Aligned with NEP 2020 & NCF 2023

Environmental Studies

For Class 5

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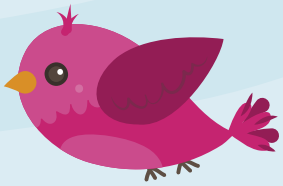

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Preface

This series of Environmental Studies consists of five books for classes 1 to 5. This series focuses on inculcating environmental awareness among children of Primary standard. It is based on the approach and guidelines in the National Education Policy and New Curriculum Framework.

The pedagogical elements in the series will sustain the interest of children and facilitate in-depth understanding the concepts in Environmental Studies (EVS). The elements in the series infuse scientific research through knowledge, skills, values and space for reflection and critical thinking among children.

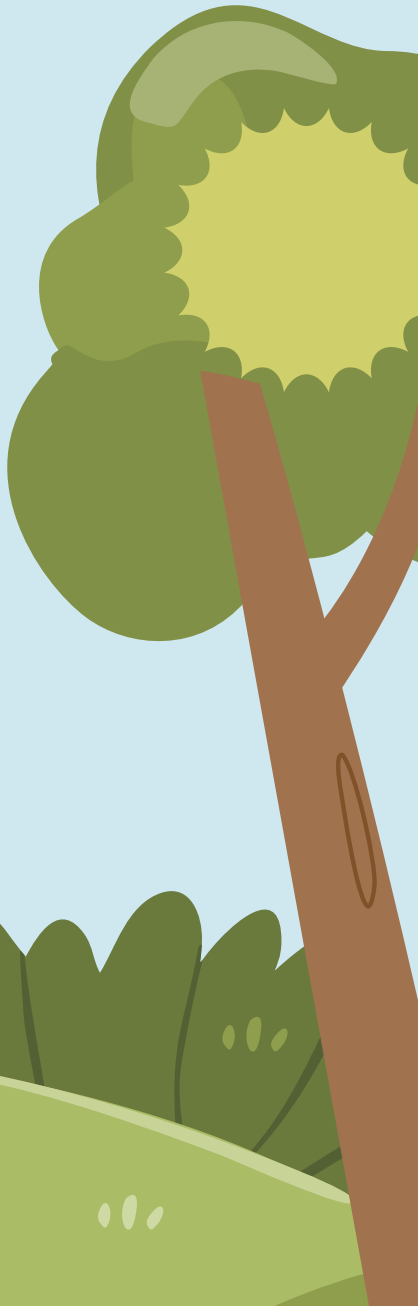
This series links the knowledge gained at school with a child's out-of-school experiences. This has been achieved by selecting contexts which are available in the child's surroundings.

The various features in each chapter contain a set of tasks which help to develop soft skills such as thinking skills, creative skills, observation and communication skills.

Exclusive features of the series are:

- Every chapter starts with the **Curricular Goals**
- Every concept in the books has been explained in simple, lucid and child-friendly language keeping in mind the age groups of the learners.
- Colourful illustrations make the books much more attractive and comprehensive.
- **Check Your Knowledge** and **Need to Know** sections with the chapters make learning, comprehensive, involving and interactive.
- **Vales**, **Life Pillars** and **Do to learn more** offers the learners value-based education.

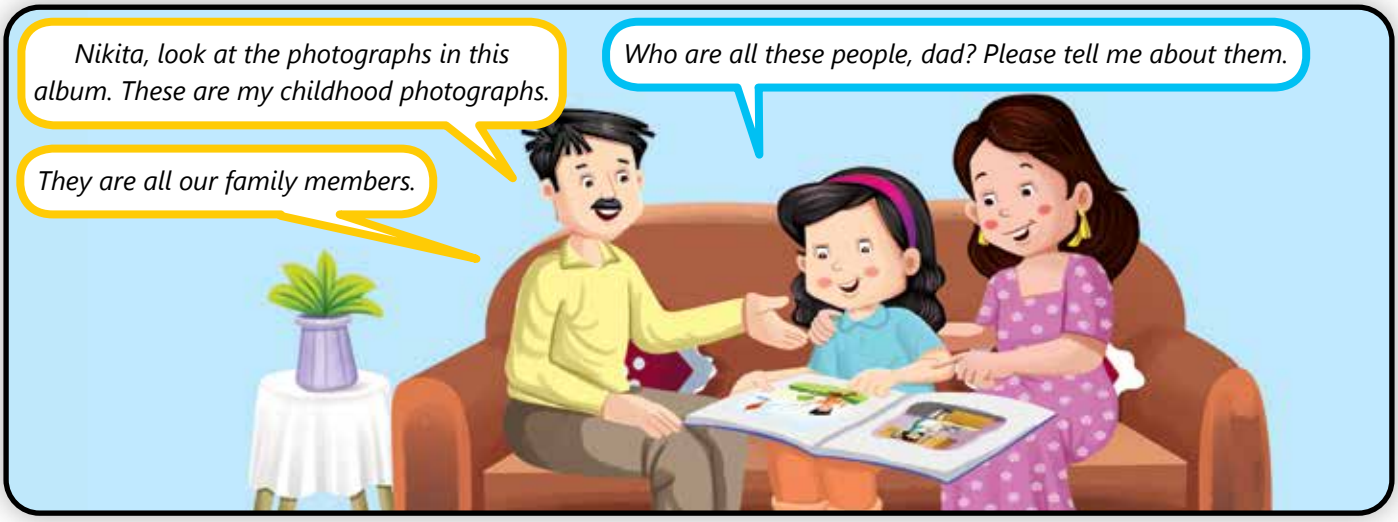
Contents



1 Family and Relationships

Curricular Goals

- Types of Families
- Impacts of Migration
- Migration
- Changes in the Structure of Family
- Factors Responsible For Migration



Types of Families

We know that a family is a group of people related to each other. Families may be small or big and they change over time in different ways. Some of our family members become older. Some new members are born. Some of our elder brothers and sisters leave home to continue with their studies. Some grown-ups leave families and go to other cities or countries for work.

There are two types of families—**joint families** and **nuclear families**. Families which consist of grandparents, parents, children, uncles, aunts and cousins are called joint families. There are fewer joint families these days than there were earlier.

Families which consist of father, mother and children are called nuclear families. Actually, the term nuclear family refers to a household consisting of a father, a mother and their children (not more than two) all in one household dwellings.

Migration

The movement of people from one place to another to settle there is called **migration**. Family members in our country believe in living together under one roof. But due to some unavoidable causes, they have to shift to other places. It happened in ancient times too. Only the reasons are different now. In ancient times, people used to move to other places in search of food, fodder and grazing grounds for their animals. With time, man started pursuing many different types of employment to earn their living. People change their jobs for better living conditions and they shift to the places where they find better jobs.

Activity Time

Make your family tree in your notebook. Write down the names of all your relatives and paste their photographs. Also, mention how they are related to you.

Factors Responsible For Migration

1. Families migrate to some other safe places in case of natural calamities like cyclones, floods, earthquakes, volcanoes, drought, etc. This shifting leads to a change in family structure and value system.
2. Man-made calamities like terrorism and wars also push people to migrate.
3. Constructions like dams, roads, industries, flyovers, etc are also push factors that force people dwelling there to migrate.
4. Family disputes may also be a factor for people to migrate.
5. The rural population with low income moves to cities for better work opportunities.
6. Job transfers are also a major push factor for people moving to bigger cities and towns.

Need to Know

When people move to some other country to settle there permanently, it is called emigration. Such people are called emigrants of the country which they leave. They are called immigrants in the country where they settle. The act of entering a country to settle is called immigration.

Check Your Knowledge

1. Where do you live? Is there any person in your locality who has migrated to another city?

   _____

2. Find out the reasons why he/she has migrated to there?

   _____

Teacher's Tips

Tell the students about the types of families and why the family members migrate to different places. Also tell them the reasons of their migration and its impacts.

Impacts of Migration

Migration have certain impacts on the lives of people who migrate as well as on the people of the places where they migrate; no matter why they migrate.

1. When the young, trained, talented and enterprising people migrate, the progress of that place is affected.
2. Migrants to a new place may usually find it difficult to adjust to the languages and the cultural changes of the place.
3. Migration may lead to disruption of work, social life, and other patterns.
4. The children and the aged people are adversely affected due to migration to new places. They have to make many adjustments in their daily activities.

5. Migration have some positive impacts too such as better job opportunities, better education, better lifestyle, healthy cultural mixing and so on.

Changes in the Structure of Family

In ancient time, during the childhood of our grandparents, the most of the household work was taken care of by women. They were usually confined to home and remained busy in taking care of children, cooking food, washing clothes and many more household activities.

However, in the present time, girls are taking higher education and they are now not limited to only household work. They are on many important posts and doing their jobs greatly. They are doctors, engineers, soldiers, politicians, managers, executives, writers, journalists and many more. Some even run different types of businesses. This all has changed the structure of an Indian family.

The structure of a family is also changed because of many young boys and girls leave their families and go to other cities or countries for a better opportunity or for a higher education. Marriage of a person and birth of a baby also bring change in the structure of a family.

Values

Everyone in the family whether a child, an adult or an old person needs to understand the value of relationships in the family. They should also know the value of love and cooperation.

Word Power

migration : the movement of people from one place to another to settle there

joint family : a family in which grandparents, parents, children, uncles, aunts and cousins live together under one roof

nuclear family : a family which consists of father, mother and children

shift : change place

calamity : an event that causes a great deal of damage or destruction

Summary

- When people move from one place to another to settle there permanently, it is called migration.
- The people who move from one place to another to settle there permanently are called migrants.
- People migrate because of several reasons such as natural or man-made calamities, construction of dams, flyovers and industries.
- Migration has many negative as well as positive impacts.
- The structure of a family is changed because of several reasons.

Practice Time

A. Fill in the blanks.

1. Migration has several _____ on the lives of people.
2. _____ may find it difficult to adjust to the languages and the cultural changes of the new place.
3. Better education is a _____ impact of migration.
4. In the ancient times, women were confined to _____ only.
5. Marriage of a person and birth of a _____ bring changes in the structure of the family.

B. Write the reasons for the following.

1. A large number of young boys and girls move to other cities and countries.
2. The structure of a family is changed when a baby is born in the family.
3. People are asked to move other places when a dam is constructed.

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. People migrate because of several reasons. ☐
2. In ancient times, people used to move to other places in search of clothes. ☐
3. The structure of the family never changes. ☐

4. Migrants have a lot of difficulties to adjust themselves to the environment of the new place.
5. Migration is always beneficial for a country.

D. Answer the following questions.

1. Why do people migrate?
2. What do you mean by migration?
3. Differentiate between nuclear family and joint family.
4. What are the positive impacts of migration?
5. How is the structure of a family changed?

Brainstorm

When people migrate, they have to adjust themselves to the new environment. It is not easy to adjust oneself to a new place, especially for old people and children. Find out what problems they face and how they can overcome those problems.

Find Out

Imagine your father has changed his job and you have to shift to Mumbai with your family. How will this migration affect your family?

Fun to Learn

Divide the class in groups and do a survey of the people in your neighbourhood. Find out their place of birth and whether they have migrated to this place. If yes, ask them when they left their birthplace and what difficulties they had to face in adjusting themselves to the new environment.

Life Pillars

When people migrate to a place, they carry with them their religions, languages, cultures and traditions. At the new place, they mingle with the new people and their culture. We should respect all the religions, languages and cultures.

Do to Learn More

It is very common that educated people migrate from one place to another. What are the impacts of migration of educated people on the place they have left and on the place they have shifted to? Discuss with your friends.

2 Our Likes and Dislikes

Curricular Goals

- Likes and Dislikes of People
- Physically Challenged People
- Factors Influencing Our Likes and Dislikes
- Some Differently-abled People

We all have feelings, emotions, likes and dislikes. They differ from person to person. They are mostly determined by our exposure, experiences and the environment in which we live. Every person has his/her own likes, dislikes, feelings and emotions. However, they are not the same in case of every person. Even the members of a family may have different likes, dislikes, feelings and emotions.

Likes and Dislikes of People

Every person has his/her own likes and dislikes. For example, one person may like *dosa* and *sambhar* while the other person may not like it. May be, he/she likes eating *dal* and *chapatti* or something else. In the same way, your friend or your brother may not like the same food, dress or game which you like.

It's Activity Time

Write the names of some of your friends in your notebook. Ask them what they like or dislike. Write their likes and dislikes before their names and then compare them. What do you conclude? Share with your parents.

Teacher's Tips

Tell the students about feelings, emotions, likes and dislikes of different people. Also tell them about physically challenged people. Tell them the inspiring stories of some physically challenged people.

Factors Influencing Our Likes and Dislikes

There are several factors that influence our likes and dislikes such as our family, occupation, traditions and many others.

Influence of Family

Our family plays a great role when it comes to our likes and dislikes. A person belongs to the family of singers usually like singing. In the same way, a person from a music-lover family likes music. Children naturally develops the liking for the things being done or followed by the family. However, other people who have not been habitual of those things may have dislike for them. For example, a child who has grown up in a slum will naturally like its environment but another child who has grown up in a developed colony would not like it. Thus, environment in which we live play an important role in deciding our likes and dislikes.

Check Your Knowledge

Write the likes and dislikes of your family members.

	Family Members	Likes	Dislikes
1.	Your father		
2.	Your mother		
3.	Your brother/sister		
4.	Your grandfather		
5.	Your grandmother		

Influence of Traditions

Our traditions and cultural and religious beliefs have a great impact on our likes and dislikes. People who are vegetarian, may not like the smell of meat, eggs and fish. However, non-vegetarians like the same smell very much. The people who like spicy food, like the aroma of spices while those who like simple food, do not like the aroma of spices. Some people find the smell of garlic and onion pungent while others like them very much.

Check Your Knowledge

1. Which food do you like the most?

_____

2. Which food do you not like?

_____

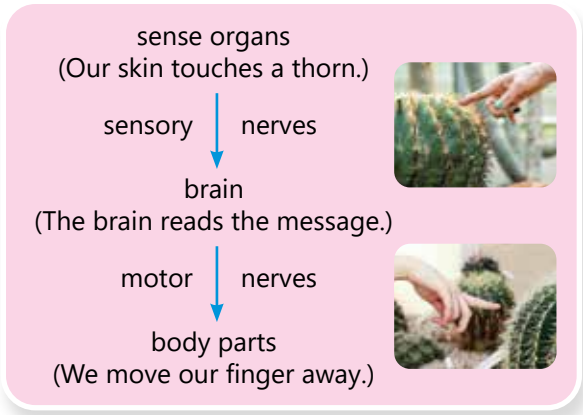
Influence of Occupation

The occupation of a person also leave a deep influence on his/her likes and dislikes. People who work in a pharmaceutical factory are habitual of the smell of chemicals. However, other people may not like it.

Influence of Mood and Circumstance

Our likes and dislikes are also influenced by our mood and circumstances. A person in a party likes to enjoy loud music while people who are not in the party would not like it.

Our feelings, emotions, likes and dislikes are closely associated with our sense organs. They help us decide whether some thing is good or not. We have five sense organs -eyes, ears, nose, tongue and skin. They help us in sensing the things. The functions of the sense organs are the same in all the persons. When we sense something, our sensory nerves immediately send message to our brain that reads the message and sends its response to that particular body part where we sense something to take immediate action as per the received message.



The brain sends its response through the motor nerves. It is our brain that senses things so as to decide whether they are good or not good for the person. Animals can also sense things around them.

Physically Challenged People

We can see many people around us whose one or more body parts do not function properly or they are permanently disabled. Such people are called **physically challenged people**. Blind, deaf or dumb people are physically challenged people. There are also people who are mentally challenged or they have some other physical disability. Physically challenged people are special and need our care and attention. We should be helpful and attentive to them.

We should be friendly to the physically challenged people and help them in every possible way. We should share our time and things with them. We should not discourage them in any way. We should appreciate their work so that they can excel in their life.

Our government is also doing a lot for the benefits of the physically challenged people and creating an environment which is sensitive to their needs.

- Ramps have been built on bus stops, railway stations, metro stations, schools and shopping malls for people who use wheelchairs or are not able to climb stairs.
- Low floor buses introduced by Delhi Transport Corporation are meant for easy boarding and alighting of such people.
- Public transport has seats reserved for the physically challenged people.
- A number of schools have been established to provide education and vocational training to them.
- Colleges and schools have reserved seats for the visually impaired and physically challenged people.

Some Differently-abled People

Helen Keller

The story of Helen Keller is very inspiring and encouraging for us. When she was one and half years old, she lost her eyesight, speech and even the sense of hearing. Her parents were very worried about her. However, because of untiring labour and firm determination, she learnt to read and write with the help of her teacher Miss Anne Sullivan who taught her the signs for the letters of alphabet. She became the first deaf and blind person to earn a Bachelor of Arts degree. Later, she became a famous educationist and author of America. Helen Keller also toured the world and encouraged and educated differently-abled people.

Need to Know

Helen Keller wrote the book The Story of My Life. It has been printed in more than 50 languages.

Stephen Hawking

Stephen Hawking is an exemplary personality for us all. Because of motor neuron disease, he is forced to stay confined to a wheelchair. He has no control on his limbs. Despite all such adversities, he has grown to be a famous scientist who can understand and speak seven languages fluently. His books are bestsellers across the globe. He currently teaches physics at the Cambridge University in England.

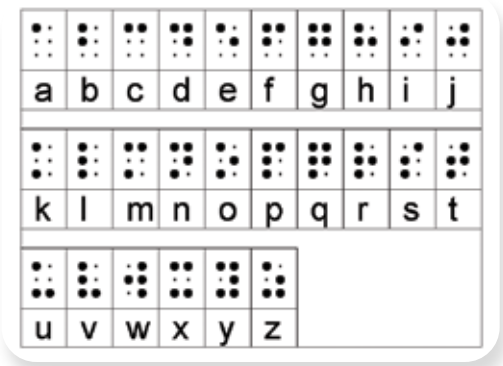
Louis Braille

Louis Braille was a blind but a great personality. He set the example that a person cannot only overcome his/her disability but can also help others to overcome theirs.

When Louis was just three years old, an accident left him blind. In spite of this, he was not discouraged and learnt to play different musical instruments such as cello and organ and became an excellent musician.

He developed Braille script for blind people to read and write. The Braille script has 63 characters made up of one to six dots.

These dots are arranged in different conditions and are embossed on a page. A visually impaired person can read them by passing his/her finger over raised lines.



Sudha Chandran

Sudha Chandran is a very famous classical dancer of India. She lost her leg in a road accident. Doctors declared her to be permanently disabled and that she would never be able to walk again. However, she never lost her courage and persisted until she was not able to walk. She started not only walking but also dancing. You can see her dancing even today with an artificial leg.

Values

Every person likes some things and dislikes other things. We should not criticize the likes and dislikes of others.

Need to Know

An artificial foot, the Jaipur foot was invented by Dr. Pramod Kumar Sethi of Jaipur. This artificial foot is being used by Sudha Chandran.

Word Power

braille : a system of raised dots that can be read with the fingers by people who are blind or with low vision

differently-abled : the people who are not able to make use of one or more of their sense organs.

motor neuron : a neuron conducting impulses outwards from the brain or spinal cord

Summary

- Every person has different likes and dislikes.
- Our likes and dislikes are influenced by our family, traditions, occupations, moods and circumstances.
- Our senses are closely associated with our senses.
- Our sense organs help us to see, smell, feel, hear and taste.
- Body parts of some people do not work properly. Such people are called differently-abled or physically challenged people.
- We should be attentive and friendly to physically challenged people.

Practice Time

A. Fill in the blanks.

1. Our likes and dislikes are influenced by our _____, _____, _____ and _____.
2. _____ taught Helen Keller to read and write.
3. _____ was the first deaf and blind person to earn a Bachelor of Arts degree.
4. The Braille script has _____ characters.
5. Braille script was invented by _____.

B. Write the names of the following.

1. She became blind at the age of one and half years.
2. This exemplary personality has motor neuron disease.
3. This famous Indian classical dancer lost her leg in a road accident.

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. Our family plays an insignificant role in our likes and dislikes. ☐
2. Every character in Braille script consists of one to six dots. ☐
3. Miss Anne Sullivan taught Helen the signs for the letters of the alphabet. ☐
4. Dumb people need Braille script to read and write. ☐
5. Stephan Hawking is a famous scientist who knows seven languages. ☐

D. Answer the following questions.

1. Do the members of a family differ from each other? How? Explain.
2. What is Louis Braille famous for?
3. Who was Helen Keller? What do you learn from her life?

4. Who is Sudha Chandran?
5. What kind of behaviour should be done with the differently-abled people?

Brainstorm

You have read about some differently-abled people in this chapter. Why they were successful? Discuss with your parents.

Find Out

You would have certainly heard about Mother Teresa. Who was she and what is she known for? Surf the Internet and find out.

Fun to Learn

Is there any person who has inspired you? Who is he/she? What have you learnt from him/her? Also, answer the following questions.

1. What will you like to do when you grow up?
2. Ask your parents what their ambitions were when they were young. Did they achieve their ambitions?

Life Pillars

Differently-abled people needs our care and love. Undoubtedly, we should we friendly to them and share our time with them. However, we should not express our sympathy to them as they may feel hurt.

Do to Learn More

Complete the following table.

