7 Weather, Climate and Adaptations of Animals

Learning objectives

To know about

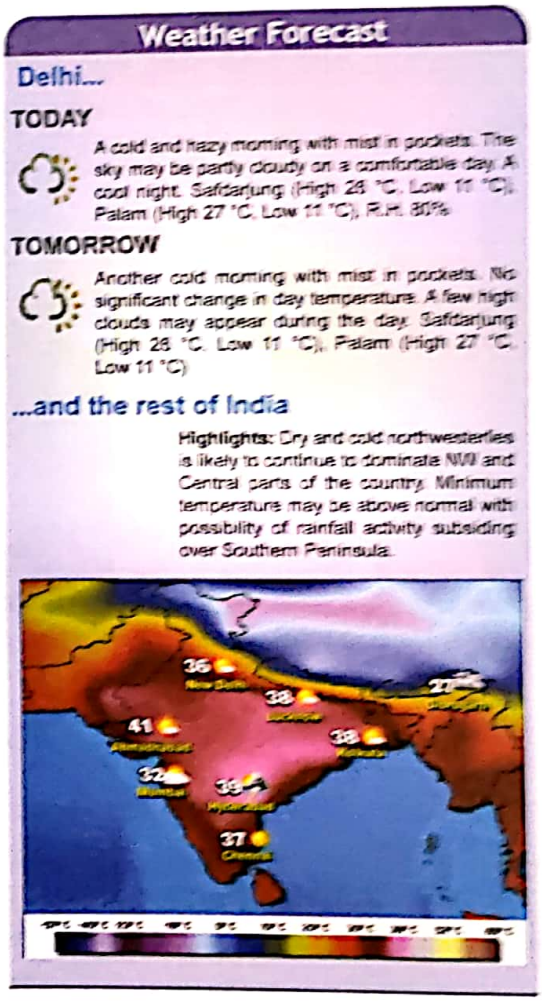
- weather and weather conditions.
- climate.
- adaptations of animals to climate.

Weather plays an important role in our lives. In cold weather we protect ourselves by wearing woolen clothes while in hot weather we use certain cooling devices like fan, cooler or air conditioner to keep ourselves cool. What do we do in the rainy season? We wear raincoats or use umbrellas to escape from the rain. We plan many of our day-to-day activities on the basis of prevailing weather conditions. We plan a picnic on a cool, pleasant and cheerful day and not on a hot and sultry day. We even plan a trip to a hill station or any other place after taking into account the weather conditions of that place.

7.1 WEATHER

You must have watched the weather report on television many times. If you read the newspaper daily, you may have seen the weather report printed in it. If you look at it carefully you will find that it gives the following information:

- Maximum and minimum temperature of the past 24 hours
- Humidity/relative humidity
- Rainfall
- Time of sunrise and sunset
- Time of moonrise and moonset
- Prediction of weather for the present day



A weather report

Classroom Discussion

Identify the following weather symbols.

7.2 WEATHER CONDITIONS

Weather plays an important role in our lives and we are often affected by it. Let us perform Activities 7.1 and 7.2 to find out more about weather conditions.

Activity 7.1 (Record and investigate.)

To find out about different weather conditions during a week

- Take the newspapers of the last seven days and cut the weather reports given in them.
- Paste these weather reports on a sheet of paper and record the information in the table given below as shown. If rainfall is not shown in the weather report, leave the column of rainfall blank.
- Now look at the data collected in the table given below carefully and find out whether
  - the maximum and minimum temperature is the same for all the days or not.
  - there is any change in humidity.
  - the change in temperature and humidity is extreme or marginal.

Weather data of a week

Day	Max. temp. (°C)	Min. temp. (°C)	Max. relative humidity (%)	Min. relative humidity (%)	Rainfall (mm)
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					
Sunday					

The weather conditions do not remain the same. The maximum and minimum temperature may be the same on some days, but all the parameters are not the same on any two days. If you compare the weather reports for a longer period of time, you may witness considerable changes in the weather.

Activity 7.2 (Collect data and study.)

To find out about weather conditions in a year

- Collect the average weather report for every month of a year and fill the data in the table given on next page. You can collect the weather reports of the place where you live.
- Do you find any change in the weather conditions throughout the year?
- If you are living in northern part of India, do you observe a particular dip in maximum and minimum temperature of the day during December and January? Or is humidity much higher in the months of June and July? Or a few months have an exceptionally high rainfall?

Weather conditions like temperature, humidity, rainfall, etc. change drastically during a year's time.

Weather data of a year

Month	Average Temperature		Relative Humidity (%)	Average Rainfall (mm)
	Maximum (°C)	Minimum (°C)		
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				

Now it is clear that no two parameters of atmospheric conditions remain the same during two consecutive days, but during a year a definite change in weather conditions is observed. It is for this reason that we say or hear people say that the weather is good today or it was warm last week or it was quite cold last month. *The day-to-day conditions of the atmosphere at a certain place with respect to temperature, wind speed, humidity, rainfall, sunshine or clouds, etc. is called the* ***weather*** *at that place.* The temperature, wind speed, humidity, rainfall, etc. are known as **elements of weather.**

The amount of sunshine received at a place depends on the duration of the day (time of sunrise and sunset) and the season. During summer, the day time is longer than it is in winter. The weather is hot when the sun shines brightly and cool when there is less sunlight or the sun is covered with clouds.

You may be surprised to know that the centre of all weather conditions is the sun. In the solar system there are eight planets including the earth, which revolve around the sun but

Do you know?

