

DAWOOD PUBLIC SCHOOL
HOME WORK: GEOGRAPHY (TASK 1)
GRADE IV

Chapter: Weather and Climate

Homework: Solve the following worksheet for reinforcement.

Q1: Fill in the blanks.

- a. A _____ climate has four distinct seasons.
- b. The composition of Nitrogen in the atmosphere is _____ percent.
- c. The earth is surrounded by a layer of air called the _____
- d. Warm air is _____ in weight than cool air hence it rises and begins to cool.

Q2: Identify the weather element and its instrument with the help of the given situations.

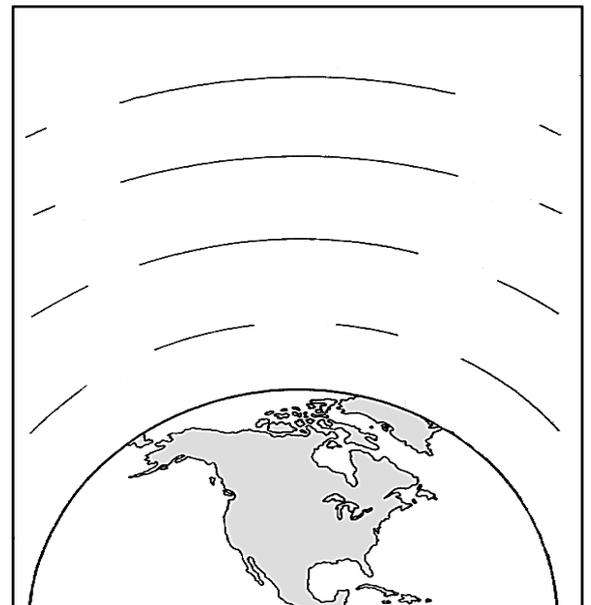
- a. Everybody agreed that the day was just right for a picnic and swim. What a bright sunny morning. I must check the _____ with the help of _____
- b. Oh! It's too hot outside I'm sweating a lot. I must check the _____ with the help of _____
- c. Wind is blowing too fast I can't sail my boat properly. I must check the _____ with the help of _____

Q3: Write if the statement refers to weather or climate.

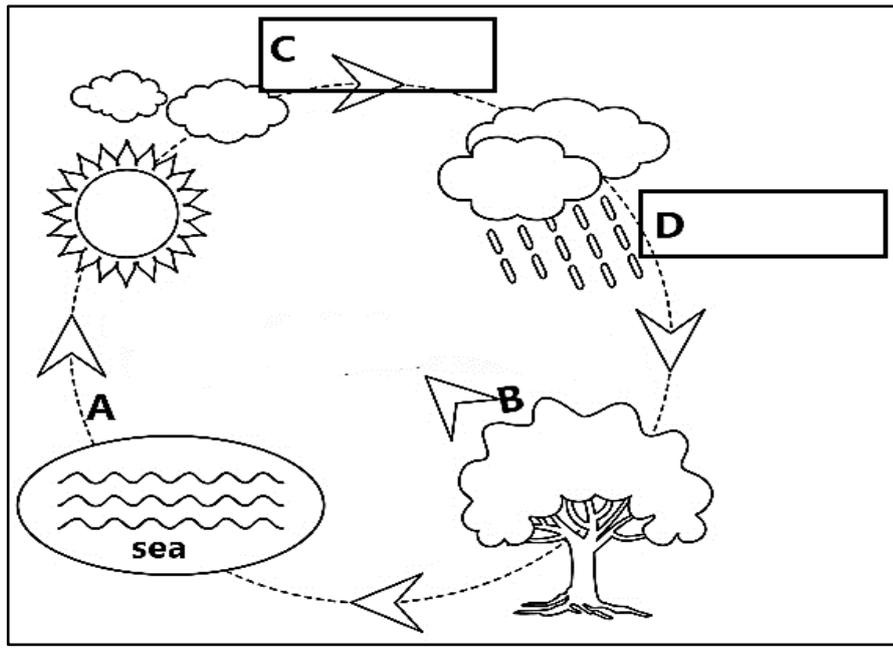
- a. It rained three days last week in Texas. It refers to _____
- b. Australia has long and hot summers. It refers to _____
- c. The rainy season is from June – August every year. _____
- d. Yesterday it was 35°C in Karachi during day time. _____

Q4: Identify the atmospheric layers and label the following objects in the correct layers of the atmosphere.