		My Friend	Myself
1.	Name		
2.	Age		
3.	Favourite Food		
4.	Favourite Game		
5.	Favourite Colour		
6.	Favourite Song		
7.	Favourite Cartoon Show		
8.	Favourite Fruit		
9.	Favourite Vegetable		

3 Games and Sports

Curricular Goals

- Different Types of Games
- Team Spirit
- National Game

Games and Sports are very important for everyone. They are mental or physical activities played according to certain rules. They encourage the spirit of competition among the players and give them opportunity to display their talents. They help to build team spirit. While playing a game, we should be fair and follow the rules and regulations. We should never fight or argue during a game.

Nikita's brother Tapas is the captain of his school's cricket team. He practices cricket whenever he gets time. On Sundays and other holidays, he practises very hard. Her teachers, parents and friends support him a lot. Sometimes, he has to miss his classes for playing matches. In such times, his teachers and friends help him in completing his school work. If you want to achieve expertise in a game, you have to practise it a lot under the supervision of a coach. A good coach teach you how to play the game skillfully.

Check Your Knowledge

1. Which is your favourite game?
2. Who coaches you in this game?

Teacher's Tips

Tell the students about different types of games and sports and their importance in their life. Make them aware of the team spirit. Also, tell them about the national games of different countries.

Different Types of Games

There are several types of games like outdoor games, indoor games, individual or team games.

- Outdoor games are the ones which are played in open grounds, stadiums or courts. Hockey, football, basketball and cricket are the examples of outdoor games.

- Indoor games are the games which are played inside a building. They do not require open grounds. Ludo, carrom, chess and snakes and ladders are the examples of indoor games.

- Some games like skating, chess, golf, cycling and swimming are played by a player alone against another player. These are known as individual games. They do not need a team. In an individual game, a single player has to achieve success on his/her own.

- Some games like hockey, cricket, football and basketball are played between two teams of players. They are called team games. They are played according to a set of rules. They are supervised by referees or umpires. They ensure that all the rules of the games are being followed.

Team Spirit

A team is a group of some players. These players may come from different regions, religions, and economic backgrounds. They all play with the team spirit and make efforts to win the game. Team spirit refers to the feeling of harmony and unity among the players.

The players maintain the following points to keep the team spirit high.

- They exhibit their best capacity and play for the team.
- They respect other players.
- They consider the opinion of each player.
- They do not argue or fight with other players.
- They are disciplined and do not cheat.

The captain of the team has a big responsibility on his/her shoulders. He/She plans and discusses the tactics of the game with the team. He/She gets the credit if the team wins and blame in case of a loss. All team members must respect and trust their captain.

National Game

A game or sport that is considered to be an important part of the culture of that country and is much popular with the people in the country is called the National Game of the country. Hockey is the National Game of our country. Between 1928 and 1956, our country won 6 gold medals in hockey at the Olympics.

Need to Know

The origin of hockey actually goes back to ancient Egypt and Greece where games were played with curved sticks and a ball.

It's Activity Time

Surf the Internet and find out the National Game of the following countries.

1. Australia _____
2. Nepal _____
3. China _____
4. Bangladesh _____
5. Sri Lanka _____
6. Brazil _____

In the present time, television, computer games and video games have become very popular among children. Children like to play them and avoid going outside in fresh air. It has reduced their physical activity to a large extent. Consequently, many problems such as obesity and low level concentration have become a big issue among them. It has also reduced their stamina. Children should avoid playing too much video games. They should dedicate a certain time to playing outdoor games requiring physical efforts.

Values

Team sports are great fun. Try to play team sports and feel the team spirit. Team spirit motivates us to move together towards a common goal.

Word Power

outdoor games : games played in open ground

indoor games : games played inside a building

team spirit : the feeling of harmony and unity among the team players

sport : a game, competition, or activity needing physical effort and skill that is played according to certain rules, for enjoyment or as a job

Summary

- Games and sports are very important for us all.
- They relax our mind and keep our body active.
- There are many types of games—indoor, outdoor, individual and team games.
- Every player should show team spirit while playing.
- The captain of a team has a big responsibility.
- Children must play outdoor games to keep their body fit, active and energetic.

Practice Time

A. Fill in the blanks.

1. Games and sports are very important for _____.
2. _____ is an indoor game.
3. _____ is an outdoor game.
4. _____ games are supervised by referees or umpires.
5. The players should play for the _____.

B. Choose the correct options.

1. Who is responsible for the performance of the team?
   (a) referee ☐ (b) coach ☐ (c) captain ☐
2. Which is the National Game of our country?
   (a) football ☐ (b) hockey ☐ (c) cricket ☐
3. Who supervises a game?
   (a) captain ☐ (b) referee ☐ (c) coach ☐
4. Which of the following is an individual game?
   (a) cricket ☐ (b) basketball ☐ (c) skating ☐

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. Games and sports are not important in our life. ☐
2. It is good to fight with other members of the team. ☐
3. The feeling of team spirit unites the players of a team. ☐
4. Referees and umpires are not necessary while playing an individual sport. ☐
5. Children should necessarily play outdoor games requiring physical effort. ☐

D. Answer the following questions.

1. What is the importance of games and sports in our life?
2. What are individual games? How are they different from team games?
3. What do you understand by team spirit?
4. Write two examples each of team games and individual games.
5. What is the difference between indoor and outdoor games?

Brainstorm

Why is team spirit valuable while playing a game? Discuss with your friends.

Find Out

Surf the Internet and find out the name of the games which the following sportspersons are associated with.

1. Abhinav Bindra _____
2. Karun Chandhok _____
3. Karnam Malleswari _____
4. Kapil Dev _____

Fun to Learn

Match the countries with their national games.

Bangladesh

Chile

Bhutan

Cuba

New Zealand

Switzerland

Canada

Bulgaria

Lilfe Pillars

Games and sports are necessary for the over all development of a child. Therefore, you should dedicate some time to games and sports. The suitable time to play outdoor game is the early morning or the evening. They keep the body fit and boost our immunity to fight diseases.

Time to Learn More

Identify the following sportspersons and write their names below them. Also write the names of the sports they are associated with.

_____ _____ _____ _____

_____ _____ _____ _____

4 Our Traditional Games

Curricular Goals

- Kabaddi
- Wrestling
- Boat Race
- Gymnastics
- Kho-Kho
- Archery
- Martial Arts
- Yoga

Ours is a country of great culture and traditions. Its people have been playing a variety of games like hunting, boat and chariot racing, wrestling, kho-kho and archery. Some of them are still played in different parts of our country. Martial art has been an important part of our culture. Some popular games which were played in ancient India are mentioned below.

Check Your Knowledge

Write the names of two games which your parents and grandparents played in their childhood.

Grandfather _____ _____

Grandmother _____ _____

Father _____ _____

Mother _____ _____

Kabaddi

Kabaddi is a very old and popular game. It is played between two teams. Each team has seven players. It is played on a levelled and soft ground. Both men and women can play it. A *kabaddi* player should be skillful, quick, and powerful. It is known as *hu-du-du* in Bengal, *hu-tu-tu* in Maharashtra and *jabarjang* in Punjab. In Nepal, it is known as *dodo* and in Bangladesh it is known as *hadudu*.

Boat Race

Boat race is the largest team sport across the globe. There are 25 singers and 100 -130 oarsmen in each boat. *Vallam Kali*, the boat race of Kerala, is very famous far and wide. It is held on Onam in the month of August/September. During the boat race a song called *vanchipattu* is sung.

Need to Know

In ancient time, *kho-kho* was called as *rathera* as it was played on *rathas* or chariots

Kho-Kho

The game of *kho-kho* is played between two teams with nine players each. It requires stamina, speed, strength, and coordination among team members. It is very popular among Maharashtrians.

Martial Arts

Some popular forms of martial arts are karate, judo and taekwondo. They are meant for self-defence. Karate originated in our country from where it reached to China and from there it spread to Japan where it developed into its present form. An expert karate master has the power of breaking a pile of bricks with bare hand. Speed, strength and technique are three basic elements of practising karate.

Teacher's Tips

Tell the students about traditional games of India. Also tell them how they are played.

In ancient time, students learnt martial arts in the supervision of their *gurus* or teachers and they had to stay with them in their *ashramas*. They learnt all the skills in the *ashramas*. This tradition was called the *guru-shishya parampara*. Some popular martial arts of our country are *Kalaripayattu* of Kerala, Kick fighting of Nagaland and *Gatka* of Punjab.

Kalaripayattu of Kerala

Kick fighting of Nagaland

Gatka of Punjab

It's Activity Time

Which are the popular games of the following states of India. Find out with the help of Internet.

1. Uttar Pradesh _____ _____
2. Bihar _____ _____
3. Delhi _____ _____
4. Gujarat _____ _____
5. Punjab _____ _____
6. Haryana _____ _____

Wrestling

Wrestling has been very popular game in our country. It is played in an *akhara* in the supervision of a *guru*. An *akhara* has a pit of mud where *kushti* or wrestling takes place.

Gymnastics

It has been a popular sport since the ancient time. In this game, the gymnast shows skill, strength and control in the use of body. Some gymnastic exercises are performed with rings, bars and balance beams. You can see acrobats performing gymnastics on the streets or in circus.

Archery

Archery has been used in our country since very ancient time for hunting and self-defence. Earlier the bows and arrows were made of bamboo. However, these days bows are made of fibre glass.

Yoga

Yoga is also being practised in our country since very ancient time. It keeps us healthy and boosts our immunity to lead a disease-free life.

Some other popular game being played since ancient time are *patangbazi* (kite-flying), camel race, cock fight, partridge fight and pigeon fight.

In olden days, children also used to play *gilli-danda*, *langhri-taang*, *stapoo*, *lattu*, *pithoo* and hide and seek. These games are not much popular nowadays. However, children in villages still play these games.

Values

In ancient time, people played games and sports which required most of the physical effort. Playing games was an essential part of their lives. That is why, they were stronger and more active.

Word Power

Traditional : existing in or as part of a tradition; long-established
Archery : shooting with a bow and arrows, especially at a target as a sport
Oarsman : a rower, especially as a member of a racing team

Summary

- Indians have been playing different games since very ancient time.
- Some traditional games of India are Boat race, *kho-kho* and *kabaddi*.
- *Guru-shishya parampara* is an ancient tradition of India.
- Judo, karate and taekwondo are some popular forms of martial arts.
- Archery has been used for hunting and self-defence since ancient times.
- *Yoga* keeps our body fit and boosts our immunity.

Practice Time

A. Fill in the blanks.

1. Each team in the game of *Kabaddi* had _____ players.
2. The largest team sport across the globe is _____.
3. Each team in the game of *Kho-kho* has _____ players.
4. Karate originated in our country from where it reached _____.
5. A gymnast shows his skills in the game of _____.

B. Match the following.

1. Boat races	(a) *Kalaripayattu*
2. *Kho-kho*	(b) Onam
3. Kerala	(c) Gymnast
4. *Kabaddi*	(d) Maharashtra
5. Gymnastics	(e) *Jabarjang*

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. Cricket is a traditional game of India. ☐
2. Only two people participate in snake boat race. ☐
3. *Kabaddi* is called *hu-tu-tu* in Bengal. ☐
4. Wrestling was not played in ancient India. ☐
5. Archery was used for self-defence and hunting in ancient India. ☐

D. Answer the following questions.

1. Where is snake boat race mainly held?
2. How is *kabaddi* played?
3. What are the three important elements for practising karate?
4. How is *yoga* useful for us?
5. What are the different names of *kabaddi* in different places?

Brainstorm

Why should we not spend much time watching television or playing video games? What should we do instead?

Find Out

Find out the names of two famous archers of India.

Fun to Learn

Let's play a traditional but interactive game to improve the spelling and subject knowledge. You will require a whiteboard and pen.

How to Play

1. Prepare a list of words related to different games and sports.
2. Divide the class into two team.
3. Select a student to stand at the front of the class.
4. Give him/her a word from the list.
5. The student would draw something on the whiteboard to represent each letter in his/her word.
6. The rest of his/her team members then guesses the word, one letter at a time. Ask one student from each team to guess alternately. Incorrect guesses result in one negative point.

The team to get more numbers will be the winner.

Life Pillars

In ancient time, *rishis* and *munis* were expert in *yogasanas*. By performing *yoga* of different kinds, they were able to control every part of their body. Their immunity was boosted so much that they lived a longer and disease-free life. We should learn *yogasanas* from some expert.

Do to Learn More

Pachisi is a traditional board game that has been played in India since the fourth century. Its name is derived from the Hindi word *pachis*, meaning twenty-five. It is the highest score that can be scored by a player using shells or cowries.The popular game of ludo is like pachisi. Learn how to play pachisi.

5 Breathing

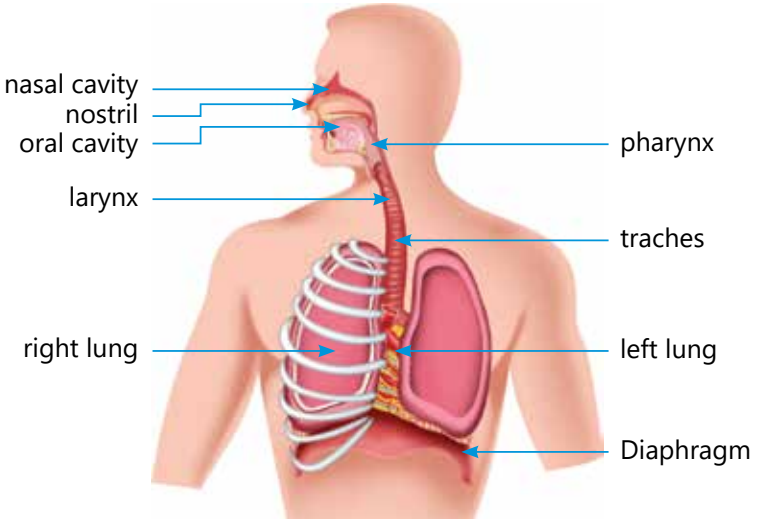
Curricular Goals

- The Process of Breathing
- Need For Clean Air
- Breathing Speed
- Good Breathing Habits

All living things breathe to live. We need oxygen to live. The air we breathe is rich in oxygen. Oxygen helps in releasing energy from the food we eat. This process of releasing energy from the food is known as **respiration**. The carbon dioxide which is produced during respiration is breathed out by us.

The Process of Breathing

The process of breathing in air which is rich in oxygen is called inhalation. The inhaled air goes through the windpipe into our lungs. Windpipe is a long tube that connects our nose to our lungs. The lungs are protected by the ribcage. The ribcage has 12 pairs of curved bones connected to the breastbone in the front, and backbone at the back. It also protects the heart.



A strong muscle called diaphragm lies below the lungs. The diaphragm moves our chest in and out when we breathe out and breathe in respectively.

Check Your Knowledge

1. What is the use of windpipe?

   _____

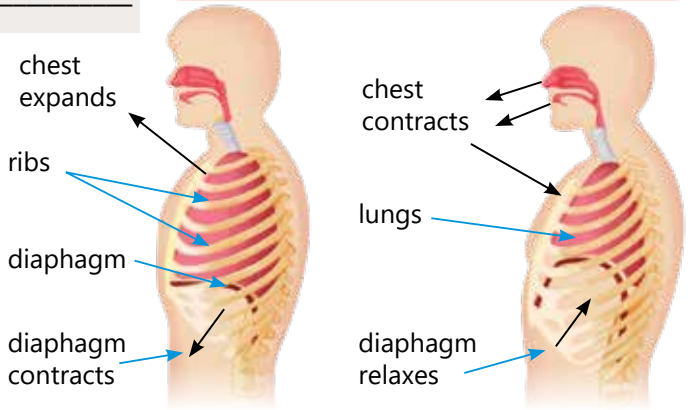
2. How many bones does the ribcage has?

   _____

Need to Know

The windpipe branches into two smaller tubes called bronchi at its lower end. Bronchi are connected to the lungs.

The diaphragm moves down when we inhale air. Our lungs expand due to the air taken in. This process of breathing air in is called **inhalation**. When we breathe out air, the diaphragm relaxes and moves up. Now, the air is pushed out from the lungs. This process of breathing air out is called **exhalation**.



It's Activity Time

Put your hand on your chest and count how many times your chest goes "in" and "out" in one minute. The number of times your chest comes out will be the number of times you breathe in.

Breathing Speed

When we run or do physical exercises, the rate of our breathing increases because our body needs more energy. For more energy, more oxygen is required and hence, we breathe at a faster rate than normal. When we breathe out, the lungs contract and their volume decreases. As a result carbon dioxide is released from the lungs along with the air present in it.

Do you know that the air that you exhale is humid and hot? Put your hand in front of your mouth and blow out air. You will feel that the blown out air is humid and hot. It is because our inside body is hot and has an average temperature of 98.6°F.

Need to Know

Human heart beats about 72 times per minute. Doctors use a **stethoscope** to listen to the heartbeat.

Teacher's Tips

Tell the students about the process of breathing and why it is necessary to breathe. Also tell them about the need of clean air and good breathing habits.

Need For Clean Air

To remain healthy, we must breathe in clean and fresh air. Unclean air which harms our health is called **polluted air**. Dust, smoke and poisonous gases released by factories and vehicles make the air polluted. If we inhale polluted air, we may suffer from different health problems like breathing problem (asthma), sneezing and coughing, burning eyes, throat irritation, etc. Polluted air may cause lung diseases and even lung cancer.

Good Breathing Habits

- Do not breathe through the mouth. It is good to breathe through the nose.
- Do not cover your nose while sleeping.
- Sleep in good postures that allow you to breathe freely.

Values

We should keep our respiratory system strong and fit. For this, we should practice taking deep and long breaths.

Word Power

Inhalation : the process of breathing air into the body
Exhalation : the process of breathing air out of the body
Windpipe : a muscular tube that carries the air from nose to the lungs

Summary

- Every living being requires air to breathe to stay alive.
- Respiration is the process of inhaling and exhaling air.
- We breathe in oxygen rich air.
- We breathe out carbon dioxide rich air.
- Our breathing speed changes with different activities.
- The air that we exhale is humid and hot.
- Unclean air which is harmful for our health is called the polluted air.
- We should breathe through our nose.

Practice Time

A. Fill in the blanks.

1. The windpipe is a _____ tube.
2. The process of breathing air out is called _____ .
3. Below the lungs, there is a sheet of muscles called the _____ .
4. The lungs are protected by _____ .
5. _____ is the process of taking in and giving out of air.

B. Match the following.

1.	Lungs	(a)	Helps release energy from food
2.	Oxygen	(b)	Windpipe
3.	Carbon dioxide	(c)	Exchange of gases takes place
4.	Inhaled air	(d)	Given out as a waste product during respiration
5.	Bronchi	(e)	Rich in oxygen

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. The air we exhale is warm. ☐
2. We should always inhale through your mouth. ☐
3. The doctor uses a thermometer to listen to our heartbeat. ☐
4. The air from our nose goes into the lungs. ☐
5. Our ribcage has 12 pairs of curved bones. ☐

D. Answer the following questions.

1. What do you mean by respiration?
2. When do we need to take breath faster?
3. What is a diaphragm? Explain its role in the process of breathing.
4. Why should we breathe through the nose?
5. What is the function of lungs in the respiration process?

Brainstorm

We should sleep with our head uncovered. Why?

Find Out

1. Why should we breathe in through our nose and not our mouth?
2. Why do we breathe in faster when we run?

Fun to Learn

Deep breathing is very beneficial for us. We should try to breathe deeply as much as possible. When we are calm, our breathing is normal. In this state, the whole of our body is relaxed and our heartbeat is normal. When we experience some stressful and unexpected situation, our heartbeat rate increases, digestion of food in our body stops and our breathing becomes shallow. This condition is very harmful for our body. Hence, to deal with such condition, we should practise deep breathing. Deep breathing helps us get more oxygen into our bloodstream. It opens our capillaries and helps us calm down and lessens stress. Deep breathing also strengthens our lungs. We can practise deep breathing in the following ways.

Bubble Breathing

It is simply using blowing bubbles. Take a bubble blower and try to blow big bubbles and focus on your out breath. Breathe in a slow and calm way.

Using a Stuffed Toy

Take a stuffed toy and lay down on your back. Put the stuffed toy on your belly. Take a deep breath and move the stuffed animal up. Now, breathe out and bring the stuffed animal back down. It will help you take big deep breaths.

Using a Pinwheel

Take a pinwheel and move it by blowing air from your mouth. Try to move it as fast as you can. It will help you take deep breath.

Hoberman Sphere

A Hoberman Sphere is a plastic, dome shaped toy. It can be folded down to a small compact ball and expanded out to a large sphere shape.

Sit in a comfortable position. Sit up tall but relaxed.

Life Pillars

Clean and fresh air is very necessary to stay healthy. If we breathe in polluted air, we may fall sick. Plants make the air fresh and clean. So we should grow more trees.

Do to Learn More

Ask your friend to take a deep breath. You will see his chest moving outwards. Measure his chest with a measuring tape. Also measure his chest when he breathes out and his chest moves inward. In which case, the measurement is more?

6 Useful Animals

Curricular Goals

- Things Obtained From Animals
- Animals Need Care
- Other Uses of Animals
- Conservation of Wildlife
- Animals Used to Earn Money
- Project Tiger

There are different kinds of animals. They are of different sizes and they live in different habitats. They are very useful for us. We get many things from them.