The city of Yuma in the state of Arizona has over 4,000 hours of sunshine per year, making it the sunniest place on the planet. The South Pole is the least sunny place. It receives sunlight for only 182 days a year.

Weather

Weather is defined as the day-to-day conditions of the atmosphere at a certain place with respect to temperature, wind speed, humidity, rainfall, sunshine or clouds, etc.

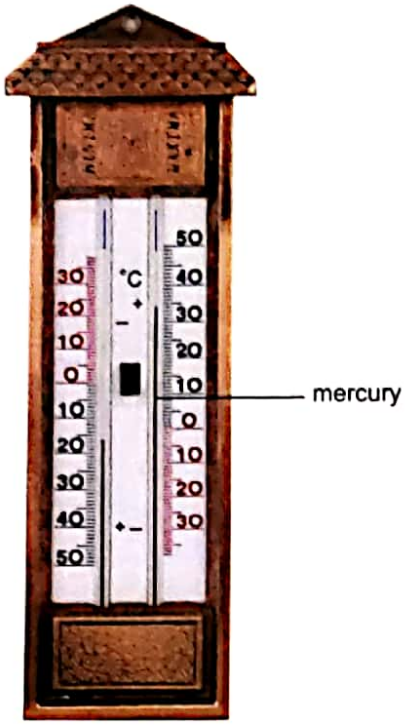


Fig. 7.1: Maximum-Minimum Thermometer

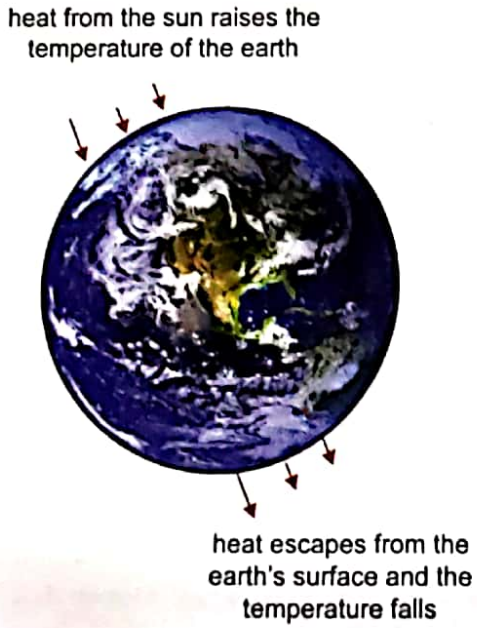


Fig. 7.2: The maximum and minimum temperature depends on the heating of the earth's surface by the sun

the earth is the only planet on which life exists. The factors responsible for the existence of life on the earth are:

- Distance of the earth from the sun is sufficient enough to keep the temperature on the earth's surface at an average of 30 °C which is appropriate for sustenance of life.
- The layer of carbon dioxide and water vapour which surrounds the earth, gives it a greenhouse effect and does not allow heat to filter out. In the absence of such an effect, the temperature of the earth may go down to –30 °C.
- The ozone layer which surrounds the earth's atmosphere does not allow the harmful ultraviolet (UV) rays to reach the earth's surface which may otherwise kill living organisms.
- The earth's axis of rotation is tilted at an angle to the normal and this causes changes in climatic conditions, i.e., hot summer, cold winter or rainy season.

7.2.1 Maximum and Minimum Temperature

In the weather report of a day, maximum and minimum temperature represents the maximum and minimum level of mercury recorded by a **maximum-minimum thermometer** as shown in Fig. 7.1. Do you know what time of the day has maximum temperature and what time of the day has minimum temperature? When the rays of the sun fall on the earth's surface during the daytime, they heat up the surface (Fig. 7.2). Generally the temperature is the maximum in the afternoon. When the heat escapes during night, the temperature falls. So, the minimum temperature is recorded generally in the morning. You must have noticed that the mornings in summer are comparatively comfortable while the afternoons are miserable because the temperature is at its highest.

In maximum-minimum thermometer, there is a U-tube filled with mercury. One arm of the U-tube records the maximum temperature and the other one records the minimum temperature. There are bulbs at the top of each arm. The bulb at the top of the minimum reading scale has alcohol while there is vacuum or alcohol vapour at low pressure in the other bulb. The column of mercury is pushed by the expansion of alcohol present in the bulb. Mercury pushes the steel markers

when it moves up in any tube but when it moves down it leaves the marker at its position. This is how the temperature is recorded at any time of the day.

You might have noticed that sometimes in the weather report the maximum temperature is reported as 44 °C (–1). This means that the temperature on that day is 44 °C and is 1 °C lower than the average maximum temperature for that day. The average **maximum** or **minimum** temperature is calculated by taking into account the maximum or minimum temperature of over 30 or more years respectively. When the maximum and minimum temperatures in a certain region/ area deviate much more than the average value, it is reported that the region/area is having a climate change.

The maximum and minimum temperature in cities and urban areas are higher than those of the surrounding rural areas or forests. The concrete structure absorbs more heat than the ground and it retains the heat for a longer time as well. Besides, lack of trees or forest cover does not provide the cooling effect by the plants.

7.2.2 Humidity

Air can hold a definite amount of water vapour in it at a particular temperature. When a certain amount of water is present in the air, it is said to be **saturated**. Therefore, ***humidity*** *can be defined as the capacity of the air to hold water vapour in it at a particular temperature.* The capacity of holding water vapour increases with rise in temperature.

