

Maharashtra Board Solutions Class

8-Geography: Chapter 3- Humidity and Clouds

BOOK SOLUTIONS
CLASS 8
GEOGRAPHY

CHAPTER 3
Humidity and Clouds






Maharashtra Board Solutions→

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8-Geography: Chapter 3- Humidity and Clouds

Class 8: Geography Chapter 3 solutions. Complete Class 8 Geography Chapter 3 Notes.

Maharashtra Board Solutions Class 8-Geography: Chapter 3- Humidity and Clouds

Maharashtra Board 8th Geography Chapter 3, Class 8 Geography Chapter 3 solutions

Questions and Answers

1. Match the column and complete the chain:

'A' Column	'B' Column	'C' Column
1. Cirrus	i. Vertical extent in the sky	a. Roaring clouds
2. Cumulonimbus	ii. Higher altitude	b. Floating clouds
3. Nimbostratus	iii. Medium altitude	c. Continuous rainfall
4. Alto-cumulus	iv Low altitude	d. Snowflake clouds

Answer:

'A' Column	'B' Column	'C' Column
1. Cirrus	ii. Higher altitude	d. Snowflake clouds
2. Cumulonimbus	i. Vertical extent in the sky	a. Roaring clouds
3. Nimbostratus	iv Low altitude	c. Continuous rainfall

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4. Alto-cumulus iii. Medium altitude b. Floating clouds

2. Choose the correct word from the brackets and complete the sentences:

(Options: Cumulonimbus, relative humidity, absolute humidity, condensation, vapor-holding capacity)

Question a.

The of the air is dependent on the temperature of the air.

Answer:

vapour-holding capacity

Question b.

The amount of vapour in 1 cu.m, of air shows the

Answer:

absolute humidity

Question c.

As is less in the desert areas, the air is dry there.

Answer:

relative humidity

Question d.

..... type of clouds are indicators of the storm.

Answer:

Cumulonimbus

Question e.

In a free environment, the of the vapour present in the atmosphere takes place around the dust particles.

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Answer:

condensation

3. Differentiate between:

Question a.

Humidity and clouds:

Answer:

Humidity	Clouds
Meaning	
The amount of water vapour present in the air is called humidity.	A mass of fine particles of ice and water accumulated around the dust particles in the air at high altitude is called a cloud.
Visibility	
Humidity is in the invisible form.	Clouds are in the visible form.

Question b.

Relative humidity and Absolute humidity

Answer:

Relative humidity	Absolute humidity
Meaning	
The amount of water vapour present in air expressed as a percentage of the amount needed for saturation at the same temperature is called relative humidity.	The amount of water vapour in 1 cu.m. of air is called the absolute humidity.
Formula	
Relative humidity (%) $= \frac{\text{Absolute humidity}}{\text{Vapour-holding capacity}} \times 100$	$\text{Absolute humidity} = \frac{\text{Mass of water vapour}}{\text{Volume of air}}$

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Question c.**Cumulus clouds and Cumulonimbus clouds****Answer:**

Cumulus clouds	Cumulonimbus clouds
Meaning	
The clouds that are found from 500 m to 6000 m altitude having comparatively less vertical expanse are called cumulus clouds.	The clouds that are found from 500 m to 6000 m altitude having comparatively more vertical expanse are called cumulonimbus clouds.
Meaning	
Cumulus clouds are the indicators of pleasant weather.	Cumulonimbus clouds are the indicators of thunderstorm.

4. Answer the following questions:**Question a.****Why is the air in a region dry?****Answer:**

Due to the low amount of the moisture in the air, the air in a region is dry.

Question b.**How is humidity measured?****Answer:**

1. The amount of water vapour in 1 cu.m, of air is called the absolute humidity.

2. Absolute humidity is measured with the help the following formula:

Absolute humidity

= $\frac{\text{Mass of water vapour}}{\text{Volume of air}}$

3. The amount of water vapour present in air expressed as a percentage of the amount needed for saturation at the same temperature is called relative humidity.

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4. Relative humidity is measured with the help of the following formula: Relative humidity (%)

$$= \frac{\text{Absolute humidity}}{\text{Vapour-holding capacity}} \times 100$$

Question c.

What are the prerequisites for condensation?

Answer:

High relative humidity and dew point temperature of the air are the prerequisites for condensation.

Question d.

What is a cloud? Write its types.

Answer:

A. Meaning:

A visible mass of fine particles of ice and water accumulated around the dust particles in the air at high altitude is called a cloud.

