

## Lesson at a Glance

- Air is one of the most important resources which is necessary for all living organisms.
- Moving air is called *wind*.
- Respiration or combustion of fuel gives energy for various purposes where air plays an important role.
- Properties of air:
  - (i) Air is a mixture of various gases.
  - (ii) It is colourless and transparent.
  - (iii) It occupies space. It fills all the space in an empty container.
- The main components of air are nitrogen (78.1%), oxygen (20.9%), argon (0.93%) and carbon dioxide (0.03 to 0.04%).
- Other components of air are water vapour, dust particles and smoke particles which have negligible percentage in air.
- **Weather Cock:** It shows the direction in which the air is moving at that place.
- **Importance of Various Components of Air:**
  - (a) **Nitrogen:** Nitrogen does not support burning and hence fire can be brought under control.
  - (b) **Oxygen:** It is vital for life. It helps in burning.
  - (c) **Carbon dioxide:** It is necessary for photosynthesis. It does not support combustion.
  - (d) **Water vapour:** The presence of water vapour in air is important for water cycle in nature.
- **Smoke:** Composition of gases and dust particles.
- **Atmosphere:**
  - (a) We are surrounded by air in the form of thin gaseous layer.

- (b) Atmosphere is extended to several kilometres around the earth.
- (c) The atmosphere is always active due to movement of air with respect to earth and its up and down movement.
- (d) The processes like, cloud formation, thundering, rain etc. occur in atmosphere.

## • Uses of Air:

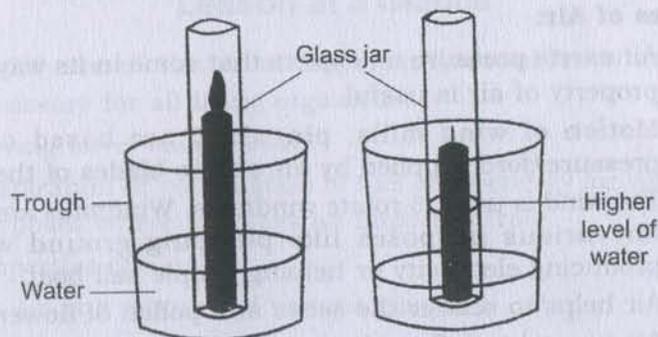
1. Air exerts pressure on objects that come in its way. This property of air is useful.
  2. Motion of wind mills, pin wheel are based on the pressure/force applied by air on the blades of the fan.
  3. The wind is used to rotate windmills. Windmills are used for various purposes like pumping ground water, producing electricity or helping people sail boat.
  4. Air helps to scatter the seeds and pollen of flowers.
  5. Air is used to inflate the tyres of vehicles.
  6. Nitrogen of air is used to manufacture fertilizers.
  7. Air is also used for winnowing.
  8. We cannot hear sound without air.
  9. Birds, insects and bats can fly due to the presence of air.
- Animals use oxygen of air:
    - (i) for respiration
    - (ii) aquatic animals use dissolved oxygen in water for respiration
    - (iii) some quantity of oxygen is trapped in the soil and is helpful for organisms present in the soil for breathing.
  - The balance of oxygen and carbon dioxide in the atmosphere is maintained through respiration in plants and animals and by the photosynthesis in plants.

## ■ TEXTBOOK QUESTIONS SOLVED ■

- Q.1.** What is the composition of air?
- Ans.** Air is mixture of nitrogen, oxygen, carbon dioxide, water vapour and a few other gases. Some dust particles may also be present in it.
- Q.2.** Which gas in the atmosphere is essential for respiration?
- Ans.** Oxygen.

**Q.3.** How will you show that air supports burning?

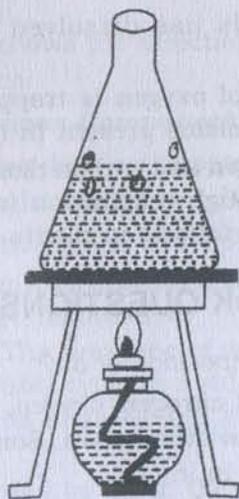
**Ans.** Take a small burning candle. Cover the burning candle with a glass jar. After few minutes the candle is extinguished. As the supply of air is stopped due to glass jar the burning of candle is also stopped. This experiment proves that air supports burning.



**Fig. 15.1** Experiments to show that air supports burning

**Q.4.** How will you show that air is dissolved in water?

**Ans.** Take some water in a glass vessel or beaker. Heat it slowly on a tripod stand. Before the water begins to boil, look carefully at the inner surface of the vessel. You will see tiny bubbles on the inside. On heating, air dissolved in water escapes in the form of these bubbles.



**Fig. 15.2** Water contains air

**Q.5.** Why does a lump of cotton wool shrink in water?

**Ans.** Lump of cotton wool has air among gaps of cotton fibres. When water replaces the air from these gaps, the cotton lump becomes heavy and also shrinks due to removal of air gaps.

**Q.6.** The layer of air around the earth is known as .....

**Ans.** Atmosphere

**Q.7.** The component of air used by green plants to make their food, is .....

**Ans.** Carbon dioxide.

**Q.8.** List five activities that are possible due to presence of air.

**Ans.** The activities that are possible due to the presence of air, are:

- To make a simple firki
- To make a weather cock
- To breathe for survival
- For burning of substance
- For photosynthesis

**Q.9.** How do plants and animals help each other in exchange of gases in the atmosphere?

**Ans.** Animals and plants use oxygen from air during respiration and release carbon dioxide gas in air. But green plants also release oxygen gas by using carbon dioxide during photosynthesis. Thus, we can say that animals and plants help each other in exchange of gases.