Humidity is sometimes recorded in terms of relative humidity in the weather reports. ***Relative humidity*** *is a measure of the amount of water vapour present in the air at a specific temperature compared to the maximum amount of water vapour air can hold at that temperature.* It is expressed as a **percentage value**. Relative humidity depends on the temperature and keeps on changing throughout the day, so it is also represented as maximum and minimum relative humidity in the weather reports as shown in Table 7.1. Graphs in Figs. 7.3(a) and (b) represent the maximum and minimum temperature and maximum and minimum relative humidity values as given in Table 7.1 respectively.

Do you know?

- 'Aziziya in Libya has the highest recorded temperature on the earth at 58 °C on 13 September 1922.
- The lowest ever recorded temperature in the world was at Vostok station, Antarctica on 21 July 1983 at –89.6 °C.

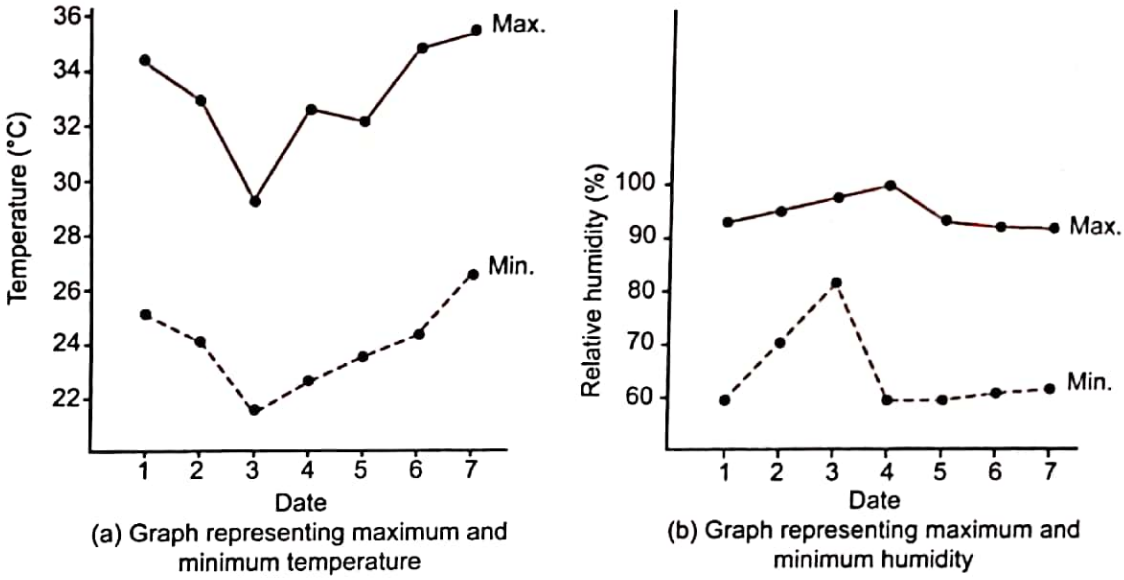
Antarctica

Key Fact

The commonly used unit of humidity is gram per cubic metre. The humidity value ranges from 0 g/m^3 in dry air to 30 g/m^3 when the air is saturated with moisture at 30 °C.

Table 7.1: Weather data for a week in a city of Northern India

Date	Maximum temperature (°C)	Minimum temperature (°C)	Maximum relative humidity (%)	Minimum relative humidity (%)
1/9	34.3 (0)	25.2 (0)	93	59
2/9	33.2 (–1)	24.1 (–1)	95	70
3/9	29.6 (–4)	21.5 (–3)	98	82
4/9	32.8 (–1)	22.9 (–2)	100	59
5/9	32.4 (–2)	23.8 (–1)	93	59
6/9	35.1 (+1)	24.4 (–1)	92	61
7/9	35.6 (+2)	26.8 (+2)	92	62



(a) Graph representing maximum and minimum temperature

(b) Graph representing maximum and minimum humidity

Fig. 7.3: Graphs for the data shown in Table 7.1

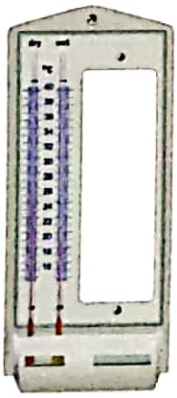


Fig. 7.4: Hygrometer

Classroom Discussion

What is the effect of humidity on the human body?

Relative humidity is measured by a **hygrometer** (Fig. 7.4). A simple hygrometer, also called **psychrometer**, has two thermometers. The bulb of one of them is wet and the other is dry. Evaporation from the wet bulb lowers the temperature relatively. As a result, the wet bulb thermometer shows a lower temperature than the dry bulb thermometer. The difference of the two readings is used to calculate relative humidity.

During conditions of high humidity, the evaporation of sweat decreases and it becomes difficult to maintain the body temperature. During a humid and hot day, the possibility of heat stroke increases.

7.2.3 Rainfall

The high humidity in the air and the sudden drop in temperature leads to rainfall. When humidity is almost 100%, and the temperature falls, the water vapour in the air condenses. Clouds are the visible mass of droplets that are formed high above the ground. When these droplets join together, they come down as rainfall. When the temperature is very low (as in case of high altitudes), the water droplets freeze and come down as snowfall.

Rainfall is measured by a **rain gauge** as shown in Fig. 7.5. A rain gauge is a graduated cylinder with a collector/funnel at the top. Rainfall is generally measured in **millimetres**.

