

ENVIRONMENTAL STUDIES

(Part One)

STANDARD FIVE



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**Maharashtra State Bureau of Textbook
Production and Curriculum Research, Pune.**



229CUY

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The Constitution of India

Preamble

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens:

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity; and to promote among them all

FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation;

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949, do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.

NATIONAL ANTHEM

Jana-gana-mana-adhināyaka jaya hē
Bhārata-bhāgya-vidhātā,

Panjāba-Sindhu-Gujarāta-Marāthā
Drāvida-Utkala-Banga

Vindhya-Himāchala-Yamunā-Gangā¹
uchchala-jaladhi-taranga

Tava subha nāmē jāgē, tava subha āsisa māgē,
gāhē tava jaya-gāthā,

Jana-gana-mangala-dāyaka jaya hē
Bhārata-bhāgya-vidhātā,

Jaya hē, Jaya hē, Jaya hē,
Jaya jaya jaya, jaya hē.

PLEDGE

India is my country. All Indians
are my brothers and sisters.

I love my country, and I am proud
of its rich and varied heritage. I shall
always strive to be worthy of it.

I shall give my parents, teachers
and all elders respect, and treat
everyone with courtesy.

To my country and my people,
I pledge my devotion. In their
well-being and prosperity alone lies
my happiness.

Preface

The ‘Primary Education Curriculum 2012’ was prepared in the State of Maharashtra following the ‘Right of Children to Free and Compulsory Education Act, 2009’, the ‘National Curriculum Framework 2005’ and the ‘Maharashtra State Curriculum Framework 2010’. The Textbook Bureau has launched a new series of textbooks based on this syllabus approved by the State Government from the academic year 2013-2014. We are happy to place this textbook ‘Environmental Studies (Part One)’ Standard Five in this series in your hands.

Our approach while designing this textbook was that the entire teaching-learning process should be child-centred, emphasis should be given on active learning and constructivism and at the end of Primary Education the students should have attained the desired competencies and that the process of education should become enjoyable and interesting.

There are many colourful illustrations and maps in this textbook. Some activities have been included in this textbook under the titles ‘Can you tell?’, ‘Try this.’, ‘Use your brain power!’. They will help the students to understand the concepts introduced in the lessons and will also reinforce them. The textbook will motivate the children to observe their environment. Conscious efforts have been made to impart values which are relevant today in the context of this textbook.

Variety in the exercises will help the children to revise and retain the concepts in the lessons and will motivate them to study on their own. They will also help the teacher with continuous, comprehensive evaluation.

This textbook introduces the children to their natural, social and cultural environment. It attempts to develop the students’ skills of problem solving and application and a healthy attitude towards the environment.

The language of presentation used in this book is simple. The topics have been presented in an inter-disciplinary manner without forming compartments of science, geography and civics. It may lead to an approach that looks at several dimensions of an issue or topic simultaneously. We have tried to keep in mind the diverse experiences of all the children in Maharashtra while writing the book.

This book was scrutinized by teachers from all parts of the State, by educationists, experts and members of the syllabus committee to make it as flawless and useful as possible. Their comments and suggestions have been duly considered by the Subject Committees while finalising the book.

The members of Science, Geography and Civics Subject Committees, Panel members, quality reviewers and artists have taken great pains to prepare this book. The Bureau is thankful to all of them.

We hope that this book will receive a warm welcome from students, teachers and parents.



(C. R. Borkar)

Director

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Environmental Studies-Part 1-Standard V-Learning Outcomes

Suggested Pedagogical Processes	Learning Outcomes
<p>The learner may be provided opportunities in pairs/groups/individually and encouraged to :</p> <ul style="list-style-type: none"> • observe and explore the animals for the unique and unusual sense of sight, smell, hear, sleep and their response to light, heat, sound etc. • explore the sources of water in their nearby surrounding and how fruits, vegetables, grains, water reach their home and kind of processes/techniques employed to convert grain to flour and flour to <i>roti</i>, purification of water etc. • share experiences and discuss about the information collected or places visited with peers, teachers and elders. • prepare guide routes to reach from one place to another. • collect information from pictures/elders/books/newspapers/magazines/web resources/museums etc., about animals which have very sharp sense of hearing, smell and vision, different landforms such as plain area, hilly area, deserts, etc., and the varieties of flora and fauna, lives of people in such places. • discuss with elders and use pictures, visit museums and collect information related to the lives for food, shelter, availability of water, means of livelihood, practices, customs, techniques of different regions and different time periods. • visit petrol pumps, nature centres, science parks, water treatment plant, bank, health centre, wildlife sanctuaries, cooperative, monument, museum and if possible, far off places with different landforms, lifestyles and livelihoods, etc. to observe and interact with people living there and share experiences in different ways. • observe and share experiences for different phenomena such as how water evaporates, condenses, and dissolves different substances under different conditions, and how food gets spoilt, how seeds germinate and the direction in which roots, shoot grow and conduct simple experiments and activities to find out the same. 	<p>The learner-</p> <p>05.95A.01 explains the super senses and unusual features (sight, smell, hear, sleep, sound, etc.) of animals and their responses to light, sound, food etc.</p> <p>05.95A.02 explains the use of technology and the process of accessing basic needs (food, water etc.) in our daily life. Explains the role and functions of different institutions in daily life. (Bank, Panchayat, Cooperatives, Police Station, etc.)</p> <p>05.95A.03 describes the interdependence among animals, plants and humans (for example, communities earning livelihood from animals, dispersal of seeds etc.)</p> <p>05.95A.04 establishes linkages among terrain, climate resources (food, water, shelter, livelihood) and cultural life. (for example, life in distant/difficult areas like hot/cold deserts)</p> <p>05.95A.05 makes the activity groups to understand features and properties of objects and materials such as shape, taste, colour, texture, sound, traits etc.</p>

- conduct activities and simple experiments to check the properties/ features of different objects/ seeds/ water/ waste materials, etc.
- observe, explore surroundings and critically think how seeds reach from one place to another, how the plants and trees grow at places where no one plants them, for example forests, who waters them and who possesses them.
- visit the night shelters, people living in camps, old age homes, homes for orphanage/orphans' asylum in surroundings and interact with old and/handicap and who change their means of earning to find out where do people belong to and why they left their places, where their ancestors had been living for ages, migration of people and debate on various such issues in the surroundings.
- enquire from parents, teachers, peers and elders at home/ community to critically think and discuss to reflect on experiences of children related to situations at home, school, neighbourhood.
- discuss freely with peers, teachers and elders about the biases, prejudices, and stereotypes by providing counter examples to one another.
- visit departments/ institutes in the surroundings for example, Bank, Water Board, and Hospital and Disaster management centre and interact with related people and interpret different documents related to them.
- watch videos on different types of landforms and the variety of life forms found in such places, different institutions which cater to the need of societies, behaviour of animals, water scarcity, etc., followed by meaningful discussions and debates on occupations that derive from the peculiar geographical characteristics of different regions.
- perform simple activities, record the observations in the form of table/ sketch/ bar graph/ pie chart/ oral/ written form, etc., interpret and present their findings.
- discuss issues of living beings (plants and animals) as rightful inhabitants of earth, animal rights and ethical treatment to animals.
- share experiences of people who work selflessly for common good/welfare and motivates them.
- participate actively and undertake initiatives of care, share empathy, leadership by working together in groups e.g., in different indoor/outdoor/local/contemporary activities, games, dance, fine art, carry out projects/role play for taking care of a plant(s), feed birds/animals, things/elderly/handicap around them.
- conduct mock drills for emergency and disaster preparedness.
- understanding the processes of rotation and revolution.
- identifying landforms from maps and drawing them. For example, contours, tint method, and understanding the differences between signs and symbols.
- understanding the physical set-up of India.
- collecting information regarding various languages, costumes, festivals and celebrations in India.
- understanding the change in the means of transport and communication with time.

- 05.95A.06 records observations, experience, information with planning. (for example, chart/plotting/histogram/ pie chart) and predicts the patterns in activities and incidences. Establishes the relation between reasoning and effects. (for example, floating / sinking /mixing / evaporation /germination / spoilage / breathing / taste.)
- 05.95A.07 identifies signs, directions, location of different objects/landmarks of a locality/place visited in maps and predicts directions in context of positions of different places for a location.
- 05.95A.08 creates posters, designs, models, set ups, local dishes, sketches, maps (of neighbourhood/different places visited) using a variety of local/waste material and writes poems/slogans/ travelogue etc.
- 05.95A.09 gives opinions on observed/ experienced issues and relates practices/happenings to larger issues of society. (for example, discrimination for access/ownership of resources, migration/displacement/ exclusion, child rights).
- 05.95A.10 suggests ways for hygiene, health, managing waste, disaster/emergency situations and protecting/saving resources (land, fuels, forests etc.) and shows sensitivity for the disadvantaged/deprived.
- 05.95A.11 reads maps with the signs and symbols in a map.
- 05.95A.12 explains/describes the physical set up of India with the help of map.
- 05.95A.13 keeping in mind the political boundries of India explains the geographical, social and cultural characteristics.
- 05.95A.14 explains the effects on living organisms and the environment because of the excessive use of means of transport and communication.

CONTENTS

No.	Chapters	Page No.
1.	Our Earth and Our Solar System	1
2.	Motions of the Earth.....	6
3.	The Earth and its Living World	11
4.	Environmental Balance.....	18
5.	Family Values	24
6.	Rules Are for Everyone.	28
7.	Let us Solve our own Problems.....	32
8.	Public Facilities and My School	35
9.	Maps – our Companions	39
10.	Getting to Know India	44
11.	Our Home and Environment	51
12.	Food for All	58
13.	Methods of Preserving Food	64
14.	Transport	68
15.	Communication and Mass Media	73
16.	Water	77
17.	Clothes – our Necessity	82
18.	The Environment and Us	89
19.	Constituents of Food	96
20.	Our Emotional World	103
21.	Busy at Work – our Internal Organs	107
22.	Growth and Personality Development	115
23.	Infectious Diseases and how to Prevent them	121
24.	Substances, Objects and Energy	127
25.	Community Health and Hygiene	133

The following foot notes are applicable :-

1. © Government of India, Copyright 2015.
2. The responsibility for the correctness of internal details rests with the publisher.
3. The territorial waters of India extend into sea to a distance of twelve nautical miles measured from the appropriate base line.
4. The administrative headquarters of Chandigarh, Haryana and Punjab are at Chandigarh.
5. The interstate boundaries amongst Arunachal Pradesh, Assam and Meghalaya shown on this map are as interpreted from the “North-Eastern Areas (Reorganisation) Act.1971,” but have yet to be verified.
6. The external boundaries and coastlines of India agree with the Record/Master Copy certified by Survey of India.
7. The state boundaries between Uttarakhand and Uttar Pradesh, Bihar and Jharkhand and Chhattisgarh and Madhya Pradesh have not been verified by the Governments concerned.
8. The spellings of names in this map, have been taken from various sources.

