

3. Atmosphere

Exercises

1 A. Question

Fill in the blanks with suitable answer:

The two major gases of the atmosphere are _____ and _____

Answer

Nitrogen, Oxygen

Since the atmosphere is a mixture of gases, dust particles, and water vapors, there are certain gases which are very important and form the major part of the atmosphere and two such important gases are nitrogen and oxygen.

1 B. Question

Fill in the blanks with suitable answer:

The lowest layer of atmosphere is _____.

Answer

Troposphere

The atmosphere consists of various layers on the basis of its characteristic features. The troposphere is the lowest layer because it contains all atmospheric elements such as temperatures, pressure, winds, clouds, rainfalls etc.

1 C. Question

Fill in the blanks with suitable answer:

The average air pressure of the atmosphere at the sea level is_____.

Answer

1013.25 milibar

Reason: since air has weight, it will exert pressure which is known as atmospheric pressure. The unit which is used to demonstrate air pressure is millibar (mb). The average air pressure is 1013.25 mb since it is affected by many factors such as temperature, rotation of earth, altitude, water vapors etc.

1 D. Question

Fill in the blanks with suitable answer:

Westerlies is also known as____,____or_____.

Answer

Roaring forties, furious fifties or shrieking sixties

Reason: Westerlies blow from sub-tropical high-pressure belts to sub-polar low-pressure belts. The Westerlies of the southern hemisphere are very strong over the oceans, hence, they are called Roaring Forties (40⁰ south latitude), Furious Fifties (50⁰ south latitude) and Shrieking sixties (60⁰ south latitude).

1 E. Question

Fill in the blanks with suitable answer:

The scientific study of weather is_____.

Answer

meteorology

The weather refers to the atmospheric conditions of a smaller area at a particular time. Therefore its scientific study is known as Meteorology.

2 A. Question

What is the atmosphere?

Answer

The atmosphere can be termed to be a layer or a set of layers of gases which surround a planet or other material body. It is a thin layer of gases, dust particles and water vapours that surround the Earth. The atmosphere is considered to be very important for all forms of life on the earth.

2 B. Question

Name the important layers of the atmosphere.

Answer

The important layers of the atmosphere are:

(a) **The Exosphere:** It is the topmost layer of the atmosphere where elements of the atmosphere are rare and the pressure is extremely low.

(b) **The Thermosphere:** This layer lies next to Mesosphere and in this layer the temperature drastically. It is also called the Ionosphere.

(c) **The Mesosphere:** It is the third layer in the earth's atmosphere and extends up to 80 km from the surface and lies above the stratosphere.

(d) **The Stratosphere:** It is the second layer of the atmosphere and extends up to 50 km from the surface. It lies between troposphere and mesosphere.

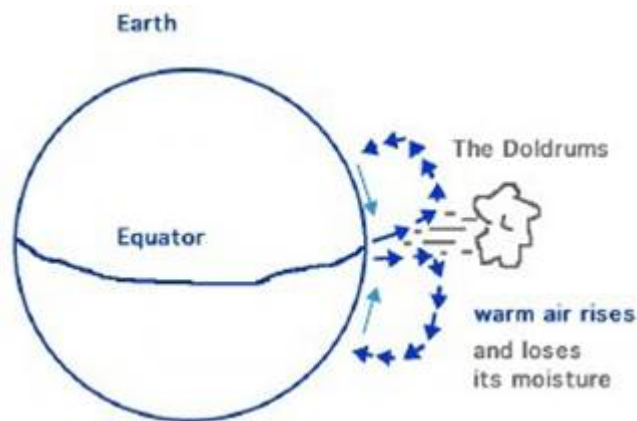
(e) **The Troposphere:** It is the lowest layer of the atmosphere and extends up to 18 km at the equator and 8 km near the poles. It consists of all the atmospheric elements.

2 C. Question

What is Doldrums? Where is it found?

