

CHAPTER 08**AIR, WINDS AND CYCLONES****Textbook exercises:**

1. Fill the missing words in the blank spaces in the following statements.

- a. Wind is _____ air.
- b. Winds are generated due to _____ heating on the earth.
- c. Near the earth's surface _____ air rises up whereas _____ air comes down.
- d. Air moves from a region of _____ pressure to a region of _____ pressure.

Ans.

a. Moving

b. Uneven

c. Warm, cool

d. High, low

2. Suggest two methods to find out wind direction at a given place.

Ans.

- 1) Hang a piece of paper by using a thread tied to it from your hand. It moves in the direction of the wind.
- 2) Fly a kite and observe it. It flies in the direction of the wind.

3. State two experiences that make you think that air exerts pressure.

Ans.

1. We open windows in our house daily. The door, often slam when we open the window. It shows that air exerts pressure.
 2. The tubes of our scooter are filled with air. When it is filled with air, beyond the limit it bursts. It also shows that air exerts pressure.
- 4. While constructing a house, where do we construct ventilators; why?**

Ans.

While constructing a house, we plan the ventilators on the upper regions above the windows. We all know that hot air rises and cool air sinks. The hot air in the room goes out through the ventilators and we get the cool air through the windows. It makes us feel fresh by circulating the air properly in the room.

- 5. Explain why holes are made in banners and hoardings hanging in the open.**

Ans.

Air exerts pressure. The holes are made in banners and hoardings to allow the air to pass through them. If not, the air pushes the hoardings and may damage them.

- 6. How will you help your neighbors in case cyclones approach your village/ town?**

Ans.

- i) Help the neighbors, in shifting them to safe places.
- ii) Help them to move their vehicles, valuables, and important documents along with them.
- iii) Make them aware of the information and alerts about the cyclone.

iv) Alert them to be aware of hanging electric wires and the purity of drinking water.

7. In the daytime, when we go to the sea the air blows towards us and does not go towards the sea. Explain.

Ans.

During the daytime, the air blows towards us and does not go towards the sea because the land heats up faster than the sea. The hot air over land rises and the cool air from the sea blows onto the land.

8. Which of the statements given below is correct?

- a) In winter, the winds flow from the land to the ocean.
- b) In summer, the winds flow from the land towards the ocean.
- c) A cyclone is formed by a very high-pressure system with very high-speed winds revolving around it.
- d) The coastline of India is not vulnerable to cyclones.

Ans.

Option 'a' is correct. In winter, the winds flow from the land to the ocean.

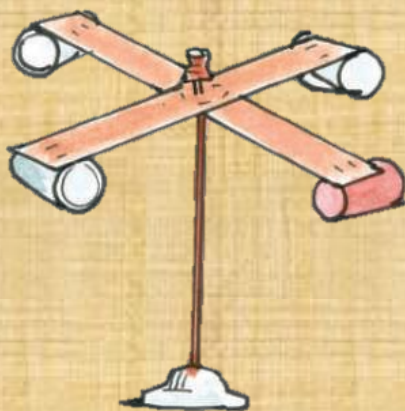
9. Read the following procedure and make your own anemometer.

Collect the following items

- (a) 4 small paper cups
- (b) Two strips of the cardboard 20 cm long, 2 cm width
- (c) Gum
- (d) Stapler
- (e) Sketch pen

(f) Sharpened pencil

Take a scale draw crosses under the cardboard strips as shown in figure.



Fix the strips at the centre, putting one over the other they make a '+' sign. Now fix the cups at the ends of the strips. Color one cup with sketch pen. All four cups should face in the same direction.

Push a pin through the centre of the strips and attach the strips to the sharpened pencil. Check that the strips rotate freely and when you blow on the cups.

Your anemometer is ready. Counting the number of rotations for a minute will give you an estimate the speed of the wind.

10. Collect some articles and photographs from newspapers and magazines about storms and cyclones. Make a story on the basis of what you learnt in this chapter.



11. Interview eye witnesses to collect the actual experiences of people affected by a cyclone.

Ans.

Cyclone is a large air mass or strong wind rotating around a lower pressure area. I met a friend named Srujana, who actually explained the situation during the cyclone hit in her area. She described about the damages happened seriously during the cyclone. Drinking water was not available at that time and no one is able to reach there immediately because of the severe weather. Afterwards, they moved to safe places and offered with the food and pure drinking water. She adds that the information and alerts

should not be neglected and the proper measures should be taken in advance to reduce the damages occur due to cyclones.

12. More fun with air:

Do the following activities and write your findings.

A. Take an empty bottle and place it on the table as shown in figure.



Place a cotton ball just inside its mouth. Now try to blow air on the ball to send it into the bottle, and then try the activity with bottles of different sizes. Throw a challenge to your friends whether they can send the cotton ball inside the bottle by blowing air. Are you surprised? Why did this happen? Think about it and discuss with your friends.

Ans.

According to Bernoulli's principle, air has lower pressure when moving quickly. When I tried to blow the cotton ball near the mouth of the bottle quickly, it seems like the air is at lowest pressure at the mouth and the pressure in the bottle is high. The cotton ball pushed out because of the high pressure inside the bottle compared to low pressure near the mouth of the bottle.

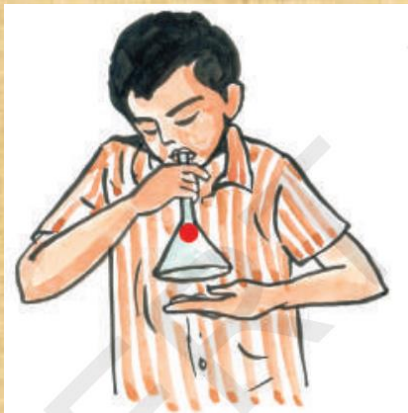
B. Can you blow out the ball from funnel?

Take a funnel and ball, keep the funnel in your mouth as shown in figure.



Keep the ball in the funnel. Blow air through the funnel and try to send out the ball from funnel. What happens? Have you succeeded in sending the ball out?

Then place the ball on your hand and put the funnel over the ball as shown in figure.



Now blow air forcefully through funnel and try to blow out the ball from the funnel (while blowing air, remove hand).

- What did you observe?
- What did you expect?
- What happens?

Try to answer and discuss with your friends.

Ans.

When I tried to blow air to send out the ball from funnel I am surprised. It is because, when the speed of air increases, the pressure decreases and low pressure maintains below the ball. The high pressure of air surrounding the funnel pushes the ball down and avoids rising of the ball any farther.

Regardless of which point you place the funnel, the higher pressure air pushes the ball back into the bowl of funnel.

C. Flow of air

Take a large plastic bottle and a two holed rubber cork that fits firmly into its mouth. Also, take two glass tubes. Tie a colored balloon to the lower end of one of the glass tubes. Insert the glass tubes into the two holes of the cork. The glass tubes should fit tightly in the holes. Close the mouth of the bottle with the cork and seal it with sealing wax to make the bottle airtight. The balloon should be inside the bottle as shown in fig.



Now suck air out of the bottle through the tube that does not have a balloon attached to it.

- What happens to the balloon?
- Why do you think this happened?

Ans.

The balloon gets inflated. When we remove the air from the bottle, a vacuum creates inside the bottle. The high-pressure air inside the balloon pushes outward harder towards the lower pressure air. The air in the balloon pushes out against the walls, keeping it inflated.