1. Our Earth and Our Solar System

When we look up from an open ground, we see the sky. In a clear night sky we can see many stars. They are very far away from the earth.

Some stars are prominent while some are tiny and faint. If we look at them carefully, we find that many of them twinkle, but some do not.

The sun and the moon are comparatively close to the earth. So, we can see their round shapes clearly. The sun, the moon, the stars, the planets, etc. are all known as heavenly bodies.

Try this.



Observe the sky on two clear nights, keeping a gap of about a week between them. Base your observation on the following points :

- The brightness of the heavenly bodies
- Whether they twinkle
- Their colour and size
- Changes in their positions

On both nights, draw a picture of the illuminated portion of the moon and note how it changes from day to day.

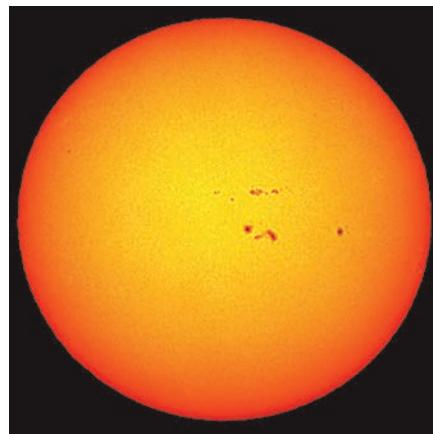
For teachers : For the sky-watching activity, call the children along with their guardians to a large open area on a clear dark night.

Stars : The heavenly bodies that twinkle are called stars. Stars have their own light.

The sun is a star. It is closer to us than any of the other stars. Hence, it appears big

and brilliant. In its bright light, during the day, we cannot see other stars.

Planets : The heavenly bodies that do not twinkle are called planets. Planets do not have light of their own. They get light



The sun

from the stars. Planets revolve around a star, even as they rotate around themselves.

The solar system : Our earth is a planet. It gets its light from the sun. It moves around the sun. Its movement around the sun is called the revolution of the earth.

Besides earth, there are seven other planets that revolve around the sun. They are Mercury, Venus, Mars, Jupiter, Saturn, Uranus and Neptune.



A photograph of the earth taken from a man-made satellite

Every planet in the solar system revolves around the sun along a specific path. This path is known as that planet's orbit. The sun, which is a star, and the planets that revolve around it are together called the solar system. Besides the planets, the solar system also includes various other heavenly bodies.

Other heavenly bodies in the solar system

Satellites : Some heavenly bodies revolve around planets. These are called satellites. Satellites too get their light from the sun. We see the moon at night. It revolves around the earth. Hence, it is called a satellite of the earth.



Most of the planets in the solar system have satellites. The planets revolve around the sun

The moon as seen on a full moon night

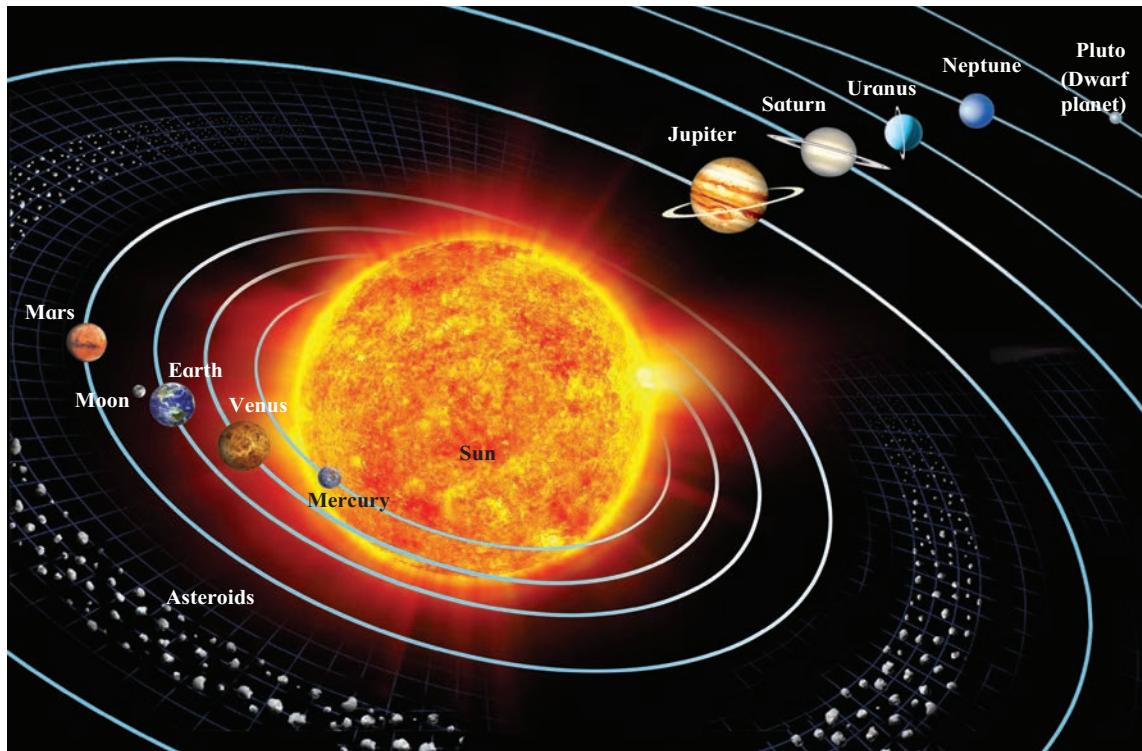
along with their satellites.

Dwarf planets : There are some smaller heavenly bodies that revolve around the sun. They are called dwarf planets. Of these, the most well-known is Pluto. Dwarf planets revolve independently around the sun. They have an orbit of their own.

Asteroids : Between the planets Mars and Jupiter, there is a band of numerous small heavenly bodies. They are called asteroids. Asteroids also revolve around the sun.

Compared to the sun, other heavenly bodies in the solar system are much smaller. The moon is closest to the earth. That is why, it appears to be so big although it is actually very much smaller than the sun.

A diagram of the solar system is given below. In it, you see the sun in the centre, the heavenly bodies that revolve around it and their orbits. The planets, satellites, dwarf planets and asteroids are all part of the solar system.



A diagram of our solar system. Please note that only the earth's satellite is shown in it.

Can you tell ?



Look at the picture of the solar system and answer the following questions.

- (1) Which planet is nearest to the sun?
- (2) At what position is the earth from the sun?
- (3) Which planet is placed between the earth and Mercury?
- (4) Name the planets beyond the orbit of Mars in serial order.
- (5) Which planet is furthest from the sun?

Gravity

All heavenly bodies exert a force of attraction or a pull on one another. This force is called the force of gravity.

The sun exerts a gravitational pull on all planets whereas the tendency of the planets is to move away from the sun. As a result of these two forces, a planet keeps revolving around the sun at a fixed distance in a fixed orbit. In the same way, satellites revolve around their planets.

In which direction do these things fall?

- (1) Leaves, flowers, fruits from a tree.
- (2) Rocks that come loose from a hillside.
- (3) Rain falling from the sky.

Due to the earth's gravity, all things on the earth remain on it. Even if we throw something upwards with great force, it finally falls down to the ground.

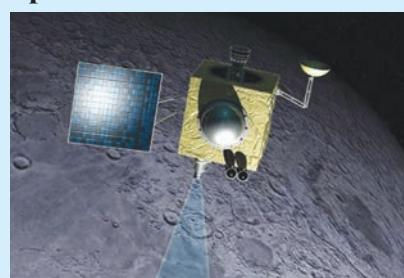
◆ **A new word – Space :** The emptiness between and beyond the stars and planets is called space or outer space.

People have always been curious about the heavenly bodies in the sky. They have always wanted to reach them. However, to send some object from the earth into space, it must be given power

Do you know ?



India's Space Missions



Chandrayaan

On 22 October 2008, the Indian Space Research Organization, ISRO, launched a spacecraft to the moon. The mission is known as Chandrayaan-1.

Mangalyaan is another important Indian space mission. It is known as M.O.M. or Mars Orbit Mission. It was launched on 5 November 2013. It got established in an orbit around the planet Mars on 24 September 2014. ISRO achieved this feat in its first attempt. Both these missions are unmanned, i.e. there were no people on board these spacecraft. The objective of the missions is a deeper study of the moon and Mars.



Mangalyaan



A photograph of the region around India taken by Mangalyaan

against the force of gravity. Rocket technology or space launch technology is used for that purpose.

One of the Diwali firecrackers is called a ‘rocket’. It is packed with explosive substances. The explosives burn rapidly and produce a lot of energy. The design of the rocket is such that the firecracker is pushed in a certain direction at a great speed.



Space launch using a rocket



Diwali rockets

Very powerful rockets are used to send a spacecraft into space. A tremendous quantity of fuel is burnt in rockets so that spacecraft weighing thousands of tons can be launched into space. In the twentieth century, a few countries of the world developed space technology and sent hundreds of spacecraft into space. Our country is well-known for the development of its space launch technology.

Some spacecraft remain in space. Some are brought back to earth while some land on other planets or satellites. In some missions, scientists also travel in the spacecraft. They are called astronauts.

Do you know ?



Indian astronaut



Rakesh Sharma became the first Indian astronaut to go into space in 1984. He spent eight days on a space station for a joint mission of the ISRO and the Soviet Intercosmos. Seeing India from space, he said that it looked ‘Saare jahan se achha!’

Find out more about the work of Kalpana Chawala and Sunita Williams, astronauts of Indian origin.

Man-made satellites : Man-made satellites provide useful information for agriculture, environment, weather forecasting, making maps, and searching for water and mineral wealth on the earth. They are also used for telecommunication. They are put into orbit around the earth. They can remain in space for many years.

Always remember –



Space scientists have not yet been able to find a single other planet which has life on it. Therefore, our earth is an invaluable planet. The degradation of its environment for any reason will be a threat to the existence of life itself.

What we have learnt –



- The sun is a star. All the other bodies in the solar system get light from the sun.
- The sun and the planets, their satellites, dwarf planets and asteroids that revolve around the sun are together called the solar system.
- Things on the earth remain on it due to the force of gravity.
- To travel in space, the earth’s gravitational force has to be overcome. Rocket technology helps us do that.

