

Air Around us

IN TEXT QUESTIONS

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Q.1. Have you ever seen air?

Ans. We might not have seen air but we must have felt its presence in so many ways.

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- Q.2. Why do you think mountaineers carry oxygen cylinders with them, while climbing high mountains?
- Ans. As we go up in the atmosphere, the availability of air gradually decreases. Thus, to carry out normal breathing, mountaineers carry oxygen cylinders with them.

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- Q.3. Why do traffic policemen wear mask with charcoal lining?
- Ans. The traffic policemen wear mask with charcoal lining because charcoal has activated carbon which absorbs most of the air pollutants, dust pollen, etc. This saves the policemen from their harmful effects.
- Q.4. Why the transparent glass of windows if not wiped off regularly appear hazy?
- Ans. Air contains some gases, water vapours and dust particles that stick to transparent glass of windows. These particles also attract other outdoor elements such as pollen, etc to collect on glass and make a layer. This is why, transparent glass if not wiped off appear hazy.
- Q.5. Why during an incident of fire, one is advised to wrap a woollen blanket over the burning object?
- Ans. The woollen blanket cuts off the supply of air (oxygen) which is helping in the burning of the object. When the supply of oxygen is cut out, the object stops burning.

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- Q.6. Will the tiny air bubbles seen before the water actually boils also appear if we do this activity by reheating boiled water kept in an air tight bottle?
- Ans. Bubbles are seen because on heating the water, the air which is already present in it, in dissolved form tends to escape out. Water after boiling if kept in air tight container and then rebelled, there will no bubbles due to the absence of air.

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Q.7. How air is important for life on Earth?

Ans. Air plays important role in respiration or combustion of fuels which gives energy for various purposes. Air helps in the movement of parachutes and aeroplanes and presence of air makes it possible to birds fly. Air also helps to scatter the seeds and pollen of flowers of several plants. It plays an important role in water cycle.



EXERCISES

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Q.1. What is the composition of air?

- Ans. Air is a mixture of gases, water vapour and dust particles. Largely, it consists of
 - (i) Nitrogen (78.09%)
 - (ii) Oxygen (20.95%)
 - (iii) Carbon dioxide (0.03 0.04%)
 - (iv) Other gases like helium, hydrogen, etc and water vapour, dust particles and smoke particles.

Q.2. Which gas in the atmosphere is essential for respiration?

Ans. Oxygen gas in the atmosphere is essential for respiration.

Q.3. How will you prove that air supports burning?

Ans. Place a burning candle in a tray. Cover it with a glass jar. To make it air-tight, fill tray with water. After sometime, burning candle dims and goes off. Water level also rises up in the jar. It shows air support burning.



During burning, oxygen is consumed and carbon dioxide is released. After sometime, no oxygen is left inside the jar and flame goes out. Once the candle goes off, the temperature surrounding the candle cools down and volume of air (carbon dioxide) decreases. Thus, water rises up little in the jar.

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, well before the water begins to boil. Look carefully at the inner surface of the vessel you will see tiny bubbles inside. These bubbles come from the air dissolved in water.

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 dipped in water, air from these gaps is replaced by water. The cotton lump becomes heavy and also shrinks due to removal of air gaps.

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- Q.6. The layer of air around the earth is known as...
- **Ans.** The layer of air around the earth is known as atmosphere.
- Q.7. The component of air used by green plants to make their food, is...
- Ans. The component of air used by green plants to make their food is carbon dioxide.
- Q.8. List five activities that are possible due to the presence of air.
- **Ans.** The activities that are possible due to presence of air
 - (i) Respiration by animals
 - (ii) Photosynthesis by plants
 - (iii) Power generation by windmills
 - (iv) Burning of fuels and substances
 - (v) Scattering of seeds and pollens of plants (pollination)
 - (vi) Movements of sailing yachts, gliders, parachutes and aeroplanes

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

Ans. There is interdependence of plants and animals for exchange gases. Plants take carbon dioxide from the atmosphere and prepare food. This is called photosynthesis. During this process, plants give out oxygen to the atmosphere. Animals inhale this oxygen and gives out carbon dioxide to the atmosphere. Therefore, plants and animal help each other in the exchange of gases in the atmosphere.



MULTIPLE CHOICE QUESTIONS

Q 1. Which of the following statements is incorrect?

