

Self –Study Pack

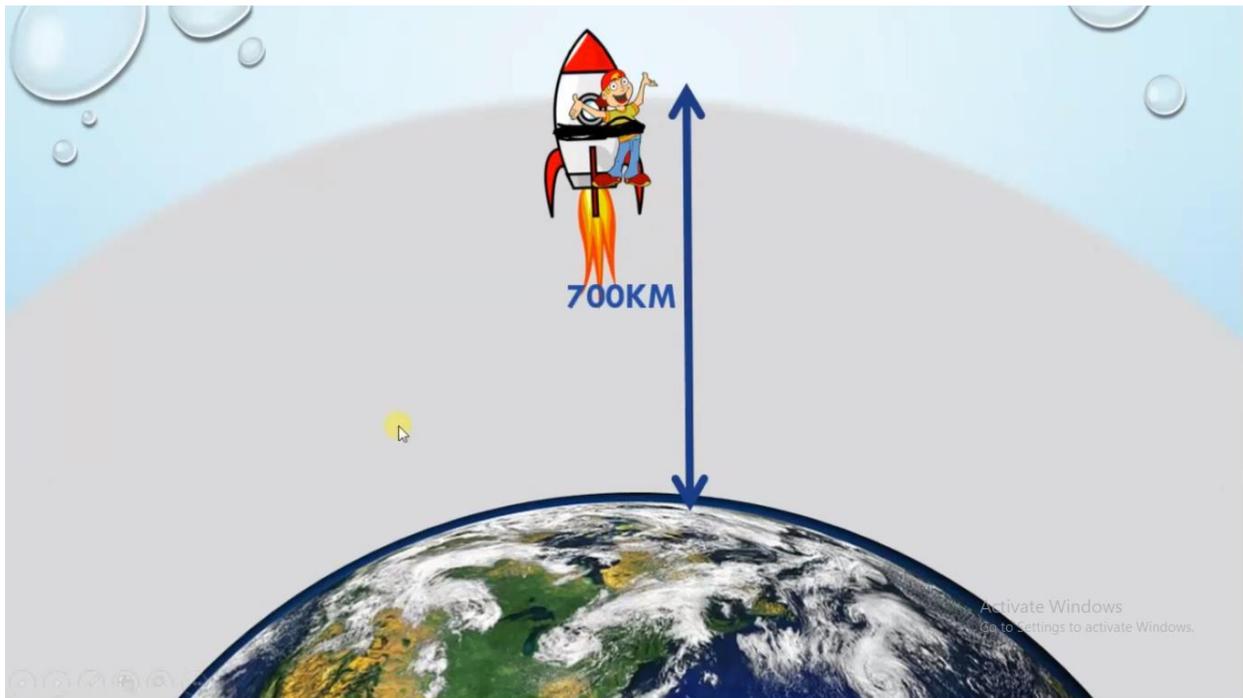
- Subject – Science
- Grade – 7
- Term – 2nd Term
- Unit – Atmosphere (Unit 13)
- Learning outcomes
 - Illustrate layers of the atmosphere and their properties using diagrams.
 - Describe the variation of pressure and temperature qualitatively across the layers of the atmosphere.
 - State the composition of the air in the troposphere. (Lower atmosphere)
 - Realize the importance of atmosphere for the existence of life on earth.

Do you know?

Atmosphere is a blanket of air that spreads around the earth spherically.

How far does this blanket of air spread?