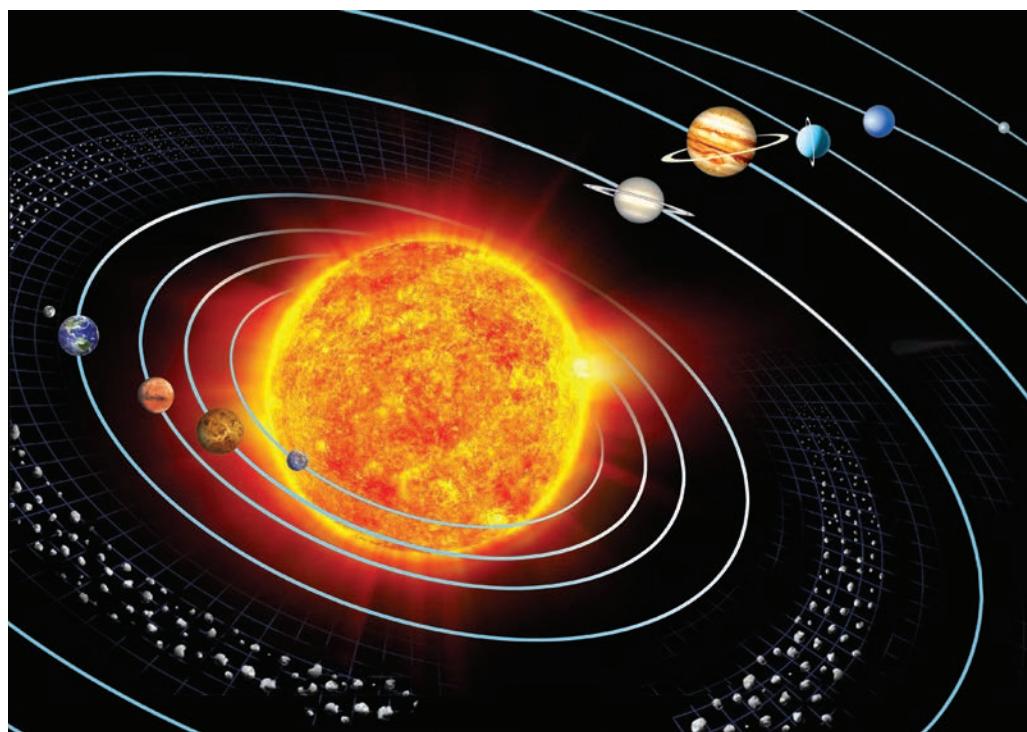
1. What's the solution ?

One of the asteroids has fallen out of its place in the asteroid belt and is hurtling towards the sun. Our earth is in its way and there is all likelihood of a collision. What can be done to prevent this collision?

2. Use your brain power !

- (1) What will happen to our solar system if the sun were to suddenly disappear?
- (2) Suppose you want to give your address to a friend you have on the planet Mars. How will you write your address if you want them to understand exactly where you live?

3. In the picture below, correct the sequence of the planets from the sun.



Activities (1) Make charts about space research and display them in an exhibition.
 (2) Find out which planets in the solar system have satellites.

4. Who am I ?

- (a) You can see me from the earth but the lighted part of me that you see changes every day.
 - (b) I have my own light. It is only from me that the planets get light and heat.
 - (c) I turn around myself, around a planet and also around a star.
 - (d) I turn around myself and revolve around the sun.
 - (e) No other planet has a living world like mine.
 - (f) I am the nearest star to the earth.
5. (a) For what purpose are rockets used in space travel ?
- (b) What information do man-made satellites provide ?

* * *

2. Motions of the Earth

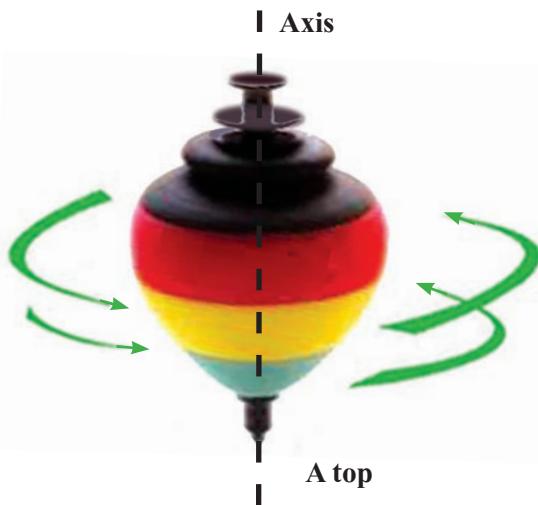
Rotation

Try this.



Take a top. Spin it and observe its movement.

The top turns around itself. Any object that turns about itself actually turns around a certain imaginary line. The turning of an object around itself is called ‘rotation’ and the imaginary line around which it rotates is called the ‘axis of its rotation’.



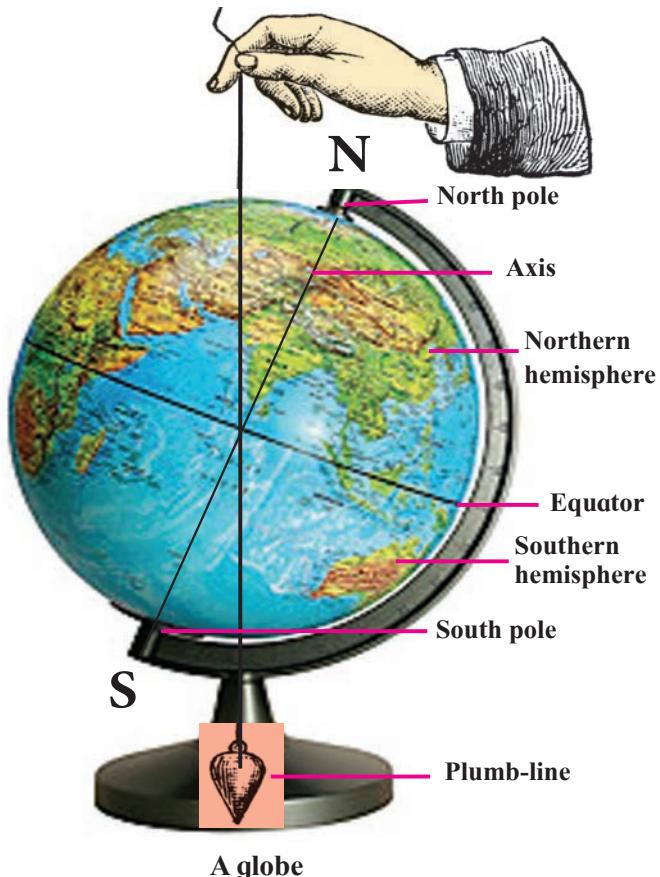
The earth's rotation

Try this.



Take a globe like the one in the picture and spin it. Note the line around which it rotates. Now take a plumb-line and hold it close to the globe as shown in the picture. (If you cannot get a plumb-line, tie a long thread to an eraser and make one.)

You will see that the plumb-line and the earth’s axis are at an angle to each other. That is, the earth’s axis is inclined.



The earth rotates with its axis inclined like this. The line NS in the picture shows the earth’s axis. It passes through the centre of the earth. The points N and S are called the poles of the earth. N is the north pole of the earth and S is the south pole.

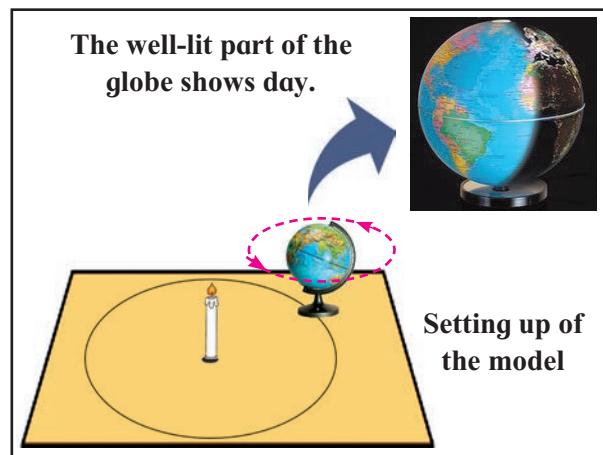
If a circle were drawn around the surface of the earth exactly in between the north and south poles, it would divide the earth into two equal parts. This imaginary circle is called the ‘equator’. The two equal parts it makes of the earth are called the northern hemisphere and the southern hemisphere respectively.

Try this.



Stand a candle in the middle of a large table. Draw a big circle around the candle. Place a globe at any point on this circle. Light the candle. See that it is dark in the room. Suppose that the candle is the sun.

Observe which part of the globe gets the sun's light and which one does not.



Now, looking at the globe from the direction of the north pole, turn it anti-clockwise. This is how the earth rotates, i.e. it rotates from west to east. As the earth rotates, its different parts come into the light of the sun one after the other and turn away from it also in the same order.

Sunset and sunrise

Try this.



Stick a red bindi on the globe. Set up the previous model of the globe and the candle.

Turn the globe anti-clockwise. Note when it is sunrise, noon and sunset at the location of the bindi.



Day and night on the globe

After one sunrise, note when the next one occurs at the bindi. You will see that this happens when the earth completes one rotation, that is, when it makes one complete turn around itself.

This period of time that the earth takes to complete one rotation is called a day. A day has two parts, daytime and nighttime or simply day and night. For the purpose of measuring time, we divide the whole day into 24 parts, each of which is called an hour.

A year

Try this.



Now, move the globe along the circle on the table. As you do this, keep rotating the globe and ensure that the axis does not change its orientation. Eventually, the globe will come back to its original place on the circle. This is how the earth revolves around the sun even as it rotates around itself. The period of time the earth takes to complete one revolution around the sun is called one year. There are about 365 days and 6 hours in a year.

A leap year

In the Gregorian calendar, the year is taken to have 365 days. It means that it counts 6 hours less every year. That makes 24 hours or one day in every four years. To make up for this lost one day, the month of February in the Gregorian calendar has an extra day every fourth year. That year is called a leap year and it has 366 instead of 365 days and February has 29 instead of 28 days.

Do you know?



You know that the length of day and night is not always equal. This happens because of the earth's inclined axis and its revolution around the sun.

In the northern hemisphere, between 22 March and 23 September, the days are longer than the nights. Therefore, it is warmer there. That is, it is summer in the northern hemisphere. However, during this same period in the southern hemisphere, the nights are longer than the days. The earth gets less heat in these parts and therefore it is winter in the southern hemisphere.

In the period from 23 September to 22 March, the days are longer than the nights in the southern hemisphere. It gets more heat and it is summer there. In this period in the northern hemisphere, it is the nights that are longer. The northern hemisphere gets less heat and it is winter there.

Note that there may be differences in these dates due to the leap year.

In India, summer, the rainy season and winter are considered to be the main seasons. We also divide the year into six seasons, namely, Vasant, Grishma, Varsha, Sharad, Hemant and Shishir.

This cycle of six seasons is called the 'rituchakra'. Many of our festivals are connected with the seasons. Many of our songs and games are also related to the different seasons.

Phases of the moon

Can you tell?



- (1) What is the name given to the changing shapes of the moon that we see?
- (2) What are the names of the days on which we see a round moon and on which we see no moon at all?

The full moon and the new moon

The moon revolves around the earth and the earth revolves around the sun. However, these two orbits intersect. Hence, the sun, the moon and the earth are not always along a straight line.

We see half of the moon's surface which faces the earth. That is, from the earth we see only one side of the moon.

The moon has no light of its own. We can see the moon because of the sun's light that falls on it. On a full moon night, we see the entire side of the moon that faces the earth. On a new moon night, we cannot see any of it.