B. Types:

The following are the types of clouds:

1. High clouds: Clouds at an altitude of 7000 m to 14000 m are considered as high clouds. Cirrus, Cirro-Stratus and CirroCumulus are high clouds.
2. Medium clouds: Clouds at an altitude of 2000 m to 7000 m are considered as medium clouds. Alto-Stratus and Alto Cumulus are medium clouds.
3. Low clouds: Clouds at an altitude of less than 2000m are considered as low clouds. Strato-Cumulus, Stratus, Nimbostratus, Cumulus and Cumulonimbus are low clouds

Question e.

Which type of clouds give rain?

Answer:

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Nimbostratus and cumulonimbus type of clouds give rain.

Question f.

On what does the percentage of relative humidity depend?

Answer:

The percentage of relative humidity depends on the absolute humidity and vapour-holding capacity of the air at a given temperature.

5. Give geographical reasons:

Question a.

Clouds float in the sky.

Answer:

1. The condensed water or fine particles of snow accumulate around dust particles at high altitudes leading to formation of clouds.
2. The condensed water or fine particles in the clouds are almost weightless. Therefore, clouds float in the sky.

Question b.

The proportion of relative humidity changes according to altitude.

Answer:

1. The temperature is found to be comparatively high in the areas at sea level. Due to high temperature, moisture-holding capacity of air near sea level is found to be high. Therefore, the humidity of the air at sea level is comparatively high.
2. The temperature is found to be comparatively low in the areas at high altitude. Due to low temperature, moisture-holding capacity of air at high altitudes is found to be low. Therefore, the humidity of the air at high altitude is comparatively low. In this way, the proportion of relative humidity changes according to the altitude.

Question c.

Air becomes saturated.

Answer:

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1. At certain temperature, the moisture-holding capacity of air gets fulfilled and it becomes equal to the proportion of the moisture present in it.
2. At this state, no more moisture can be absorbed by the air. Thus, air becomes saturated.

Question d.

Cumulus clouds change into cumulonimbus clouds.

Answer:

1. Cumulus clouds are found between 500 m to 6000 m altitude. They are mostly formed due to the vertical flow of the air.
2. Sometimes, the vertical expanse of the cumulus clouds increases and it leads to formation of huge mountain-like cumulonimbus clouds. Thus, cumulus clouds change into cumulonimbus clouds.

6. Solve the following:

Question a.

When the temperature of the air is 30° C, its vapour-holding capacity is 30.37 gms/cu.m., If absolute humidity is 18 gms/cu.m., then what will be the relative humidity?

Answer:

Relative humidity (%)

$$\begin{aligned} &= \frac{\text{Absolute humidity}}{\text{Vapour-holding capacity}} \times 100 \\ &= \frac{18.00}{30.37} \times 100 \\ &= \underline{59.26 \%} \end{aligned}$$

Question b.

What would be the absolute humidity of air if 1 cu.m, air contains 4.08 gms of vapour at 0° C temperature.

Answer:

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Absolute humidity

$$\begin{aligned} &= \frac{\text{Mass of water vapour}}{\text{Volume of air}} \\ &= \frac{4.08}{1} \\ &= \underline{4.08 \text{ gm/ m}^3} \end{aligned}$$

7. Collect the weather related information from newspapers for the month of July. Relate the difference in the maximum and minimum temperatures with humidity.

Activity:

Question a.