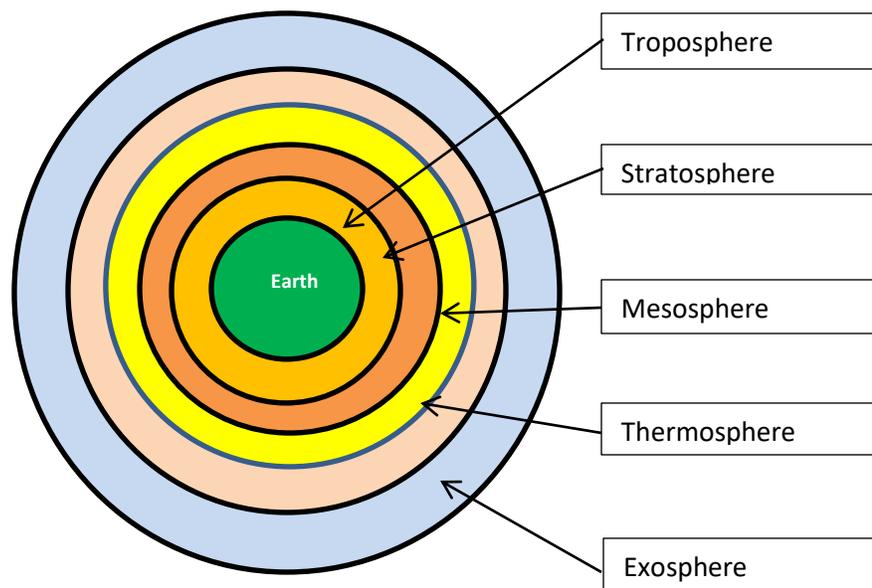
It spreads up to a height of 700km from the earth surface.



Activity 1

Let us illustrate the layers of the atmosphere.

- Cut a circle with the radius of 12cm with a colour paper.
- Cut four other circles decreasing their radius by 2cm in four different colours.
- Then keep other circles in the descending order of their radius on the largest circle co-centrally and fix all the circles at the center with a drawing pin.
- Label the layers of the atmosphere as illustrated in the diagram.
- This is a model of the atmosphere.

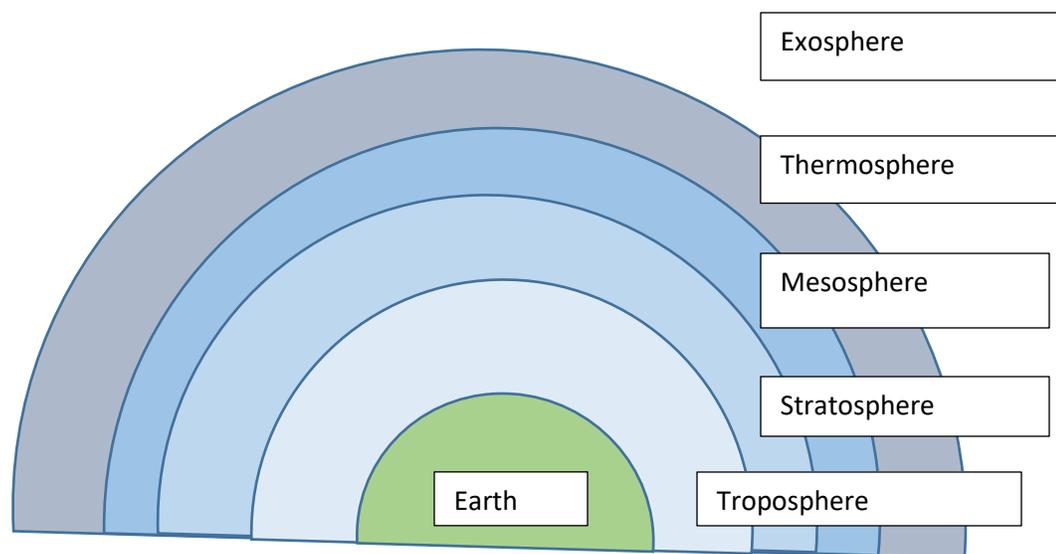
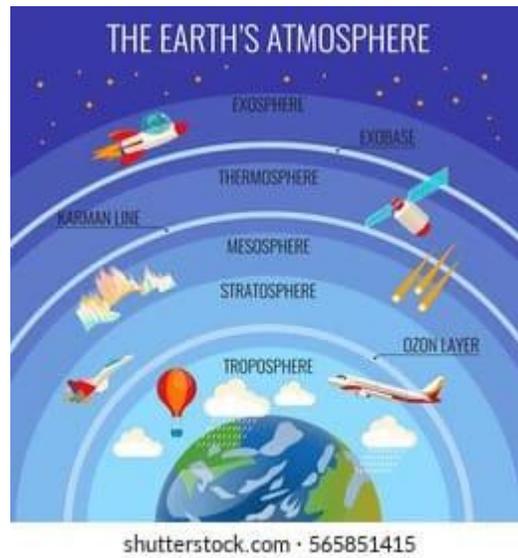


Do you know?