Things Obtained From Animals

Animals are very useful for us. We get milk from goats, cows, buffaloes, sheep and camels. Milk is nutritious and contains fats, proteins, minerals and vitamins. Cream, curd, butter and cheese are made from milk. We get eggs from hens, ducks and geese. Eggs are also a source of proteins, vitamins and minerals. Goat and hen also provide us meat.

Check Your Knowledge

1. What do you mean by dairy products?

   _____

2. Why do some people rear hens and ducks?

   _____

- Fish, prawns and crabs are used as seafood.
- We get oil rich in vitamin A and D from cod and halibut fish.
- Fur of rabbit, sheep and lamb is used for making wool.
- We get silk from the silkworm. It is used to make clothes.
- Skin of some dead animals is used to make bags, belts, jackets and shoes.
- Animal dung is used as manure and fuel.
- We get honey from honeybees. Honey is used to make medicines.
- Wax is obtained from honeycombs.
- Tribal people use feathers of some birds to adorn themselves. They are also used to fill in the pillows.

Other Uses of Animals

Some animals like camel, donkey, ox, buffalo, horse, elephant, reindeer, etc. are used as the means of transport. They carry people and their luggage. Oxen also help us to draw water from wells, plough fields and thrash grains. Besides carrying load, horses, camels, mules, ponies and elephants are also used for riding. They are called **beasts of burden**.

It's Activity Time

Surf the Internet and Find out the names of two organizations that work for the welfare of animals. Also find what they do to protect animals from cruelty.

1. _____

2. _____

Teacher's Tips

Tell the students about the uses of animals and how we should take care of them. Also tell them about the conservation of animals.

Animals Used to Earn Money

Some people earn their livelihood with the help of animals. A snake charmer earn money by showing the play of snakes. *Madaris* earn money by showing the play of monkeys and bears. They train them to dance and entertain people. *Mahouts* earn their livelihood by using elephants for giving rides and in processions.

Animals Need Care

We should be very caring for animals. Killing of wild animals should not be allowed in any ways. Forests are the natural habitat of wild animals. Cutting down of forests should be strictly banned. A large number of animals live in water bodies. So, we should not pollute them. It harms the aquatic life.

We should keep the shelters of domestic animals clean and feed them good quality food. They should be given clean water to drink. We should not take too much work from them.

Conservation of Wildlife

Unthoughtful and unwise activities of human beings have led to the destruction of a large number of animal species. Many animals have become rare because of overhunting and destroying their habitat by cutting down forests. They are called **endangered animals**. Some animals like dodo has been disappeared and cannot be seen at all today. They are called **extinct animals**. When someone hunts animal illegally for their body parts, it is called **poaching**. Such hunters are called poachers.

The table given below shows some endangered animals.

	Animal	Body Part for it is Poached	For What the Body Part is Used
1.	Elephant	Tusks	Ornaments
2.	Rhinoceros	Horns	Ornamental things, medicines
3.	Bear	Gall bladder, fur, flesh	Medicines, food
4.	Musk deer	A pair of smell glands present under the belly of the males	Medicines, perfumes
5.	Tiger	Bones, skin, teeth	Skin for decoration, bones and teeth for medicines

Project Tiger

Tiger is one of the most endangered species. Its number is decreasing day by day. Indian Government started the Project Tiger in 1973 to save the tigers. India has a number of tiger reserve forests that help tigers to regenerate and grow in their natural habitat. There are 27 Tiger Reserves in 14 states of our country under Project Tiger. Some of them are Ranthambore in Rajasthan, Sunderbans National Park in West Bengal and Kanha National Park in Madhya Pradesh.

Values

We can help to conserve wildlife by refusing to buy things made of ivory, horns and animal skin.

It's Activity Time

PETA is an organisation that encourages animal protection, prevent cruelty to animals and work for conservation of wildlife.

Word Power

Endangered animal : an animal that is on the verge of extinction
Extinct animal : an animal that has disappeared from the earth
Poacher : a person who catches birds and animals for their body parts

Summary

- We get many things from animals such as milk, egg, meat, leather and honey.
- Animals are also used for various other purposes like transportation and earning livelihood.
- We should take proper care of animals.
- Many animal species have become rare. They are called endangered animals.
- Tiger is an endangered animal.
- Project Tiger was launched in India in 1973.

Practice Time

A. Fill in the blanks.

1. We get milk from _____ and _____.
2. Eggs are a source of _____, _____ and _____.
3. _____ and _____ are seafood.
4. Animal dung is used as _____ and _____.
5. _____ plough fields and thrash grains.

B. Write four lines about each of the following.

1. Poaching
2. Endangered animal
3. Extinct animal
4. Project Tiger

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. Tiger is not an endangered animal. ☐
2. The extinction of animals is not due to any natural event. ☐
3. Elephants across the world are hunted for their gall bladder. ☐
4. Ox is an endangered species. ☐
5. Dodo is an extinct animal. ☐

D. Answer the following questions.

1. What do we get from animals?
2. How do some people earn money from animals?
3. From where do we get honey? What is its use?
4. What is Project Tiger? When was it started and why?
5. What should we do to take care of animals?

Brainstorm

How is *gobar* gas or bio gas, obtained from cow dung? What are its uses?

Find Out

An earthworm is called a 'farmer's friend'. How can an earthworm be a friend of farmer? Find out.

Fun to Learn

Make a poster depicting the importance of wildlife for the maintenance of ecological balance in nature and also make an awakening call for the conservation of wildlife. Display your poster in the classroom for creating awareness among the children.

Life Pillars

You would have seen animals in circus obeying the ring masters. They use different methods to train animals like beating, giving shock and others. This is cruelty to animals. They should not treat animals in this way.

Do to Learn More

Make a list of articles that you use in your daily life. Find out the source of their raw materials (animal/plant/synthetic). Suggest alternative articles for use to save the life of animals.

7 Growing Plants

Curricular Goals

- Reproduction From Seeds
- Reproduction From Other Parts
- Reproduction From Spores
- Plants From Far Away

Like all living beings, plants also produce their own kind. This process is called **reproduction**. Plants reproduce by seeds, spores or other body parts such as stem, roots or leaves.

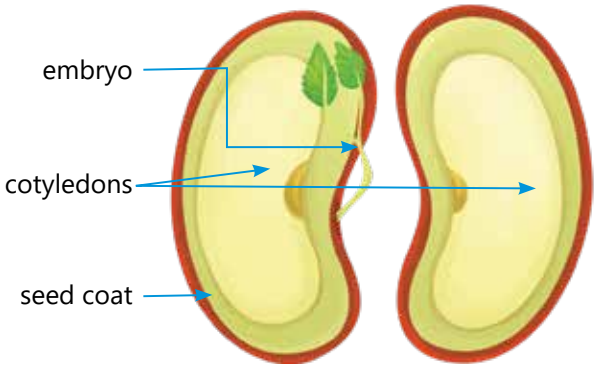
Reproduction From Seeds

Reproduction from seeds takes place mostly in the flowering plants like mango, hibiscus, rice and mustard. In flowering plants, flower is the reproductive organ. In due course, flowers develop into fruit with seeds. Number of seeds in a fruit vary from plant to plant.

Teacher's Tips

Tell the students about the reproduction in plants. Also, tell them the structure of a seed and how they are dispersed to different places so that they could germinate and grow well.

A seed has three parts–seed coat, cotyledon and embryo. The hard, outer covering of the seed is called the seed coat. The baby plant inside the seed is called **embryo**. It develops into a seedling when the conditions are favourable. The baby plant is protected and fed by the cotyledons which are two leaves in the seed. These two leaves are protected by the seed coat. The number of cotyledons may vary from plant to plant. The seeds of corn and onion have one cotyledon while the seeds of *rajma* and peanuts have two cotyledons.



parts of seed

Germination of Seeds

The development of a seed into a new plant is called **germination**. A seed germinates when it gets water, warmth of sunlight and air. A seedling grows into a big plant only when it keeps getting water and food from the soil and plenty of sunlight and air. The embryo first grows downwards as a tiny root to form the radicle. In future, it develops into the root system. Then, a tiny shoot grows upwards to form the plumule. This forms the furure shoot system. However, not all seeds germinate. Some seeds are used as food by people and animals. Some are destroyed by heat and rain. Some seeds are not mature and not ready for germination.


germination of seed

It's Activity Time

Take some green gram seeds. Sow them in two separate pots. Put one pot in the dark and the other in the sun. Water them regularly. Observe the pots for a few days. Make a progress chart to compare the growth of seeds in both the pots.

Dispersal of Seeds

If plants grow too close to each other, they will not get enough space, air, water, minerals and sunlight for their proper growth and some of them may even die. Therefore, the seeds need to be scattered far away from each other. The scattering of seeds over a wide area is called seed dispersal. Seeds are dispersed by wind, water, animals or by the explosion of fruit. They are called agents of dispersal.

Need to Know

When the soil is soggy, seeds cannot get oxygen. They rot and do not germinate.

Dispersal by Wind

Seeds of some plants are small and light. They can be carried by wind easily. Seeds of grasses and orchids are dry and weightless. Seeds of drumstick and cinchona have wing like structures. Seeds of cotton, dandelion and *madar* have tufts of hair and are very light. Hiptage, maple and sycamore seeds have wings attached to them. These structures help in the dispersal of seeds by the wind.

Dispersal by Water

Flowing water carries away fruits which fall in it. You may have seen coconuts floating in water in coastal areas. When a coconut reaches a suitable area, it germinates. Lotus and lilies have seeds in them which are light and float on water. This mode of dispersal takes place mostly in the plants that grow in or around water bodies.

Check Your Knowledge

1. How many cotyledons have the seeds of *rajma* and peanuts?

   _____

2. What are the plants whose seeds are dispersed by wind?

   _____

Dispersal by Explosion

When the fruits of some plants get dry, they burst open and the seeds are flung around in the soil. Plants like balsam, castor, pea, lady's finger, beans and gorse spread their seeds by explosion.

Dispersal by Animals

Animals and birds also contribute to the dispersal of seeds. Fruits of some plants have hooks, spines or stiff hair which stick to the fur of animals passing by or the clothes of humans. For example, the fruit of cocklebur has spines.

Animals and birds eat the fruits of some plants and pass their seeds along with the faeces.

Reproduction From Spores

Some plants like fern, fungi and moss do not have flowers. They do not produce seeds. They produce tiny spores. Each spore grows into a new plant.

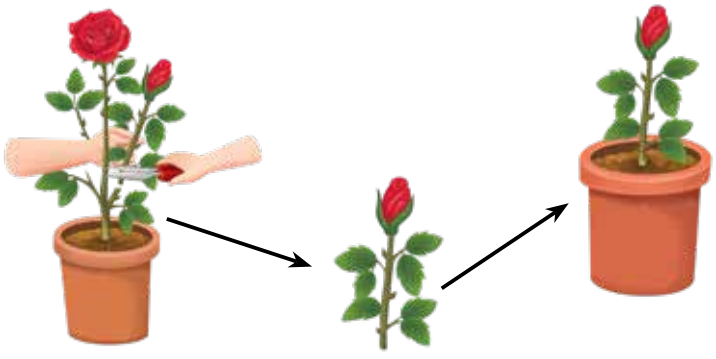
Reproduction From Other Parts

Many plants reproduce from their other body parts. Such type of reproduction is called **vegetative propagation**. Plants like sweet potato, dahlia, and asparagus reproduce through their roots. Potato, ginger and onion are underground stems in which food is stored. They have eyes on them. Each eye has bud and under suitable conditions it grows into a new plant. New plants grow from the bulbs of onion when they are planted in the soil.

The bryophyllum plant has buds on the edges of its leaves. When these leaves fall on the moist soil, they produce new plants.

potato onion bryophylium

Some plants like rose, hibiscus and sugarcane have buds on them. When the stems of these plants are cut into pieces and put into the soil, new plants grow from them.



rose

Plants From Far Away

Some of the plants that we see in our country have their origin in other countries. They are not native plants of our country. Tea, for example, has its origin in China where it was grown about 1700 years ago. They grew it for its medicinal value. The Britishers brought it to India. In our country, it is grown in Darjeeling, north-eastern regions, Brahmaputra valley of Assam and some regions of south India. Tea plant grows well where the air is warm, humidity is high and there is plenty of rainfall.

Values

We should plant a tree every month at a suitable place. We should also encourage our friends to do so.

Word Power

reproduction : the process of producing one's own kinds
germination : the process of growing seed
seedling : very small plant that grows from seeds
dispersal : scattering of seeds from one place to another

Summary

- The process of producing one's own kind is called reproduction.
- Flower is the reproductive organ of a plant.
- Plants reproduce from seeds, spores or other body parts such as leaves, stem or roots.
- A seed has three parts seed coat, cotyledons and embryo.
- Favourable conditions are essential for the germination of seeds.
- Seeds can be dispersed by wind, water, animals or by explosion.
- Some plants that we see in our country have their origin in other countries.

Practice Time

A. Fill in the blanks.

1. The fruit of _____ has spines.
2. A _____ grows into a big plant.
3. Wind, water and animals are called agents of _____.
4. The _____ plant has buds on the edges of its leaves.
5. New plants grow from the bulbs of _____.

B. Match the following.

1.	Rose plant	(a)	Leaf
2.	Bryophyllum	(b)	Eye
3.	Onion	(c)	Stem
4.	Ginger	(d)	Root
5.	Sweet potato	(e)	Bulb

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. All plants can produce only by seeds. ☐
2. Stem is the reproductive organ of all plants. ☐
3. Producing plants by leaves, stems and buds is called the vegetative propagation. ☐
4. Tea plant has its origin in China where it was grown about 1700 years ago. ☐
5. The bryophyllum plant has buds on the edge of its leaves. ☐

D. Answer the following questions.

1. What do you mean by reproduction?
2. How do the seeds of a plant germinate?
3. What is the dispersal of seeds?
4. Seeds of which plants are dispersed by wind?
5. What is vegetative propagation?

Brainstorm

Take some seeds of pea and put them in fridge for two days and then sow them in a pot. Will they grow? Why? Why not?

Find Out

Which of the following fruits have one seed, a few seeds and many seeds. Write below them.

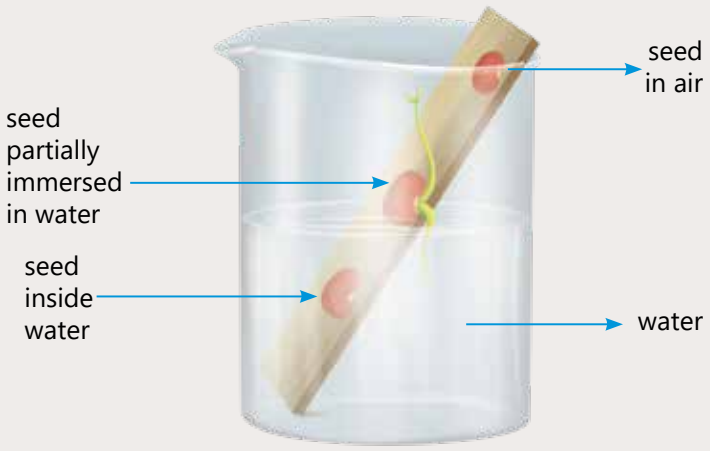




_____ _____ _____ _____ _____

Fun to Learn

Take a plastic scale and three bean seeds. Tie the seeds to the plastic scale at different points. Take some water in a glass. Put the scale with the seeds in it, such that,one of the seeds is totally immersed in water, second seed is partially immersed in water and the third seed is out of water. Place the set up on a safe and open place for a few days. You will notice that the only second seed germinate. Why? Discuss with your friends.



Life Pillars

We know that flowers are the reproductive parts of a plant. They develop into fruits which have seeds and seeds grow into plants. Thus, if we pluck a flower, we actually destroy many plants which could grow from the seeds which the flower would ultimately produce.

Do to Learn More

1. Take a stem of a rose plant. Cut it into small pieces. Plant a stem cutting into the soil. What do you find after a few days? Write your observations in your notebook.
2. Take some gram seeds and soak them in water over night. Next morning cut open fewseeds and observe their structure.

8 Healthy Food

Curricular Goals

- Groups of Food
- Preservation of Food
- Deficiency Diseases
- Journey of Food in Our Body
- Spoilage of Food

Everyone needs food to grow, to get energy, to work and to keep their body healthy. Do you eat the same food items all the time? No, we eat a variety of foodstuffs every day. We need to eat the right type of food at every meal to keep ourselves healthy and grow well.There are a variety of nutrients in the food that we eat. However, not all nutrients that our body needs are present in all the foods.

Groups of Food

There are three groups of food.

- Body-building food or proteins
- Energy-giving food or fats and carbohydrates
- Protective food or minerals and vitamins

Teacher's Tips

Tell the students about different groups of food and deficiency diseases caused due to lack of different nutrients. Also, tell them the sources of different nutrients. Describe to them the methods of food preservation and the process of digestion.

If any of these nutrients are absent in our diet for a few days, it may lead to deficiency diseases. Proteins, fats, carbohydrates, minerals and vitamins are the main nutrients in our food. Water and roughage are also essential for our body. Most foodstuffs contain more than one nutrient.

It's Activity Time

Surf the Internet and find out what a balanced diet is and why it is important to take a balanced diet.

Deficiency Diseases

If we take a diet that lacks some nutrients regularly, it can lead to a deficiency disease. Deficiency of vitamin A causes night blindness in children while deficiency of vitamin D causes rickets. Deficiency of minerals such as iron causes anemia and deficiency of iodine causes goitre. These diseases do not spread from person to person. However, many people can suffer from the disease at the same time. For example, many people living in mountainous regions suffer from goitre. This is due to the deficiency of iodine in the water they drink. These diseases can be prevented by consuming a balanced diet.

Deficiency Diseases: Causes, Symptoms and Sources

Deficiency Disease	Deficient Nutrient	Symptoms	Sources
Marasmus	Carbohydrates	Thin child with loose folds of skin	Rice, wheat, potato and maize are the sources of carbohydrates.
Kwashiorkor	Proteins	Abdomen swollen and legs thin	We get proteins from eggs, fish, meat, cereals and pulses.
Anaemia	Iron	Loss of appetite and weight	Green leafy vegetables are the rich sources of iron.
Goitre	Iodine	Swelling of the thyroid gland near the neck	We can get iodine form fish and iodized salt.
Rickets	Vitamin-D	Bow legs	Sunlight, Milk, fish and eggs are rich sources of Vitamin-D.
Night blindness	Vitamin-A	Person cannot see in dim light	We can get Vitamin-A from carrot, butter, milk, spinach, and green vegetables.
Beri-Beri	Vitamin-B	Dry scaly skin, weakness	Milk, eggs, meat and green leafy vegetables are the sources of Vitamin-B.

Scurvy	Vitamin-C	Swelling and bleeding gums	We can get Vitamin-C from citrus fruits like lemon, orange, tomato and lime.

Check Your Knowledge

1. What are the deficiency diseases?

   _____

2. Deficiency of which nutrients in our diet causes following diseases.

   Beri-Beri _____ Goitre _____

Spoilage of Food

Food gets spoilt when left at room temperature for long time. Tiny germs called bacteria are present in the air. They need air, warmth and food material to grow. When food is left at room temperature for a long time, bacteria begin to grow in the food. Sometimes you can see a white fluffy growth on bread, cake or sweets. This is a fungus. Both bacteria and fungus are harmful to health. Such food becomes unfit for eating. All vegetables, fruits and milk get spoilt easily. Even cooked food gets spoilt at room temperature after some time. It is necessary to preserve food for later use.

Preservation of Food

We can preserve food using different methods. The method of food preservation depends on the nature of the food item. Some methods of food preservation are given below.

Refrigeration

Food kept in a cool place stays fresh for a longer time. At home, we store food, vegetables, fruits, meat and eggs in the refrigerator. Deep freezers are used for storing food for a much longer time.

Using air-tight containers

This is the easiest method of preserving food. Moisture helps in breeding of bacteria and fungus. Hence, all grains and pulses are kept in airtight containers. Such containers also keep away insects, rodents and worms.

Salting

Some food items are preserved in salt. Salt absorbs moisture of the food and dehydrates it. All living things require water and cannot grow in the absence of it. High salt is toxic to most microbes like bacteria and fungus. Pickles and fish are preserved by this method. Salt also gives taste to the food.

Boiling

It is a common method of preserving food. High temperature destroys germs which spoil the food. Milk is boiled to preserve it.

Sugaring

It works similarly as salting. Thick sugar syrup absorbs moisture. Germs cannot live in sugar syrup. Jams and tinned fruits are preserved by this method.

Drying

By removing water(moisture) from food items, we can preserve it for a longer time. Dehydrated peas and condensed milk stay for a long time. Germs do not grow in dehydrated food because there is not enough water to help them to grow. Moisture, insects and rats destroy food grains. So food grains must be:

1. first sun dried, then cooled to room temperature and then stored in a dry place in airtight containers.
2. kept away from insects and rats. These pests eat away food grains and leave them diseased.