From the full moon to the new moon the illuminated part of the moon seen from the earth becomes smaller and smaller. From new moon to full moon it again grows bigger and bigger. These different shapes of the moon that we see are called the phases of the moon.

The lunar month and days (tithi)

You know that it takes 14 or 15 days from new moon to full moon. This is the

fortnight of the ‘waxing’ moon. After the full moon, the moon appears smaller and smaller and after 14-15 days it is new moon again. This period is the fortnight of the ‘waning’ moon. Thus, the period from one new moon to the next is of 28 - 30 days. It is called the lunar month. Every day of the lunar month is called a *tithi*.

Always remember –



The rotation of the earth gives rise to day and night. The revolution of the earth and the inclination of its axis give rise to the cycle of seasons.



The phases of the moon

The new moon $\xrightarrow{15 \text{ days}}$ The full moon = The waxing moon (*Shukla Paksha*)

The full moon $\xrightarrow{15 \text{ days}}$ The new moon = The waning moon (*Krishna Paksha*)

The fortnight of the waxing moon + The fortnight of the waning moon = A lunar month

What we have learnt –



- The rotation of the earth causes day and night.
- The revolution of the earth around the sun and its inclined axis together cause the seasons.
- The revolution of the moon around the earth gives rise to the phases of the moon.

- The period from one new moon to the next is called a lunar month. It has about 28 to 30 days.
- The fortnight ending on a full moon is that of the waxing moon. The fortnight that ends on a new moon is that of the waning moon.
- The days of the lunar month are called ‘*tithis*’.

Exercises

1. What's the solution ?

Amit wants to take his granny to Australia which is in the southern hemisphere. But she cannot bear very cold weather. When should they make this trip ?

2. Use your brain power !

- (a) How many rotations does the earth complete during one revolution around the sun ?
- (b) It is sunrise at Itanagar in Arunachal Pradesh. Write the names of the following cities in the order in which the sun will rise there.

Mumbai (Maharashtra), Kolkata (West Bengal), Bhopal (Madhya Pradesh), Nagpur (Maharashtra).

3. Fill in the blanks.

- (a) The motion of the earth around itself is called
- (b) The motion of the earth around the sun is called

- (c) The rotation of the earth gives rise to

4. What is meant by each of the following terms ?

- (a) Full moon
(b) New moon
(c) Lunar month
(d) *Tithi*

5. Answer the following questions.

- (a) What is the equator ?
(b) What are the two parts of the earth made by the equator ?

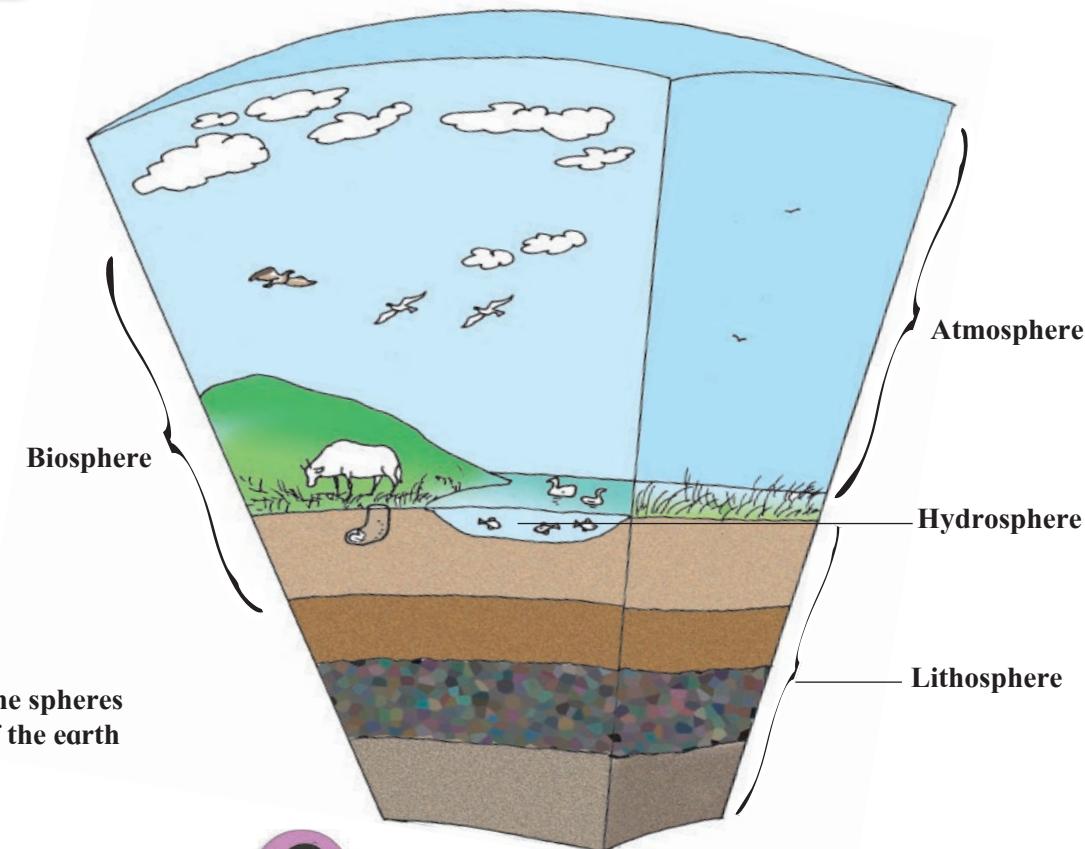
Activity

Find the names of the various ‘*tithis*’ using a calendar which shows them.

* * *



3. The Earth and its Living World



Can you tell ?

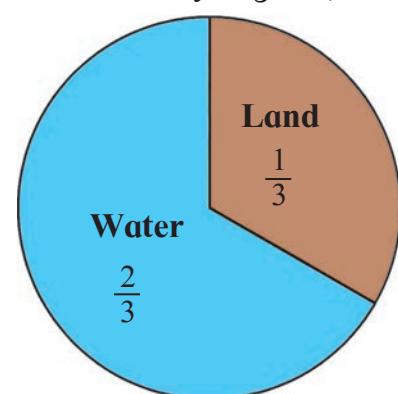
- (1) Where do you get water from?
- (2) Where do we lay the foundation of buildings?
- (3) What need do we meet through breathing?
- (4) From where does the earth get light and heat?

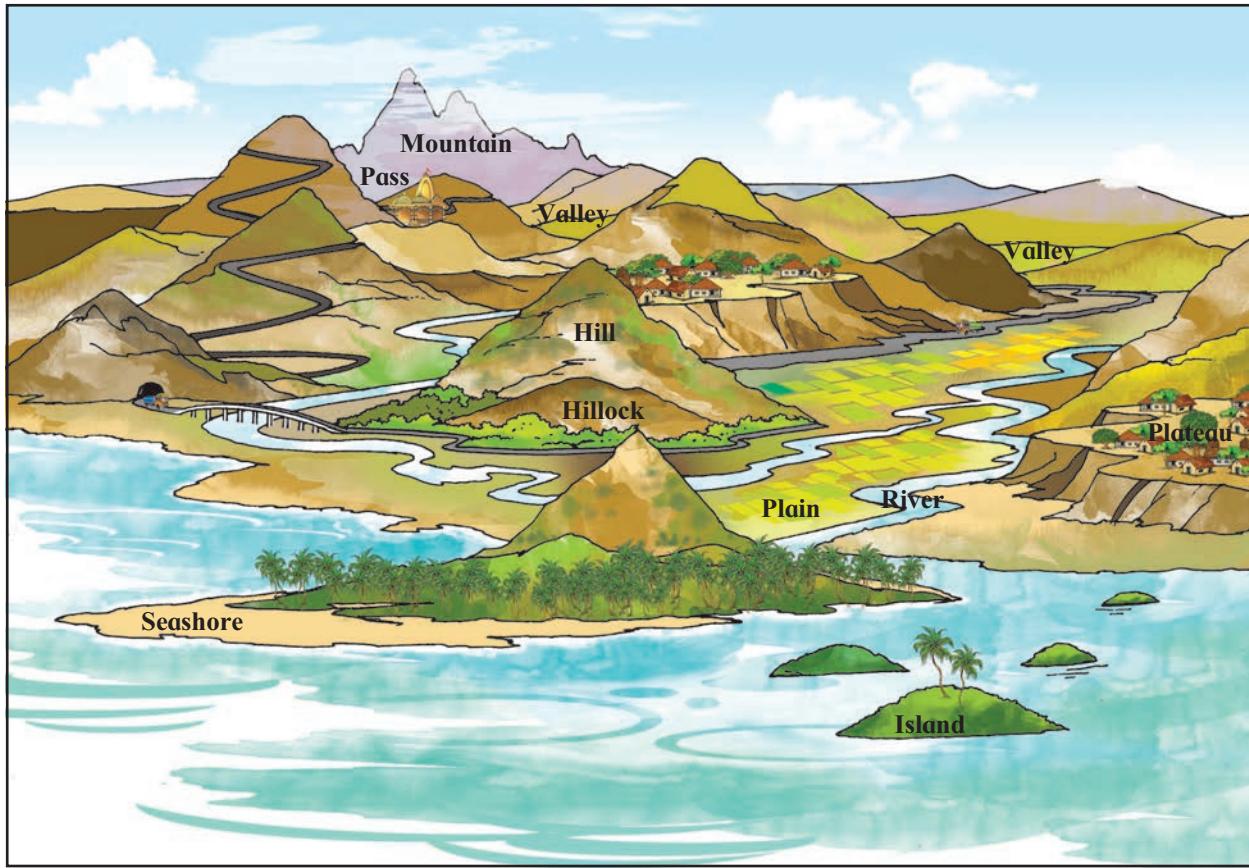
On the surface of the earth, we find land in some places and water in others. The earth is surrounded by the atmosphere. There are living things on land, in water and in the air. The sun is the cause of many natural processes on the earth. Water, land and air constitute envelopes of the earth, namely, the hydrosphere, lithosphere and atmosphere. The biosphere spreads in all the other three spheres.

The lithosphere and the hydrosphere

The earth's crust is hard. It is mainly made of rock.

When we travel in hilly regions, we see layers of soil and rock along roadcuts. We see grassy expanses of land in some places and only sand in others. The land is covered with crops in some places and with forests in others. Sometimes we get to see the deeper layers of soil into which tree roots spread. At others we see rocks split apart by the





Various landforms

tree roots. There are gentle mountain slopes as well as sheer cliffs of rock. All these land features are a part of the earth's lithosphere. Much of the earth's surface is occupied by water. The lithosphere extends under this water too.

About a third of the surface of the earth consists of land. A vast continuous stretch of land is called a continent. The land on earth is divided into seven continents. They are Asia, Europe, Africa, North America, South America, Antarctica and Australia. Asia is the largest continent and Australia the smallest.