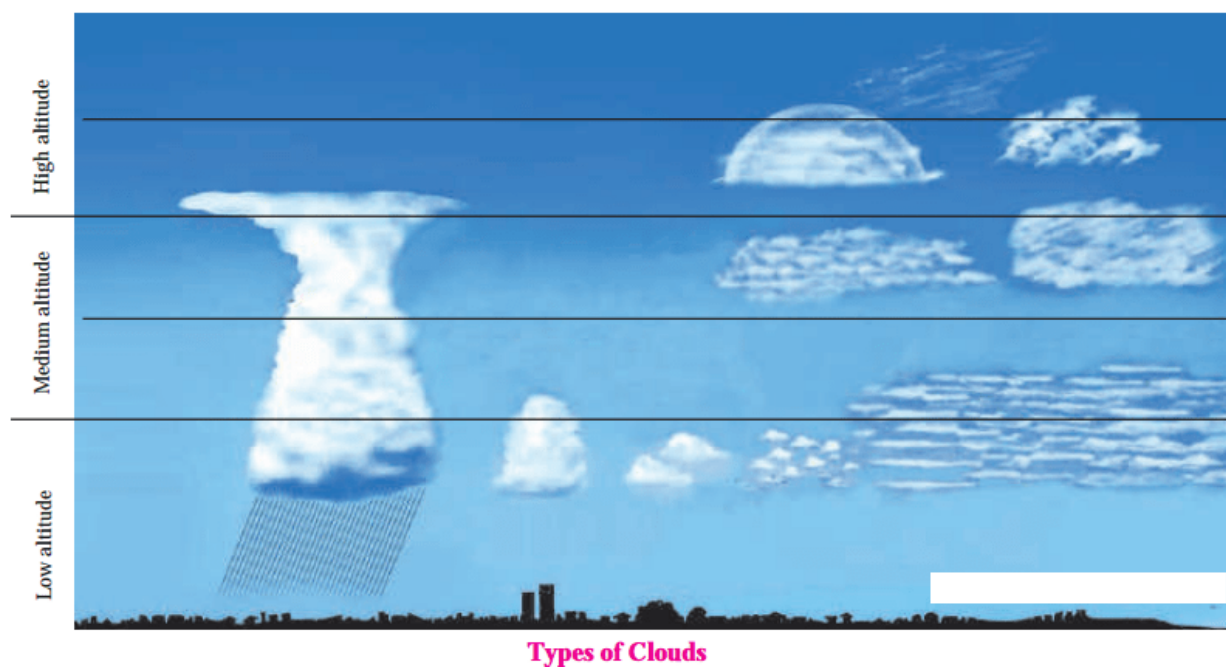
Make a table showing the types of clouds. Use various photographs.

Answer:

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Cloud types according to international classification

No.	Types of Clouds	General Altitude (meters)
1.	Cirrus	7000 to 14000
2.	Cirro-Stratus	
3.	Cirro-Cumulus	
4.	Alto-Stratus	2000 to 7000
5.	Alto-Cumulus	
6.	Strato-Cumulus	Less Than 2000
7.	Stratus	
8.	Nimbostratus	
9.	Cumulus	The extent could be variable
10.	Cumulonimbus	



Additional Important Questions and Answers

Examine the following statements and correct the incorrect ones:

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Question a.

Cumulonimbus clouds are the indicators of the pleasant atmosphere.

Answer:

Incorrect.

Correct statement: Cumulonimbus clouds are the indicators of the thunderstorm.

Question b.

The relative humidity is found to be high in desert region.

Answer:

Incorrect.

Correct statement: The relative humidity is found to be less in desert region.

Question c.

The high temperature of the air leads to rapid evaporation.

Answer:

Correct.

Question d.

When the humidity in the air is 0 gm/cu.m. at any temperature, the air is said to be humid.

Answer:

Incorrect.

Correct statement: When the humidity in the air is 0 gm/cu.m. at any temperature, the air is said to be dry.

Question e.

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Cirrostratus appears like a bed sheet with wrinkles.

Answer:

Correct.

Answer the following questions in one sentence each:

Question a.

What is evaporation?

Answer:

The process of converting water into steam or water vapour is called evaporation.

Question b.

What is meant by the moisture-holding capacity of air?

Answer:

The capacity of air to hold moisture at a given temperature, is called the moisture-holding capacity of air.

Question c.

What is meant by the saturation of the air?

Answer:

The condition of air at a certain temperature, in which the moisture-holding capacity of air becomes equal to the proportion of moisture present in it, is called saturation of the air.

Answer the following questions in brief:

Question a.

Write in brief about the features of high clouds.

Answer:

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Clouds at an altitude of 7000 m to 14000 m are considered as high clouds. High clouds are mainly made up of ice particles. Cirrus, Cirro-Stratus and Cirro-Cumulus are high clouds. The following are the features of high clouds :

1. Cirrus: Cirrus are wispy.
2. Cirro-Stratus: Cirro-Stratus look like bed sheet with wrinkles. A halo is generally seen around these clouds.
3. Cirro-Cumulus clouds: Cirro- Cumulus look like groups of small waves.

Question b.

Write in brief about the features of medium clouds.

Answer:

Clouds at an altitude of 2000 m to 7000 m are considered as medium clouds. Alto-Stratus and Alto-Cumulus are medium clouds. The following are the features of medium clouds :

1. Alto-Stratus : Alto-Stratus are comparatively thin. The sun is visible through these clouds as if seen through a milky glass.
2. Alto-Cumulus : Alto-Cumulus are in the form of layers. They have wave-like structure. They are white in colour and have a grey shade.

Question c.

Write in brief about the features of Strato-Cumulus, Stratus and Nimbostratus.