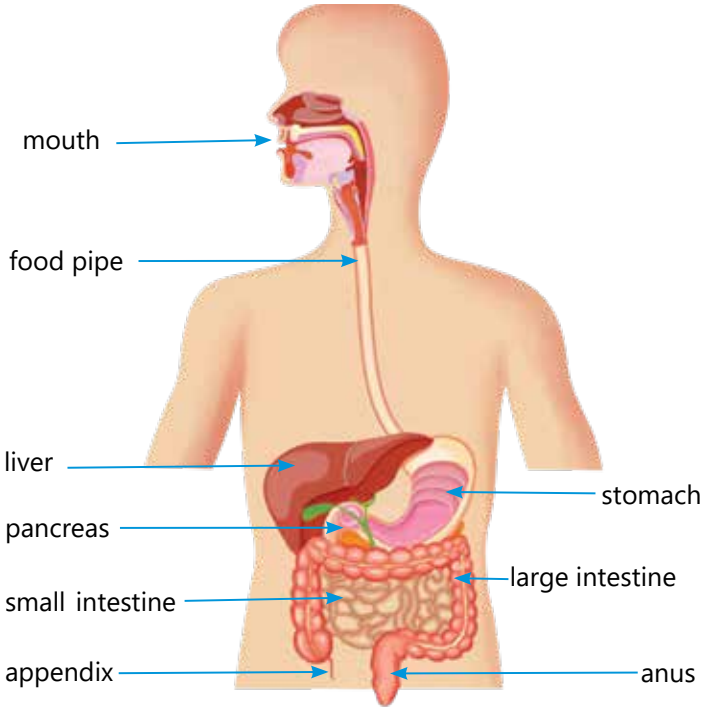
Pasteurization

This is the method to preserve milk. It was discovered by Louis Pasteur. In this method, milk is boiled for 10–15 minutes and then cooled very quickly.The sudden change in temperature kills the bacteria present in milk.

Journey of Food in Our Body

Our body cannot use the food that we eat directly. It needs to be broken down into a simple form. This process is called **digestion**. The food which we eat pass through several organs such as mouth, foodpipe, stomach, small intestine and large intestine to get digested.

When we eat food, our teeth break it into small pieces. Our tongue helps to taste and move the food. From the mouth the food goes to the stomach through the food pipe. In the stomach, it is churned into a semi-fluid mixture. The digestive juices in the stomach further break down the food into simpler form.The partially digested food from the stomach enters the small intestine where it is completely digested by the digestive juices. This completely digested food passes through the walls of the small intestine into the blood stream. The blood absorbs the nutrients from the digested food and takes them to different parts of the body to give us energy.The non-absorbed or undigested food from the small intestine goes to the large intestine which absorb the water from the food. The food gets converted into solid waste and is expelled out of the body as faeces through anus.



digestive system

Our digestion should be good to remain healthy. We should follow the points given below to keep our digestion good.

- Take small bites
- Chew your food well.
- Drink enough water during the day. It helps in the digestion of food.
- Do not sleep with a full stomach.
- Include food rich in fibre in your diet. It helps to move food within the body and eliminate waste from it.

Need to Know

The watery fluid in our mouth is called saliva.

Values

We should not waste food. Food preservation helps to prevent wastage of food.

Word Power

anaemia : lack of blood in the body
refrigeration : keeping food in a cool place
preservation : protection of something

Summary

- Everyone needs food to live and grow.
- Food gives us energy to do work.
- Deficiency of nutrients causes deficiency diseases.
- Food spoils if we keep it for long time.
- We can preserve food using different methods like refrigeration, salting, sugaring, boiling, pasteurisation, etc.
- Food needs to be digested before our body can use it.

Practice Time

A. Fill in the blanks.

1. When food is left at room temperature for a long time, _____ begin to grow in the food.
2. _____ are used for storing food for a much longer time.
3. _____ cannot grow in the solution of salt.
4. _____ syrup absorbs moisture and germs cannot grow in this syrup.
5. _____ is caused by deficiency of Vitamin D.

B. Choose the correct options.

1. It is not an energy giving food?
   (a) protein ☐ (b) fat ☐ (c) carbohydrate ☐
2. Goitre is caused by the deficiency of this nutrient.
   (a) calcium ☐ (b) manganese ☐ (c) iodine ☐
3. This is the white fluffy growth on bread, cake or sweets.
   (a) fungus ☐ (b) bacteria ☐ (c) virus ☐
4. Digestion of food starts in this part of our body.
   (a) food pipe ☐ (b) mouth ☐ (c) small intestine ☐
5. It is a rich source of protein.
   (a) potato ☐ (b) apple ☐ (c) egg ☐

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. We must eat plenty of fatty foods. ☐
2. Deficiency of iodine causes rickets. ☐
3. We get iodine from iodized salt. ☐
4. Anaemia is caused by bacteria. ☐
5. Food cannot be preserved. ☐

D. Answer the following questions.

1. Why are carbohydrates and fats called energy-giving food?
2. Name the important sources of Vitamin B.
3. What does deficiency of vitamin B cause?
4. Why is iron required by our body?
5. Name any four methods of preserving food.

Brainstorm

Newborn babies are given vaccination against many diseases. Why?

Find Out

Take a bite from a chapatti and chew it well for some time. You will find that after chewing the chapatti for some time, its taste become sweeter. Why? Discuss with your friend.

Fun to Learn

Divide the class in groups of five and make a chart on the symptoms of various deficiency diseases. Also mention how these deficiency diseases can be avoided.

Life Pillars

We should eat the right kind of food in the right quantity to remain healthy. There are some people who do not get even one meal a day. Millions of people around the world die due to hunger and malnutrition. It is very important for us to use food judiciously and not waste it.

Do to Learn More

You would have noticed that the food get spoiled faster in summers and rainy season. Ask your parents or teacher why it happens so.

9 Forests Our Friends

Curricular Goals

- Our Dependence on Forests
- Threats to Tribal Communities
- Forests and Tribal People
- Conservation of Forests

A forest is a large area of land thickly covered by trees. They grow and survive on their own. Hence, they are called natural resources. Ideally, one-third of the total land area of our country should be covered with forests but at present only one-fifth of our land is covered with forests.

India has different types of forests at different places -evergreen forests, monsoon forests, mountain forests, desert forests and tidal forests.

Our Dependence on Forests

Forests are very useful for us.

- They are called the green 'lungs' of the environment. They keep the air fresh and cool.
- Trees give us oxygen which all living things need to breathe.

Need to Know

Sundari trees are commonly found in tidal forests. That's why, they are also called sundarbans.

- The roots of trees reduce soil erosion.
- Forests also increase the rainfall by releasing moisture in the air.
- The dead leaves, twigs etc. turn into humus that increase fertility of the soil.
- They provide shelter to birds and animals.
- Forests provide us with food, fruits, lac and medicinal plants.
- Forests also provide timber, which is used for making furniture, houses, railway sleepers, tools, matchstick, etc.
- Paper is made from wood pulp.
- Forests also provide us firewood.
- The livelihood of many people depends on forests. They make many useful things from sal, teak, sheesham, bamboo and sandalwood.

Check Your Knowledge

1. Which trees are used to make medicines?

   _____

2. Wood of which trees is used to make furniture?

   _____

Forests and Tribal People

Forests are home to tribal communities known as adivasis. Many of them have shifted to villages and cities because of deforestation. However, a large number of them still lives in the forests. They depend on forests for their survival. We can find a large population of tribal people in Madhya Pradesh, Chhattisgarh, Jharkhand, West Bengal, Orissa and north-eastern states.

The largest group of tribal people in our country is the Gond followed by the Bhils and Santhals.

Tribal people use forest products like bamboo cane, tendu leaves, gum and lac to make a number of things such as mats, *dona*, *pattals*, baskets and brooms.

Tribals are very fond of wearing ornaments which they make from glass beads, shells, ivory and metal. They enjoy dancing and singing on festivals. They play instruments like *sarangi*, flute and drums. They believe in the presence of god in everything whether a stone or a tree.

Teacher's Tips

Tell the students about different types of forests and their uses. Also, tell them why forests are being depleted and how we can save them.

It's Activity Time

Which tribal people are found in the following states of India?

Assam _____ Rajasthan _____

Chhattisgarh _____ Uttarakhand _____

Threats to Tribal Communities

Many tribal communities are facing the threat of existence because of the cutting down trees in a forest. Cutting down of tress without planting new ones is called **deforestation**. Deforestation is taking place because of increasing requirement of land for building homes for ever increasing population. As a result, tribals are being uprooted from the forests. Because of deforestation, some tribes are even becoming extinct such as the Bo tribe of the Great Andamanese tribe, Andaman islands.

Conservation of Forests

Deforestation is very harmful for not only us but also wild animals. Because of deforestation, wild animals are forced to flee from their natural habitat. Many of them are dying or being killed for various reasons. Some of them have become extinct while some are endangered.

Our government has set up national parks and wildlife sanctuaries to protect animals and forests. At present, there are nearly 100 National parks and 500 wildlife sanctuaries in India. In these areas, birds and animals cannot be hunted. Poaching is banned. Trees cannot be cut. Many programs for forest conservation have been started like Van Mahotsava, Joint Forest Management (JFM), Social Forestry and Project Tiger, Project Elephant, etc.

Following steps can be taken to conserve the forests.

- Checking overexploitation of resources from the forests
- Controlling forest fires
- Banning deforestation
- Planting trees or afforestation
- Banning the use of wood as a fuel
- Recycling the old newspapers, magazines, books, notebooks, etc.
- Many movements and programmes have also been started to conserve the forests.

Tribal people worship some patches of forests called **sacred groves**. No one can cut down trees in this area. Sacred groves are called *deo bhumi* in Andhra Pradesh, *devkot* in Madhya Pradesh, *Oran* in Rajasthan and *devrai* in Maharashtra.

In Rajasthan, the Bishnoi People consider it to preserve animal and plant life of their religion. Guru Jambheshwar who was a great ecologist made some rules including the ban on killing of animals and felling of trees to protect all life forms. Amrita Devi, a *Bishnoi* woman, used to cling to trees to protest against their felling.

Values

People of different tribes are very important for the cultural heritage of our country. It is our duty to preserve their culture.

Word Power

National Park : a reserved area to preserve wildlife and vegetation.
Poaching : killing animals illegally
Sacred groves : patches of forest which tribal people worship

Summary

- A large area of land covered with trees is called forest.
- Forests are very useful for us.
- Many tribal communities live in forests.
- Tribal people fulfill all their needs from forests.
- Deforestation is the main threat faced by the tribal people.
- We should make efforts to protect forests.
- Many programmes and movements have been started to conserve forests.
- Some famous programmes to conserve forests are, Van Mahotsav, Joint Forest Management, Social Forestry and Project Tiger and Project Elephant Movement.

Practice Time

A. Fill in the blanks.

1. _____ means planting trees.
2. Sunderbans are also called the _____ forests.
3. _____ is banned in India.
4. Tribal people are known as _____.
5. Bishnoi people belong to the state of _____.

B. Write short notes on following.

1. Importance of Forests
2. Chipko Movement
3. Van Mahotsava
4. Tribal People of India

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. The Bo tribe of Andaman islands is now found in Uttar Pradesh. ☐
2. Van Mahotsava is not a useful program. ☐
3. Forests lead to soil erosion. ☐
4. Gond is the largest tribal community in India. ☐
5. Tribals do not have belief in God. ☐

D. Answer the following questions.

1. Why do we need to protect the forests?
2. What is the impact of deforestation on tribal communities and wild animals?
3. What do you mean by sacred groves?
4. Who was Guru Jambheshwar?
5. How can we conserve forests?

Brainstorm

Forests are being cleared for the development of urban areas. Is it right doing so? Why? Why not?

Find Out

Find out the ways by which we can protect the tribes of our country?

Fun to Learn

List the various things you use every day which are made from forest products. Collect their pictures and make a collage.

Life Pillars

As forests are very important for us, it is of utmost significance that we preserve them. We should try every effort to protect them. Gaura Devi is a well-known name when it comes to protect forests. On 26th March 1974 in the village of Reni in Uttarakhand, some forest officials reached the village to chop the trees but Gaura Devi stood before them with other women and said, "We are hugging the trees. If you cut the trees down, you will have to hit us with your axes first." Officials and labourers had to relent and go away.

Do to Learn More

Collect and paste the pictures of different tribes of India living in various parts of our country.

10 Food For Plants and Animals

Curricular Goals

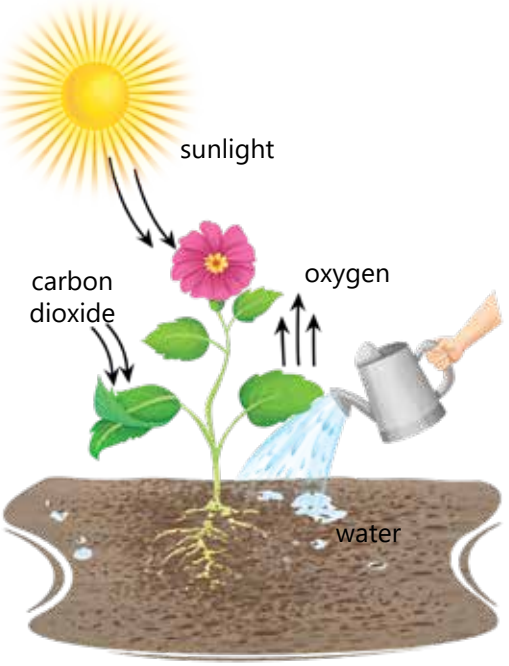
- Photosynthesis
- Food Chain
- Some Peculiar Plants
- Food Web
- Feeding Habits of Animals

We know that all living things need food. Human beings and animals directly or indirectly depend on plants for their food. However, green plants can make their food on their own.

Photosynthesis

Green plants make their food through the process of photosynthesis that takes place in the leaves of plants. Hence, leaves are called the **food factories of plants**. Since the plants can make their food, they are **producers** or **autotrophs**.

Plants require carbon dioxide, water, sunlight and chlorophyll to prepare their food. They take carbon dioxide from the air through small openings called stomata present on the leaves. They absorb water from the soil with the help of their roots.



photosynthesis in plants

Chlorophyll is present in the green parts of the plant. It traps the energy from the sun. During the process of photosynthesis, plants produce sugar and release oxygen through the stomata. Oxygen is necessary for animals and human beings to stay alive.

chlorophyll + water + carbon dioxide + sunlight → sugar + oxygen

It's Activity Time

Take two potted plants. Put them in an open area where they can get enough sunlight and air. Regularly water one of the pots. Leave the other pot without water. You will notice that the plant in the pot which you watered regularly remains healthy while the plant in the pot which you did not water withers. It indicates that water is necessary for the plants to stay alive. If we do not water the plant for a couple of days, it would ultimately die.

The food prepared by plants is stored in different parts like roots, stems, leaves, seeds or fruit in the form of starch. They use some of the food for their growth and survival.

Check Your Knowledge

1. What is chlorophyll?

   _____

2. What is the role of the sun in the preparation of food by plants?

   _____

Some Peculiar Plants

Moulds and Mushrooms

Mould and Mushrooms are non-green plants. They do not have chlorophyll and cannot make their food. Such plants are called fungi. Mushroom is also a fungus. It grows on dead and decaying plants and animals or on stale food and get its food from them.

Need to Know

Mushrooms contain about 90% water.

Insectivorous/ Carnivorous Plants

There are some plants that eat insects. They are called insectivorous plants such as sundew, venus flytrap and pitcher plant. These plants cannot fulfill their nutritional requirements from the soil in which they grow. Hence, they depend on insects to get these nutrients. Their special structures help them capture the insects.

Teacher's Tips

Tell the students about the process of photosynthesis and interdependence of all living beings in the nature. Also tell them about food chain and food web.

The Venus flytrap has jaw-like leaves. As an insect sits on the leaves, they shut and the insect is captured.

The leaves of the pitcher plant are in the shape of a pitcher. Their cavity is filled with a sweet-smelling nectar which attracts insects. When an insect enters the leaf, its lid is automatically closed and the insect gets trapped.

The leaves of sundew have thick growth of hair with sticky liquid. This liquid shines in the sun and attracts insects. When an insect sits on the plant, the hair on the leaves capture it.

Parasitic Plants

Some plants depend on other plants for their food and water as they cannot produce their food. They are called parasitic plants. Dodder or amarbel is an example of parasitic plant. The plant from which they get their food and water is called host plant.

Feeding Habits of Animals

Animals depend on plants or other animals for their food. Hence, they are called **consumers**. Different animals eat different types of food. Some animals eat plants and are called **herbivores** such as zebra and deer. Some animals eat flesh of other animals. They are called **carnivores** such as lion and snake. The animals which eat plant as well as the flesh of other animals are called **omnivores**. Some animals depend on the left over flesh of animals killed by other animals. They are called **scavengers** such as hyena and vulture.

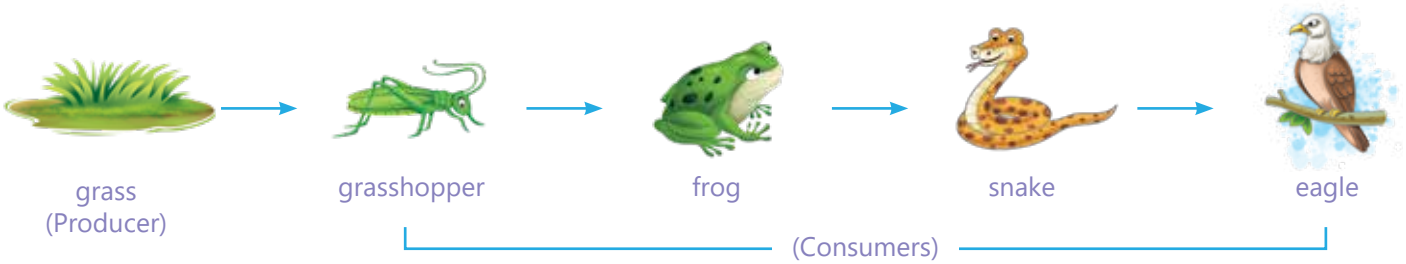
herbivores — carnivores — omnivores — scavengers

Bacteria and fungi are microorganisms that obtain their food from dead and decaying plants and animals. They are called **decomposers**.

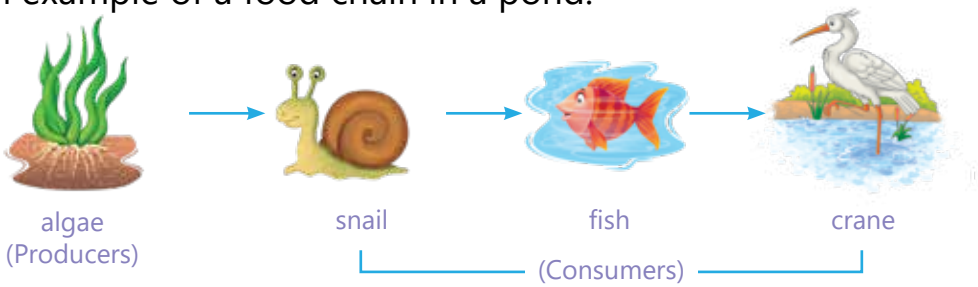
Food Chain

All living beings are interdependent on each other for their food. A food chain refers to a series of organisms linked together in an order in which they feed on each other. As the plants are producers, every food chain begins with green plants. Therefore, plant-eating animals are the first consumers while flesh-eating animals are the second consumers in a food chain.

Look at the food chain given below. It is a food chain on land. Grass is the producer which is eaten by a grasshopper which in turn is eaten by a frog. The frog is the food of a snake and the snake in turn is eaten by an eagle.



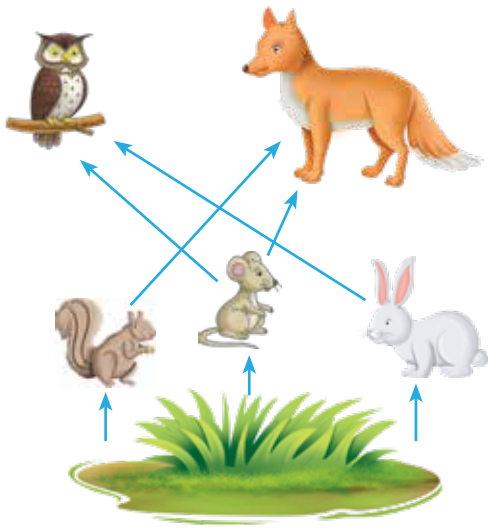
Given below is an example of a food chain in a pond.



Food Web

A food web is like a food chain. However, a food web is much larger than a food chain. Organisms of a food chain can be eaten by organisms of another food chain. It means an organism can be eaten by many organisms. There are many animals which eat green plants. These plant-eating animals can be eaten by many flesh-eating animals, which in turn can be eaten by other flesh-eating animals. Thus, many food chains are interlinked. This forms a food web.

Food chains and food webs are very important in nature when it comes to maintain the natural balance. If any member of the food chain decreases or increases in number, it affects the whole food web negatively and the nature is adversely affected too.



food web

Values

You know that mushroom is a type of fungus. Some types of mushrooms are edible while others, especially wild ones, may be very poisonous.

Word Power

herbivores : animals that eat plants and plant products
insectivores : animals that eat insects
carnivores : animals that eat the flesh of other animals
photosynthesis : the food making process in plants.

Summary

- Green plants can make their food themselves. They are called producers.
- Plants use carbon dioxide, water, chlorophyll and sunlight to make their food.
- Moulds and mushrooms are non-green plants. They cannot make their own food.
- Sundew, pitcher plant and venus flytrap are insectivorous plants.
- Parasitic plants grow on other plants to get their food from them.
- Animals depend on plants for their food. Hence, they are called consumers.
- All living beings are linked to each other in a food chain.
- Many food chains form a food web.