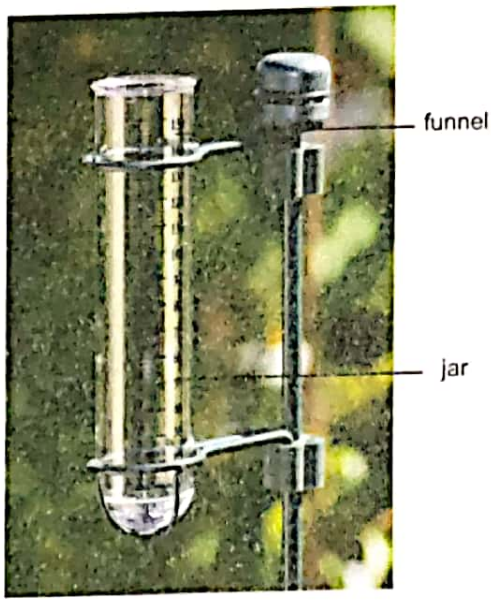


Fig. 7.5: Rain gauge

7.3 CLIMATE

The climate of a place is actually the average weather pattern of that place. The meteorological department keeps the record of day-to-day weather conditions. *The average of these weather patterns taken over 25–30 years is called the* ***climate*** *of that place.* If the temperature of a certain place/region is high throughout the year and it receives good rainfall, the climate of such a place is termed as hot and wet.

The climate of a place is primarily determined by its **latitude** (Fig. 7.6). There are mainly three temperature zones throughout the world based on the difference in their climates:

(i) The hot or **torrid** zone is the region around the equator which is heated by the direct rays of the sun.

(ii) The cold or **frigid** zone is the region around the north and the south poles which receive slanting rays of the sun.

(iii) The **temperate** zone is the region between the torrid and the frigid zone.

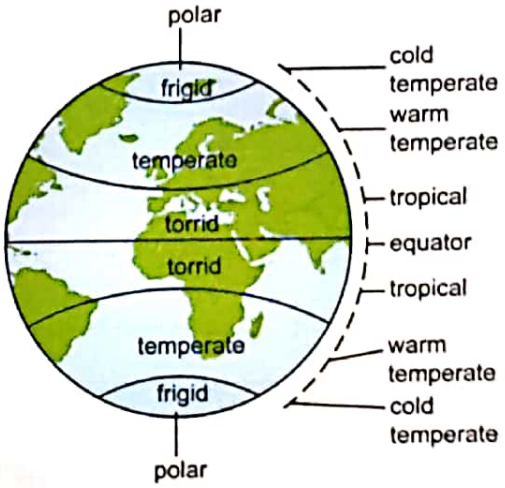


Fig. 7.6: Different temperature zones

The climate of India is warm and tropical by and large but the mountains have a much colder climate throughout the year. Generally the temperature falls by 1 °C with every 300 feet rise (above the sea level) in the altitude.

Another factor that determines the climate of a place is its **proximity to the sea**. Places close to the sea have a moderate climate whereas those away from the sea face extreme climatic

Classroom Discussion

Staying indoors in an air-conditioned room during hot summers is not good for your health. Discuss.

Do you know?

Some of the wettest places in the world are:

- Mawsynram in India
- Mount Wai-'ale-'ale in Hawaii
- Lloro in Columbia

Mawsynram

Mount Wai-'ale-'ale

conditions. It is a feature of land to absorb and radiate the heat of the sun much faster than the seawater, which accounts for the difference in the climate of these places.

The climate of a place is also influenced by the amount of **rainfall** it receives which in turn depends on factors like wind, proximity to the sea and presence of mountains. In general, winds blowing from the sea bring rainfall while the winds blowing from the land are dry. The winds blowing from the Indian Ocean or Bay of Bengal in monsoon season bring rainfall, while the winter winds blowing from the northern mountains are cold and dry.

Mountains trap rainfall from moisture laden winds. When these winds hit the mountains, they get pushed up. They rise up and the water vapour condense to form water droplets. These droplets fall down in the form of rainfall or snowfall. *The side of the mountain which receives rainfall is called* ***windward side.*** These winds then rise further and reach the other side of the mountains. Since there is not enough moisture left, so they do not bring sufficient rainfall here. *This side of the mountain is called the* ***leeward side.*** For example, Mumbai present at the windward side of the Western Ghats gets plenty of rainfall, while Pune, on the leeward side does not get much rain.

Different parts of our country have wide variations in climate. For example, the climate in most parts of Rajasthan is hot and dry, while it is wet in the north-east. Mumbai has a moderate and humid climate.

Answer Orally

1. Define weather and climate.
2. Why do different places have different climate?
3. Name the conditions which determine the weather of a place.

7.4 ADAPTATIONS OF ANIMALS TO CLIMATE

Where do you find camels and penguins on earth?

Camels are found in deserts and penguins in Antarctica. Do you find penguins in deserts and camels in Antarctica? The answer is 'no'. But why?

Classroom Discussion

What kind of weather would Delhi have if it was near the sea?

The climate in deserts is hot and dry, whereas in Antarctica, it is extremely cold. Camels and penguins have adapted themselves to survive in these diverse climatic conditions. These animals have developed special features to protect themselves against the extreme hot or cold conditions. The special features that the living organisms have developed are a result of the long process of evolution. Before studying the adaptations of animals to different climates, let us first study the general features of these climatic zones.

Polar regions are situated near the poles—north pole and south pole. These regions remain covered with snow and the climate is extremely cold for most part of the year. The temperature in winter may be as low as −37 °C. The sun does not set for six months in a year and for the other six months, it does not rise.

Desert regions may be hot or cold. They have a dry climate with very little precipitation. Some regions do not receive rain or snow for years. In hot deserts, animals develop adaptations to conserve water.

Some famous deserts are the Sahara and Kalahari deserts in Africa, Thar desert in India and Gobi desert in Mongolia.