Answer

The equatorial low-pressure belt is basically a zone of high temperature with low pressure. This belt lies between 0° to 5° North and South of the equator. This is the region which gets direct rays from the sun throughout the year. Hence, air is always very warm and hot because of which it becomes a calm region with very little wind. This is known as 'Doldrums' (as shown in figure below)



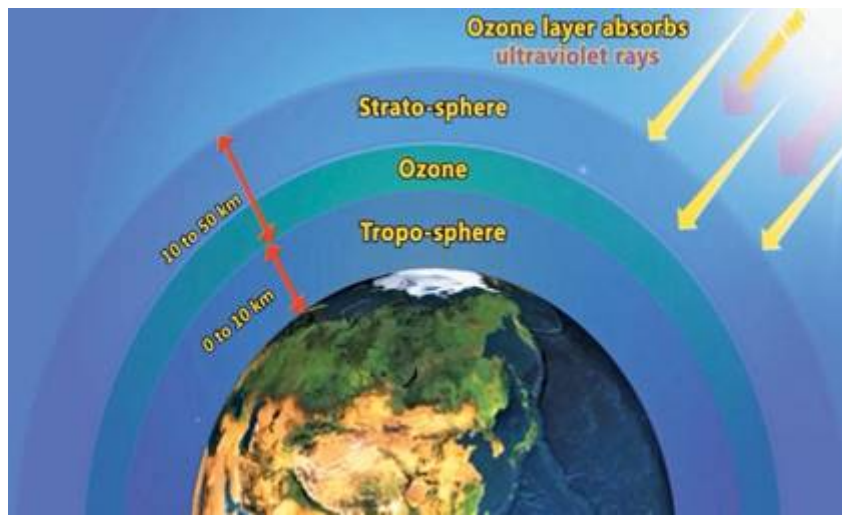
This region is also known as Inter-Tropical Convergence Zone where trade winds converge.

2 D. Question

What is the significance of the Ozone layer?

Answer

Ozone is a gas present in the atmosphere that protects everything living on the Earth from harmful ultraviolet (UV) rays from the sun (as shown below)



Without the Ozone layer in the atmosphere, it would be very difficult for anything to survive on the surface.

2 E. Question

Name the different types of planetary winds.

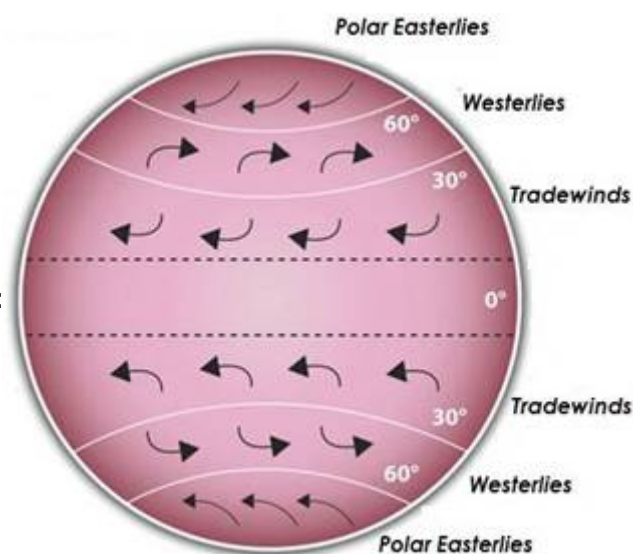
Answer

The winds blowing throughout the year from one latitude to another in response to the latitudinal differences in air pressure are called planetary winds.

The different types of planetary winds are:

- (a) Trade winds
- (b) Westerlies
- (c) Polar Winds

The diagram is given below:



2 F. Question

What are the local winds? Give any two examples.