Practice Time

A. Fill in the blanks.

1. Mould is an example of _____ plant.
2. The process by which plants make their food is called _____.
3. The leaves of the _____ are modified into a pitcher.
4. _____ is a fungi.
5. _____ is a kind of sugar prepared by the plant

B. Choose the correct options.

1. Which is the food factory of a plant?

   (a) Stem ☐ (b) Leaf ☐ (c) Root ☐

2. Which is not a carnivorous plant?

   (a) Lotus ☐ (b) Pitcher plant ☐ (c) Venus flytrap ☐

3. What are the tiny holes on the surface of leaves called?

(a) Stomata ☐ (b) Chlorophyll ☐ (c) Cuscuta ☐

4. Which animal is not a carnivorous animal?

(a) Lion ☐ (b) Tiger ☐ (c) Bear ☐

5. What does a pitcher plant eat?

(a) Grass ☐ (b) Soil ☐ (c) Insect ☐

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. Plants make their own food. ☐
2. Omnivores eat only the flesh of other animals. ☐
3. Carnivores are called predators. ☐
4. Bear is an omnivore. ☐
5. The dodder plant is a non-green plant. ☐

D. Answer the following questions.

1. How do plants make their food?
2. What are parasitic plants?
3. What is the difference between producers and consumers?
4. What are the feeding habits of animals?
5. What is the difference between food chain and food web?

Brainstorm

In a forest the number of deer is reduced greatly. What would be its impact on the food web of that forest? Discuss in your class.

Find Out

Most of the desert plants such as cactus have spines and their stem is fleshy and green. Find out the reasons.

Life Pillars

Every animal and plant are very important for maintaining the balance in the nature. Reduction or increment in their number leads to imbalance in the nature.

Fun to Learn

Divide the class in the groups of five each. Each group will collect some plastic plants and toy animals. Using these plants and animals make the models of food chain and food web.

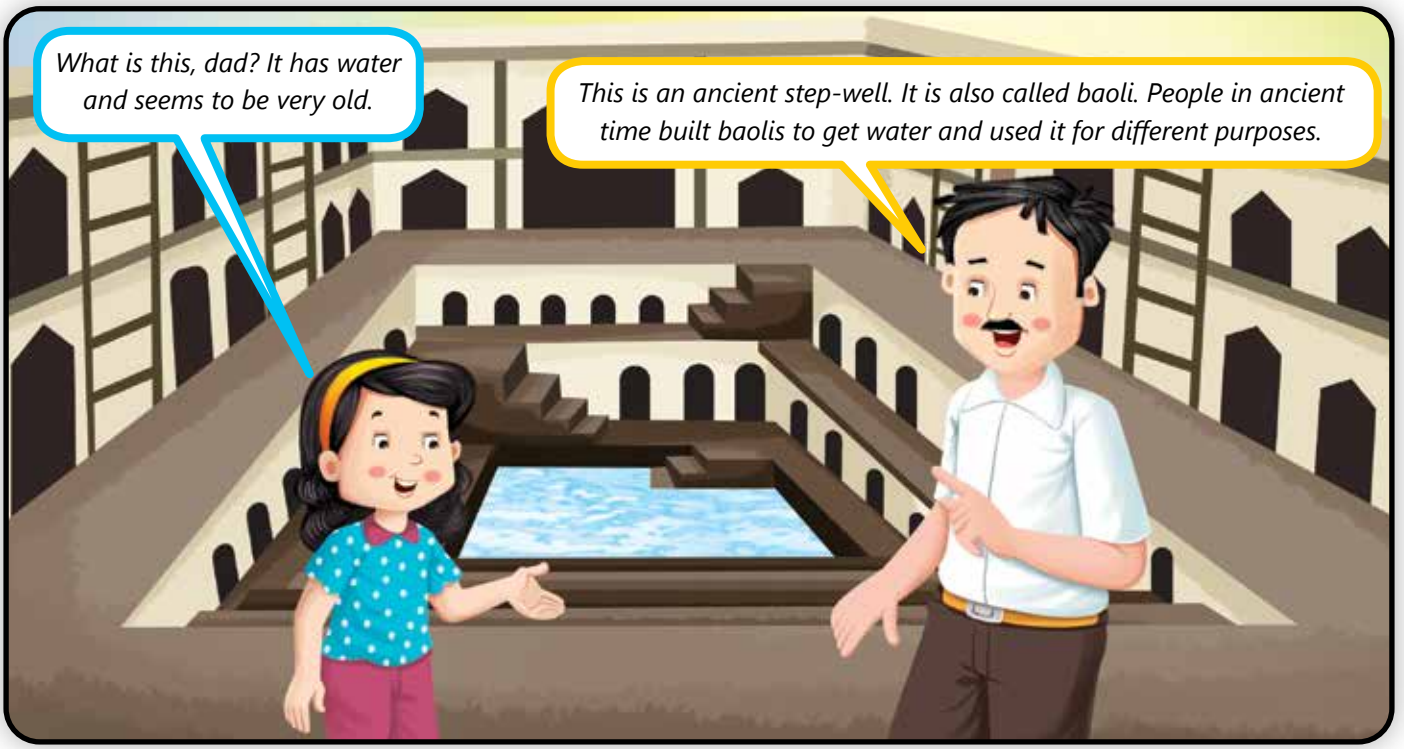
Do to Learn More

Surf the Internet and find out about some unusual plants. Draw their pictures in your notebook and write a few lines about each of them.

11 Water Resources

Curricular Goals

- How We Get Water at Homes
- Properties of Water
- How Ancient People Got Water
- Density of Water
- Irrigation



We know very well that water is very essential for the survival of life on the Earth. It is a significant natural resource and exists in all living beings—plants, animals and human beings. It is present in vegetables, fruits, leaves and air.

The main source of water on the Earth is the rain. When it rains, a part of the rainwater is absorbed by the ground. It is stored as the **underground water**. We can get underground water through handpumps, wells and tube wells. Plants also use underground water. Some rainwater gets collected in ponds, lakes, rivers, seas and oceans. This is called **surface water**.

How We Get Water at Homes

In urban areas, we get water in our homes mostly through taps. Before water reaches our homes, it is purified and made drinkable. There are pipelines laid between the water treatment plants and our homes. Water reaches our homes through these pipelines. Thus, we get water at our homes and need not go anywhere. However, in most of the rural areas, people get water from wells, rivers and ponds. In most of the villages, people have to cover long distances to reach the water source.

Check Your Knowledge

1. What is the source of water in your home?

   _____

2. Ask your grandparents how they got water in their homes in their childhood.

   _____

How Ancient People Got Water

In ancient time, people had to cover long distances to get water. They also built some structures to store rainwater or to get underground water. Some ancient sources of water are as follows.

Baolis

In ancient time, people built stepwells or *baolis* to store rainwater. The *baolis* had peculiar and very attractive designs with steps on all sides. The stored water was used for drinking and other purposes. *Baolis* were generally built in Gujarat and Rajasthan. However, in the present time, *baolis* are not in use. Most of them are in ruins.

Agrasen ki Baoli in central Delhi is a very famous monument of India. It is said that it was built by King Agrasen during the period of Mahabharata. It was renovated by Agrawal Community. Its length is 60 metres and width is 15 metres. The baoli has three visible levels lined with arched gates, passages and chambers on both sides. It has 103 steps and served as a reservoir and summer refuge.

Teacher's Tips

Tell the students about different ancient sources of water and how water reaches their homes. Also tell them about the irrigation of crops.

Piaos

In ancient time, kings or charitable organizations built *piaos* for the travellers on the roadsides or highways. They were usually wells. We can still see *piaos* but in the present time, they have taken the form of earthen pots or pitchers. Pitchers filled with water are placed along the roadsides during summer. They are maintained by a mosque, gurudwara or a temple. Some local residents may also maintain them.

Irrigation

Irrigation is very necessary for the growth of crops. Different crops require different quantity of water. Rice and jute need a lot of water. Hence, they are grown in areas with plenty of rainfall. Millets are grown in areas with scanty rainfall while wheat and sugarcane need moderate rainfall. Tea and coffee are grown in the regions where it rains heavily. When we water crops by artificial means, it is called irrigation. Wells, tube wells, canals and tanks are some major sources of irrigation in India. From a well, water is drawn using bucket and rope. In some areas, diesel and electric pumps are also used to draw water from wells. These wells are called tube wells. Canals are also dug to take water from rivers to fields.

Water Wheel

At some places water wheels are used for irrigation. They use the energy of falling water. When the water strikes the buckets fixed to the wheel, the wheel begins to rotate and the water in the buckets fall on the other side. This water is directed into water channels to irrigate the field.

Windmill

A windmill utilizes the energy of wind to draw water from a well.

Water Pump

Nowadays, electric water pumps are being used to draw underground water for irrigation purposes.

Sprinkler System

In the present time, sprinkler system is being used to irrigate fields. It saves a lot of water.

Properties of Water

Pure water is colourless, tasteless and odourless. It is found in three states—solid (ice), liquid (dew, rain) and gas (steam).

Density of Water

Density refers to the degree to which a substance is heavy in relation to size. You must have noticed that stones and iron nails sink in water whereas dry wood and thermocol float. Have you ever wondered why it happens? If some object is less dense than water, it will float. However, if it is denser than water, it will sink. Since the stones and iron nails are denser than water, they sink and dry wood and thermocol being less dense float on water.

Solubility in water

You would have noticed that some substances mix or dissolve in water while others not. Substances that get dissolved in water are called soluble substances such as sugar and salt. Substances that do not dissolve in water are called insoluble substances such as sand and oil.

salt, is soluble in water

sand, is insoluble in water

It's Activity Time

Take a small quantity of each of sugar, salt, sand, milk and oil. Take some water in five cups and try to dissolve one substance in each cup. What do you notice? Which substances gets dissolved in water and which ones do not dissolve. Write below.

1. Substances that dissolves easily:

   _____

   _____

2. Substances that do not dissolve:

   _____

   _____

Liquids such as water, oil and milk are measured in litres which is the standard unit of measurement for liquids. One litre is equal to 1000 ml.

Elder Talk

Sometimes there is shortage of water in cities. There is no water supply because of different reasons. Whenever, there are such circumstances, people have to go far off places to get water. They sometimes call water tankers too.

Word Power

baoli	: a stepwell
canals	: channels dug to divert river water
litre	: standard unit to measure liquids
density	: the state or quality of being dense, compact or closely set
irrigation	: The supply of water to land or crops to help growth

Summary

- The main source of water on the earth is the rain.
- In ancient time, people built *baolis* and *piaos* for getting water.
- When a field is watered using artificial means, it is called irrigation.
- Wells, tube wells, canals and tanks are major sources of irrigation in India.
- Pure water is colourless, tasteless and odourless.
- Floating or sinking of an object in water depends on the density of the object.

Practice Time

A. Fill in the blanks.

1. A *baoli* is a type of _____.
2. The main source of water on the earth is _____.
3. Irrigation is the process of watering crops using _____ means.
4. The standard unit of measuring liquids is _____.
5. _____ system saves a lot of water.

B. Find out the reasons for the following.

1. Tea and coffee grow in the area with heavy rainfall.
2. Thermocol floats on water.
3. Iron nails sink in water.
4. People in some regions have to travel long distances to fetch water.

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. Seas and oceans are the main source of water on earth. ☐
2. Well are not the means of irrigation. ☐
3. In ancient time, *baolis* were made on the roadsides. ☐
4. Rice and jute crops need very little water. ☐
5. Tube wells use electric or diesel water pumps. ☐

D. Answer the following questions.

1. What is the difference between baoli and piao?
2. What do you mean by irrigation?
3. Differentiate between soluble and insoluble substances.
4. How does a sprinkler system work?
5. What is a water wheel?

Brainstorm

Water has the property of flowing from a higher level to lower level. How is this property of water utilized in terrace farming?

Find Out

Visit a nearby village and find out the different types of irrigation practiced there.

Fun to Learn

Work in groups. Prepare a PowerPoint presentation on the different types of irrigation. Present your report with different pictures supporting the text.

Life Pillars

As you know there is shortage of drinking water in different parts of the country. Sometimes, even in the cities there may arise a shortage of water because of several reasons. It is mandatory for us to use water judiciously. We should avoid the wastage of water in any way.

Do to Learn More

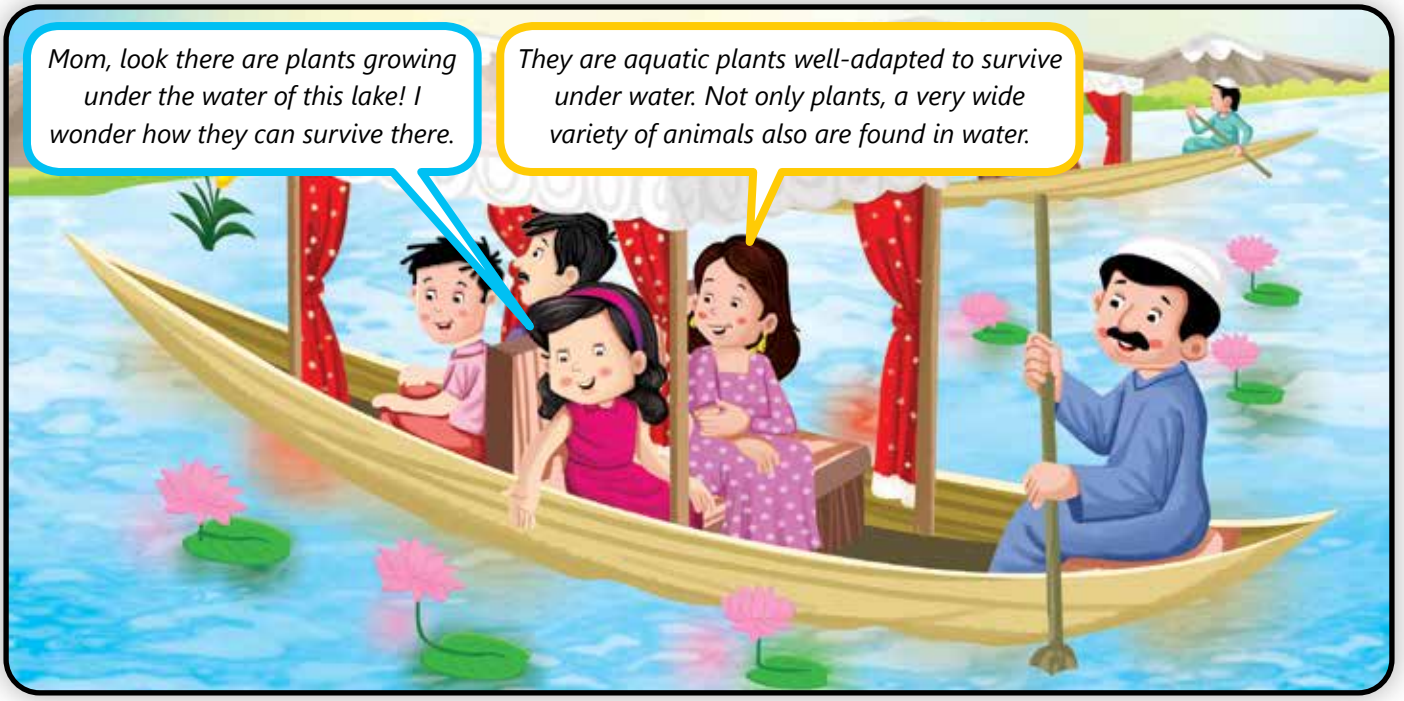
Divide the class into two groups. Ask one group to collect information about the shortage of water in different areas of the country. Ask the second group to make a poster on 'Save Water'.

12

Aquatic Life

Curricular Goals

- Aquatic Plants
- Aquatic Animals



A vast number of plants and animals are found on the earth. Some of them are found on the land while others in water. The plants and animals living on land are called terrestrial plants or animals while those living in water are called aquatic plants or animals.

Aquatic Plants

The plants growing in water are called aquatic plant. There are three types of aquatic plants.

Free-floating Plants

These are the plants that float on the surface of water. They float freely on the water surface of ponds and lakes. They have spongy body with many pores which are filled with air. This makes them light and helps them float over the surface of water.

duckweed

Teacher's Tips

Tell the students about aquatic plants and animals.

These plants are not attached to the soil. Duckweed, pistia, water hyacinth and wolffia are the examples of floating plants.

pistia

water hyacinth

Check Your Knowledge

1. Name two aquatic plants.

   _____

2. Name two aquatic plants that float on the water.

   _____

Rooted-floating Plants

These are the plants which are rooted in the soil at the bottom of the water body but they float on the water. These plants have long, hollow and light stem which help the leaves and flowers to float on the water. They have circular and large leaves with oily surface which make them waterproof. Water lily and lotus plants are fixed aquatic plants. Their roots are fixed on to the mud at the bottom of the pond. Their leaves float on the surface of the water. They have hollow, light and flexible stems. They bend easily to the flow of water. This prevents the plants from getting uprooted by strong currents in the water.

water lilly

lotus

Need to Know

Kamal kakri that we eat is actually the stem of the lotus plant.

Submerged Plants

These are the plants that remain submerged in water. Hydrilla, vallisneria and tape grass are the examples of submerged plants. Their roots remain fixed in the muddy soil. Their stems are flexible and have air spaces. These types of plants breathe through those parts of their stems which are closer to the surface.

tapegrass

hydrilla

Aquatic Animals

fish

The animals which live in water are called aquatic animals. Examples of aquatic animals are fish, whales, octopus, crabs and so on. Fish breathe through their gills in water and use their fins to swim. They have boat-shaped body to swim. Aquatic animals have scales and waterproof eyes and body that prevent water from seeping into their body and damaging their organs.

whale

Whales and dolphins are not fish they are mammals which live in water. Their streamlined body and fins help them to swim. They do not have gills. They breathe with the help of their lungs. They need to come up to the surface of water to breathe.

Activity Time

Which of the following are water animals and which are not?

1. Camel
2. Frog
3. Sea turtle
4. Duck
5. Whale
6. Deer
7. Crab
8. Mouse

Amphibians

turtle

frog

There are some animals which can live both on land and in water such as frog, turtle and salamanders. They are called amphibians. Their limbs help them to swim well. Their moist skin helps them to breathe in water. They have lungs as their breathing organs when come on land. Turtles have paddle-like flippers to help them to swim. Some animals have a long tongue that helps them catch flying insects.

Water Birds

duck

swan

Birds that live in or around water bodies are called water birds such as ducks, geese, pelicans, swans and penguins. They have webbed feet which help them to swim in water.

Word Power

Aquatic : living or growing in water
Amphibians : animals that live on land as well as in water
Submerged : under the surface of water

Values

It is our duty not to make water bodies polluted because water pollution poses a big threat to the existence of aquatic plants and animals.

Summary

- The plants and animals living in water are called aquatic plants or animals.
- Free-floating plants float on the surface of water freely.
- The plants that float on the water but whose roots are fixed in the soil are called rooted-floating plants.
- The plants that grow underwater are called submerged plants.
- Aquatic animals are well adapted to live in water.
- Amphibians are the animals that can live both on land and in water.
- Birds that live in or around water bodies are called water birds.

Practice Time

A. Fill in the blanks.

1. Fish breathe through their _____.
2. Turtles have _____ flippers which help them to swim.
3. Whale is a _____.
4. Frogs breathe through their _____ when they are in water.
5. Hydrilla is a plant that grows _____.

B. Choose the correct options.

1. Which organ do whales use to breathe?
   (a) gills ☐ (b) lungs ☐ (c) skin ☐
2. Which animal is an amphibian?
   (a) turtle ☐ (b) fish ☐ (c) octopus ☐
3. What are the animals living on land called?
   (a) aquatic ☐ (b) terrestrial ☐ (c) amphibian ☐
4. Which bird has webbed feet?
   (a) crow ☐ (b) pigeon ☐ (c) duck ☐
5. Which of the following is a mammal?
   (a) duck ☐ (b) dolphin ☐ (c) crab ☐

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. Animals living on land are called terrestrial animals. ☐
2. Duckweed is not an aquatic plant. ☐
3. Whale is a mammal that lives in water. ☐
4. Swan is a water bird. ☐
5. Rose is a submerged water plant. ☐

D. Answer the following questions.

1. What special features of a fish help it to swim in water?
2. Why are humans a threat to aquatic life?
3. How do water birds swim in water?
4. How are submerged plants different from rooted-floating plants?
5. How do frogs breathe when they are on land and in water?

Brainstorm

What are the young ones of frog called? What do they look like?

Find Out

Some aquatic animals such as seal, walrus and whale have a thick layer of fat under their skin. What is this layer of fat called and what is its use for them?

Fun to Learn

Whales

Whales are aquatic mammals. They are open ocean creatures. They range in size from 2.6 metres and 135 kilograms to 29.9 metres and 190 metric tons. They are the largest animals on the earth. They are warm-blooded creatures that nurse their young. There are many types of whales.

Blue Whale

It is the largest animals ever to have lived on the earth. It reaches the lengths up to 100 feet and weigh 100 to 150 tons. Its skin is of gray-blue colour.

Fin Whale

It is the second-largest animal in the world. It is also called the "greyhound of the sea." It has a streamlined body and the only animal known to be asymmetrically coloured because. It has a white patch on its lower jaw on the right side.

Sei Whale

It is one of the fastest whale species. It has a dark back and white underside. It has a curved dorsal fin.

Humpback Whale

It is also known as the "big-winged New Englander". It has long pectoral fins or flippers. It is a medium-size whale with a thick blubber layer. It makes them clumsier in appearance than some of their more streamlined relatives.