The height to a certain place from the sea level is known as the **Elevation**. Pressure and temperature of different levels of the atmosphere vary according to the elevation. The atmosphere is divided into five layers on the basis of these variations. (The boundary of these layers cannot be exactly stated.)

The layers of the atmosphere from the earth surface upwards in order are,

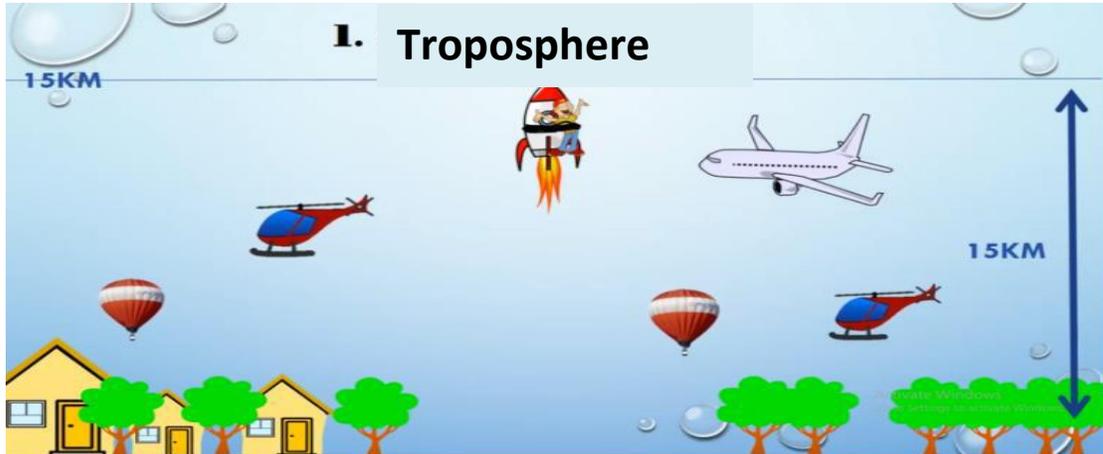
1. Troposphere
2. Stratosphere
3. Mesosphere
4. Thermosphere
5. Exosphere



Activity 2

Let us study about different layers of the atmosphere in detail.

- Stratosphere



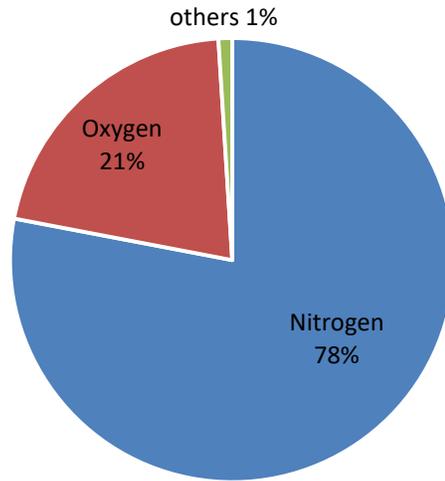
For your knowledge,

- The bottommost layer of the atmosphere.
- It spreads up to a height of 15km from the sea level near the equator. However, in the Polar Regions, it spreads only up to a height of 8km from the sea level.
- Troposphere is the most important layer for the organisms.
- 75% of air in the atmosphere is found in this layer.

Composition of air in the troposphere can be tabulated as follows.