Tropical regions are located around the equator and therefore, have a hot climate. But these regions get plenty of rainfall. During summer, the temperature may cross 40 °C.

Tropical rainforests are an important part of tropical regions. Due to continuous rain and warmth, a wide variety of plants and animals are found in this region.

Now let us study adaptations of animals to different climates.

7.4.1 Adaptations of Animals Living in the Polar Region

Animals found in the polar region are polar bears, penguins, birds, fishes, reindeers, foxes, seals and whales.

Adaptations in a Polar Bear (Fig. 7.7)

- The body has a white fur. This blends with the snowy white background. This adaptation protects the polar bear from predators. It also helps in catching the prey.
- The fur has two layers. The two thick layers of fur protect the polar bear from the extremely cold surroundings.

Do you know?

- The Sahara desert in Africa is the **hottest and largest desert** in the world.
- The Gobi desert in Mongolia is the **coldest desert** in the world.

Tropical Rainforests

- Tropical rainforests occupy 1/12 of the earth's surface and contain more than half of the earth's total number of living organisms.
- Tropical rainforests are found in Western Ghats and Assam in India, Southeast Asia, Central America and Central Africa.

Mind Scrambler

Unscramble each of the following to form a word or term.

(a) POTICARL _____

(b) ITUHIDMY _____

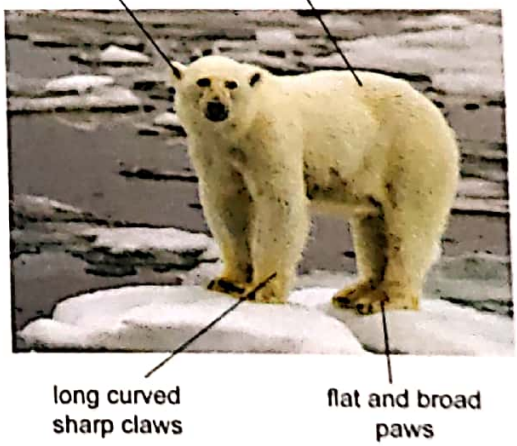


Fig. 7.7: Polar bear

Do you know?

Penguins huddle together

- to keep their bodies warm.
- to fight their enemies.

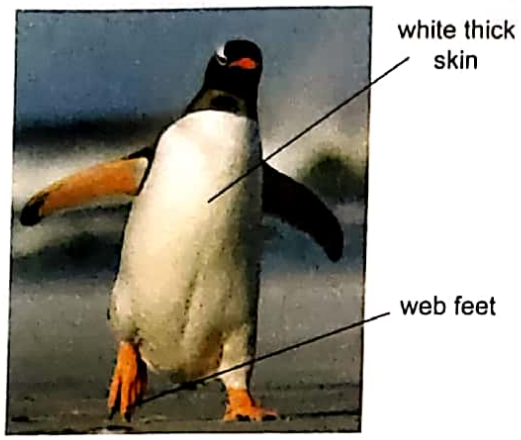


Fig. 7.8: Penguin

- In addition to fur, a thick layer of fat is present under the skin. This layer of fat also helps to keep the body warm (insulates the body from cold).
- It can close its nostrils. This feature helps the animal during swimming. By closing its nostrils, it can remain under water for long periods.
- It has a strong sense of smell that helps in locating the prey from a distance.
- Its paws are flat and broad which help it to walk on ice.
- It has long curved and sharp claws. This provides good grip and helps it to walk on ice.
- It has small ears that help it to retain as much heat as possible.

Adaptations in a Penguin (Fig. 7.8)

Penguin is another well-known animal living in the polar region and shows the following adaptations:

- Its body is white coloured from the underside and merges well with the white background of snow.
- It has thick skin and a thick layer of fat under the skin. These features protect it from cold.
- The body is streamlined and the feet have webs. Both these features help in swimming. Penguins are good swimmers.
- Like polar bears, penguins also have very small ears which help the animal to retain as much heat as possible.

Migration

Migration is a means to escape the extreme climatic conditions at home environment.

Adaptations in Birds

Birds are covered with feathers to protect their bodies from the cold. For survival, birds must remain warm. They migrate to warmer regions when winter sets in. They come back after the winter is over.

Migratory Birds

The birds which migrate to warmer regions at the onset of winter (cold) season and come back after the winter is over are called **migratory birds.**

For example, Siberian crane comes from Siberia to warmer places in India like Bharatpur in Rajasthan and Sultanpur in Haryana.

7.4.2 Adaptations of Animals Living in Deserts

You have learnt in Class VI about adaptations of some organisms found in desert conditions. To recall, only adaptations in **camel** are described here.

- It has a brown-coloured body which matches well with the surroundings.

- It has long eyelashes which protect the eyes during sand storms.
- It can close its nostrils to prevent sand from entering the nasal cavity.
- The hump of a camel stores fats and helps the animal to survive without food for several months.
- The animal can drink over 40 litres of water at a time and this water is stored for later use.
- It has thick lips which help it to eat prickly desert plants like cacti without hurting itself.
- It has well-padded wide feet which enable it to walk on hot sand (Fig. 7.9).

7.4.3 Adaptations of Animals Living in Tropical Rainforests

The climatic conditions in rainforests are highly suitable for supporting a rich variety of plants and animals. The animals include apes, gorillas, monkeys, lions, tigers, elephants, leopards, lizards, snakes, birds and insects.

Since the number of animals living in rainforests is very large, there is intense competition between animals for food and shelter (living space).