Bowhead Whale

It gets its name from its high, arched jaw that resembles a bow. It is found in the Arctic. It has a blubber layer which is very thick and saves it from the cold waters.

Whales, particularly humpbacks, produce vocalizations that can be heard for miles underwater. It's believed that whales communicate through these calls. According to researchers their calls can be heard for thousands of miles.

Life Pillars

There are some aquatic plants like hydrilla and water hyacinth which grow densely in water. They prevent the sunlight from reaching the other plants and hence, they cannot make their food and ultimately die. They also suck up all the oxygen from water and thus cause death to water animals. Therefore, their growth in water bodies should be checked.

Do to Learn More

Make a collage of different aquatic plants and animals and paste it in your scrapbook.

13

Different Places Different Houses

Curricular Goals

- Climate
- Availability of Material
- Budget
- Some Special Houses

We can see different types of houses in different regions of the world. Their design and structure depends on several factors like climate, available material and budget.

house of plain region

Climate

The design and structure of a house is greatly affected by the climate of a place. The houses in mountainous and hilly regions have sloping roofs as in these areas, snowfall is very common. From sloping roofs, the snow slides down easily. The walls of the houses are made of wood. They keep the house warm as they do not allow heat to escape from the house.

Plains experience high temperature in summers and low temperature in cold. Therefore, the houses in the plains have thick walls and high roofs which keep them cool in summers and warm in winters.

house of hilly region

In the areas which experience heavy rainfalls, houses are built mostly on stilts so that rainwater does not enter the house. They have sloping roofs to let the rainwater slide down easily.


stilt house

Availablity of Material

Most of the people use the material locally available to build their houses. The village people make their houses using mud, straw and wood as they are easily available in the locality. This is the reason, the most of the houses in villages are *kutcha* houses. They are not very strong houses. In cities, people make their houses using material like bricks, cement and iron. Houses made from these materials are *pucca* houses. They are strong houses. Bungalows and apartments are common in cities. Now, people in villages make *pucca* houses as well.


kutcha house (hut)

Budget

It is very common to find different types of houses even in the same place. They may be very different from each other in structure and design. Have you ever thought why it is so? It is because of the budget of people. People having different budgets build different houses. People who have low income, mostly build low-cost houses. We can see such houses in slums and *chawls*. People who belong to higher income group build big houses such as bungalows and villas using expensive material. In villages as well, people build *kutcha* or *pucca* houses according to their income. Number of rooms in houses vary as per their size. *Havelis* are high-cost houses in villages.


apartment


bungalow

Check Your Knowledge

1. In which type of house do you live?

   _____

2. Which material has been used to build it?

   _____

Teacher's Tips

Tell the students about different types of houses built in different regions of the world. Also tell them various factors deciding the type of house in an area.

Some other factors that play a major role in the design and size of a house are availability of space, the needs of a person, traditions and landforms. Because of the shortage of space multi-storeyed buildings are being built in cities and towns. In the areas where earthquakes are very common bamboo and wood houses are built to prevent big injuries when they are collapsed because of shaking of the earth.

Some Special Houses

- In some parts of the world like Europe America, many people use a **caravan**. It is a house on wheels and is pulled by a horse or a van.

Need to Know

Castles are a type of home that was built to protect the people inside. People who lived in the castle included kings and their families as well as soldiers to defend it from enemies.

- There are also houses that float on water. They are called **houseboat**. You can see houseboats in Srinagar and Kerala.

It's Activity Time

An igloo is a special type of house. It is built by Eskimos in Arctic. Make a model of an igloo and display it on your study table.

- Mountaineers, gypsies, nomads, scouts and campers build **tent** houses. They are temporary houses.

Values

We all have a house to live in. It may be small or big. Whatever the size of the house, it should be well-ventilated to let the sunlight and fresh air in.

Word Power

slum : a thickly populated, run-down, squalid part of a city, inhabited by poor people
chawl : a large building divided into many separate tenements
multi-storeyed : having many storeys

Summary

- There are several factors that affect the design and structure of a house.
- Major factors deciding the type of houses are climate, available material and budget.
- We can see different types of houses even in a single area.
- Caravan, houseboat and tent house are some special houses.

Practice Time

A. Fill in the blanks.

1. The houses in areas where snowfall is very common have _____ roofs.
2. In earthquake prone areas like Japan houses are made from _____ and wood.
3. We can see _____ houses mostly in villages.
4. _____ are high cost houses in villages.
5. We see multi-storyed buildings usually in _____.

B. Find out the reasons for the following.

1. Houses in plains have thick walls and high roofs.
2. Houses in areas with heavy rains are made on stilts.
3. Houses in hilly regions have sloping roofs.
4. Houses in areas which have frequent earthquakes are made from bamboo and wood.

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. Houses in mountainous regions have flat roofs. ☐
2. We can see *pucca* houses in urban areas. ☐
3. Budget is a major factor in determining the type of houses. ☐
4. We can see houseboats only in Kashmir. ☐
5. A caravan is a moveable house. ☐

D. Answer the following questions.

1. What are the major factors determining the design and structure of a house?
2. How does climate affect the type of a house?
3. What is the difference between a *kutcha* and *pucca* house?
4. What are multi-storeyed buildings? Where can we see them?
5. Why can different types of houses be seen even in a single area?

Brainstorm

What are caves? Where are they found and who live in them?

Find Out

Which types of houses are built in the areas where strong winds blow and why?

Fun to Learn

Surf the Internet and find out what a hamlet is. How is it different from a village and town?

Life Pillars

Many people do not have houses to live in. They have to live in open areas in every season. These people should be provided shelters so that they can protect themselves from harsh weather conditions.

Do to Learn More

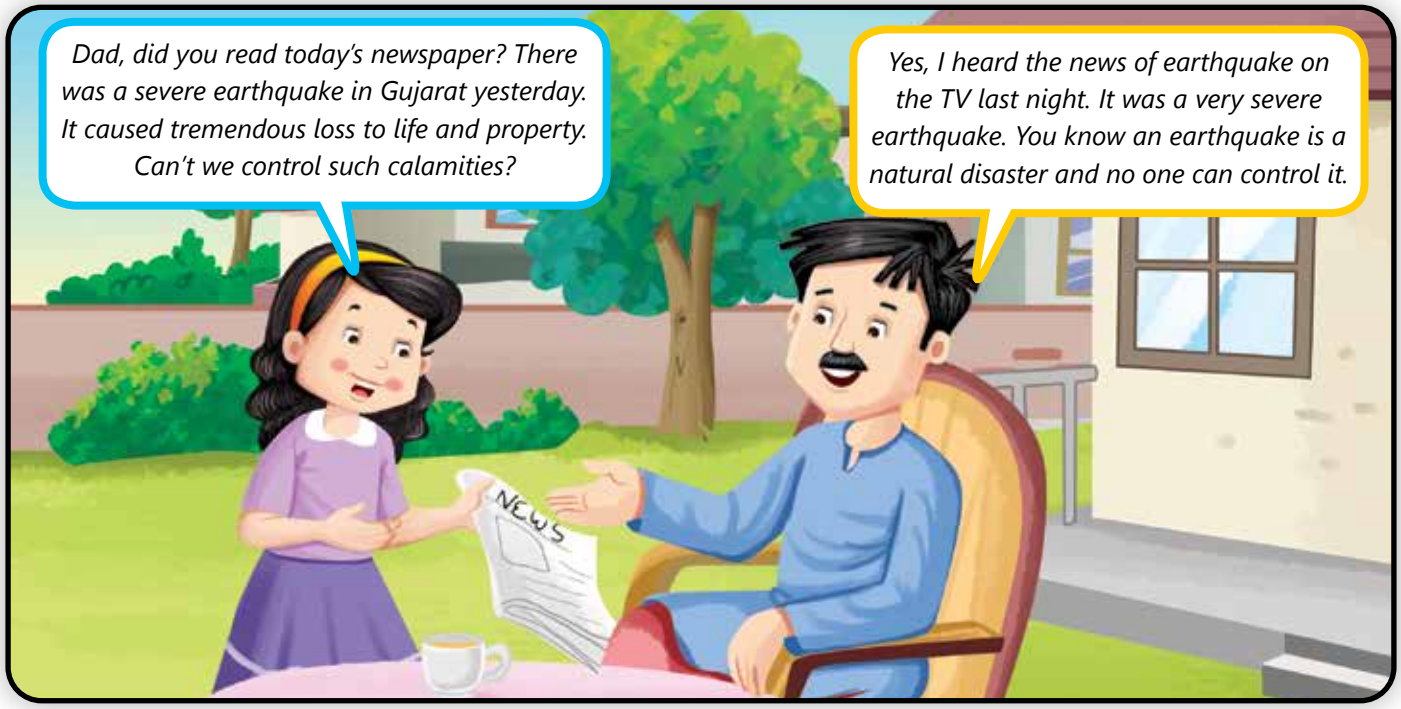
A yurt is a special type of house which is portable and circular in shape. It is made of a lattice of flexible poles and covered in felt or other fabric. It is a strong and reliable type of tent. In ancient time, the Mongolians built it as their dwellings. It is very easy to be built up and takes around 30 minutes to 3 hours to set up or take down. It can usually house for 5 to 15 people. Its height is about 6 feet. It has slightly domed top rising another meter. It has a wood-burning iron stove in its middle. The stove has a long chimney that reaches up past the roof.

Given here is the picture of a yurt. Surf the Internet and find out how a yurt is made.

14 Natural Disaster

Curricular Goals

- Cyclone
- Draught
- Role of Community During Natural Calamity
- Earthquake
- Tsunami
- Floods
- Volcanic Eruption



Disasters or calamities are terribly harmful events causing great damage to life and property. They may be natural or man-made. Natural disasters occur due to natural forces like movements inside the earth, fire, lightning, changes in temperature and excess or shortage of water. Some examples of these calamities are cyclone, earthquakes, floods, drought, tsunami, volcanic eruptions, etc.

Cyclone

A storm in which rotating winds travel at very high speed is called a cyclone. They destroy everything coming in their path. A cyclone is typically accompanied by very heavyrains. They uproot tress and electric poles and damage houses.

The coastal regions of Odisha, West Bengal, Andhra Pradesh, Tamil Nadu and Maharashtra are often hit by cyclones.

Check Your Knowledge

1. What are the two types of natural calamities?

   _____

2. What are natural disasters? Name them.

   _____

Consequences of a Cyclone

The consequences of cyclone are very severe. The wind blows so fast that it destroys everything that comes in its way like buildings, bridges, vehicles and overpasses. Trees and electric poles get uprooted. Transportation, communication and electricity supply are interrupted in the cyclone hit area. The area is flooded with water and when this water remains in the area for several days, it gets contaminated and causes water-borne diseases like typhoid, cholera and jaundice.

Precautions

The people living in cyclone-prone areas should take several precautions.

- They should regularly watch out for weather forecasts and warnings on radio and television.
- They should keep an emergency kit with things like a first-aid kit, torch, stock of food and drinking water handy.
- They should build strong houses so that they can cope with the force of the cyclone.
- They should keep the roofs of the houses in good condition.
- They should not go near the sea.
- They should turn off all the electrical gadgets when a cyclone arrives.
- They should shift to a safer place.
- They should cooperate with others in the community.
- They should help the rescue team.

Teacher's Tips

Tell the students about different natural disasters, their harms and what precautions to be taken during a natural disaster.

Earthquake

When the huge masses of rock move beneath the earth's surface, they cause the ground to shake. It is called an earthquake. Earthquakes occur constantly around the world. Often, they are so small that we cannot feel them. When an earthquake occurs, the surface of the earth shakes and trembles. It results in strong tremors on the earth's surface.

Consequences of Earthquake

Earthquakes cannot be predicted. They cause major damage depending upon their strength and what kind of ground is shaking. Loose soils shake more than the solid ground. It may result in minor or sometimes wide spread destruction.

Buildings may collapse, trees may get uprooted, bridges and roads might break. The Himalayan region is prone to frequent earthquakes.

There was a massive and disastrous earthquake in Bhuj, Guajarat on 26th January 2001. About 20,000 people lost their lives and over 15 lakhs got injured. Many houses got destroyed and people became homeless.

What Causes an Earthquake

The earth's surface is made up of tectonic plates which are interlocked to each other. Tectonic plates float on a layer of molten matter. When they collide with each other, it causes strong vibrations or tremors which are felt as an earthquake. The point at which these plates collide is called the focus of the earthquake. The surface of the earth above the focus is called the epicenter. The effect of the earthquake is greatest at the epicenter.

Precautions

The intensity of an earthquake is measured by an instrument called **seismograph**. It can also measure the duration of the earthquake. The intensity of an earthquake is measured on a **Richter Scale** from 1 to10. Scientists have marked certain regions as highly earthquake prone regions. Japan is the most earthquake prone country in the world.

We should take the following precautions during an earthquake.

- Run out of your house or school building. The safest place is open areas, where nothing can fall on you.
- If you are not able to run out, sit under a strong table to protect yourself from things falling on you.
- Keep away from heavy objects and windows that may fall or shatter.

- Do not use any electrical gadget.
- Do not use a lift during or immediately after an earthquake. Use stairs instead.

Floods

Sometimes, when there are excessive rains, a river overflows its bank. The water then spills over to the nearby land causing floods. Floods can also be caused by collapsing of a dam built on a river. Sudden melting of huge amount of snow on mountains during summer can also result in floods.

In India, flood is common when there are heavy rains during the monsoon. In this season, rivers such as the Ganga, Brahmaputra or Kosi overflow and many areas such West Bengal, Bihar and Assam experience floods. Floods cause damage to crops, life and property. They wash away houses and disrupt availability of transport, communication, and electricity. It also leads to acute shortage of food supply, drinking water and shelter. Once the flood water recedes then diseases such as cholera, malaria and dengue break out.

Precautions

Take the following precautions during a flood.

- Collect all the necessary emergency supplies like food, drinking water and medicines.
- Listen to your local radio or television station for updates.
- Bring in outdoor possessions such as furniture, grills, trash cans, etc. or tie them down securely.
- Turn off all utilities at the main power switch and close the main gas valve.
- If possible move to a higher and safer place where flood water cannot reach.
- Don't drive flooded areas and standing water.
- Never drink flood water or use it to wash dishes, to brush teeth or to prepare food.
- Listen to water advisory from local authorities to find out if your water is safe for drinking and bathing.
- During a water advisory, use only bottled, boiled, or treated water for drinking, cooking, etc.

Draught

Drought takes place because of the shortage of rains. In our country farmers depend on monsoon rains for growing crops. When there is no rain, crops do not grow causing shortage of food. Some regions in India such as Rajasthan, Orissa, Maharashtra, Andhra Pradesh, and Gujarat are more prone to droughts. In severe droughts, there is a great shortage of food leading to famine. Many people die in famines.

Precautions

During a drought we can take the following precautions.

- Never waste food. Take as much food as you can eat.
- Don't waste water in any way.
- If you live in a drought-prone area, build water tanks to store water so that it can be used during emergency.
- Practice rainwater harvesting to conserve every drop of water for later use.
- Plant more and more trees.

Tsunami

Tsunami is caused due to an underwater earthquake, landslide, or a volcanic eruption. Tsunamis are often referred to as tidal waves but it is not supported by oceanographers because tides have little to do with these giant waves. In Japanese 'tsunami' means 'harbour waves'. These waves can rise to 20 metres and travel at great speeds and destroy everything on their way. On 26 December 2004, several countries of South and South-East Asia were hit by a very big tsunami. It costed the lives of about three lakh people and resulted in huge devastation.

Precautions

A tsunami cannot be predicted. However, if a tsunami warning has been issued then immediately move to a safer place. Keep phone numbers of hospitals and relatives ready and take the following precautions.

- Always keep a check on the local warning arrangements.
- Always a Getaway Kit ready with you.

- Always know the nearest safe place.
- Do not travel to the areas which are at the risk.
- Take your pets with you. Never leave them at risky places.
- If you are unable to escape the tsunami, go to an upper storey of a sturdy building.
- Never go to the shore to watch for a tsunami. Always try to stay away from risky areas.

Volcanic Eruption

A volcanic eruption takes place when molten rocks inside the earth called the magma find a vent through the surface of the earth. This molten magma that comes out from the crust of the earth is called lava which is often accompanied by harmful gases and ash causing heavy air pollution. When the lava cools down, it forms a volcanic mountain.

There are three types of volcanoes- **extinct**, **dormant** and **active**. The volcanoes which have not erupted since a very long time and probably may never will erupt are called extinct volcanoes. Mount Kilimanjaro in Africa is an extinct volcano.

Dormant volcanoes are those that have not erupted since many years but there is a chance of their erupting again. Mount Fujiyama in Japan is an example of a dormant volcano. Active volcanoes are very dangerous and can erupt any time. For example, Mount Etna in Italy.

Precautions

In the present time, there are tools available, which scientists can use to predict a volcanic eruption in advance. You should take the following precautions.

- Move to safer places.
- Keep an emergency kit consisting of torch, first-aid kit.
- Always keep with you important phone numbers.
- Switch off all electronic gadgets during such times.

It's Activity Time

Let's prepare a first-aid box. Take a plastic box, an antiseptic solution, sterile gauze pads of different sizes, adhesive tape, adhesive bandages, antiseptic wipes, soap, antibiotic ointment, painkiller, tweezers, scissors, thermometer, plastic non-latex gloves, flashlight and extra batteries. Put all these things in the box. You can use your first-aid box during the time of an emergency.

Role of Community During Natural Calamity

We cannot control or prevent natural calamities but we can help the victims and try to reduce their sufferings. There are many government and non-government agencies, voluntary organisations that do a lot of work to bring relief to the people affected by these natural disasters.

Need to Know

Prime Minister National Relief Fund is a programme that allows people to contribute money to help people in need throughout the country.

- During a natural calamity, several relief camps are established that provide food items, clothes, blankets and medicines to the affected people.
- Various organizations work hard to maintain hygienic conditions in the affected area to prevent the outbreak of epidemics. Some of these organizations are:
  - The National Cadet Corps (NCC) consisting of dedicated and trained youngsters
  - The Red Cross Society and WHO (World Health Organization)
  - The United Nations Disaster Management Team (UNDMT)
  - Child Relief and You (CRY)
- Police and army help in providing relief work and maintain law and order in the affected areas. They provide food, water, medicines and other items to the affected people.

Values

Rehearse a mock drill in your school or at home to plan and prepare an escape route to save yourself from an earthquake.

Word Power

seismographs : a machine that measures the intensity and duration of an earthquake.
epicenter : the surface of the earth above the focus of an earthquake.
magma : molten rocks inside the earth.

Summary

- Natural disasters occur because of natural causes.
- Earthquake, volcanic eruption, flood, drought, tsunami and cyclones are some natural disasters.
- Regions located near a sea are more prone to tsunami and cyclones.
- A tsunami is a series of very high waves in the sea created by under sea disturbances.
- Heavy rainfall causes floods and low or no rainfall is responsible for droughts.
- We should take precautions to protect ourselves from these disasters.
- We cannot control or prevent natural calamities but we can help the victims and try to reduce their sufferings.

Practice Time

A. Fill in the blanks.

1. The molten rock that comes out from a volcano is called _____.
2. The crack or an opening on the surface of the earth from which molten magma comes out is called _____.
3. The intensity of an earthquake is measured on the _____ scale.
4. An earthquake under the seabed causing a series of sea waves is called _____.
5. _____ are mountains formed due to solidification of molten magma.

B. Choose the correct options.

1. The places near _____ are affected maximum during an earthquake.
   (a) focus ☐ (b) epicenter ☐ (c) seismograph ☐
2. Cyclones are always accompanied by _____.
   (a) heavy rains ☐ (b) forest fires ☐ (c) dry winds ☐
3. Scarcity of food leads to _____.
   (a) floods ☐ (b) famines ☐ (c) forest fires ☐
4. Areas near the _____ are prone to cyclones.
   (a) mountains ☐ (b) river sides ☐ (c) sea coasts ☐
5. Always keep an _____ as a precautionary measure.
   (a) medicine ☐ (b) emergency kit ☐ (c) tyre ☐

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. Natural disasters take place because of human activities. ☐
2. The volcanoes which will never erupt are called extinct volcanoes. ☐

3. The molten magma that comes out from the earths crust is called lava.
4. Floods in our country are caused because of heavy rains.
5. There is no fear of epidemic because of natural disasters.

D. Answer the following questions.

1. What do you understand by a natural calamity?
2. How are earthquakes caused?
3. How can we help people affected by natural calamities?
4. How can we prevent droughts?
5. What should we do if there is an earthquake while we are in the house?

Brainstorm

In the summer season, we most often hear about forest fires. How are these forest fires caused? What are their effects and what precautions should we take during a forest fire?

Find Out

Surf the Internet and find out the worst earthquakes that have occurred around the globe during the last 50 years. List them in your notebook.

Fun to Learn

Collect newspaper and magazine clippings of reports and pictures related to natural disasters. Find out how the victims of the disaster were helped to get back to normal life.

Life Pillars

Natural disasters are the times of great distress for the victims. We should try to help them as much as we can do to normalize their lives.