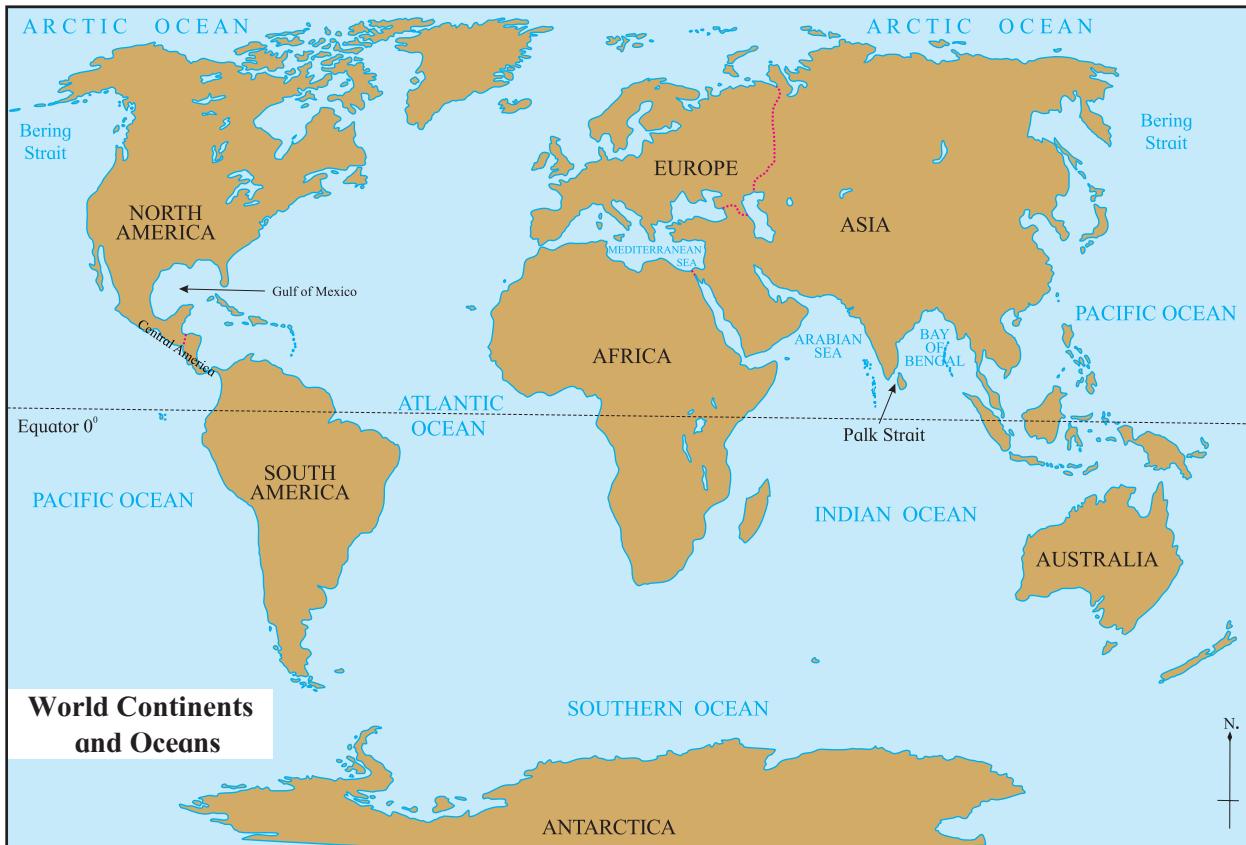
The land is not even in all places. The unevenness gives different shapes to the land in different places. They are called landforms. In the picture above you can see some landforms like the plain, hill, mountain, etc.

Two-thirds of the earth's surface is covered with water. Most of this water is in the oceans. Ocean water is salty. There are five oceans, namely, the Atlantic, Pacific, Arctic, the Southern Ocean and the Indian Ocean. The land along the margins of an ocean is called the coastal region. Water bodies of different shapes and sizes are formed along the coast, for example, sea, bay, strait, gulf, creek, etc. These water bodies are part of the ocean.

Surface water

There are many streams of water flowing over the land. This water is not salty but fresh. These streams of water may be rills, brooks, streams or rivers. Rills are the smallest and rivers, the biggest.

Rills, brooks, streams join each other to form rivers. Rivers which join to make



a bigger river are called its tributaries. In some places, a river cascades down a sudden drop. This forms a ‘waterfall’. All rivers eventually flow into the ocean.

Lakes : A water body formed by water collecting naturally in a low-lying area of land is called a lake.

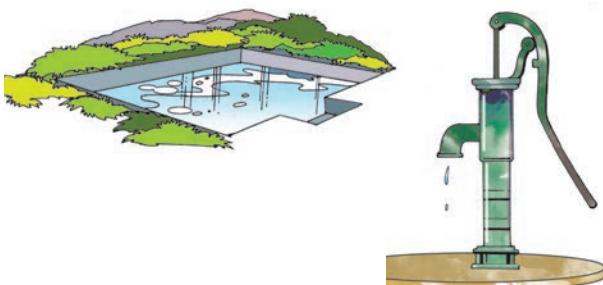
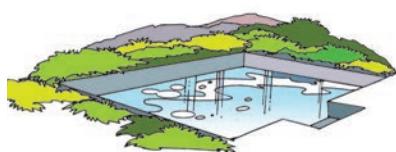
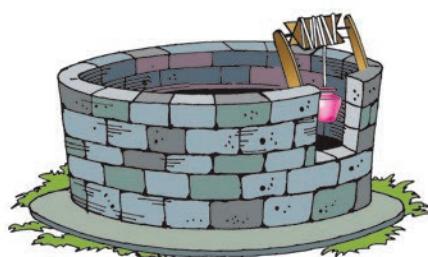
Water in the form of ice : Water particles in the clouds freeze and in cold regions, they come down in the form of snow. When layers of snow pile up on the ground, they form ice. When such layers of ice pile up in a low-lying area, they become enormous in size. This huge mass slips down a slope at a very slow speed. This is called a glacier.

There are also huge blocks of ice floating in the sea. They are called icebergs.

Groundwater : Besides these water bodies on the earth’s surface, there is a lot of water stored in the underground layers

of rock. It is called groundwater. We reach it by means of dug wells and bore wells. Many lakes and wells get water from underground springs.

The water or ice that occupies the earth’s surface, groundwater and the water vapour in the atmosphere together form the earth’s hydrosphere.



The atmosphere

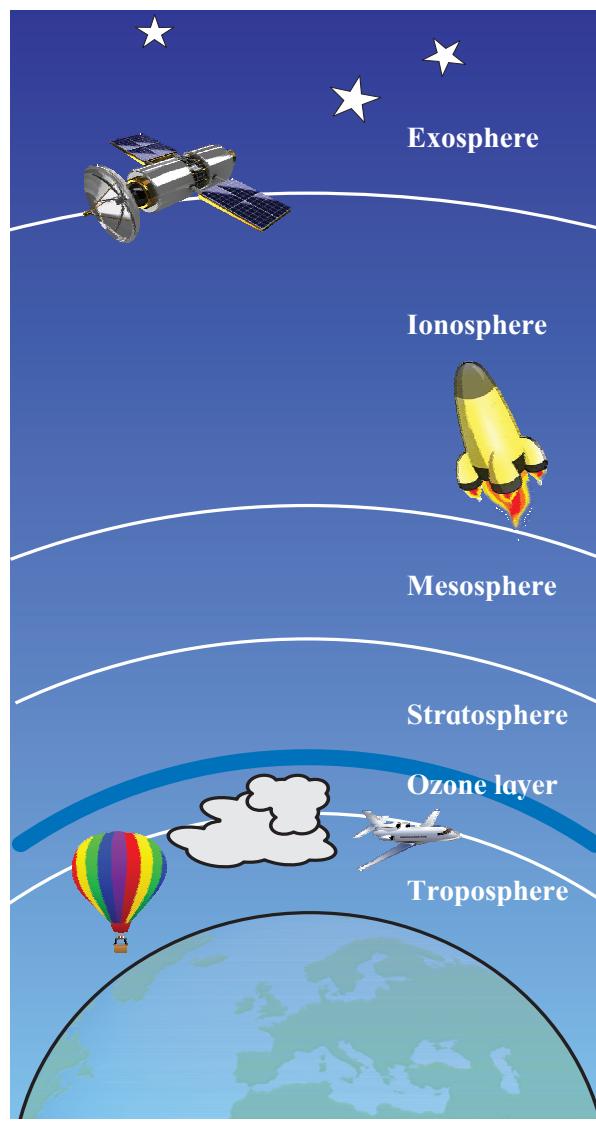
The envelope of air around the earth is called the atmosphere. As we go higher from the surface of the earth, the air in the atmosphere becomes rarer. The air consists of a mixture of gases, namely, nitrogen, oxygen, water vapour and carbon dioxide. There are some other gases too in the air in very small quantities.

The layers of the atmosphere are named as the troposphere, stratosphere, mesosphere, ionosphere and exosphere. The layer that extends from the earth's surface to a height of about 13 km is called the **troposphere**. The conditions in the troposphere change continuously. They affect the living world to a great extent.

The surface of the earth gets heated due to the heat it receives from the sun. Hence, the air nearest the surface is the hottest. As we go higher in the troposphere, it becomes cooler.

Almost all the water vapour in the atmosphere is contained in the troposphere. That is why, all weather-related phenomena such as formation of clouds, rain, fog, winds and storms take place in the troposphere. The air on high mountains is rarer than the air near the earth's surface. Aeroplanes fly in the higher parts of the troposphere. There, the air is very rare. Therefore, arrangements have to be made to ensure that passengers get enough air for breathing.

Beyond the troposphere, up to a height of about 50 km from the earth is the layer called the **stratosphere**. In the lower part of the stratosphere, there is a layer of a gas called ozone. Ultraviolet rays coming from the sun are harmful for living things. But the ozone layer absorbs them and protects the living world from those rays.



