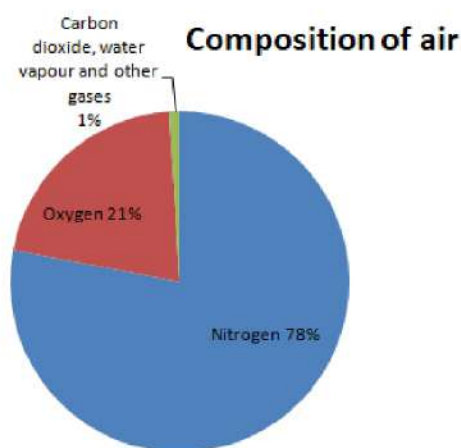
The layer of air which surrounds the earth is called the atmosphere. Earth is surrounded by a layer of air. This layer around the earth extends up to many kilometers above the surface of the earth. As we move higher in the atmosphere, the amount of air becomes less and less.

\* Tip: A mountaineers carry oxygen cylinders with them while climbing high mountains because the air at the top of very high mountains is so thin that it does not have enough oxygen for the people to breathe.



### Composition Of Air

Air is a mixture of many gases. These gases are nitrogen, oxygen, carbon dioxide, water vapor, other gases, and dust particles.



**Nitrogen:**

- Air contains 78% of nitrogen.
- Nitrogen gas does not support burning.
- Nitrogen gas is important for all living things.
- Plant uses nitrogen gas of air to make proteins and these proteins are used by plants and human beings for their growth.

**Oxygen:**

- Air contains 21% of oxygen.
- Oxygen gas is essential for breathing gas.
- Oxygen is necessary for the process of burning fuels such as wood, coal, LPG, kerosene, petrol etc.

**Carbon dioxide:**

- The amount of carbon dioxide in the air is comparatively small but it is very important.
  - The plants need carbon dioxide for photosynthesis.
  - It does not support burning.
- \* Tip: Carbon dioxide does not support burning. It is used as a fire extinguisher.

**Water Vapour:**

- The presence of water vapour in the air is important for the water cycle in nature.

**Dust and Smoke:**

- Dust comes into the air from the blowing of the wind, construction activities, etc.
- Smoke is produced by the burning of fuels.



### ◆ Air Pollution:

Air pollution is the contamination of air by an undesirable substance known as air pollution.



\* Tip: The chimneys in the factories are made long. The long chimney carries the harmful smoke and gases away from the ground and reduces the harmful effects of these gases.

We inhale air when we breathe through our noses. The fine hairs and mucus present inside the nose prevent the dust particles from entering our respiratory system.

If we breathe through our mouth the harmful dust particles present in the air may enter our respiratory system and cause damage to our health. So, we should not breathe through our mouths.

### How Does Oxygen Become Available To Animals And Plants Living In Water And Soil?

- The space between the soil particles is filled with air. The animals which live inside the soil get oxygen for breathing from the air present between the soil particles.
- During the rainy season the earthworms come out of the soil because when it rains heavily all the spaces occupied by air in the soil get filled with water and no air is left in the soil. In this situation, the animals living inside the soil come out to get air for breathing.
- Animals living in water use the oxygen dissolved in water for breathing.

- The plants that live in water also use the oxygen which is dissolved in water. If there were no oxygen in water, then no living things could survive in water.

### How Is The Oxygen In The Atmosphere Replaced?

The oxygen present in the air is consumed by animals and human beings for respiration. During this process carbon dioxide is released into the air which is utilized by plants to make their food by the process of photosynthesis. Thus, plants and animals help in maintaining the balance of oxygen and carbon dioxide gases in the air. This shows the interdependence of plants and animals.