Do to Learn More

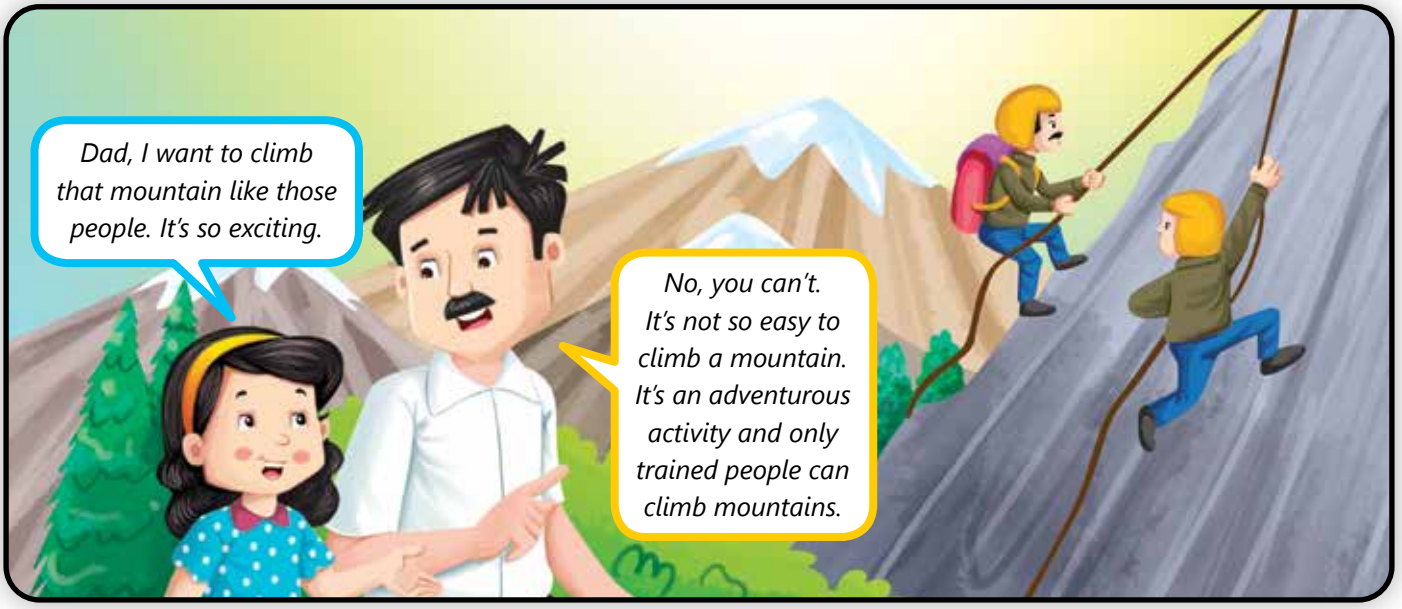
Divide the class into groups. Ask each group to suggest some help they can provide in case of a natural disaster in their area.

15

Adventure and Space

Curricular Goals

- Mountaineering
- Constellations
- Training For Mountain Climbing
- Human Beings into Space
- Space
- Some Interesting Facts
- Our Solar System



A daring activity which is undertaken by a person is called an **adventure**. Some examples of adventurous activities are paragliding, scuba-diving, mountaineering, river rafting and rock climbing.

Mountaineering

Mountaineering includes several activities that involves ascending mountains, for example, walking, hiking, trekking and climbing. It requires courage and a lot of stamina.

Check Your Knowledge

1. Which is the highest peak in the world? What is its height?

   _____

2. Who was the first person to climb the highest peak of the world?

   _____

The Youngest Woman to Climb the Mount Everest

On 25th May 2014, Malavath Poorna from the Nizamabad district of Telangana became the youngest woman of the world to climb the Mount Everest at the age of 13 years and 11 months. She was accompanied by Sandhanapalli Anand Kumar from Khammam.

She was born in a small village called Pakala, and joined Telangana Social Welfare Residential Educational Institutions Society for her education. Dr RS Praveen Kumar, the secretary of the society noticed her talent and she was shortlisted for Operation Everest along with Sadhanapalli Anand Kumar and was successful in scaling the highest peak of the world at a very young age.

She scaled Mt Elbrus, the highest peak in Russia and in Europe on 27th July 2017. After reaching the summit of Elbrus, she unfurled a 50 ft long Indian Tricolor and sang the Indian National Anthem.

Training For Mountain Climbing

As you know mountaineering is not an easy task. It requires a lot of courage and strength. While climbing upon a mountain, a person has to face a lot of difficulties. As the height increases, the oxygen level in the air decreases. It becomes difficult to breathe easily. Because of low level of oxygen, it becomes difficult to move further and mountaineers get tired soon. Harsh winds and low temperature make the adventure even more difficult.

To face all these challenges, mountaineer are trained before they start their expedition. The following two institutes in India give formal training of mountaineering.

1. Himalayan Mountaineering Institute in Darjeeling
2. Nehru Institute of Mountaineering at Uttarkashi in Uttarakhand

Necessary Equipment for Mountaineering

Following are the essential equipment for a mountaineer.

- Spare clothes, map, food, water bottle, compass, waterproof jacket, first-aid kit, etc. in a backpacking bag. The weight of backpack should not be more than 15 kilograms.
- Tents, ice axe, ropes, sleeping bags, etc.
- Mountaineering boots with thick rubber soles called crampons.

Teacher's Tips

Tell the students about adventurous activities and various heavenly bodies.

Before a person goes on a mountaineering expedition he/she needs to take proper training so that they can handle mountaineering equipment. They are medically checked for their physical fitness. They are also trained to deal with high altitude sickness. They have to build up physical stamina by taking exercise months before going on the expedition. They also need to carry and eat protein rich high calorie diet.

Space

Stars, moon, planets and the sun are heavenly bodies. The area in which they exist is called **space**. A spacecraft is a vehicle which is built to fly into the space. It is used for the observation of the earth, communication and space travel. **Astronomy** is the branch of science that studies the objects in space. Scientists studying astronomy are called astronomers and astronauts are the people who travel to space.

Our Solar System

Our solar system consists of the sun, eight planets, moons, many dwarf planets, an asteroid belt, comets, meteors and others. The sun is the center of our solar system; the planets, their moons, a belt of asteroids, comets and other rocks and gas orbit the sun. The eight planets according to their distance from the sun are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. Another large body is Pluto, now classified as a **dwarf planet** or **plutoid**. A belt of asteroids (minor planets made of rock and metal) lies between Mars and Jupiter. These objects orbit the sun in roughly circular orbits that lie in the same plane, the ecliptic. There are also artificial satellites that are man-made. They are launched into space by rockets. They are used to aid communication and forecast weather.

Constellations

We can see numerous stars in the night sky. Some groups of stars form patterns in the sky. These patterns are called constellations. Some major constellations are Ursa Minor, Ursa Major, Orion and Scorpius. We can also see the moon on most nights.

Need to Know

The moon is the brightest object in our night sky. It looks so big and bright because it is closer to us compared to the stars and planets. It is about 384,000 km away from the earth.

We can see the sun shining brightly in the day sky. The sun is a star. It is very far from the earth. It is in the centre of the solar system.

Human Beings into Space

With the invention of the spacecraft, it has been possible for the human beings to reach the space. Yuri Gagarin, a Soviet Union cosmonaut, made the first flight into space on 12 April 1961. The first man to land on the moon was Neil Armstrong on 20 July 1969. Since then, several astronauts have been to the moon. They took photographs of our earth. In these photographs, the earth looks blue because of the presence of water on it. Hence, it is also called the **blue planet**.

It's Activity Time

Name the following:

1. Planet with life _____.
2. Largest planet _____.
3. Planet closest to the sun _____.
4. Red planet _____.

Some Interesting Facts

- Valentina Tereshkova, a Russian, was the first woman to go into space.
- Neil Armstrong and Edwin Aldrin became the first two men to walk on the moon.
- Squadron Leader Rakesh Sharma was the first Indian to go into space.
- Kalpana Chawla was the first Indian woman to go into space in the US space shuttle Columbia.
- Sunita Williams of Indian origin has set a record for the longest stay in space by a woman.
- A dog named Laika was the first living being to go into space.

Rakesh Sharma

Kalpana Chawla

Sunita Williams

Values

Mountaineering is one of the most exciting adventurous activities. It has been observed that people climbing mountains leave rubbish and garbage on the mountains. It is not a good habit. They should ensure that they keep the surroundings there clean.

Word Power

Space : the area where heavenly bodies exist
Planet : a heavenly body that revolves around the Sun
Natural Satellite : a heavenly body that moves around a planet

Summary

- A daring activity undertaken by a person is called an adventure.
- Mountaineering includes a set of activities like walking, hiking, trekking and climbing.
- Malavath Poorna is the youngest woman to climb the Mount Everest.
- Mountaineers have to face many difficulties while climbing up a mountain.
- The area in which the heavenly bodies like the sun, moon, planets and stars exist is called the space.
- There are eight planets in the solar system revolving around the sun.

Practice Time

A. Fill in the blanks.

1. _____ is an adventurous activity.
2. Malavath Poorna belongs to _____ district of Telangana.
3. _____ are trained before they start their expedition.
4. _____ is a vehicle built to travel into the space.
5. _____ satellites are used to aid communication and forecast weather.

B. Write short notes on following.

1. Mountaineering
2. Solar System
3. Constellation
4. Malavath Poorna

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. Mountaineering boots are called crampons. ☐
2. Our solar system has 10 planets. ☐

3. The earth is at the centre of the solar system.
4. Laika was the first living being to travel into the space.
5. In our country, no formal training of mountaineering is given.

D. Answer the following questions.

1. What do you mean by mountaineering?
2. What are the equipment used in mountaineering?
3. Name two institutes which give formal training of mountaineering.
4. What are constellations? Write the names of any two constellations.
5. Write the names of all the planets in our solar system in the order of their distance from the sun.

Brainstorm

What is the difference between an astronaut and a cosmonaut?

Find Out

Which was the first artificial satellite launched by India? Find out the names of some other artificial satellites launched by India and their year of launching.

Fun to Learn

Given along side is the picture of a famous mountaineer from India. Find out her name along with her achievements in the field of mountaineering.

Life Pillars

Sunita Williams while visiting her father's ancestral village in Gujarat said, "If you have determination, will and a dream, you can achieve what you want."

Do to Learn More

Find out and discuss what happened to Kalpana Chawla when she went into space for the second time.

16

Historical Buildings

Curricular Goals

- Taj Mahal
- Konark Sun temple
- Jama Masjid
- Lotus Temple
- Red Fort
- Gateway of India
- Charminar
- Saving Our Monuments

India is renowned throughout the world for its rich architectural beauty and heritage. There are a large number of monuments in the country which display not only its architectural refinement but also its history and culture. Right from the forts to palaces to memorial tombs and to temples to churches, the country has it all.

Taj Mahal

The Taj Mahal is located at Agra city in Uttar Pradesh state of our county. It is well known as the finest example of Mughal architecture. It has been declared as the world Heritage site by UNESCO in 1983 and is one of the 7 wonders of the world. The Taj Mahal stands on the bank of the Yamuna river. It was built by Shahjahan in the memory of his beloved wife Mumtaz. The Taj Mahal is made of pure white marble and it took 22 years to build.

Jama Masjid

Jama Masjid, the biggest mosque in India is located near the Red Fort. It was also built by Emperor Shahjahan. It is made of red sandstone and white marble.

Red Fort

The Red Fort or the Lal Quila is a red sandstone structure. It was built by Mughal Emperor Shahjahan. The Red Fort has two main sections: the *Diwan-i-aam* and the *Diwan-i-khas*. In *Diwan-i-aam* the Emperor used to meet his people to solve their problems. *Diwan-i-khas* was the hall for the royal guests. Every year on 15th August which is our Independence Day, the Prime Minister of India hoists the National Flag and addresses the nation from the Red Fort.

Charminar

Charminar is the emerald of Hyderabad city. The majestic beautiful building is built with granite, lime-crushed marble and mortar. The mosque is popularly known as Charminar because of its four minarets. Charminar is a square like structure with 4 towers in the four corners of the square. Each minaret has four stories and each looks like a delicately and skillfully carved ring around the minaret.

Pause to Do

Name some historical buildings in Delhi. Who built them?

Konark Sun temple

Konark Sun temple is located in the state of Odisha near the sacred city of Puri. It is a masterpiece of Odisha's medieval architecture. The sun temple of Konark is dedicated to the sun God or *Surya*. The entire temple has been conserved as a chariot of the Sun God with 24 wheels with a set of spokes and elaborate carvings. Seven horses drag the temple. Two lions guard the entrance, crushing elephants. Sun temple has been declared a world heritage site by UNESCO.

Teacher's Tips

Tell the students about different monuments of India and their architecture.

It's Activity Time

Collect information about Sanchi Stupa and Ajanta Caves. Share the information with your friends in the class.

Lotus Temple

The Lotus temple is distinctive lotus shaped Bahai temple made with white marble surrounded by a landscaped garden and is a symbol of peace. It is a very recent architectural marvel of the Bahai faith. It is made of marble, cement, dolomite and sand. It comprises of 27 petals in the free-standing state. The grand "Lotus Temple" is termed by many as the Taj of Modern India.

Gateway of India

The Gateway of India is a monument in Mumbai. It was built to honour the arrival of the British King George V and Queen Mary, in 1911. It was formerly used by the fisher folks and was later renovated and used as a landing place for British governors and other distinguished personages. The design of the Gateway is a combination of both Hindu as well as Muslim architectural styles. The decorations are in Hindu style while the arch is in Muslim style.

Saving Our Monuments

Historical monuments are very important for us. We can know about the life of the ancient people with the help of them. We should preserve our monuments for the sake of the generations to come so that they can visit them and learn about the past of our country.

The historical monuments are at the risk of several reasons, pollution being one of them. The increased pollution because of vehicles and industries is causing harm to these monuments. Ill-planned development, floods, earthquakes and lack of management are other reasons for their decay.

Heritage buildings are taken care of by the Archaeological Survey of India (ASI). The buildings which are recognized by the government for their cultural and historical value are called **heritage buildings**. The person who wants to visit them has to pay an entry fee. Fund thus obtained is used in the maintenance of the monument.

While visiting the monument, we should not cause any harm to them. We should not scratch or write on their walls. We should not throw garbage around or in the monument.

Values

Historical monuments show our cultural richness. We should do our best to preserve them.

Word Power

architecture : the discipline dealing with the principles of design and construction and ornamentation of fine buildings

marble : a hard-crystalline metamorphic rock that takes a high polish; used for sculpture and as building material

sandstone : a sedimentary rock consisting of sand consolidated with some cement

emerald : a green transparent form of beryl; highly valued as a gemstone

Summary

- Our country has hundreds of historical monuments.
- Taj Mahal is located at Agra in Uttar Pradesh.
- Jama Masjid is the biggest mosque in India.
- The Red Fort has two mainsections: the *Diwan-i-aam* and the *Diwan-i-khas*.
- Charminar has four towers in the four corners.
- Konark Sun temple is located in Odisha.
- Lotus Temple is located in Delhi.
- Gateway of India is in Mumbai.

Practice Time

A. Fill in the blanks.

1. _____ has been declared as the world Heritage site by UNESCO in 1983.
2. _____ is a very recent architectural marvel of the Bahai faith.
3. The design of the _____ is a combination of both Hindu as well as Muslim architectural styles.
4. _____ is the emerald of Hyderabad city.
5. Konark Sun temple is located in the state of Odisha near the sacred city of _____.

B. Write short notes on following.

1. Red Fort
2. Sun Temple
3. Jama Masjid
4. Lotus Temple

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. Taj Mahal is located in Mumbai. ☐
2. Red Fort at Delhi was built by Shahajahan. ☐
3. The Sun Temple has a chariot with 24 wheels. ☐
4. Each Minaret in Charminar has four stories. ☐
5. In *Diwan-i-am*, the emperor would meet the common people. ☐

D. Answer the following questions.

1. What is the Taj Mahal made of?
2. Which is the biggest mosque in India?
3. What is peculiar about the Sun Temple at Konark?
4. Who looks after the historical buildings in India?
5. How can you help to preserve the monuments?

Brainstorm

Some people scratch and write on the walls of historical buildings just for fun and throw garbage. Is it right or wrong? Discuss.

Find Out

What is UNESCO? How does it work to protect heritage monuments? Discuss in class.

Life Pillar

Statue of Unity in the state of Gujarat is the tallest statue of the world. Its height is 182 metres (597 ft). It is located on a river facing the Sardar Sarovar Dam on the river Narmada in the Kevadiya colony.

Fun to Learn

Identify the following monuments of our country. Where are they located?




Do to Learn More

Collect information about these monuments and make a poster.

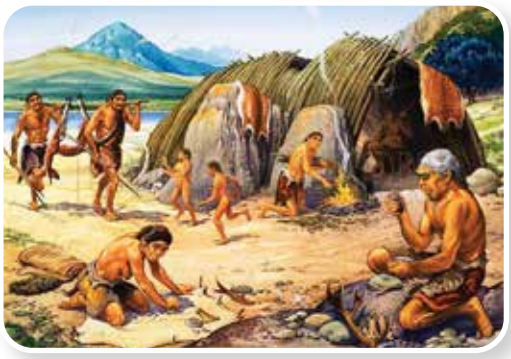
1. Kailash Temple, Allora
2. Khajuraho Temple, Madhya Pradesh
3. Meenakshi Temple, Madurai,
4. Akshardaham Temple, Delhi

17

Farming

Curricular Goals

- Stages in Farming
- Selling
- Maintaining the Fertility of Soil



Agriculture is the process of producing food. It is also called **farming**. In the early times, man did not know how to grow crops. He was a hunter and food gatherer and moved from place to place in search of food. Gradually, he learnt from his experience and came to know how to cultivate crops. Thus, from a hunter and gatherer he changed into a food producer. After learning how to grow crops, a great change came into his life. Now, he had no need to wander here and there in the search of food. He could stay at one place. Once he sowed seed, he had to stop at the place to take care of the crop and wait for them to ripen. Now, he began to live in groups. He also started to domesticate animals like cow, goat and sheep for household use and farming. This was the beginning of farming. Thus, farming includes not only growing crops but also breeding animals.

Time passed by and in the present time our scientists have developed better varieties of seeds and advanced machines and highly effective fertilizers and pesticides. These developments have reduced the labour and increased the produce.

The land in which plants are grown is called field and the plants which are grown on a field are called crop plants. All types of crops cannot be grown in all places and in every season. The cultivation of crops depends on the climate, type of soil and availability of water.

Need to Know

A farm is a piece of land used to grow crops and/or raise animals. People who grow these plants or raise these animals are called farmers.

Pause to Do

Which vegetables are freshly available in the following seasons.

Winter _____

Summer _____

Stages in Farming

There are several stages in farming which farmers follow to grow a good crop.

Preparation of Soil

First, the soil is prepared for growing crops. Farmers loose and turn soil by ploughing. Ploughing loosens soil and makes it airy. Consequently, plants grow well and healthy as their roots can penetrate deeper and breathe well. Ploughing also improves the water-holding capacity of soil. Farmers use animals like oxen or tractors to plough their fields. They use a wooden or iron plough with the animals while ploughing their field.

The soil in the ploughed field can be eroded with wind and water. Therefore, it is levelled with the help of a leveller. It also distributes the soil uniformly over the whole field.

Sowing Seeds

When the farmers plant seeds in the field, it is called sowing. Sowing can be done by hands or with the help of a seed drill. There are a variety of seed drills like tiphan or mogada. A wooden board is drawn over the field to cover the scattered seeds with soil.

Teacher's Tips

Tell the students about agriculture and different steps in growing crops.

Weeding

After sowing seeds, they begin to germinate after a certain period and along with them some unwanted plants also grow. They are called **weeds**. It is necessary to remove weeds from the crops as they restrict the growth of crop. Farmers remove them manually by using a trowel or harrow. Some farmers also use **weedicides**.

Irrigation

The process of supplying water to the crops is called irrigation. Irrigation can be done with the water from wells, canals, channels and sprinklers.

Addition of Manure and Fertilizers

Manure and fertilizers are very important for good crop. They make the soil fertile. Fertilizers are made from chemicals such as potassium and nitrogen while manure are made from animal and plant wastes.

Protecting Crops

After the crops are ready, it becomes essential to protect them from insects and pests. For this, farmers use insecticides and pesticides. Pesticides and insecticides should be handled and used very carefully as they may cause harm.

Harvesting

The process of cutting and gathering mature or ripe crops is called harvesting. A sickle or other machines are used to harvest crops. It is necessary to harvest the crop at the right time to get maximum produce.

Threshing

The process of separating grains from the harvested stalks of plants is called threshing. It can be done using bullocks or with the help of machines.

Winnowing

The process of separating husk from seeds by dropping them from a height is called the winnowing. Seeds are heavier, so they fall on the ground and husk is lighter, so it is blown further away by wind.

Storing

Proper storage of harvested crop is very essential. Grains are first dried completely and then stored safely. They are stored in mud or metal containers or jute sacks. They are stored in godowns. Vegetables and fruits are stored in a cold storage.

Selling

The crops are sold by the farmers to the wholesalers and they in turn sell them to retailers. Common people purchase them from the retailers.

Maintaining the Fertility of Soil

It is very necessary to maintain the fertility of soil to get good crops year by year. There are a number of methods which farmers can use to maintain the fertility of the soil. They use mixed cropping method in which two or more crops are grown at the same time. They also use crop rotation method in which they grow two or more crops in the same field alternately. They leave the field uncultivated to help the soil to regain fertility. Adding manures and fertilizers is very useful to maintain the soil fertility. Our government also organizes many workshops and radio and television programmes for farmers to tell them about new techniques of growing crops.