Adaptations for food: As there is competition for food, some animals have developed adaptations to obtain food which is not easily available to all animals. For example, the bird **toucan** (Fig. 7.10) possesses a long, large beak. This helps the bird to reach the fruit on branches which are too weak to support the weight of the bird. The birds with small beaks are not able to reach the fruit on such branches.

Adaptations for shelter: As the living area is quite less in comparison to the large number of animals, many animals are adapted to living on trees. For example, the **red-eyed frog** (Fig. 7.11) has developed sticky pads on its feet. These pads help to climb trees on which it lives. Generally, **monkeys** have long tails (Fig. 7.12) for grasping branches.

Other Adaptations

Other adaptations include sensitive hearing, sharp eyesight, thick skin and a skin colour that matches or blends with the

Fig. 7.9: Camel

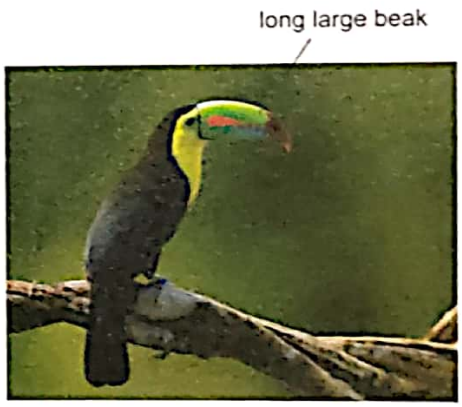


Fig. 7.10: Toucan

Fig. 7.11: Red-eyed frog

Fig. 7.12: Monkey

Fig. 7.13: Lion-tailed macaque

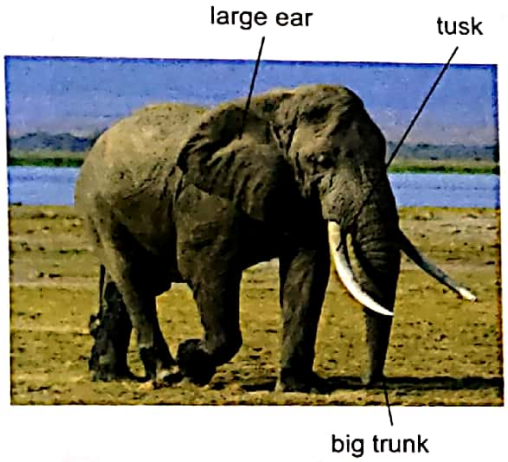


Fig. 7.14: Elephant

surroundings (**camouflage**). Camouflaging provides protection from predators. For example, big cats (lions and tigers) have sensitive hearing and thick skins. The **beard ape** (also called lion-tailed macaque) found in the rainforests of Western Ghats in India lives on trees (Fig. 7.13). It has a silvery-white mane which surrounds the head from the cheeks down to its chin. As it lives on trees, it is a good climber. It feeds on fruit, seeds, young leaves, stems and flowers. It also looks for insects under the bark of trees. Since it is able to get sufficient food on the trees, it rarely comes down to the ground.

Elephant (Fig. 7.14) is commonly found in the Indian tropical rainforests. It has developed a number of adaptations to live in the rainforests.

- It has a big trunk which is used for two purposes—as a nose and for picking up food.
- Its tusk can tear the bark of trees and eat them. The elephant thus does not face problems as far as availability of food is concerned.
- It has large ears which can hear even very small sounds. The large ears also help the elephant to remain cool in the hot and humid climate of the rainforest.

Answer Orally

1. Where do you find polar and tropical regions on earth?
2. Name some animals found in polar regions and tropical rainforests.
3. How is the climate in polar regions different from that in tropical rainforests?

DEFINITIONS

- **Weather:** The day-to-day conditions of the atmosphere at a certain place with respect to temperature, wind speed, humidity, rainfall, sunshine or clouds, etc.
- **Humidity:** The capacity of air to hold water vapour in it at a particular temperature
- **Climate:** The average of weather patterns taken over 25–30 years
- **Relative humidity:** A measure of the amount of water vapour present in the air at a specific temperature compared to the maximum amount of water vapour air can hold at that temperature

QUICK ROUNDUP

1. The maximum temperature of a day is generally measured in the afternoon whereas minimum temperature is measured in the early hours of morning.
2. Relative humidity is 100% when the air is saturated with water vapour up to its capacity at a particular temperature.
3. Sudden fall in temperature causes the water vapour present in the air to condense and form clouds and then fall as rainfall or snowfall.
4. The changes in different weather conditions are governed by the sun.
5. The world's climate is divided into three major regions—**torrid**, **frigid** and **temperate**.
6. The polar regions and the tropical regions are the two regions on the earth which have severe climatic conditions.
7. Animals have developed adaptations to live under different climates.

EXERCISES

A. Answer in Detail

1. Mention the adaptations found in the following animals.
   (a) Polar bear
   (b) Penguin
   (c) Birds in cold climate
   (d) Camel
   (e) Bird Toucan
   (f) Red-eyed frog
   (g) Elephant
   (h) Beard ape
2. Why do we find animals of a certain kind living in particular climatic conditions? Give some examples of such animals.

B. Answer Briefly

1. Name the instrument used to measure:
   (a) maximum and minimum temperature.
   (b) humidity.
   (c) rainfall.
2. What are the conditions on which the climate of a place depends?
3. The tropical rainforest has a large population of animals. Explain why it is so.
4. Why does Mumbai receive a lot of rainfall whereas Pune does not get much rain?

C. Answer in One Word or a Few Words

C1. State whether the following statements are True (T) or False (F).

1. Weather changes frequently but the climate does not. [ ]
2. The maximum temperature of the day is likely to occur in forenoon. [ ]
3. The climate in Rajasthan is dry and temperate. [ ]
4. Tropical rainforests are found in India. [ ]

C2. Fill in the blanks.