- a. Birds
- b. Jet plane
- c. Meteors
- d. Ozone gas
- e. Satellites and space shuttles



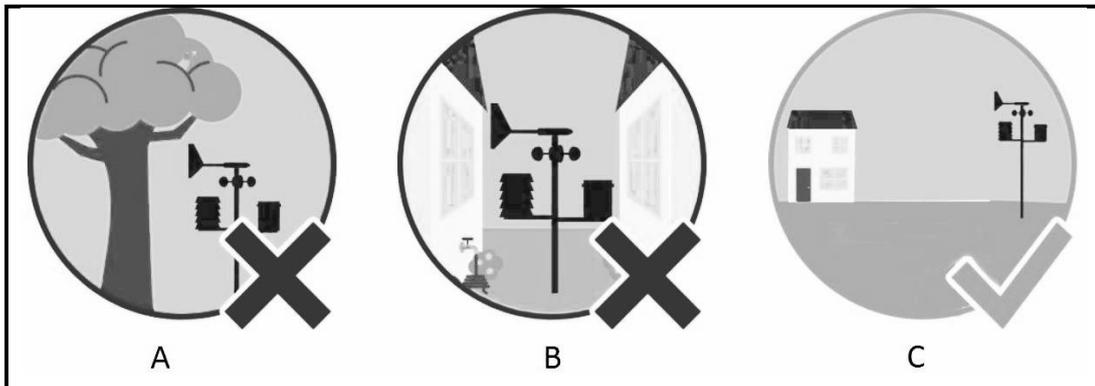
Q5: Label the process C and D in the given diagram of water cycle and differentiate between the process of A and B.



A	B

Q6: State the two forms of the precipitation.

Q7: The location of the weather station is very important. Study the figure and give a reason to explain why the weather instrument should be placed in area C and not in areas A and B.



a. Give reason why it should not be placed in areas A and B?

b. Give reason why it should be placed in area C?

6.1 Weather and Climate

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Weather and climate.

Have you ever been caught in the rain by surprise? One moment it is bright and sunny and in another, it starts to rain suddenly. After perhaps an hour or two, just as suddenly as it starts, the rain stops. This is what we call **weather** — **the changes in the atmosphere for a short period of time at a given place.**

Take a walk outdoors and look at the sky. Are there clouds in the sky? Is it sunny? Does it feel hot or cold? Is there a breeze or strong wind blowing? Ask yourself these questions again an hour or so later. Do you observe any changes in the clouds in the sky, the wind or the temperature? When we talk about weather, we are actually talking about changes such as these within a short period of time.



▲ Figure 6.1 Weather – changes in the atmosphere within a short period of time

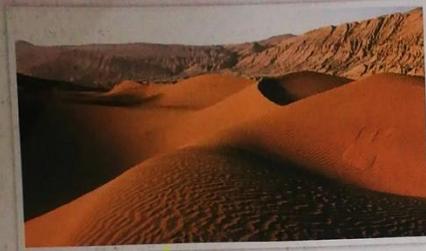
Weather is different from **climate**. **Climate describes the average weather conditions over a long period of time in a given place.** The weather data is collected over many years, often as many as 30 years, and the average is calculated from the data. Weather data collected include the temperature, rainfall or precipitation and wind. Switzerland, for example, is said to have **a temperate climate where there are four distinct seasons** (Figure 6.2).



▲ Figure 6.2 A temperate climate has four distinct seasons.

On the other hand, Karachi in Pakistan has a moderate climate, which is not too hot or too cold. A desert is very hot in the day and very cold at night (Figure 6.3).

All these statements tell us what the place is usually like. The statements are based on climate data collected over a long period of time.



Desert in the day



Desert at night

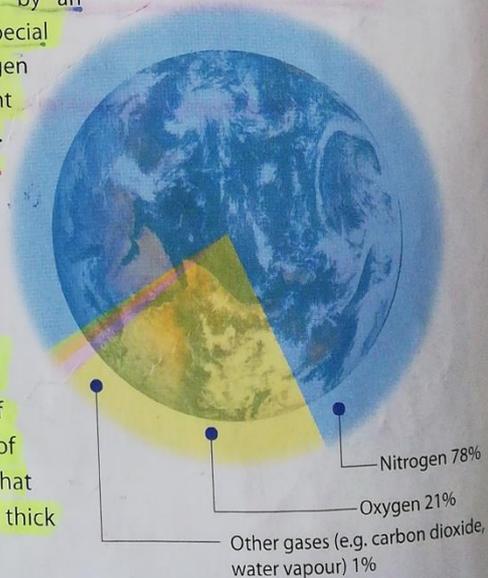
▲ Figure 6.3 A desert experiences great differences in day and night temperatures.

6.2 The Earth's Atmosphere

Can you name another planet besides the Earth that has life on it? The answer is probably "no". The Earth is a very special planet, not just because it is our home but also because it is the only planet that is able to support life. Why do you think this is so? Is there anything that is special about our Earth? Yes, the Earth is surrounded by a layer of air called the atmosphere.