The human population is growing very rapidly. Hence, the demand for food has also increased. As a result, land and other natural resources are being overused. Careless use of natural resources and other activities of human beings have decreased the fertility of soil and increased pollution in the air and water. For getting the most from the nature, human beings should use natural resources judiciously.

It's Activity Time

Visit a farmer with your parents and ask him how he maintains the fertility of the soil in his field.

Values

Farmers should use new and advance techniques of growing crops. It would provide them high yield.

Word Power

food Producer	: one who produces food
plough	: a tool used to loosen soil
seed drill	: a machine used to sow seeds in the field

Summary

- Agriculture is the process of growing crops and breeding animals.
- The early man wandered here and there in search of food.
- The early man was a hunter and food gatherer.
- There was a great change in his life after he learnt how to grow crops.
- Plants that are grown in a field are called crop plants.
- There are several stages of growing food like preparing soil, sowing seeds, weeding, irrigation, adding manure and fertilizers, protecting crops, harvesting, threshing, winnowing and storing.

Practice Time

A. Fill in the blanks.

1. _____ also called farming is the process of producing food.
2. _____ also started domesticate animals like cow, goat and sheep for household use and farming.
3. The land in which plants are grown is called _____.
4. Farmers loose and turn soil by _____.
5. A _____ is drawn over the field to cover the scattered seeds with soil.

B. Match the following.

1. Unwanted plants in a crop	(a) Leveller
2. Tool used to level the soil	(b) Irrigation
3. Plants grown in field	(c) Weeds
4. Supplying water to a crop	(d) Ploughing
5. Loosening and turning the soil	(e) Crop

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. The early man did not know how to grow crops. ☐
2. Manure and fertilizers are not necessary to increase the fertility of the soil. ☐
3. Every crop can be grown at every place and in every season. ☐
4. Some farmers practise mixed cropping to increase the fertility of the soil. ☐
5. Crop rotation is not useful for increasing the soil fertility. ☐

D. Answer the following questions.

1. Differentiate between threshing and winnowing.
2. Why is it necessary to plough the field?

3. What methods are used by farmers to maintain the fertility of soil?
4. What is the use of pesticides and insecticides?
5. Why are manures and fertilizers added to soil?

Brainstorm

You must have seen a scarecrow in some fields. Why do farmers use them?

Find Out

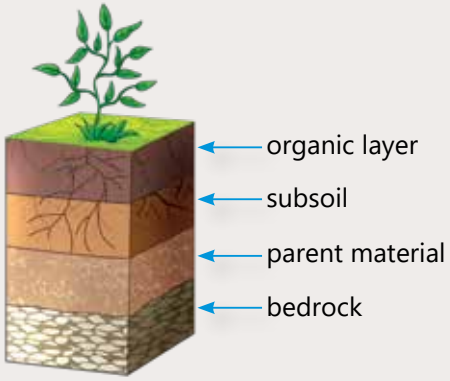
Wheat and rice are used to make different dishes in different parts of the world. Make a list of items made from them.

Items made from wheat : _____

Items made from rice : _____

Fun to Learn

The soil has many layers as shown in the picture given alongside. Which layer of the soil is the most fertile and why?



Life Pillars

Excessive use of chemical fertilizers in fields causes pollution. Therefore, farmers should lessen their use. In the same way, insecticides and pesticides are harmful for human health. They also cause pollution.

Do to Learn More

Seeds of some plants are not sown directly in the soil. They are first sown in pots or in a nursery. When they grow into seedlings or small plants, they are picked and transplanted to the fields. What is this procedure called? What are the plants which are grown by the procedure of transplanting?

18

Simple Machines

Curricular Goals

- Lever
- Pulley
- Inclined Plane
- Wedge
- Screw
- Wheel and Axle

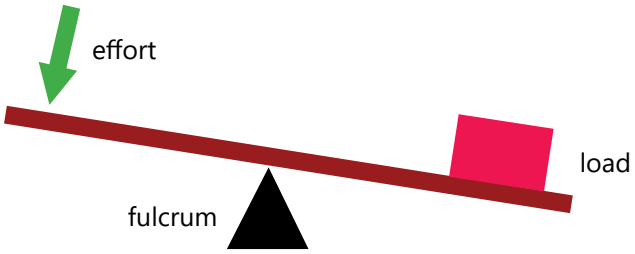
The early man did not have machines like we have today. He used his hands, feet and teeth to do his work. He used his hands to lift and carry objects. He cut things for food by biting with his teeth. In due course of time, he found out ways to make his work easier.

Now, we have simple machines like levers, pulleys, inclined planes, wedge, screws and the wheel and axle. They are the most basic of the machines that we use daily to make our work easier. These simple machines require human to work. They ensure that we need less force to do the same amount of work.

Lever

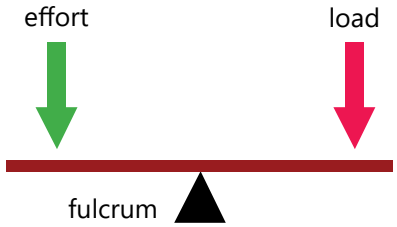
A lever is a simple machine which helps us to lift heavy load. It consists of a rigid bar. This bar is free to turn about a fixed point called a **fulcrum** which is a pivot point. The effort force is applied on one arm of the bar and the other arm goes up or down in the opposite direction. The idea of a lever is based on three things – effort, distance and balance.

Effort is the force which is applied on one arm of the lever. The balance point of a lever is called fulcrum. It is the unmovable part of the machine. The effort is applied at the different point from the load. The closer the fulcrum to the load, the less force is needed to lift the load.



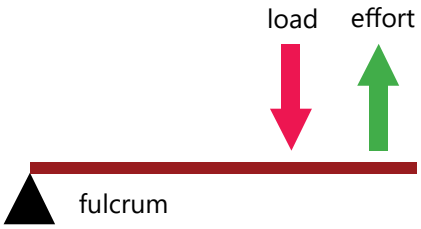
There are three types of levers depending on the position of the fulcrum.

First Class Lever: It has the fulcrum in the middle as in a see-saw. Other examples of first class lever are a car jack, a pair of pliers, a pair of scissors, a water pump, a balance or pair of weigh scales and a crowbar.



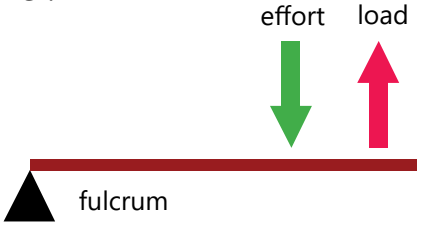
first class lever

Second Class Lever: In second class lever, the load is in the middle, between the effort and the fulcrum. The fulcrum is usually closer to the load. A wheelbarrow, a pair of nutcrackers and a bottle opener are the example of second class lever.



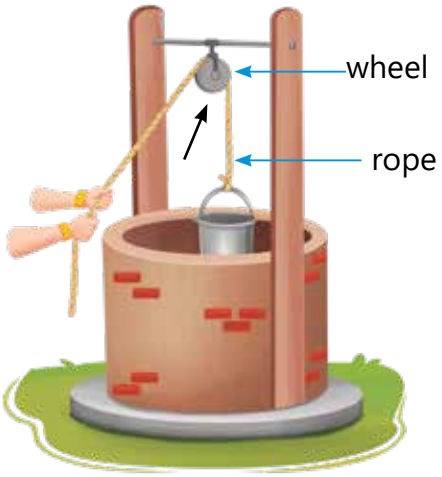
second class lever

Third Class Lever: In this type of lever, the effort is in the middle, between the load and the fulcrum. This arrangement requires large force to move the load. But this arrangement facilitates movement of the load over a long distance with a relatively small movement of the force arm. Its examples are a fishing pole, a pair of tweezers, a pair of calipers, a tennis racket, a spade, or a shovel.



third class lever

Pulley



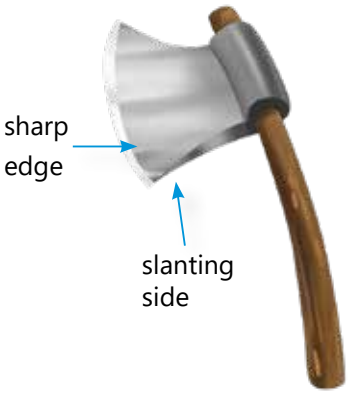
It is a wheel with a grooved track for the rope, belt or chain to move through it. In this simple machine, a wheel rotates freely on the axle. A pulley may be a fixed pulley or a movable pulley. The fixed pulley acts as a first-class lever. The fulcrum is the axle (the point at which the pulley is supported). The movable pulley moves along a rope or wire. It causes increase in force and works like a turning second class lever. Pulleys make lifting easier.

It is much easier to pull down than to pull up a load, as our own body weight and gravity help us to pull down. Thus, a pulley is used extensively to do twice as much work with the same effort. Some situations where pulleys are used are drawing water from a well, raising a flag on a flagpole and workers loading goods.

Inclined Plane

An inclined plane is a slope or a ramp. It is useful in moving or raising heavy objects. With its help, a heavy load can be lifted with less force. If ramp is longer, person will need less force to move the object up as compared to shorter ramp. A ramp is used by a workman to push a heavy load on wheels up into a truck. Its examples include an escalator, slide, slope such as the side of a hill.

Wedge



A wedge is made up of two inclined planes back to back. It is used to force things apart. An axe is a good example of a wedge. The head of an axe is a wedge. It is used to cut wood and rocks. Other examples of a wedge include blade of a knife, razor and a chisel.The narrower the wedge, the easier it is to drive it in and push things apart.

Check Your Knowledge

1. You would have noticed that it is easier to climb a sloping staircase than a steep staircase. Why?

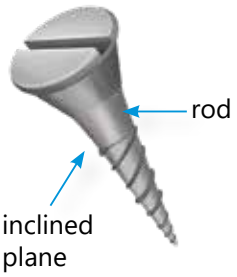
   _____

2. Is a fishing rod an example of pulley? How?

   _____

Screw

A screw is an inclined plane wrapped around a cylinder. The inclined plane makes ridges in a spiral along the cylinder. These ridges are called the threads. The distance between the threads is called the pitch of the screw. A screw is used for holding things together and lifting heavy objects. With the help of a screw, we can interlock two things in such a way that they can't be forced to separate.



It's Activity Time

Unscramble the following to get the names of simple machines.

1. SCSIORSS _____
2. GWEDE _____
3. VERLE _____
4. HSRAPNERE _____
5. LULPEY _____
6. ESCRW _____

Wheel and Axle

The arrangement of a wheel and an axle forms a simple machine in which a large wheel rotates around the centre or axle. An axle refers to a smaller wheel which is attached at the centre of a larger wheel. The wheel and axle move together to make the work easier. Effort applied to the wheel helps in turning the axle and vice versa. Wheel and axle is used for moving and lifting loads. Tyres of cars, screwdriver, pencil and sharpener and door knobs are the examples of wheel and axle.

Need to Know

No one knows when the wheel was invented but it is the one of the most important invention of human beings. We cannot even imagine our lives without any vehicles and all other wonderful machines around us.

Values

Machines make our work easier. However, we should not be dependent on machines for all our work. We should also do some work manually to keep ourselves healthy.

Word Power

fulcrum : the support, or point of rest, about which a lever turns in moving a body
ramp : an inclined surface connecting two levels
axle : a shaft on which a wheel rotates

Summary

- A machine makes our work easier.
- Simple machines are the most basic machines which help us do our work without much effort.
- Lever is a rigid bar or rod that rests on a support called fulcrum.
- A pulley consists of a rope or chain wrapped around a wheel.
- A sloping or a slanting surface connecting a lower level to a higher level is called a inclined plane.
- A wedge is a pair of inclined plans attached back to back.
- A screw is actually an inclined plane wrapped around a rod.
- A wheel and axle arrangement is a simple machine in which a large wheel rotates around the centre or axle.

Practice Time

A. Fill in the blanks.

1. A car jack is an example of _____ lever.
2. A wheel and _____ together act as a simple machine.
3. _____ are devices, which help us to do a great deal of work with less effort.
4. A lever's balance point is called its _____.
5. An axe is an example of a _____.

B. Match the following.

1.	Ladder	(a)	Wheel and axle
2.	Jar lid	(b)	Pulley
3.	Light switch	(c)	Inclined plane
4.	Door knob	(d)	Screw
5.	Car's wheel	(e)	Lever

C. Mark (✓) for a correct statement and (×) for an incorrect statement.

1. A fixed pulley acts as a second class lever. ☐
2. A lever's balance point is called its fulcrum. ☐
3. Simple machines are the most complex machines that we use daily to make work easier. ☐
4. An inclined plane helps a person to move or raise heavy objects. ☐
5. Wheelbarrow is an example of second class lever. ☐

D. Answer the following questions.

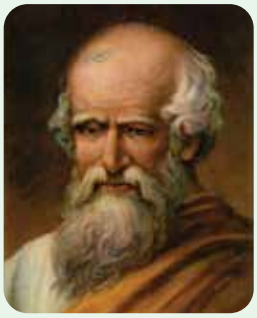
1. What do you mean by a simple machine?
2. What is the use of a lever?
3. How is a wedge useful for us?
4. Explain what is a wheel and axle arrangement. What are its uses?
5. What is a screw? Mention its uses.

Brainstorm

It is not right to depend completely on machines to do all your work. Discuss.

Find Out

Given below is the picture of Greek philosopher. He is known to discover simple machines. Find out his name and his other achievements.



Fun to Learn

Name this simple machine and tell where it is used for and how it works.

Life Pillars

We should be grateful to the scientists who have contributed in the development of modern machines which have made our life easier and comfortable.

Do to Learn More

Take a heavy book and put it on the table. Now push the book with your hands. Again, take some pencils and put them on the table horizontally side by side. Put the book on the pencils and again push it. In which set up did you have to use less force to push the book? Why?

Global Warming

(Only for Reading)

We all know that the Earth is getting hotter and the days are getting warmer and warmer. It is often said that it is due to global warming. What is Global warming?

Global warming is the process of rising the Earth's atmospheric temperature. Our Earth is covered with a blanket of air that protects us from the harsh rays of the Sun and allows for the nights to be cool. The atmosphere consists of greenhouse gases like carbon dioxide, water vapour, methane and nitrous oxide. Greenhouse gases are essential for keeping the earth warm for the survival of living beings. Due to various human activities, the amount of green house gases has started rising resulting in enhanced green house effect that is increasing global temperature. It is called global warming.

What is greenhouse effect?

Have you ever seen a greenhouse? A greenhouse is made of glass that allows the sun's rays to shine into during the daytime. It makes the plants and air inside the green house warm. At nighttime, it's colder outside, but the greenhouse stays pretty warm inside. That's because the glass walls of the greenhouse trap the Sun's heat.

Now, think of the Earth as a giant greenhouse. The greenhouse gases act just like the glass, this is how the Earth gets warm from the Sun even though it is about 93 million miles away. The greenhouse gases like-carbon dioxide, water vapour, methane, nitrous oxide and ozone allow the Sun's rays to shine in but prevent the heat from escaping the Earth. This way of warming the Earth's surface is called the greenhouse effect.

What is climate change?

A change in the average conditions of the Earth such as temperature and rainfall in a region over a long period of time is called Climate change. Global climate change means the average long-term changes over the entire Earth. These include increasing earth's temperarure and changes in precipitation, as well as the other effects of Earth's warming are rising sea levels, shrinking mountain glaciers, ice melting at a faster rate than usual and changes in flowering and blooming pattern in Greenland, Antarctica and the Arctic.

Signs that the climate is changing.

- surface temperature is rising on the land and sea.
- sea level is rising
- glaciers are melting fast.
- rising temperatures are affecting plants and animals.

Who is responsible for Global warming?

We, the humans, are most responsible for global warming and thereby climate change. How? Mainly because of our two activities.

Burning fossil fuels

You can see more and more vehicles on the road and more machines in industries and homes. Fossil fuels like coal or petroleum are used to run these machines. These machines release huge amount of carbon dioxide and other green house gases into the atmosphere thereby cause green house effect and further global warming.

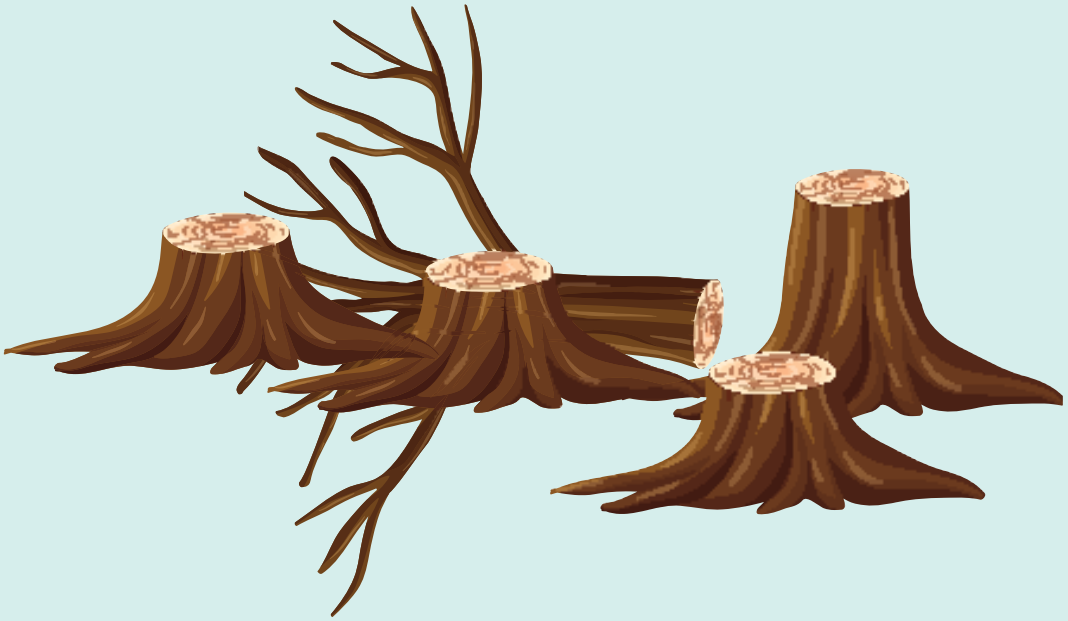
Deforestation:

It means cutting down of forests and green trees. When trees are cut down and burned, their stored carbon is released into the air as carbon dioxide thereby contributing to global warming.

What can you do?

You can do some simple things to prevent global warming.

- Save energy in your everyday life. Turn off the lights and fans when not required. Switch off the computer when not in use.
- Ask your parents to replace normal lights at home with CFL lights. They consume less energy.
- Tell your parents to switch off car engines when waiting for you at school. This reduces fuel and thereby saves energy.
- Plant more and more trees so that the level of carbon dioxide can be reduced. Carbon dioxide is considered as major green house gas.
- Spread awareness about global warming and ways in which we can reduce it.



Test Paper - 1

A. Fill in the blanks.

1. In the ancient time, women were confined to _____ only.
2. Braille script was invented by _____.
3. _____ games are supervised by referees or umpires.
4. A gymnast shows his skills in the game of _____.
5. Sunderbans are also called the _____ forests.

B. Write T for true and F for false statements.

1. All plants can reproduce only by seeds.
2. Carnivores are flesh-eating animals.
3. A carpenter lays bricks and builds our houses.
4. Deep freezers are used for storing food for a longer time.
5. Paper is made from wood pulp.

C. Match the following.

1. Lungs	(a) Green lungs
2. Forests	(b) Fungi
3. Mushroom	(c) Exchange of gases takes place
4. Mud and straw	(d) Oil wells
5. Petroleum	(e) Kutcha house

D. Define the following.

1. Refrigeration
2. Occupation
3. Aquatic plants
4. Vegetative propagation

E. Answer the following questions.

1. What are the positive impacts of migration?
2. What are individual games? How are they different from team games?
3. What is a diaphragm? Explain its role in the process of breathing?
4. What is Project Tiger? When was it started and why?
5. Why is iron required by our body?

Test Paper - 2

A. Fill in the blanks.

1. The leaves of the _____ are modified into a pitcher.
2. In earthquake prone areas like Japan houses are made from _____ and wood.
3. The intensity of an earthquake is measured on the _____ scale.
4. Coal is used to produce _____.
5. A _____ is drawn over the field to cover the scattered seeds with soil.

B. Write T for true and F for false statements.

1. Natural disasters take place because of human activities.
2. Budget is a major factor in determining the type of houses.
3. Whale is a mammal that lives in water.
4. Renewable sources of energy make our environment dirty.
5. The task of queen bee is to collect food.

C. Write the reasons for the following.

1. Houses in plains have thick walls and high roofs.
2. Honeybee is social insect.
3. Pesticided and insecticides should be handled carefully.
4. Crop rotation is very useful for increasing soil fertility.

D. Differentiate between the following.

1. Food chain and food web
2. Honeybee is social insect.
3. Renewable and non-renewable energy sources
4. Wedge and inclined plane

E. Answer the following questions.

1. What is the difference between a *kutcha* and *pucca* house?
2. How can we help people affected by natural calamities?
3. What do you mean by simple machines? Explain with examples.
4. What methods are used by farmers to maintain the fertility of soil?
5. What is peculiar about the Sun Temple at Konark?