Type of Gas	Volume as a Percentage
Nitrogen	78%
Oxygen	21%
Argon	1%
Carbon dioxide	
Water vapour	
Other gases	

Main Components of Air in the Troposphere



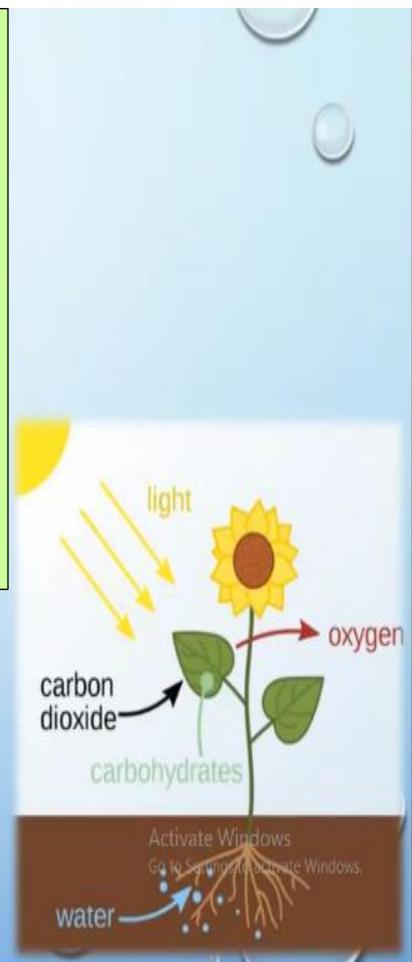
Argon

Argon is the third gas according to the volume percentage of gases in the atmosphere. It is an inert gas. It does not react with other elements. This property of Argon is made use in following instances.

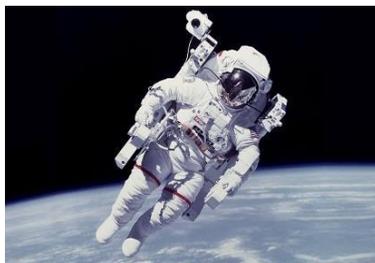
- Fill the filament bulbs
- Produce electric bulbs that emit orange light.

Carbon dioxide

This gas is a raw material of photosynthesis in plants. It is also used for extinguishing fire. It maintains the temperature of the earth at an optimum level as it is present in the atmosphere. Exhale air contains more carbon dioxide than inhale air.



Oxygen gas is necessary for divers, astronauts and combustion.



Nitrogen gas is useful for filling tires of vehicles.



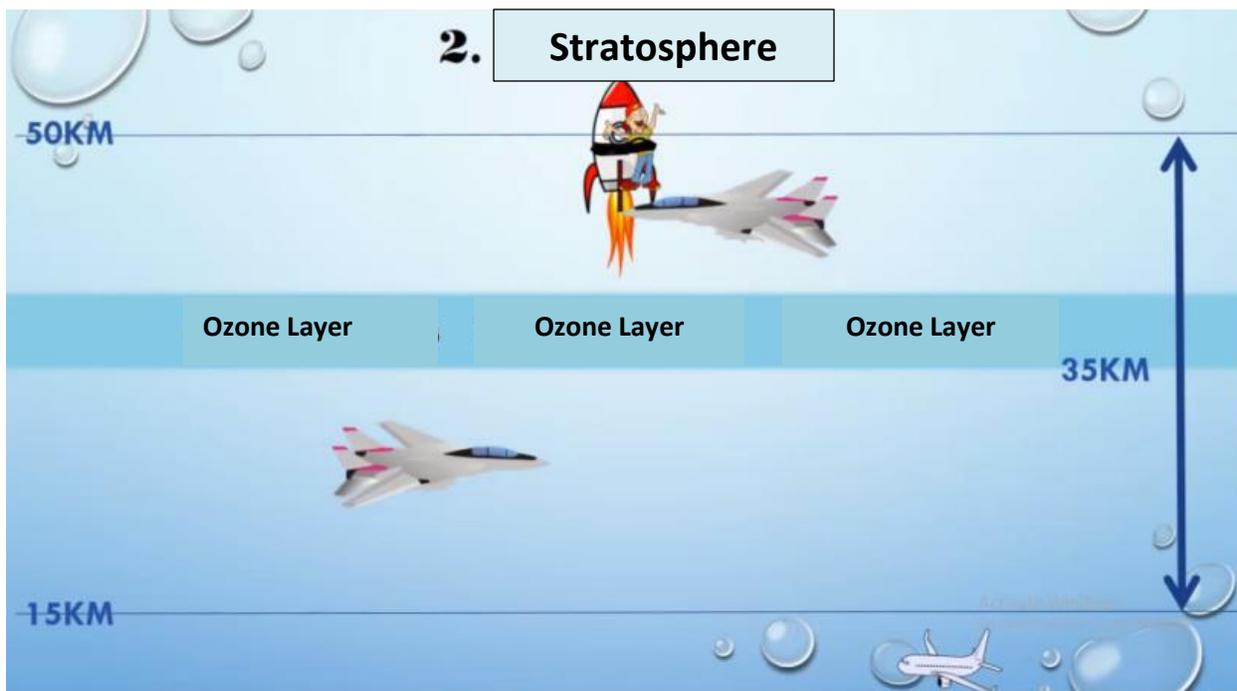
- Most of water vapour and dust particles are found in the troposphere. Therefore, most of the weather changes take place in this layer.