The earth's atmosphere

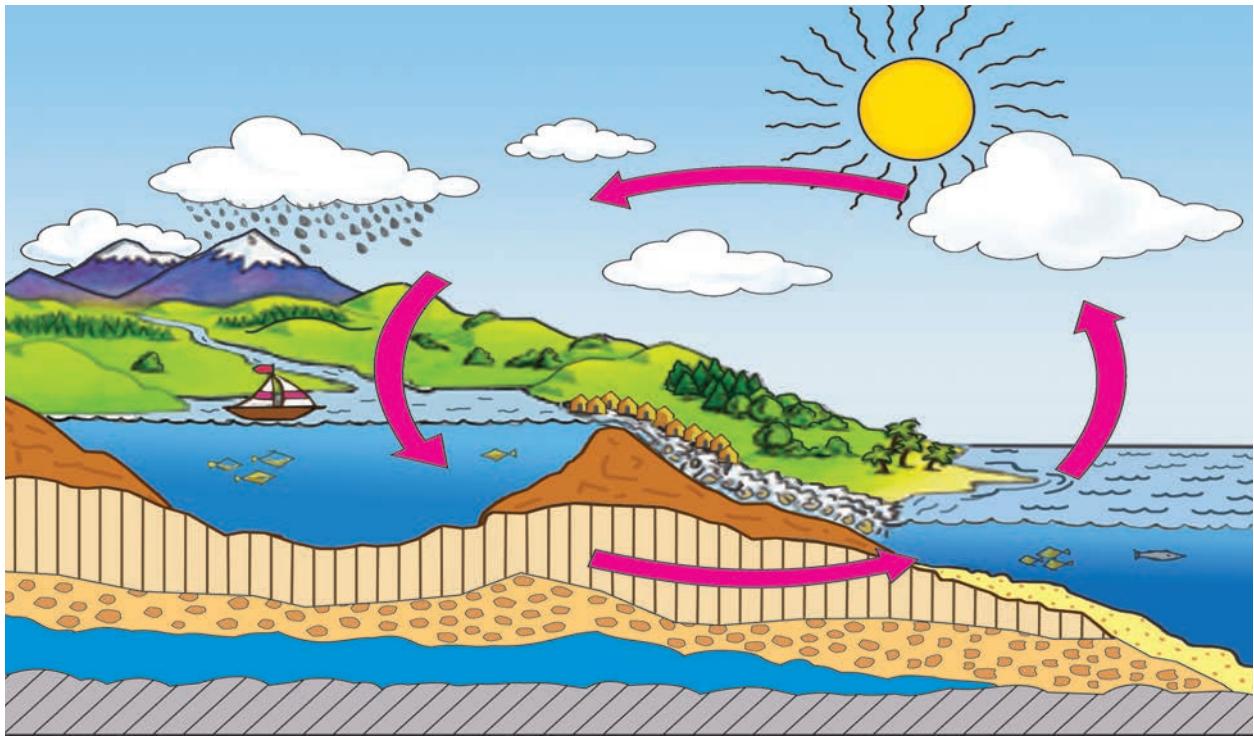
Use your brain power!



- (1) In which layer of the atmosphere do we see the rainbow?
- (2) Mountaineers carry oxygen in cylinders when they climb mountains that are more than 5000 m high. What could be the reason for that?

A new word

Condensation : the process of vapour turning into water on cooling.



The water cycle

How does it rain ?

Water on the earth evaporates continuously due to the heat of the sun. Water that has percolated into the soil also evaporates due to the heat and enters the atmosphere. As water vapour is lighter than air, it rises high up into the atmosphere. As it goes higher, it cools and condenses forming very fine droplets of water. The droplets are so small and light that they float in the atmosphere forming clouds. These small droplets join together and form bigger drops which are heavy. They cannot float. Such drops of water fall down on the earth in the form of rain.

This rainwater flows into rills, streams, rivers and finally into the sea. Ice in the snow-covered regions also melts due to the heat of the sun to finally flow into rivers.

These processes of evaporation, condensation and rainfall go on in a

continuous cycle. This is known as the **water cycle** in nature.

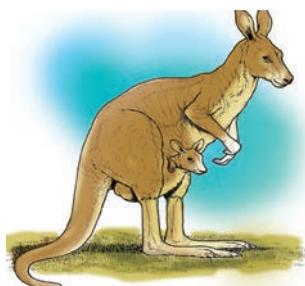
The biosphere

Can you tell ?



Make as long a list as you can of all the living things you see in the lithosphere, hydrosphere and atmosphere.

There are innumerable kinds of living things on the earth. The various regions of the earth differ in many ways. Some regions are always covered with ice while others have a hot climate. There are mountains in some places and plains in others. Some places have a lot of rainfall while others are dry deserts. There are salty seas and oceans and also freshwater lakes. The ocean is shallow near the coastline but away from the coastline, the ocean can be several kilometres deep.



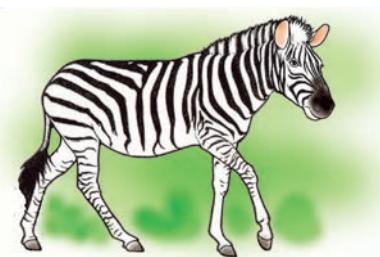
We see a great variety in the living things that inhabit these different regions.



The polar bear is seen only in the snowbound polar regions. Zebras are found in Africa and kangaroos are found only in Australia. These animals are not found in any other regions. Elephants and lions are found in regions of hot climate. Plants in all these different regions also show a great variety. This variety is characteristic of those different regions.



Many different kinds of plants, animals and micro-organisms are found everywhere on the earth – on land, in water and in the air. Living things exist in the lithosphere, hydrosphere and atmosphere. They also interact with these spheres. This living world constitutes the biosphere.



Always remember –



All animals, plants and micro-organisms are dependent on one another. They are also dependent on the spheres of the earth. The biosphere is where they take birth, live and die.

What we have learnt –



- The earth's crust and a small hard portion of the layer under it is called the lithosphere.
- About one-third of the earth's surface is occupied by land while about two-thirds is covered with water.
- Surface water, ice on the land, groundwater and the water vapour present in the air together form the hydrosphere.
- The envelope of air around the earth is called the atmosphere.
- The water cycle on earth goes on continuously.
- The ozone gas in the stratosphere absorbs the harmful ultraviolet rays coming from the sun and protects the living things from them.
- Living things occupy parts of the lithosphere, hydrosphere as well as the atmosphere. Living things and all the parts they occupy are together called the biosphere.

Exercises

1. What's the solution ?

Dark patches appear on the skin after exposure to the sun.

2. Use your brain power !

- (a) Why are micro-organisms important ?
- (b) Think about all the foodstuffs obtained from the sea. Find more information and write ten lines about them.

3. Answer the following questions.

- (a) What are clouds made of?
- (b) What is meant by 'biosphere' ?
- (c) Make a list of the landforms you see in your surroundings and give a description of any two of them.

4. In the following sentences, underline the words that refer to landforms.

- (a) Anil lives at the foot of a hill.
- (b) Ria lives in the plateau region.

5. Write a note about the following.

- (a) Evaporation
- (b) Condensation
- (c) The water cycle

6. Give two examples of each.

- (a) Weather-related events
- (b) Sources of water

7. Draw a labelled diagram showing the water cycle.

Activity

Find out more information about the different layers of the atmosphere.

* * *



4. Environmental Balance

Try this.



Ask the elders in your family to take you to a riverside or to a lake or stream.



Observing the various living things

Make a list of all the living things you see there. If you do not know the names of any of the living things you see, make a note of them describing their shape, colour, sound, shelter, etc. Or, draw their pictures. Count how many types of living things you see.

Now repeat the activity near your house, in the school garden or in a field.

Can you tell?



- (1) In the course of your observations, did you notice any signs of the presence of living things though the living things themselves were not seen? For example, did you notice any partly

eaten fruits or shells, fallen feathers, animal tracks, dung, droppings, nests, cocoons, eggs, honeycombs, etc.?

- (2) Could you observe any micro-organisms?

- (3) How many types of living things did you see at the places you visited? Do you think you saw all the kinds of living things that belong there? Did you see the same living things at various places or different ones?

The variety we see in all the living things that belong to a particular area is called the ‘biodiversity’ of that place.

Can you tell?



Which one of the places you visited shows greater biodiversity?

To study the biodiversity of a place, scientists make a large number of observations. They make these observations in different conditions such as day and night, in different seasons, etc. They use special devices to make observations of living things that are found at great heights or depths as well as of micro-organisms. Observations of many scientists are brought together and studied again. Only when all such efforts are made over a long period of time can we be sure of the biodiversity of a place.

The environment

The surroundings and the conditions in those surroundings which affect the life of the organisms there, are together known as their environment. It includes many components such as sunlight, air, water, soil, plants and animals, etc.

Living and non-living things are dependent on each other. There is a lot of give and take or interaction between them. Environmental Science studies these interactions.

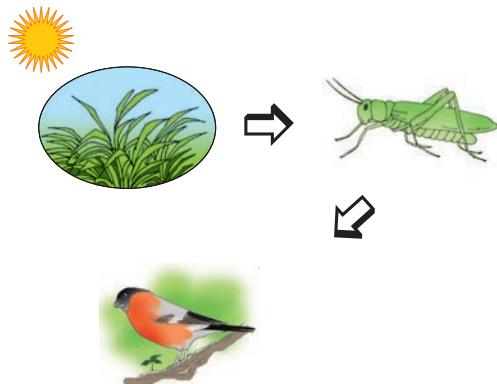
Look at the pictures of the living and non-living things shown below. Discuss the mutual relationships between these various factors of the environment.



Living and non-living factors of the environment

The food chain

Look at the pictures below.



Grasshoppers eat grass and leaves.

Birds eat grasshoppers.

Can you tell?



Look at the pictures.

What is the deer's food?



Can you tell?



(1) Who eats birds?

(2) What is the food of plants?

Look at the picture below.



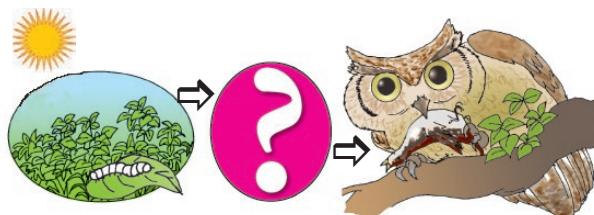
There are several links in this chain. If the links were to separate from each other, could they be called a chain? Even though each link is a complete object, it is joined to the links before and after it. If any link comes loose, the chain is broken.

In the first picture, we see the sun, some plants, a grasshopper and a bird. They are all connected. Each of the components – plants, grasshopper, bird – is food for the next one. That is why we say that they form a chain. Such a chain is called a food chain. Each of these components is a link in a food chain.

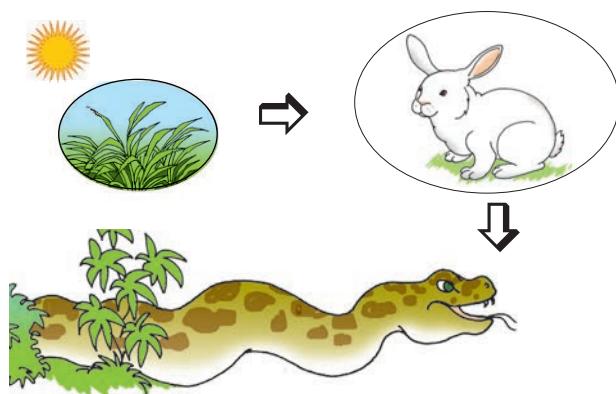
What is food for the tiger?



The picture below shows another food chain. You have to guess the missing link in it. Look at the first and third pictures. Think of the connection between them and complete the chain.



In nature, there are many food chains. If one of the links in a chain becomes extinct can the food chain last?



The food web

Observe the various food chains shown in the picture below.

Can you tell ?

