Revision Notes

Class- 7 Social Science (Geography)

Chapter 4 - Air

In CBSE Class 7 Social Science geography Chapter 4, you come to learn about air. As we all know, the earth is surrounded by an atmosphere that acts as a blanket of air. It is vital for the survival of living beings on earth. We breathe the air provided by the atmosphere.

Harmful sun rays are protected because of it. Without an atmosphere, the temperatures on the earth would have been extreme and unsuitable for living. Without the atmosphere in the morning, the temperatures would be highly high, while at night, it would be freezing. We would be baked alive in the day without the atmosphere.

The Atmosphere and Its Composition:

● Air is a mixture of gases. Nitrogen and oxygen contribute to the bulk of the atmosphere. Other gases present in low quantities are carbon dioxide, hydrogen, ozone, helium, and argon. In the atmosphere tiny dust particles are present.

● **Nitrogen:** forms 78% of the atmosphere. The plants need it for their survival. Nitrogen cannot be directly taken in from the air by plants. Hence, bacteria living in soil and roots of the plants take nitrogen from the atmosphere and change it into usable forms for the plant.

● **Oxygen:** is the second most abundant in the atmosphere. It is essential for humans and animals as it is used for breathing and respiration. Plants produce oxygen by the method of photosynthesis. Oxygen content in the air hence remains stable. Imbalance occurs when there is cutting down of trees.

● **Carbon dioxide:** is another vital gas in the atmosphere. Green plants use it for photosynthesis, in which food is produced. Oxygen is released in the process. Human beings and animals release carbon dioxide. The carbon dioxide released from respiration and taken in for photosynthesis by plants create a perfect balance. The imbalance occurs when fossil fuels are burned. They are responsible for adding tons of carbon dioxide to the atmosphere.

Structure of the Atmosphere:

● It is divided into five layers: Troposphere, Stratosphere, Mesosphere, Thermosphere, and Exosphere.

● With an average height of 13 kilometers, the troposphere is the most vital layer of the atmosphere. It has all the gases, including oxygen which is used for breathing. Weather phenomena like rainfall, fog, and hail storms occur in this region.

● The stratosphere has a height of 50 kilometers and is free from weather phenomena and clouds. Conditions here are ideal for flying airplanes. It contains a layer of ozone that protects us from the harmful UV rays of the sun.

● The mesosphere is above the stratosphere and extends up to a height of 80 kilometers. When meteorites enter this layer from space, they burn up.

● The thermosphere extends between 80 kilometers to 400 kilometers. Herewith increasing height temperature rises rapidly. One of the parts of the thermosphere is the ionosphere. This layer is responsible for radio transmission. Radio waves transmitted are reflected by this layer.

● The exosphere forms the uppermost layer of the atmosphere. It has gases like helium and hydrogen.

Weather and Climate:

Weather is the condo of the atmosphere at a particular time at a specific place. Weather changes occur within a day, and these changes can be dramatic. Average weather conditions calculated in an area over a long period are termed as the climate of that place. There are various components of the weather and climate. These parameters are the same for both. Some of these parameters or features are:

Temperature:

● The temperature of the atmosphere can be defined as the degree of hotness or coldness of the air.

● Temperature varies from day to night, from season to season. During summers, temperatures are higher than in winters.

● Insolation or the incoming solar energy intercepted by the earth acts as an essential factor in influencing temperatures on earth.

● The insulation amount decreases from equator to pole, and so does the temperature. Poles are covered with ice for the same reason.

● Cities have a higher temperature than villages since cities have buildings made of concrete and metal, which gets highly heated up during the day and releases heat at night. High-rise crowded buildings in cities trap warm air, and this raises the temperature in the region.

Air Pressure:

● Air pressure is because of the pressure exerted by the air column.

● As we go up in the atmosphere, air pressure decreases rapidly. It is higher at sea level and decreases with height.

● The temperature of a given place influences the horizontal distribution of air pressure.

● Where temperatures are high, the air gets heated and becomes light. This air rises, thus creating a low-pressure trough. Low-pressure areas are associated with cloudy skies and wet weather.

● In regions with lower temperatures, the air is cold and heavy, shrinking and creating a high-pressure space. This area is associated with clear skies and sunny weather.

● Air always tends to move from the high-pressure region to a low-pressure part.