- Helicopters, parachutes and air planes travel in this layer.



- Stratosphere



For your knowledge,

- Spreads up to a height of 15km – 50km from the sea level.
- As there is little amount of water vapour, this layer is relatively dry.

- There are no air turbulences or storms.
- The ozone layer which prevents entering of harmful rays from the sun to earth is found in this layer.
- Jets travel in this layer.



- **Temperature of this layer gradually increases** with the height.
- There are no clouds. Cumulonimbus clouds which reach the level of stratosphere form characteristic flat anvil –top shape.



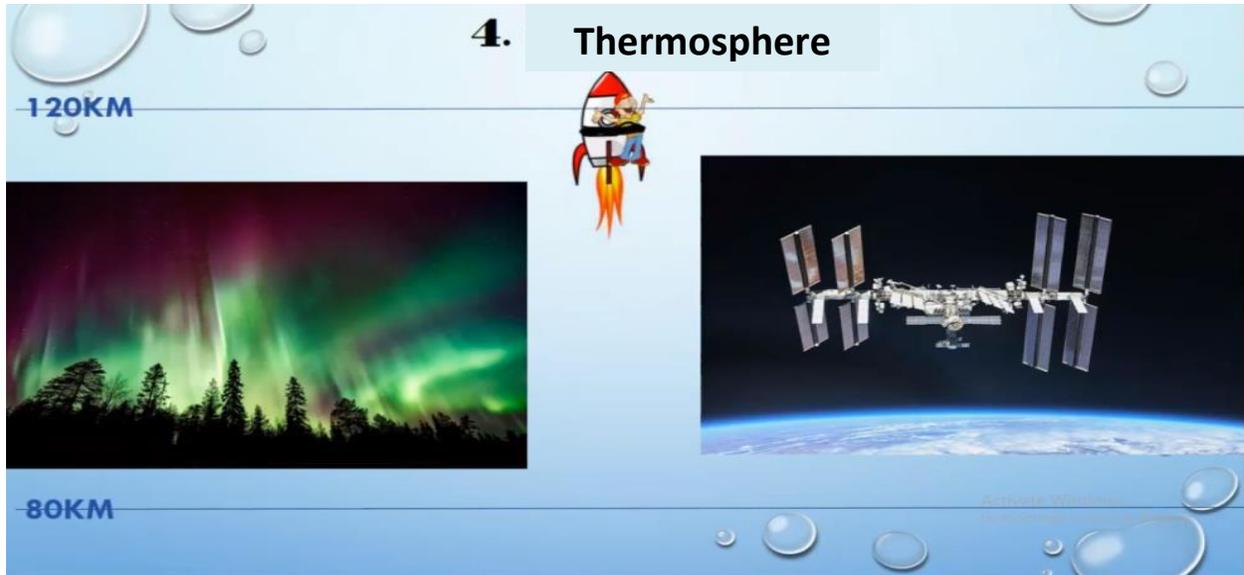
○ Mesosphere

- Spreads up to a height of 50km – 80km from the sea level.
- Water vapour freezes into ice clouds. (These clouds can be seen at night.)