- (a) All living things require air to breathe
- (b) We can feel air but we cannot see it
- (c) Moving air makes it possible to fly a kite

(d) Air is present everywhere but not in soil

Ans. (d) Air is present everywhere even in the soil. Oxygen is trapped in the soil and is helpful for organisms present in the soil for breathing.

Q 2. Wind does not help in the movement of which of the following

- (a) Firki (b) Weather cock
- (c) Ceiling fan (d) Sailing yacht
- Ans. (c) Wind does not help in movement of ceiling fan. It rotates by electricity.

Q 3. What is not true about air?

- (a) It makes the windmill rotate
- (b) It helps in the movement of aeroplanes
- (c) Birds can fly due to presence of air
- (d) It has no role in water cycle
- Ans. (d) Air has water vapour that plays an important role in water cycle.
- Q 4. Mountaineers carry oxygen cylinders with them because
 - (a) there is no oxygen on high mountains
 - (b) there is deficiency of oxygen on mountains at higher altitude
 - (c) oxygen is used for cooking
 - (d) oxygen keeps them warm at low temperature
- Ans. (b) As we go up above the sea level, the atmospheric pressure goes on decreasing and the amount of oxygen also decrease at higher altitude. This is why, mountaineers carry oxygen cylinders with them.
- Q 5. Boojho took an empty plastic bottle, turned it upside down and dipped its open mouth into a bucket filled with water. He then tilted the bottle slightly and made the following observations:
 - (i) Bubbles of air came out from the bottle.
 - (ii) Some water entered into the bottle.
 - (iii) Nitrogen gas came out in the form of bubbles and oxygen gas dissolved in water
 - (iv) No bubbles formed, only water entered into the bottle
 - Which observations is/are correct?
 - (a) (i) and (ii) (b) Only (iv)
 - (c) (iii) and (iv) (d) Only (i)
- Ans. (a) Bubbles of air came out from the bottle and some water entered into the bottle, when it was tilted.

Q 6. Which of the following components of air is present in the largest amount in the atmosphere? (a) Nitrogen (b) Oxygen

- (c) Water vapour (d) Carbon dioxide
- Ans. (a) Nitrogen is present in largest amount in the atmosphere. It occupies 78.09% of atmosphere.

Q 7. The components of air which are harmful to living beings are

- (a) nitrogen and carbon dioxide
- (b) dust and water vapour
- (c) dust and smoke
- (d) smoke and water vapour
- Ans. (c) Dust and smoke present in air are harmful to living beings.
- Q 8. Usha took a lump of dry soil in a glass and added water to it till it was completely immersed. She observed bubbles coming out. The bubbles contain
 - (a) water vapour (b) only oxygen gas
 - (c) air (d) None of the above
- Ans. (c) The bubbles contain air because soil absorb some amount of air

VERY SHORT ANSWER TYPE QUESTIONS

- Q 9. State whether the following statements are true or false. If false, correct them.
 - (a) Plants consume oxygen for respiration.
 - (b) Plants produce oxygen during the process of making their own food.
 - (c) Air helps in the movements of sailing yachts and glider but plays no role in the flight of birds and aero planes.
 - (d) Air does not occupy any space.
- Ans. (a) True
 - (b) True
 - (c) False, air also helps in the flight of birds and aeroplanes.
 - (d) False, air occupies space.

Q 10. In a number of musical instruments, air plays an important role. Can you name some such instruments?

Ans. Air plays an important role in number of musical instruments such as flute, shahnai, harmonium.

Q 11. In the boxes of Column I the letters of some words got jumbled. Arrange them in proper form in the boxes given in Column II.

- Ans. (a) Windmill (b) Oxygen (c) Smoke (d) Dust
- Q 12. Make sentences using the given set of words.
 - (a) 99%, oxygen, nitrogen, air, together
 - (b) Respiration, dissolved, animals, air, aquatic
 - (c) Air, wind, motion, called
- Ans. The correct sentences are:
 - (a) Oxygen and nitrogen together make up 99% of the air.
 - (b) Aquatic animals use dissolved air for respiration.
 - (c) Air in motion is called wind.

SHORT ANSWER TYPE QUESTIONS

Q 13. A list of words is given in a box. Use appropriate words to fill up the blanks in the following statements.