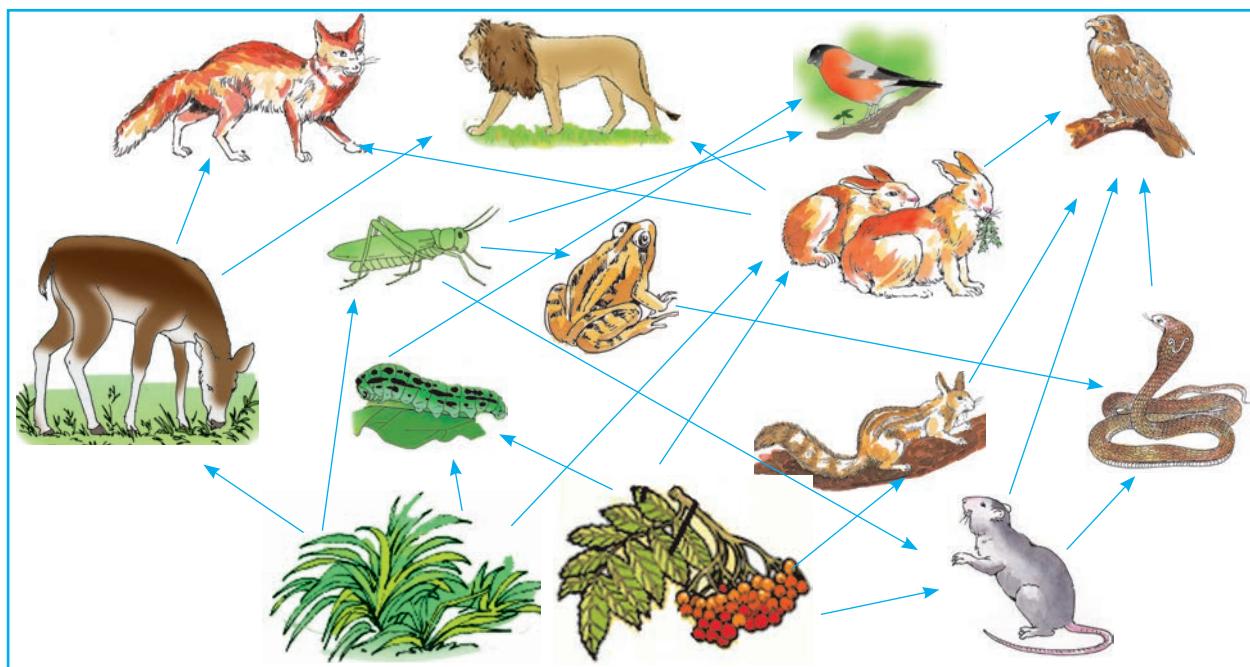
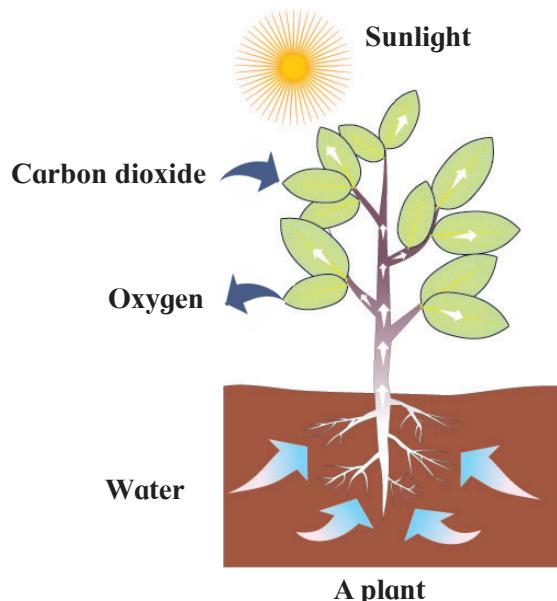
Find the different food chains of which the worm and the mouse form a link.

One living thing can be a part of a number of food chains. That gives rise to a food web in nature.

The most important food in food chains – plants

Every living thing gets its food from the environment.

Many animals in the environment eat only plants. Other animals eat the animals that live on plants. But plants make their own food in the presence of sunlight using water and the carbon dioxide from the air. It means that plants are the main support of every food chain.



A food web formed by the interlinking of several food chains

Environmental balance

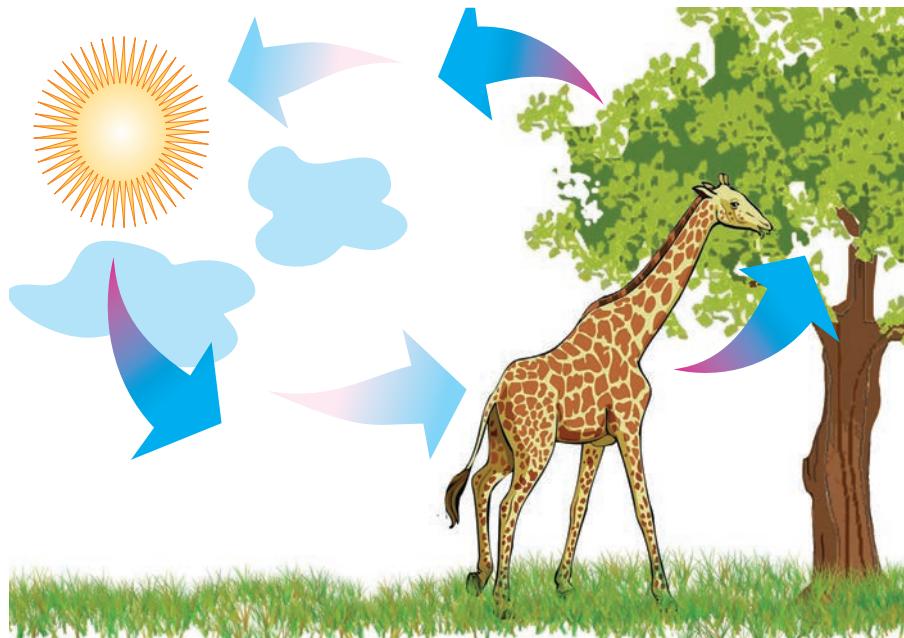
There are many food chains in our environment. Because of these food chains, every living thing gets the food it needs and therefore continues to live. Micro-organisms living in the soil help the process of decomposition of plant residue, dead animals, excreta, etc. As a result, substances that help the growth of plants are formed and get added to the soil. Plants use them for their growth.

Thus plants use substances in the soil for their growth and when plants and animals die, the decomposition of their remains adds these substances to the soil once again. This is an important cycle in the environment.

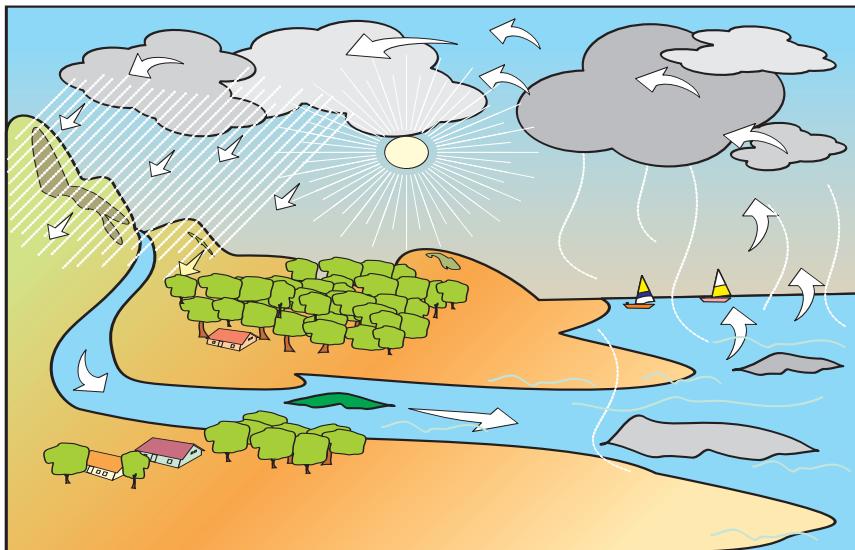
Also, living things get a continuous supply of water because of the water cycle.

Living things use oxygen from the air for breathing and give out carbon dioxide gas. Plants use the carbon dioxide from the air for making their food. Oxygen is given out in this process and gets added to the air again. This too is a cycle in nature.

There are several other such cycles in nature. Thus, there is interaction amongst living things and between living and non-



living things in nature. The interactions go on continuously. This helps to maintain the food chains in the environment. When the various cycles in the environment go on uninterrupted, environmental balance gets maintained.



Always remember –



For the existence of living things, it is important that environmental balance is maintained.

What we have learnt –



- There are innumerable types of living things on the earth.
- There is interaction between living and non-living things in the environment.
- Different kinds of animals, plants and micro-organisms are found in different regions of the earth.
- The water cycle, various other cycles and food chains in nature help to maintain the balance in the environment. This balance has been maintained for thousands of years.

Exercises

1. What's the solution ?

We have to remove insects from the grain without using insecticides.

2. Use your brain power !

Make up a food chain :

Frog, kite, worm, snake, grass.

3. Answer the following questions.

- (a) What is a food chain? Give an example of it.
- (b) How is the balance in the environment maintained?

4. What substances in the soil are useful for the growth of plants ?

5. True or false ?

- (a) Micro-organisms form a part of the environment.
- (b) It is necessary to maintain biodiversity.
- (c) A grasshopper eats birds.

Activities

1. Find out more about the birds you see in your surroundings.
2. Make up your own slogans about maintaining environmental balance.

* * *



5. Family Values

Can you tell ?



- (1) In your family, how do you make the decision to go on a trip?
- (2) Do you offer suggestions about the places to visit during the trip?
- (3) Do you get to suggest which guests should be invited over during a holiday?
- (4) How do you help during preparations for festivals or functions at home?

Role in decision-making

We live together in a family. Every person's likes and dislikes are different. Thoughts and opinions can also differ. We ourselves are different from others. Even so, our thoughts and opinions can match those of others on various topics. We have love and affection for each other. We take care of each other and are concerned about other people's well-being. We talk to each other before making decisions about anything in the house. We consult each other and make decisions that everyone agrees with. In this way, we are part of the decision-making in the family.

What happens when everyone has a role in decision-making ?

- Each person gets the opportunity to say what they think.
- By asking everyone's opinions, the subject is thoroughly discussed from every aspect.
- We feel like a more important part of the family when we see that our opinion is valued.

Just as we have a role in making decisions in our family, we also have a role in public decision-making. In newspapers, we read about matters requiring public participation. A few examples of such news have been summarized below.

Read and discuss :

**Citizens participate in municipal budget planning.
Citizens to decide the matters on which to spend money.**

Citizens crowd to suggest improvements to city development plan.

Inauguration of road joining six villages : Joint effort by six villages bears fruit.

We feel the need for minor changes in our environment. It is to our advantage that everyone has a role in making decisions about changes in our surroundings. The government we elect makes decisions regarding public matters. If we feel that a decision made by the government is wrong, we can register our opinion. In this way, we can be a part of the decision-making process.

Think !