1. _____ causes all the changes in the weather.
2. Rainfall is measured by _____ in _____.

3. The average weather pattern taken over a long period of time is called _____ of that place.
4. The air can hold different amount of _____ at different temperatures.
5. _____ is generally not the same on any two consecutive days.
6. The two regions of the earth with extreme climatic conditions are _____ and _____.
7. To escape harsh cold conditions, birds show _____.
8. To obtain food, the bird toucan has a _____.

C3. Match the given columns.

Column A	Column B	Column C
1. Polar bear	(i) Desert	(a) Well-padded wide feet
2. Monkey	(ii) Polar region	(b) Flat and broad paws
3. Camel	(iii) Tropical forests	(c) Feet with sticky pads
4. Penguin		(d) Thin with long tail
5. Red-eyed frog		(e) Webbed feet

C4. Multiple Choice Questions (MCQs): Choose the correct answer for each of the following.

1. The climate of a place is called wet and temperate when
   (a) it rains moderately at that place. (b) the temperature at that place is high.
   (c) both (a) and (b) are present. (d) both (a) and (b) are not found.
2. The amount of rainfall a place receives depends upon
   (a) its proximity to the sea. (b) presence of mountains.
   (c) wind speed. (d) all of them
3. Humidity in air is generally high in
   (a) summer. (b) winter. (c) monsoon. (d) all the seasons.
4. The water vapour present in air condense in the form of
   (a) rainfall. (b) snowfall. (c) fog. (d) all the options.
5. The climate in the polar regions is
   (a) very cold. (b) both cold and hot. (c) very hot. (d) cold and humid.
6. The climate of tropical rainforest is
   (a) extremely cold. (b) extremely hot. (c) hot and humid. (d) cold and humid.

DO AND LEARN

A. Project Work

On an outline map of the world, mark the polar, desert and tropical rainforest regions. You can use pens of different colours for marking different regions.

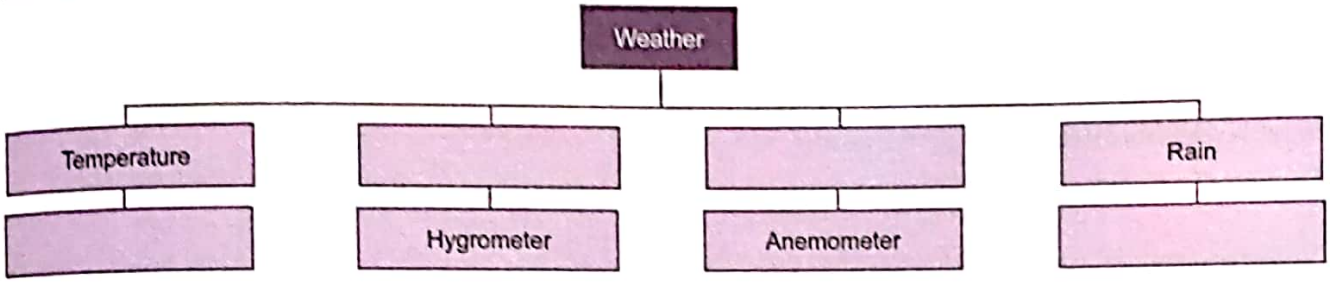
B. Class Presentation

Collect information about the Indian Meteorological Department using the link. *http://www.imd.gov.in.* Make a PowerPoint presentation using this information and present in your class.

C. Group Discussion

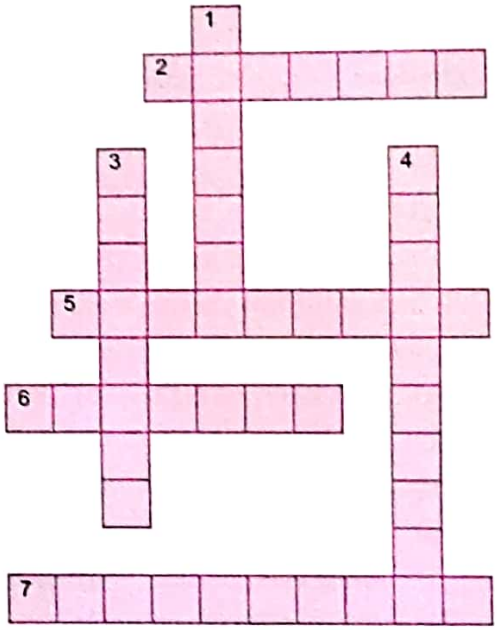
Hold a group discussion on the topic 'Ecological degradation is the result of industrialization and urbanization'.

D. Complete the Web Chart.



E. Crossword Puzzle

Solve the **crossword puzzle** given alongside with the help of the clues given below.



Across

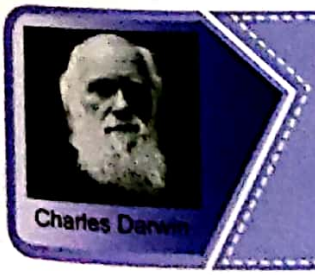
2. Areas with hot and dry climates (7)
5. Means to escape the extreme climatic conditions in the home environment (9)
6. Average weather pattern of a place over a long period of time (7)
7. Instrument to measure relative humidity (10)

Down

1. Day-to-day condition of the atmosphere at a place, with respect to temperature, humidity, rainfall, etc. (7)
3. The amount of water vapour present in the air at a certain temperature (8)
4. To merge with the surroundings (10)

Surf to Know More

Visit *http://himalayasworld.com/index.php?option=com_content&view=article&id=134&Itemid=46* to study climate of India.