- Air, oxygen, wind, water vapour, mixture, combination, direction, road, bottles,
- cylinders
- (a) The makes the windmill rotate.
- (b) Air is a of some gases.
- (c) A weather cock shows the in which the air is moving at that place.
- (d) Mountaineers carry oxygen with them, while climbing high mountains.
- Ans. (a) wind (b) mixture
 - (c) direction (d) cylinders
- Q 14. Observe the picture given in figure carefully and answer the following questions.



- (a) What is covering the nose and mouth of the policeman?
- (b) Why is he putting a cover on his nose?
- (c) Can you comment on air quality of the place as shown in the figure?
- (a) Mask is covering the nose and mouth of the policeman.
- (b) Policeman is putting a cover on his nose to save himself from dirt/polluted air.

(c) Air quality of the place is not good. It is due to the smoke and gases emitted by the automobiles along with dust particles present in the air.

Q 15. Garima observed that when she left her tightly capped bottle full of water in the open sunlight, tiny bubbles were formed all around inside the bottle. Help Garima to know why it so happened?

Ans. Air is dissolved in water in the form of oxygen. When water bottle is left in the open sunlight, tiny bubbles were formed all around inside the bottle because air dissolved in water starts escaping in the form of tiny bubbles due to heat from the sun.

Column I	Column II
(a) Weathercock	(i) Gases and fine
	dust particles
(b) Mountaineers	(ii) Sailing yacht
(c) Fine hair inside the	(iii) Oxygen cylinders
nose	
(d) Smoke	(iv) Direction of air
	flow
(e) Wind	(v) Prevent dust
	particles

Q 16. Match the items of Column I with the items of Column II.

Ans.

Ans.

Column I	Column II
(a) Weathercock	(iv) Direction of air
	flow
(b) Mountaineers	(iii) Oxygen
(c) Fine hair inside the	(v) Prevent dust
nose	particles
(d) Smoke	(i) Gases and fine
	dust particles
(e) Wind	(v) Sailing yacht

LONG ANSWER TYPE QUESTIONS

- Q 17. Explain the following observations very briefly:
 - (a) A firki does not rotate in a closed area.
 - (b) The arrow of weather cock points towards a particular direction at a particular moment.
 - (c) An empty glass in fact is not empty.
 - (d) Breathing through mouth may harm you.
- Ans. (a) Motion of firki is based on the pressure/force applied by air on the blades of the firki. A firki does not rotate in a closed area because of lack of air movement.

(b) The arrow of weather cock points towards a particular direction as it shows the direction in which the air is moving at that place at a particular moment.

(c) Even the so called empty glass is not in fact empty. It is filled with air. Air is present everywhere.

(d) Breathing through mouth may harm us because we may inhale dust if present in air which is harmful.

Q 18. Write just a few sentences for an imaginary situation if any of the following gases disappear from the atmosphere.

(a) Oxygen (b) Nitrogen (c) Carbon dioxide

Ans. (a) There will be no life on Earth. Oxygen is vital for life. It helps in burning, respiration, photosynthesis, etc. Oxygen is basic need of living beings.

(b) Nitrogen does not support burning. If nitrogen gas disappear from the atmosphere, things will burn very fast.

(c) Carbon dioxide is basic need for photosynthesis which occur green plants. In its absence, plants will not be able to prepare their food and hence, there will be no life on Earth.

Q 19. Paheli kept some water in a beaker for heating. She observed that tiny bubbles appeared before the water stated to boil. She boiled the water for about 5 min and filled it in a bottle up to the brim and kept the bottle airtight till cooled down to room temperature.

(a) Why did the tiny bubbles appeared?

(b) Do you think tiny bubbles will appear on heating the water taken out from the bottle? Justify your answer,

- Ans. (a) Air is dissolved in water in the form of oxygen. Tiny bubbles are formed, when air present in the water escape on boiling it. So, tiny bubbles appeared due to the evolution of air dissolved in water.
 (b) No, tiny bubbles will not appear as there is no dissolved air in this water.
- Q 20. On a Sunday morning, Paheli's friend visited her home. She wanted to see some flowering plants in the nearby garden. Both of them went to the garden. While returning from the garden, they also observed some flowering plants on the roadside. But to their surprise, they found that the leaves and flowers of these roadside plants were comparatively very dull. Can you help them to know why?

Ans. The leaves and flowers of the roadside plants are very dull. The air along the roadside is polluted with air pollutants due to emissions from vehicles and industries, etc.
 Thus, the roadside plants had probably some dust and soot deposited on them. This made them appear dull.