Answer:

The features of Strato-Cumulus, Stratus and Nimbostratus are as follows :

1. Strato-Cumulus: Strato-Cumulus have layers. These clouds are mostly seen in round clusters. They are white to earthy in colour.
2. Stratus: Stratus are found in layers. They have uniform base. They are ash coloured.
3. Nimbostratus: Nimbostratus have thick layers. They are greyish in colour. They cause continuous rainfall. They are also responsible for snowfall.

Question d.

Write in brief about the features of Cumulus and Cumulonimbus.

Answer:

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The features of Cumulus and Cumulonimbus are as follows :

1. Cumulus : Cumulus are found between 500 m to 6000 m altitude. They are mostly formed due to the vertical flow of the air. They have huge size and dome-like shape. They are grey in colour. They indicate pleasant atmosphere. With an increase in the vertical expanse, these clouds turn into cumulonimbus clouds and bring rain.
2. Cumulonimbus : Cumulonimbus appear like huge mountain. They are dense and dark in colour. They have anvil-like shape at the top. They are the indicators of thunder, lightning and storm. They bring rain with storm. Sometimes they also bring hailstones. The raindrops of these clouds are found to be larger in size.

Give geographical reasons for the following:

Question a.

The absolute humidity of air in coastal region is higher than humidity of air in inland areas.

Answer:

1. The rate of evaporation is found to be high in the coastal region. As its effect, the amount of moisture in air in coastal region is found to be high. This results in high absolute humidity of air in coastal region.
2. On the other hand, the rate of evaporation is found to be low in the inland areas. As its effect, the amount of moisture in air in inland regions is found to be low. This results in low absolute humidity of air in inland areas. Thus, the absolute humidity of air in coastal region is higher than humidity of air in inland areas.

Question b.

The absolute humidity of air in equatorial region is higher than humidity of air in polar region.

Answer:

1. Equatorial region receives perpendicular sunrays throughout the year leading to high temperature. High temperature increases the rate of evaporation and this further leads to high absolute humidity of air in equatorial region.
2. Polar regions receive extremely slanted sunrays throughout the year leading to very low temperature. Very low temperature decreases the rate of evaporation and this further leads to

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very low absolute humidity of air in polar region. Thus, the absolute humidity of air in equatorial region is higher than humidity of air in polar region.

Question c.

Damp air is found in the coastal regions.

Answer:

1. The rate of evaporation is found to be high in the coastal region. As its effect, the amount of moisture in air in coastal region is found to be high.
2. The absolute humidity of the air near coastal region is found to be high. Therefore, damp air is found in the coastal regions.

Question d.

Dry air is found in the inland regions.

Answer:

1. The rate of evaporation is found to be low in inland region. As its effect, the amount of moisture in air in inland region is found to be low.
2. The absolute humidity of the air in inland region is found to be low. Therefore, dry air is found in inland regions.

Differentiate between the following :

Question a.

Densification and Sublimation :

Answer:

Densification	Sublimation
Meaning	
The process of changing of water vapour in the air into liquid state, i.e. water is called densification.	The process of changing water vapour in the air into solid state, i.e. snow is called sublimation.
Outcome	
Densification leads to precipitation on the surface of the earth.	Sublimation leads to snowfall on the surface of the earth.

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Study the following map/figure /graph and answer the following questions:

1. Study the figure 3.7 given on page 20 of the textbook and answer the following questions :

Question a.

What is the maximum diameter of the raindrop?

Answer:

The maximum diameter of the raindrop is 5 mm.

Question b.

Around what does the condensation of the water vapour in the air occur?

Answer:

The condensation of the water vapour in the air occurs around the minute particles of dust or salt in the air.

2. Study the Figure 3.9 given on page 22 of the textbook and answer the following questions :

Question a.

Which type of charge is found at the upper end of the cumulonimbus clouds?

Answer:

Positive charge is found at the upper end of the cumulonimbus clouds.

Question b.

Which type of charge is found at the low end of the cumulonimbus clouds?

Answer:

Negative charge is found at the low end of the cumulonimbus clouds.

Question c.

Which type of charge is found on the land below the cumulonimbus clouds?

