

Grade VII

Lesson 4. Air

GEOGRAPHY

I Multiple choice questions

1. Excess of CO₂ is responsible for:
(a) Global warming (b) Global cooling
(c) Both (a) and (d) (d) None of these
2. When the air is heated it becomes:
(a) Heavier (b) Lighter
(c) Colder (d) Warmer
3. Stratosphere contains a layer of:
(a) Nitrogen gas (b) Ozone gas
(c) Helium gas (d) None of these
4. All weather phenomenon occurs in:
(a) Troposphere (b) Stratosphere
(c) Thermosphere (d) Mesosphere
5. The wind blows constantly throughout the year in particular direction:
(a) Permanent winds (b) Local winds
(c) Seasonal winds (d) Both (a) and (b)
6. Which one of the following is a local wind?
(a) Sea breeze (b) Trade wind
(c) Monsoon wind (d) None of these

1. (a) 2. (b) 3. (b) 4. (a) 5. (a) 6. (a)

II Multiple choice questions

1. Which gas released in the atmosphere creates a greenhouse effect trapping the heat?
(a) Carbon dioxide (b) Oxygen
(c) Nitrogen (d) All of these
2. Excess amount of CO₂ is responsible for
(a) global cooling (b) global warming
(c) both (a) and (b) (d) none of these
3. What are the important objects for survival of plants and animals?
(a) Rainfall (b) Sun light
(c) Oxygen (d) All of these

1. COMPOSITION OF THE ATMOSPHERE

- 1.1. Which one of the following gases is present in the atmosphere in the highest amount?
(a) Oxygen (b) Carbon dioxide
(c) Nitrogen (d) Lithium
- 1.2. Which gas is used by the green plants to make their food?
(a) Oxygen (b) Carbon dioxide
(c) Nitrogen (d) None of these
- 1.3. Which is the important gas used by human beings for breathing?
(a) Nitrogen (b) Carbon dioxide
(c) Oxygen (d) Sodium chloride
- 1.4. When the air is heated it becomes
(a) Lighter? (b) Heavier?
(c) Colder? (d) None of these

2. STRUCTURE OF THE ATMOSPHERE

- 2.1. What is the average height of the troposphere?
(a) 3 km (b) 6 km
(c) 9 km (d) 13 km

2.2. As we go up in troposphere layer of the atmosphere the pressure

- (a) Increases
- (b) decreases
- (c) no change
- (d) all of these

2.3. Which one of the following gases protects us from harmful sun's rays?

- (a) Ozone
- (b) Nitrogen
- (c) Carbon dioxide
- (d) Oxygen

3. WEATHER AND CLIMATE

3.1.1. Which of the following are part of weather forecast in the newspapers?

- (a) Temperature
- (b) Pressure
- (c) Time of Sunset
- (d) Gravity

3.1.2. The water boils at

- (a) 10°C
- (b) 50°C
- (c) 75°C
- (d) 100°C

3.2. Air Pressure

3.2.1. Where is the air pressure highest?

- (a) Moon
- (b) Sea Level
- (c) Stratosphere
- (d) Exosphere

3.3. Wind

3.3.1. What is very hot wind called?

- (a) Loo
- (b) Cool breeze
- (c) Monsoon air
- (d) Trade wind

3.3.2. Which one of the following is a local wind?

- (a) Sea breeze
- (b) Trade wind
- (c) Monsoon wind
- (d) None of these

3.4. Moisture

3.4.1. Rain, snow sleet the or hail are the different forms of:

- (a) Condensation (b) Evaporation
 (c) Precipitation (d) All of these

0.1. (a)	0.2. (b)	0.3. (d)	1.1. (c)
1.2 (b)	1.3. (c)	1.4. (a)	2.1 (d)
2.2. (b)	2.3. (a)	3.1. (d)	3.1.1. (a)
3.1.2. (d)	3.2.1. (b)	3.3.1. (a)	3.3.2. (a)
3.4.1. (c)			

III Multiple choice questions

- (i) Which one does not happen when air is heated?
- (a) It expands (d) It becomes lighter
 (c) It goes up (d) It comes down
- (ii) The most plentiful gas in the atmosphere is
- (a) Nitrogen (b) Oxygen
 (c) Carbon dioxide (d) Argon
- (iii) This layer helps in radio transmission
- (a) Troposphere (b) Stratosphere
 (c) Thermosphere (d) Mesosphere
- (iv) This instrument measures temperature
- (a) Barometer (b) Wind vane
 (c) Thermometer (d) Rain gauge
- (v) These winds blow constantly through-out the year in a particular direction
- (a) Permanent winds (b) Local winds
 (c) Seasonal winds (d) Both (a) and (b)