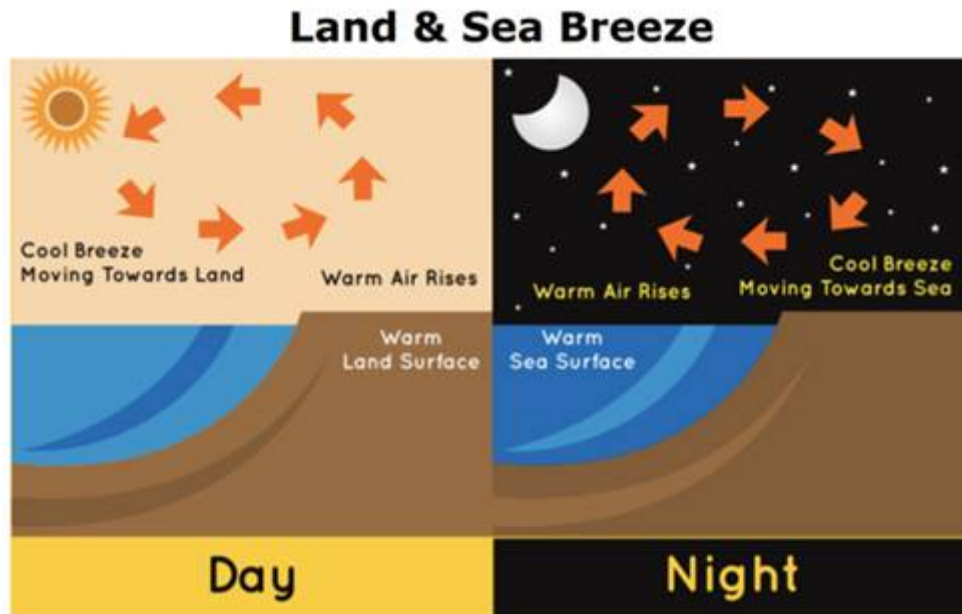
Answer

Local winds blow only during a particular period of the day or a year in a small area. It is also called the Loo. The two examples of local winds are Land Breeze and Sea Breeze.

Land Breeze : The wind flow from land to water is called land breeze.

Sea Breeze: The winds that blow from large bodies of water (seas and oceans) are called sea breezes

The figure shows the difference:



2 G. Question

Mention the different types of clouds.

Answer

Clouds are defined as aggregates of innumerable tiny water droplets, ice particles or a mixture of both in the air which are much above the ground surface.

Based on the average height, clouds are divided into four types:

- (a) High-level clouds, which are above 6 km.
- (b) Middle-level clouds, which are between 3-6 km.
- (c) Low-level clouds, which are below 3 km.
- (d) Multi-layered clouds, which are also known as Rainy clouds.

2 H. Question

Distinguish between weather and climate.

Answer

Weather	Climate
Weather is a day to day condition of the atmosphere at any place.	Climate is the average state of weather for a longer period of time at any place.
Weather can be determined with regard to temperature, pressure, wind, humidity, and rainfall.	Climate can be determined with regard to latitude, altitude, distance from the sea, wind, position of mountains,

3. Question

Define the following:

1. ionosphere 4. horse latitudes
2. normal lapse rate 5. orographic rainfall
3. torrid zone 6. climatology

Answer

- 1) Ionosphere: It is the layer of the earth's atmosphere which contains a high concentration of ions and free electrons and is capable of reflecting the radio waves. This layer lies above the Mesosphere.
- 2) Normal lapse rate: The higher one travels into the troposphere, or the first layer of the atmosphere, the lower the temperature becomes. The rate at which the temperature drops is known as the lapse rate.
- 3) Torrid Zone: It refers to the area of the Earth between the Tropic of Cancer and the Tropic of Capricorn.
- 4) Horse latitude: horse latitudes are the subtropical regions which are known for calm winds and little precipitation.
- 5) Orographic rainfall: it is produced when moist air is lifted as it moves over a mountain range. As the air rises and cools, orographic clouds form and serve as the source of precipitation, most of which falls upwind of the mountain ridge.
- 6) Climatology: It is the scientific study of climate

4. Question

Terms to remember:

1. insolation 4. roaring forties
2. inversion of temperature 5. nimbus
3. anemometer 6. meteorology

Answer

- 1) Insolation: It is the solar radiation that reaches the Earth's surface and is measured by the amount of solar energy received per square centimeter per minute.
- 2) Inversion of temperature: It is a reversal of the normal behavior of temperature in the troposphere, in which a layer of cool air at the surface is overlain by a layer of warmer air.
- 3) Anemometer: It is also called wind gauge which is an instrument for recording the speed and direction of winds.
- 4) Roaring forties: It is the area between latitudes 40° and 50° south in the Southern Hemisphere, where the prevailing winds blow persistently from the west. They have strong winds throughout the year.
- 5) Nimbus: It is a cloud that produces precipitation which reaches the ground as rain, hail, snow or sleet. They can be characterized by their great height.
- 6) Meteorology: Meteorology is a branch of atmospheric science. Here we study about the happenings in the environment around us and the reasons behind them.

Precisely it is the scientific study of weather.

5. Question

Draw the picture of planetary winds.

Answer