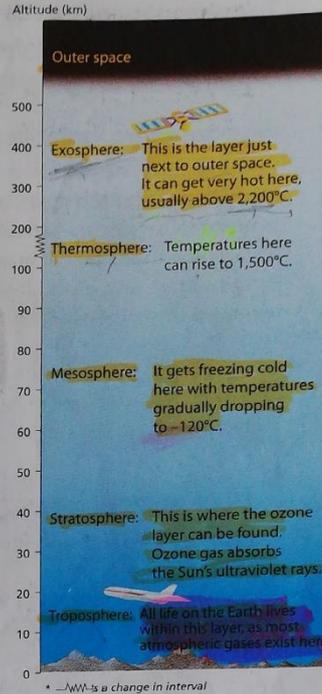
The other planets are also surrounded by an atmosphere but the Earth's atmosphere is special in several ways. It consists mainly of nitrogen and oxygen. It also contains a small amount of carbon dioxide and water vapour.

The combination of nitrogen (78 per cent), oxygen (21 per cent), carbon dioxide, other gases and water vapour (1 per cent) is just right for living things to survive (Figure 6.4). If there is too much carbon dioxide, for example, the Earth may become too hot for living things as carbon dioxide absorbs heat. The atmosphere of Venus, for example, is made up mainly of carbon dioxide and thick clouds of acid that completely cover the planet. It also has a thick and heavy atmosphere.



▲ Figure 6.4 The composition of air in the lowest layer of the Earth's atmosphere

It is so heavy that the weight would kill a living thing! You can see therefore that the Earth's atmosphere is unlike the atmosphere of the other planets, as it has the right balance of gases and water vapour to support life. The Earth's atmosphere is made up of several layers (Figure 6.5). We all live in the troposphere where most of the gases in the atmosphere are found. The layer next to the Earth's surface is the warmest because it is next to the surface where the sun's rays are converted into heat.



► **Figure 6.5** The five layers of the Earth's atmosphere

6.3 Elements of Weather

When we talk about weather, we are talking about the changes in elements such as temperature, clouds and rainfall or precipitation of a place for a short period of time. These changes take place in the Earth's atmosphere. Let us now take a closer look at these weather elements in Figure 6.6.

Defination



Temperature tells us how hot or cold a place is. We measure temperature in degree Celsius or degree Fahrenheit.

Relative humidity refers to the amount of water vapour in the air. When relative humidity is high and our bodies are warm, we perspire. Relative humidity is commonly expressed as a percentage.

Precipitation refers to water returning to the Earth's surface. Rain is an example of precipitation. Other examples include snow, frost and hail. Rain is usually expressed in mm or cm.

Wind occurs when air moves as a result of differences in air pressure. We measure wind in terms of its speed, in km/h.

▲ **Figure 6.6** The elements of weather include temperature, relative humidity, precipitation and wind.

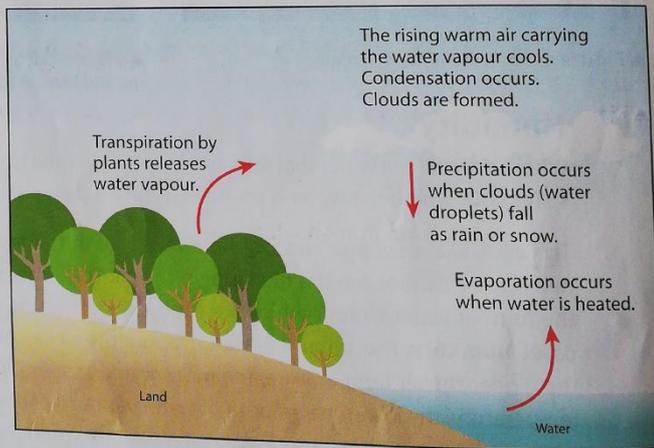
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Not include

The air is not always saturated. Sometimes the water vapour it holds is below the maximum that it can hold at a given temperature. The actual amount of water vapour in the air is called the **relative humidity**. When we say that the relative humidity is 50 per cent at 16°C, we mean that the air contains only half of what it can hold at that temperature. If the relative humidity at that temperature is 100 per cent, the air is saturated. When this happens, the air is said to have reached its saturation point.

WATER CYCLE / HYDROLOGIC CYCLE

Water becomes water vapour when **evaporation** takes place. Evaporation takes place when the sun's rays heat the surfaces of lakes, rivers, seas and oceans. Water vapour is also released by plants through their leaves. This process is called **transpiration**. The water vapour is carried by the warm air and rises. **Warm air is lighter than cool air hence it rises.** As the warm air rises, it begins to cool. As the air cools, its capacity to hold water vapour falls. Although the amount of water vapour it holds remains unchanged, its capacity has dropped. It can no longer hold all the water vapour. The water vapour condenses to form water droplets. These water droplets are very small and they remain suspended in the air. When billions of these water droplets combine, bigger droplets are formed. These droplets combine to form clouds (Figure 6.9a). When the droplets are heavy enough, they fall as precipitation. Precipitation can be in the form of rain, snow or hail (Figure 6.9b).



► **Figure 6.9a**
Hydrologic cycle – The processes of evaporation, condensation and cloud formation



Rain



Snow



Hail

▲ **Figure 6.9b** Examples of precipitation