Wind:

● movement of air is defined as air, from an area of high pressure to a place of low pressure.

● Winds are of three types- permanent winds, local winds, and seasonal winds.

● Permanent winds are the trade winds, easterlies, and westerlies. These winds constantly blow in a particular direction throughout the year.

● Seasonal winds are winds that change the rules with changing seasons. The monsoon winds in India are seasonal.

● Local winds are which blow only at a particular time of the day or year in a restricted area. Land breeze and sea breeze in the coastal regions are local winds, loo in the northern plains is also a local wind.

Moisture:

● The moisture content in the air at a given time and place is called the humidity at that place.

● Water evaporates from the body of water to form water vapor. When there is an excess of water vapor in the air, we call it a humid day.

● With rising temperatures, the water holding capacity of the air increases. On humid days clothes take a longer time to dry, we feel sweaty and uncomfortable

● Rising water vapors aggregate to form clouds. When clouds cannot further hold moisture, they pour down in the form of precipitation.

● Jet planes leave behind white trails of moisture that have been condensed in their engines. These white trails are visible till air disturbances dissolve them.

● Rain forms due to precipitation. Groundwater is primarily stored rainwater. Plants are instrumental in water preservation. If trees on hill slopes are cut down, rainwater flows down and floods the low-lying areas.

● Rainfalls are three types: convectional rainfall, orographic rainfall, and cyclonic rainfall. Rainfall is significant for the survival of living beings on the earth as it gets freshwater to the surface water. Scarcity and drought occur in the absence of rainfall, but if there is an excess of rainfall, floods take place.

● Cyclones are rotating storms with a low-pressure centre termed as the eye of the hurricane. Cyclones are associated with large-scale destruction and damage to life and property.

● Odisha is on the east coast of India and is a central cyclone-prone area.

● Storms originating in the Bay of Bengal hit this state and caused widespread destruction.

Important Questions and Answers

1. What are the three types of rainfall? Name one place which experiences each type of rainfall.

Ans: The three types of rainfall are:

● **Convectional rainfall:** This type of rain is not prominent in India. It occurs in equatorial regions where the temperature is exceptionally high, and water from water bodies evaporates due to extreme heat and after condensation comes down as precipitation.

● **Orographic Rainfall:** This rainfall is experienced on the windward side of the Western Ghats in India. The Western Ghats forces the moisture-laden winds from the Arabian Sea to rise and cause rain.

● **Cyclonic Rainfall:** Cyclonic Rainfall is experienced in parts of Odisha when the cyclones originating over the Bay of Bengal hit Odisha.

2. Define the atmosphere. Why is it important for us?

Ans: The atmosphere can be defined as a blanket of air surrounding the Earth.

● Atmosphere saves us from the harmful UV rays of the sun. It protects us from incoming meteorites. It provides air that every living being breathes in.

3. What is the greenhouse effect and which gas is associated with it?

Ans: The incoming solar radiations of the sun are trapped inside the earth, which results in Its warming up. This causes the temperatures of the planet to rise.

● The primary greenhouse gas is carbon dioxide. Methane, chlorofluorocarbons are few greenhouse gases.

4. What do you understand by the term weather?

Ans: Weather can be defined as the condition of the weather at a particular time and place. The weather of an area may change over a day drastically.

● The parameters associated with air are temperature, air pressure, humidity, etc.

5. What is air pressure?

Ans: Air pressure can be defined as the pressure exerted by the column of air of the earth on the planet's surface.

● Air pressure decreases with increasing altitude. The highest air pressure is measured at sea level.

6. What is insolation?

Ans: Insolation is the amount of solar radiation intercepted by the atmosphere of the earth. It quantifies the solar energy incident on a specific area on land over a given period.

● There are two units of insolation: a. kilowatt hours per square meter per day (kWh/sq.)/day - of solar energy hitting an area on a day b watts per square meter (W/sq.)- the average amount of solar energy (or power) intercepting an area annually, i.e., over one year. Insolation decreases with the distance from the equator to the poles.

7. Give a reason why wet clothes take longer to dry in humid weather.

Ans: On a humid day, the moisture content of the air is already high. So, it cannot accommodate further moisture and takes longer to absorb moisture from the clothes. Hence, it takes very long to dry clothes on a humid day.