Ans. (i)-(d), (ii)- (a), (iii)-(c), (iv)-(c) (v)-(a)

IV Multiple choice questions

- Which of the following gases protects us from harmful sun rays?
(a) Carbon dioxide (b) Nitrogen
(c) Ozone (d) None of these
- The most important layer of the atmosphere is
(a) Troposphere (b) Thermosphere
(c) Mesosphere (d) none of these
- Which of the following layers of the atmosphere is free from clouds?
(a) Troposphere (b) Stratosphere
(c) Mesosphere (d) None of these
- When precipitation comes down to the earth in the liquid form, it is called
(a) Cloud (b) Rain (c) Snow (d) none of these
- The quantity of nitrogen in atmosphere is
(a) 72% (b) 73% (c) 74% (d) 78%
- Ionosphere is a part of
(a) Troposphere (b) Stratosphere
(c) Thermosphere (d) Exosphere
- The upper most layer of the atmosphere is called
(a) Exosphere (b) mesosphere
(c) Troposphere (d) none of these
- Temperature is measured by
(a) Barometer (b) thermometer
(c) rain gauge (d) none of these
- Atmosphere pressure is measured by
(a) barometer (b) thermometer
(c) rain gauge (d) none of these

10. Amount of rainfall is measured by

- (a) barometer (b) rain gauge (c) wind vane (d) none of these

1. (c)	2. (a)	3. (b)	4. (b)	5. (d)
6. (c)	7. (c)	8. (b)	9. (a)	10. (b)

I Fill in the blanks

1. Earth is surrounded by a blanket of air called Atmosphere .
2. Green plants produce Oxygen during photosynthesis.
3. Increased volume of Carbon dioxide is affecting the earth's weather and climate.
4. Ionosphere is the part of Thermosphere
5. Amount of rainfall is measured by Rain gauge
6. Insulation influences the distribution of Temperature

II Fill in the blanks

- (i) The standard unit of measuring temperature is degree Celsius.
- (ii) Meteorites burn up in mesosphere on entering from the space.
- (iii) One important feature of stratosphere is that it contains a layer of ozone gas.
- (iv) Green plants produce oxygen during photosynthesis
- (v) All weather phenomena occur in troposphere

III Fill in the blanks

1. Carbon dioxide is present in 0.03% amount in the air.
2. Astronauts have to wear special protection suits filled with air when they go to the moon.
3. Hot and dry local wind of the northern plains of India is called Loo.
4. Carbon dioxide released in the atmosphere creates a Greenhouse effect.
5. Trade winds, westerlies and easterlies are the permanent winds.
6. Windvane shows the direction of the wind.

IV Fill in the blanks

1. The atmosphere consists of **78** % nitrogen and **21** % oxygen.
2. **Carbon dioxide** released in the atmosphere creates greenhouse effect.
3. **Green** plants produce oxygen during photosynthesis.
4. Third layer of atmosphere is **Mesosphere**.
5. Meteorites burn up in **Mesosphere** on entering from the space.
6. **Ozone layer** protects us from the harmful effects of sun rays.
7. **Nitrogen** is the most plentiful gas in the air.
8. **Barometer** is used to measure atmospheric pressure.
9. All the weather phenomena occur in **Troposphere**.
10. Average heights of **Troposphere** is 13 km.
11. The upper most layer of atmosphere is known as **Exosphere**.
12. **Isolation** influences the distribution of temperature.

I Match the columns

Column A	Column B
1. Temperature	(a) Bacteria in soil
2. Pressure	(b) Thermosphere
3. Seasonal wind	(c) Barometer
4. Radio waves transmission	(d) Thermometer
5. Nitrogen from air	(e) Change directions in different seasons

1. d	2. c	3. e	4. b	5.a
------	------	------	------	-----

II Match the columns

Column A	Column B
(i) Oxygen	(a) Precipitation
(ii) Nitrogen	(b) Stratosphere
(iii) Carbon dioxide	(c) 21%
(iv) Rain, snow, sleet	(d) 0.03%
(v) Uppermost layer	(e) 78%
(vi) Ideal for flying aeroplanes	(f) Exosphere

(i) c.	(ii) e.	(iii) d.	(iv) a.	(v) f	(vi) b
--------	---------	----------	---------	-------	--------