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Answer:

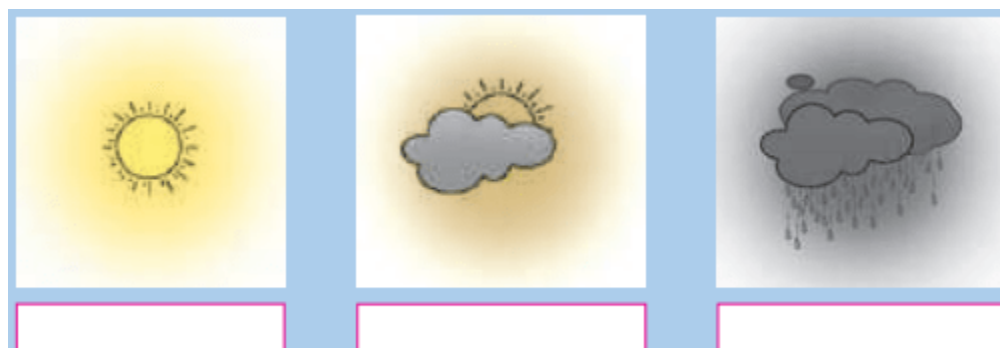
Positive charge is found on the land below the cumulonimbus clouds.

Use your brainpower!

Find where the symbols given below are used while showing the weather of a place. Write their meanings in the boxes given below:

(Note: The answer is given directly.)

Question a



Answer:

		
Clear Sky, No chance of rain.	Moderately cloudy sky, Chance of light rain.	Cloudy sky, Chance of heavy rain.

Thought-Provoking Questions:

Think about it.

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Question a.

During winters, when you exhale on the glass of your mirror, what happens. If you do this in summer why doesn't it happen?

Answer:

1. During winters, the moisture-holding capacity of air is low due to low temperature. Therefore during winters, when we exhale on the glass of mirror, the condensation of water vapour present in the exhaled air takes place. As its effect very thin water drops are found on the glass of mirror.
2. During summer, the moisture-holding capacity of air is high due to high temperature. Therefore during summer, when we exhale on the glass of mirror, the water vapour present in the exhaled air gets absorbed in air. Therefore, no water drops are found on the glass of mirror.

Give it a try.

The vapour-holding capacity of 1 cu.m, of air in various temperature is given in the following table.

Calculate the difference in the capacities by observing the following table :

(Note: The answer is given directly.)

Question a.

Tempera- ture of the air(0 C)	Vapour holding capacity (gm/ cu.m.	Difference in the capacities (gm/ cu.m)
-5	3.26	---
0	4.85	1.59
5	6.80	
10	9.40	
15	12.83	
20	17.30	
30	30.37	
40	51.12	

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Answer:

Temperature of the air (°C)	Vapour-holding (gm/cu.m ³) capacity (gm/cu.m ³)	Difference in the capacities (gm/cu.m ³)
-5	3.26	—
0	4.85	1.59
5	6.80	1.95
10	9.40	2.60
15	12.83	3.43
20	17.30	4.47
30	30.37	13.07
40	51.12	20.75

Use your brain power!

Question a.

In which season is humidity generally more?

Answer:

Humidity is generally more in monsoon.

Question b.

How does the humidity affect the human body?

Answer:

The rate of respiration and sweating increases due to humidity.

Question c.

Observe how humidity affects the food materials at our home and write about the same.

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Answer:

Due to humidity, fungus flourish on food materials at our home and it gets spoiled.

Question d.

Is there any relationship between formation of fungus and humidity?

Answer:

There is a direct relationship between formation of fungus and humidity. Humidity supports the growth of fungus.

Question e.

How is the early or late drying up of clothes related to humidity?

Answer:

As the moisture-holding capacity is found to be high in low humidity air, it leads to early drying up of clothes. As the moisture-holding capacity is found to be low in high humidity air, it leads to late drying up of clothes.

Think about it.

Question a.

What will happen if the temperature of saturated air at 20° C drops to 10° C abruptly?

Answer:

1. If the temperature of saturated air at 20° C drops to 10° C abruptly, the relative humidity of the air will increase abruptly.
2. Rise in the relative humidity will lead to condensation or sublimation of water vapour in the air. This in turn, will lead to precipitation or snowfall.

Open-Ended Question:

Question a.

Explain the effect of humidity on human life.

Answer:

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1. High humidity increases the rate of sweating and respiration. This adversely affects the daily functioning.
2. Low humidity with pleasant atmosphere, have favourable effects on the daily routine.
3. High humidity leads to late drying up of clothes and early spoiling of food materials.
4. Low humidity leads to early drying up of clothes and late spoiling of food materials.



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Class 8 Geography

- Chapter 1- Local Time and Standard Time
- Chapter 2- Interior of the Earth
- Chapter 3- Humidity and Clouds
- Chapter 4- Structure of Ocean Floor
- Chapter 5- Ocean Currents
- Chapter 6- Land Use
- Chapter 7- Population
- Chapter 8- Industries
- Chapter 9- Map Scale
- Chapter 10- Field Visit

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