Know the Scientist

Charles Darwin (1809–1882), a British naturalist, proposed the theory of evolution by natural selection. He pointed out that in the struggle for existence only the fittest organisms survive and others die out.

Some Questions from NCERT

Weather, Climate and Adaptations of Animals to Climate

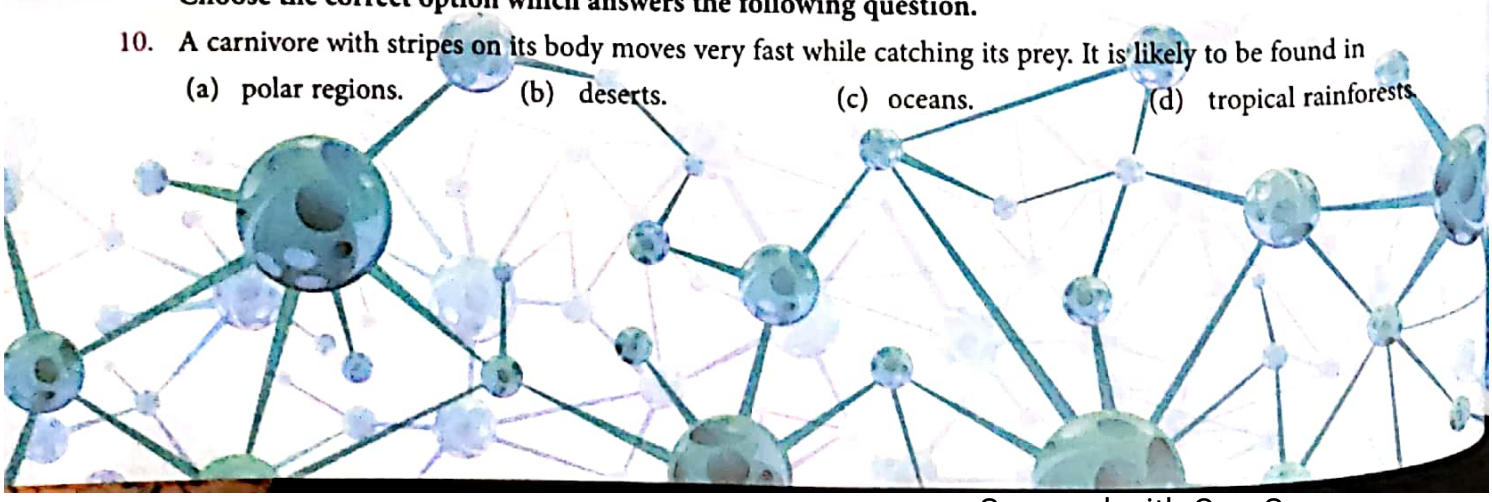
Exercises

1. Name the elements that determine the weather of a place.
2. When are the maximum and minimum temperature likely to occur during the day?
3. Fill in the blanks.
   (a) The average weather taken over a long time is called _____.
   (b) A place receives very little rainfall and the temperature is high throughout the year, the climate of that place will be _____ and _____.
   (c) The two regions of the earth with extreme climatic conditions are _____ and _____.
4. Indicate the type of climate of the following areas.
   (a) Jammu and Kashmir : _____
   (b) Kerala : _____
   (c) Rajasthan : _____
   (d) North-east India : _____
5. Which of the two changes frequently, weather or climate?
6. Following are some of the characteristics of animals.
   (a) Diets heavy on fruits (b) White fur
   (c) Need to migrate (d) Loud voice
   (e) Sticky pads on feet (f) Layer of fat under skin
   (g) Wide and large paws (h) Bright colours
   (i) Strong tails (j) Long and large beak

   For each characteristic indicate whether it is adaptation for tropical rainforests or polar regions. Do you think that some of these characteristics can be adapted for both regions?
7. The tropical rainforest has a large population of animals. Explain why it is so.
8. Explain, with examples, why we find animals of certain kind living in particular climatic conditions.
9. How do elephant living in the tropical rainforest adapt itself.

Choose the correct option which answers the following question.

10. A carnivore with stripes on its body moves very fast while catching its prey. It is likely to be found in
    (a) polar regions. (b) deserts. (c) oceans. (d) tropical rainforests.



11. Which features adapt polar bears to live in extremely cold climate?
    (a) A white fur, fat below skin, keen sense of smell
    (b) Thin skin, large eyes, a white fur
    (c) A long tail, strong claws, white large paws
    (d) White body, paws for swimming, gills for respiration
12. Which option best describes a tropical region?
    (a) Hot and humid
    (b) Moderate temperature, heavy rainfall
    (c) Cold and humid
    (d) Hot and dry

Extended Learning—Projects and Activities

1. Collect weather reports of seven successive days in the winter months (preferably December). Collect similar reports for the summer months (preferably June). Now prepare a table for sunrise and sunset times as shown in the given table.

Sunrise and sunset times

June			December		
Date	Sunrise	Sunset	Date	Sunrise	Sunset

Try to answer the following questions.
(a) Is there any difference in the time of sunrise during summer and winter?
(b) When do you find that the sun rises earlier?
(c) Do you also find any difference in the time of sunset during the month of June and December?
(d) When are the days longer?
(e) When are the nights longer?
(f) Why are the days sometimes longer and sometimes shorter?
(g) Plot the length of the day against the days chosen in June and December.

2. Collect information about the Indian Meteorological Department. If possible visit its website: *http//www.imd.gov.in.*
Write a breif report about the things this department does.