III Match the columns

Column A	Column B
1. Trade winds	(a) Seasonal wind
2. Loo	(b) Horizontal movement of air
3. Monsoon	(c) Permanent wind
4. Wind	(d) Local wind
5. Ozone Layer	(e) Rainfall
6. Insolation	(f) Anders Celsius
7. Celsius	(g) Temperature
8. Relief	(h) Stratosphere

1. (c)	2. (d)	3. (a)	4. (b)	5. (h)	6. (g)	7. (f)	8. (e)
--------	--------	--------	--------	--------	--------	--------	--------

I True or False

1. Hot air is dense and heavy and cold air is lighter and expands. **False**
2. Without Greenhouse effect earth would have been too cold to live. **True**
3. Ionosphere contains the ozone layer. **False**
4. Helium and hydrogen float from exosphere into space. **True**
5. Wind-vane shows the direction of wind. **True**
6. Air moves from high pressure to low pressure. **True.**

II True or False

- 1 (i) Our atmosphere is divided into five layers **True.**
(ii) Climate can change from day to day **False.**
(iii) The air always moves from low pressure areas to high pressure areas **False .**
(iv) Local winds blow only during a particular period of the day or year in a small area. **True**
(v) Heavy air rises up and creates a high pressure area **False.**

III True or False

1. Cold air is denser and heavy **True.**
2. The amount of isolation decreases from the equator towards the poles **True .**
3. A wind is named after the direction from which it blows **True .**
4. Plants help preserve water **True .**
5. Rainfall brings fresh water to earth's surface **True .**

Very Short Answer Questions

1. Which gas creates greenhouse effect in the atmosphere?

Carbon dioxide released in the atmosphere creates a greenhouse effect by trapping the heat radiated from the earth. This is greenhouse gas. Without it the earth would have been too cold to live in.

2. What is global warming?

When greenhouse gas level increases due to factory smoke or car fumes, the heat retained increases the temperature of the earth. This is called global warming.

3. Distinguish between weather and climate.

Weather is hour-to-hour, day-to-day condition of the atmosphere. On the other hand, the average weather condition of a place for a longer period of time represents the climate of a place.

4. What is temperature?

The degree of hotness and coldness of the air is called temperature.

5. What is insolation?

Insolation is the incoming solar energy intercepted by the earth.

6. What is air pressure?

Air pressure is defined as the pressure exerted by the weight of air on the earth's surface.

7. What is water vapour?

When water evaporates from land and different water bodies, it becomes water vapour.

8. What is humidity?

Moisture in the air any time is called humidity.

9. What is rain?

Precipitation that comes down to the earth in liquid form is called rain.

10. What is wind?

The movement of air from high-pressure area to low-pressure area is called wind.

Short Answer Questions

1. What are the effects of global warming?

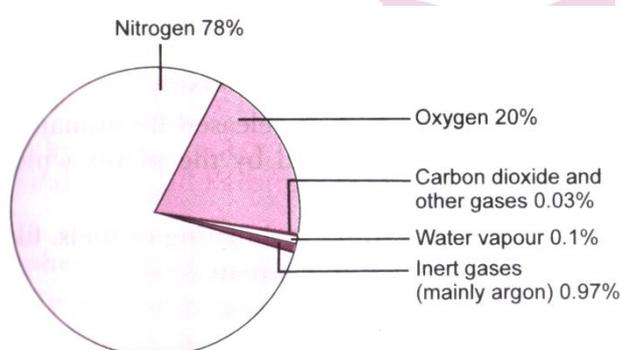
- (i) The rise in temperature causes the snow in the coldest parts of the world to melt.
- (ii) Due to this, sea level rises causing floods in the coastal areas.
- (iii) There may be drastic changes in the climate of a place leading to extinction of some plants and animals in the long run.

2. How is nitrogen a constituent of the atmosphere?

- (i) Nitrogen is the most plentiful gas in the air.
- (ii) When we inhale, we take some plants and animals in the long run.
- (iii) But plants need nitrogen for their survival.
- (iv) They cannot take nitrogen directly from the air.
- (v) Bacteria, which live in the soil and roots of some plants, take nitrogen from the air and change its form so that plants can use it.

3. Describe the composition of the atmosphere.

- (i) Nitrogen and oxygen are two gases which make up the bulk of the atmosphere.
- (ii) Carbon dioxide, helium, ozone, argon and hydrogen are found in lesser quantities.
- (iii) Apart from these gases, tiny dust particles are also present in the air. The composition of atmosphere is as follows:



Next Generation School

4. How is oxygen a constituent of the atmosphere?

- (i) Oxygen is the second most plentiful gas in the air.
- (ii) Humans and animals take oxygen from the air as they breathe.
- (iii) Green plants produce oxygen during photosynthesis.
- (iv) In this way, oxygen content in the air remains constant.
- (v) If we cut trees, this balance gets disturbed.