- Temperature of this layer gradually decreases with the height.
- This is the coldest layer.

○ Thermosphere



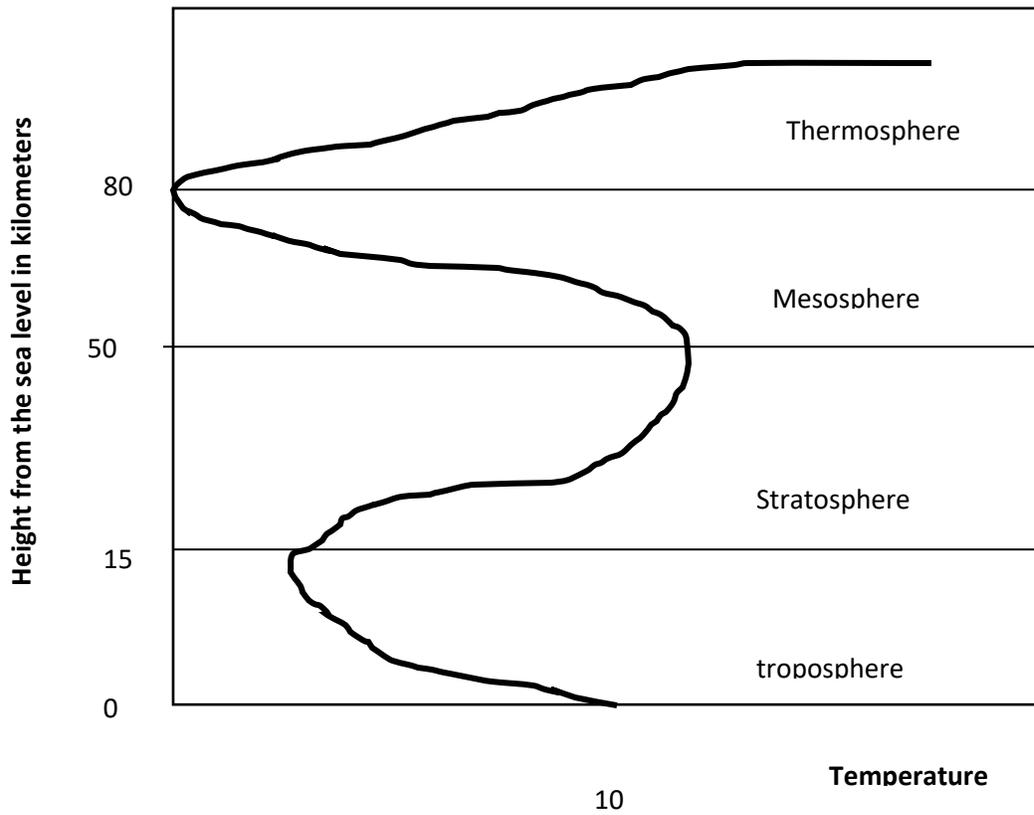
- Spreads up to a height of 80km -120km from the sea level.
- The International Space Station is established in this layer.



- Northern light (Aurora borealis) and Southern light (Aurora australis) are two sceneries that can be seen in mesosphere.



- Temperature of this layer gradually increases with the height.
 - This is the hottest layer of the atmosphere.
- Exosphere
 - This is the thinnest layer of the atmosphere.
 - Spreads above from a height of about 120km from the sea level. It spreads up to the space.



Collect as much information as possible about the layers of the atmosphere apart from the details given above.

Do you know?

Accordingly, mesosphere is the coldest layer with the lowest temperature and the thermosphere is the hottest layer with the highest temperature.

Activity 3

Identify the following situations that you experience in your day today life which cause air pollution.

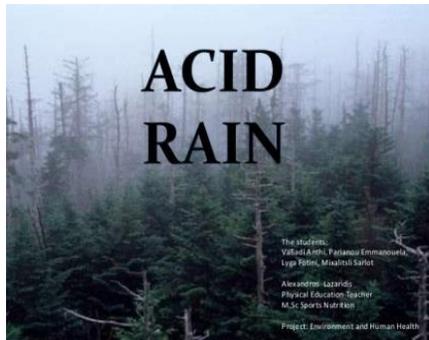


Following harmful outcomes are caused by air pollution.

- Increasing the global temperature.



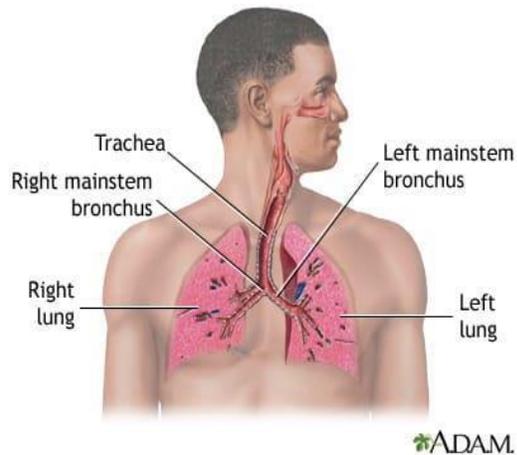
- Acid rain



- Reducing the transparency and clearness of air



- Causing diseases associated with the respiratory system



- Occurrence of climatic changes in earth

Let us measure knowledge.

Underline the correct answer.

- The layer of the atmosphere that consists of all factors necessary for maintenance of life on earth is,
 1. Stratosphere
 2. Troposphere
 3. Thermosphere
 4. Mesosphere
- What is the layer of the atmosphere with the lowest temperature?
 1. Exosphere
 2. Mesosphere
 3. Troposphere
 4. Stratosphere
- In which layer of the atmosphere do the meteors burn before reaching the earth's surface?

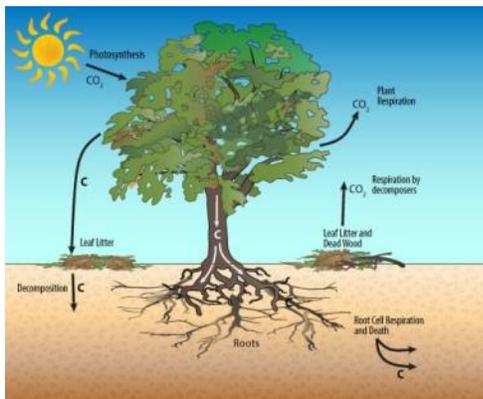


1. Thermosphere
2. Mesosphere
3. Troposphere
4. Stratosphere

iv. Arrange the layers of the atmosphere according to elevation.

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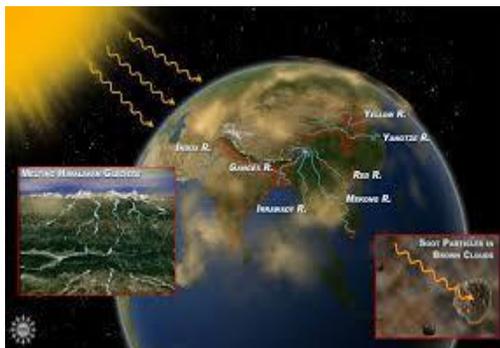
3. Some importance of the atmosphere is depicted in the figures given below. Identify them.



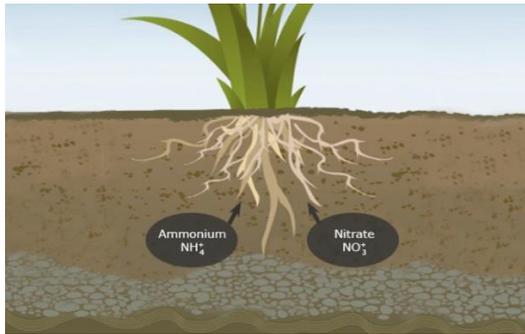
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4. An instrument that is used for measuring the atmospheric pressure is shown below. Identify it.