5. How does humidity affect us?

- (i) When the air is full of water vapour, we call it a humid day.
- (ii) As the air gets warmer, its capacity to hold the water vapour increases and so it becomes more and more humid.
- (iii) On a humid day, clothes take longer to dry, and sweat from human body does not evaporate easily, making us feel uncomfortable.

6. How does water vapour lead to precipitation?

- (i) When the water vapour rises, it starts cooling.
- (ii) The water vapour condenses, causing the formation of droplets of water.
- (iii) When these droplets of water become too heavy to float in air, they come down as precipitation.

7. How did cyclone affect Odisha in October 1999?

- (i) The cyclone in Odisha in October 1999 affected 13 million people, uprooted trees and damaged the houses.
- (ii) A large number of livestock were killed. Standing crops of paddy, vegetables and fruits were heavily damaged.
- (iii) Due to salinisation caused by tidal surge, large tract of agricultural land became infertile.
- (iv) Large number of mangrove forests vanished.

Long Answer Questions

1. How is carbon dioxide useful?

- (i) Green plants use carbon dioxide to make their food and release oxygen.
- (ii) Humans or animals release carbon dioxide.
- (iii) The amount of carbon dioxide released by humans or animals seems to be equal to the amount used by the plants which make a perfect balance.
- (iv) However, the balance is upset by burning of fuels, like coal and oil. All this affects earth's weather and climate.

2. How does insolation affect temperature?

- (i) The amount of insolation decreases from the equator towards the poles.
- (ii) Therefore, the temperature decreases in the same manner.
- (iii) If the earth's temperature rises too high, it would become too warm for some crops to grow.
- (iv) Temperature in cities is much higher than that of villages.
- (v) The concrete and metals in buildings and the asphalt of roads get heated up during the day.
- (vi) This heat is released during the night.
- (vii) Further, the crowded high-rise buildings of the cities trap the warm air and thus raise the temperature of the cities.

3. How does air pressure get affected due to layers of atmosphere?

- (i) The pressure falls rapidly as we go up the layers of the atmosphere.
- (ii) The air pressure is highest at the sea level and decreases with height.
- (iii) Horizontally, the distribution of air pressure is influenced by temperature of air at a given place.
- (iv) In areas where temperature is high, the air gets heated and thus rises.
- (v) This creates a low-pressure area, which leads to cloudy skies and wet weather.
- (vi) In areas with low temperature, air is cold and pressure is heavy.
- (vii) Heavy air sinks and creates a high-pressure area.
- (viii) High pressure is associated with clear and sunny skies.
- (ix) Air moves from high-pressure to low pressure areas.

4. Give reasons.

(a) Wet clothes take longer time to dry on a humid day?

(b) Amount of insolation decreases from equator towards poles?

(a) On a humid day, evaporation from wet clothes takes place slowly in the atmosphere due to low temperature. Hence, wet clothes take longer to dry on a humid day.

(b) Insolation comes through vertical rays on equator. As we go up from equator towards poles, the sun rays become slanting. The slanting rays take up more space, the degree of hotness is felt less. Hence the amount of insolation decreases from equator towards poles.

5. Examine the structure of the atmosphere.

The structure of atmosphere is divided into five layers. These include:

(i) Troposphere: Its average height is 13 km and all weather phenomena like rainfall, fog and hailstorm occur here. The air we breathe is found here.

(ii) Stratosphere: It extends up to a height of 50km. It is free from weather conditions and clouds making it ideal for flying aeroplanes. It even contains ozone layer which protects us from the harmful sun rays.

(iii) Mesosphere: It extends up to a height of 80km. Meteorites burn up in this layer on entering from the space.

(iv) Thermosphere: In this, the temperature rises with increasing height. Ionosphere is a part of this layer. It extends 80-400 km. It even helps in radio transmission. Radio waves transmitted from the earth are reflected back to the earth by this layer.

(v) Exosphere: It is the upper most layer and has very thin air. Light gases like helium and hydrogen float into the space from here.

6. How are winds classified?

Winds are classified into three types:

(i) Permanent winds: It consists of trade winds, westerlies and easterlies. These blow constantly throughout the year in a particular direction.

(ii) Seasonal Winds: These winds change their direction in different seasons, like monsoons in India.

(iii) Local winds: These blow only during a particular part of the day or year in one area or the whole area; for example, land and sea breeze or winds in North India.