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Write down the unit of measuring atmospheric pressure.

5. Identify the following instances that pollute the atmosphere. Name them.



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7. Some importance of oxygen gas is shown in the figures given below. Identify and name them.



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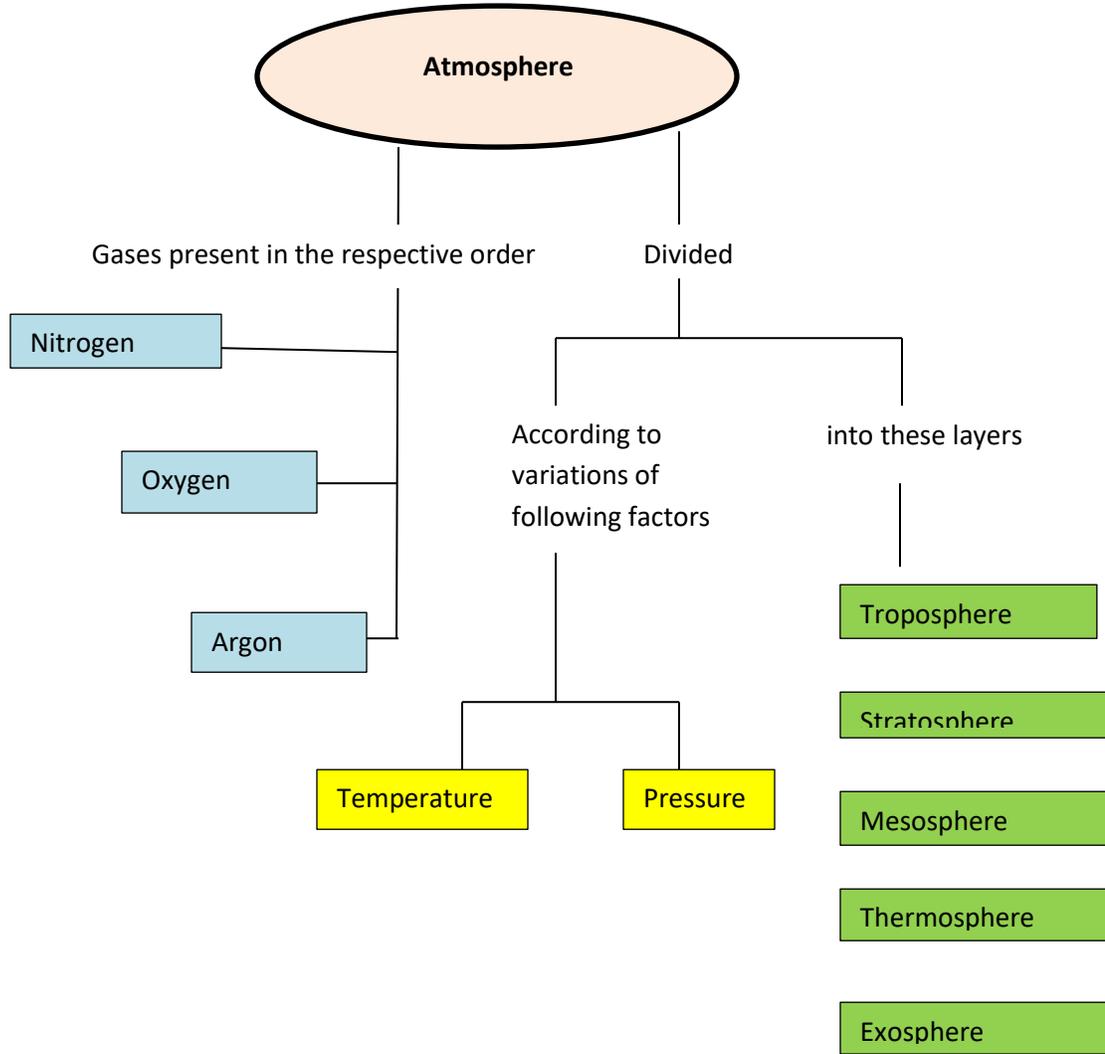


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Summary



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