Be a part of the decision-making process in your home. Do not form your opinions merely on the basis of what others say. Share your thoughts with others.

Can you tell ?



Note the following situations carefully. State which of the children show honest behaviour.

- (1) Afreen borrowed a pencil from Meenu. After she finished using it, she returned it.
- (2) Shama fell from her bicycle. However, she told her mother, "Neha pushed me off the bicycle".
- (3) Mary took the bag she found in a rickshaw to a police station.

Effects of honest and dishonest behaviour

We do many different things every day. Sometimes we make mistakes. When we realise that we have made a mistake, we should talk about it openly with our friends and family. By doing this, we learn to be honest and find a way to correct our mistakes.

It is also necessary to be honest and sincere in our work. We must try hard to keep the trust in any relationship and never cheat. If we are honest, we do not have to

Do you know ?



In 2011, during a cricket match between India and the West Indies, a bowler caught Sachin Tendulkar right at the beginning of the match. The bowler appealed to the umpire. Thinking that the ball had not touched the bat, the umpire declared Tendulkar not out. However, knowing that the ball had touched his bat, Tendulkar returned to the pavilion though he was declared not out.

be afraid. But if we are dishonest, we lose our self-confidence. We must be honest at home as well as in public. Everyone respects an honest person. Honesty is our strength.

Honesty in public life

If we are honest in our public life, we will get better public services and facilities. What happens if we travel on a train or bus without a ticket? Our public transport system will run at a loss and would soon have to shut down. If each person buys a ticket honestly, this problem will not arise.

Honesty can increase efficiency in public life. Honesty is the best way to increase discipline and efficiency in public life.

Advantages of co-operation

In a family, we co-operate with each other. Similarly, in team sports, the more the players co-operate with one another, the better is their game. Instead of keeping the feeling of co-operation restricted to sports, we should bring it into public life as well. Everyone needs co-operation in public life. We, too, need the help of others. Fairs, rallies and other such gatherings can only be arranged successfully if we co-operate with one another.

What's the solution ?



- (1) We meet a boy who has lost his way.
- (2) While on a trip, we realise that our friend has forgotten her tiffin at home.
- (3) Some people are stuck in the lift of a building.

Read and discuss :

Read the dialogue given below. Discuss the problem stated and its solution.

Our teacher's taking us to see a fort. It will be a lot of fun ! But let us not include Savita and Sameer in our group. Savita talks too much and Sameer is always playing pranks.

So what ? Savita sings well. Sameer tells jokes. Let's talk to them. They will understand. Let's not leave them out.

That's true! I didn't think of that. Let us prepare for the trip together.

Yes, Gayatri's right. Let us learn new songs from Savita and new jokes from Sameer.



Tolerance

We all have some faults. We can improve on these faults with the help of our family and friends. We may not agree with each other every time. Sometimes, there are disagreements even between friends. At such times, we must try to understand the point of view of others instead of insisting that only our point of view is correct. On such occasions, we must listen to the other person. In this way, we learn to be tolerant. Respecting opinions which are different from our own is called tolerance or broadmindedness.

Tolerance has a special significance in our country. People from various religions, creeds, cultures and following different customs live here. That is why, it is necessary for everyone to be tolerant or broadminded. Diversity can be preserved through tolerance. Diversity enriches our

social life. It encourages us to think about others with concern. We can solve problems in our environment by being broadminded.

Gender equality

Boys and girls or men and women are equal as human beings. Considering boys and girls to be equal without discrimination is called gender equality. Boys and girls must respect one another. In the company of our friends, we consider all of them to be our equals. We must maintain this sense of equality as citizens when we grow up.

By developing this sense of equality, everyone gets to learn and make progress. Food, clothing, shelter, health and education are the common needs of men and women. For the purpose of equality, each of these needs must be fulfilled properly. Men and women have equal rights to facilities such as these. Similarly, men and women must get equal opportunities of progress.

- Prepare slogans on gender equality.

What's the solution ?



The following things are observed in some families.

- (1) In some homes, boys' uniforms, textbooks and bags are bought first. Purchases for girls are put off.
- (2) When his team lost a kabaddi match, Raju began to cry. Dinesh said, "Why are you crying like a girl?"
- (3) Vandana likes the bat and ball a lot; however, she is given dolls and toy stoves and utensils to play 'house'.
- (4) Sarika helps her mother with the cooking and household chores. Her brother is never asked to do the same.

Always remember –



Honesty increases efficiency in public life and makes it possible to avoid wastage of time, money and labour.

What we have learnt –



- Everyone in the family must have a say in decision-making.
- We must be honest in our private and public life.
- Tolerance and co-operation make our community life harmonious and peaceful.
- A tolerant attitude makes it easy to preserve diversity.
- Men and women are equal. It is not right to discriminate between them.

Exercises

1. Fill in the blanks.

- (a) Honesty is our
- (b) Everyone needs in public life.
- (c) has a special significance in our country.
- (d) By developing a sense of equality, everyone gets to

2. Answer in one line.

- (a) Who should make decisions regarding changes in our environment?
- (b) What is tolerance?
- (c) What is gender equality?
- (d) What are the common needs of men and women?

3. Answer in short.

- (a) How do you take part in the decision-making process in the family?

- (b) How do we develop a sense of tolerance?

Activities

1. Collect stories of social reformers which highlight the values of tolerance and gender equality. Narrate the stories in the class.
2. Can you narrate a few incidents of your honesty? Do so.

* * *



6. Rules Are for Everyone.

Can you tell?



- (1) Can you tell some traffic rules?
- (2) Give reasons why we should obey these rules.
- (3) Which one of these rules do you feel needs to be changed?
- (4) What other rules do you think are needed for better discipline in traffic?

We follow traffic rules so that traffic moves smoothly. In the same way, there are rules of social life that tell us what each person should be doing. Rules need to be made to specify each person's duties and responsibilities. If we follow the rules, our day-to-day life becomes disciplined. We can work more efficiently.

Rules are meant for everybody. They apply equally to all. No one is above the rules. Disobeying the rules leads to punishment. There is no discrimination in punishments for breaking the rules. In this way, 'equality' is the basis of rules.

Changes in rules for the society

Our society works according to certain rules. We make the rules ourselves. We follow these rules because they are meant for the common good. Proper changes are also introduced in the rules made for a society. There is a difference between the rules of society and the laws of nature.

Natural occurrences follow laws of nature. We cannot change the laws of nature. The rising and setting of the sun

and the change in the seasons never stop. The law of gravity does not change. The rising and falling of the tides, the phases of the moon – all of these things occur according to the laws of nature. Nature's laws are constant and fixed; they do not ever become outdated. However, human laws need to be changed with changing conditions. The laws followed in India under the rule of the British were different. When India gained Independence, the situation changed and the laws of civic life changed accordingly. For example, after Independence, the voting age was 21 years. After 1988, the voting age was lowered to 18 years.

Try this.

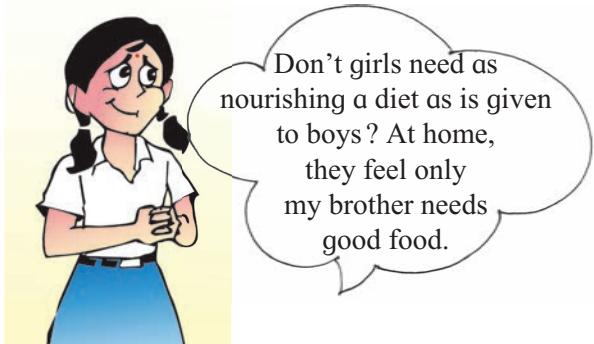
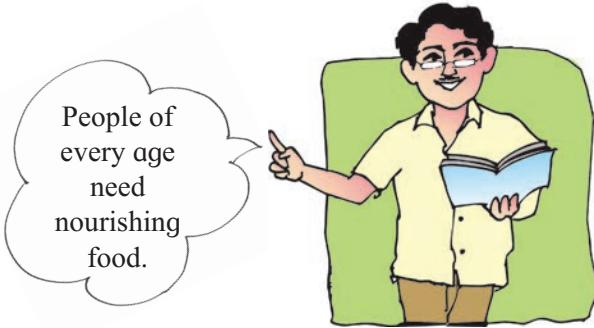


Ask your parents and grandparents what rules were followed during their time at school. Make three columns – one each for yourself, your parents and grandparents. Enter the school-rules related information in each column and compare it. Discuss which rules have changed and which have not.

Always remember –



Boys and girls or men and women are equal. They must get the same opportunities for development.



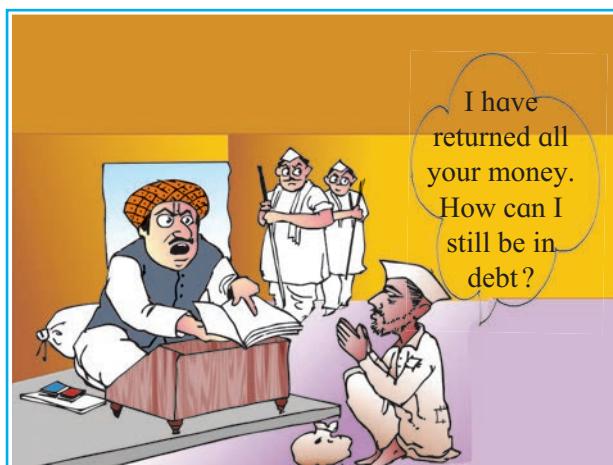
Can you tell?



- (1) How will you answer the girl's question?
- (2) In what other ways do you feel there is discrimination between boys and girls?

It is incorrect to discriminate between boys and girls. It is unjust to deprive girls of good food or to prevent them from going to school. Such injustice can also be seen with respect to other sections of society.

In the pictures below, what injustice do you observe?



Rules have to be made to ensure that no injustice is done.

Can you tell?



A list of rules is given below. Each rule has a specific purpose. Some rules have more than one purpose. Discuss each rule in class. Under the heading, 'This is what I think', note down your opinions.

- (1) Prohibition against loudspeakers in public places after 10 o'clock at night.
- (2) Free primary education for boys and girls.
- (3) Prohibition against dumping garbage in the river.
- (4) Protection against domestic violence for women.
- (5) Ban on child labour.
- (6) Ban on felling trees, hunting and poaching.

We follow many customs and traditions in our lives. We follow those traditions by observing our mother, father, grandparents and other relatives. There are several good customs and traditions in our society. We celebrate festivals together. We welcome guests who visit us



and are hospitable to them. Many of our customs enable us to maintain the balance of nature. We express our love and gratitude towards animals. The values of non-violence and peace have been a part of our social life since ancient times.

Even so, there are some traditions and customs that are not desirable. They are not beneficial for our society, for example, caste distinction. Because of this, a divide has been created in society. It has given rise to inequality. Untouchability was an inhuman and unjust custom. The Constitution of Independent India abolished the custom of untouchability.

Many times, laws have to be made to abolish unjust customs. In our country, customs such as *sati* and child marriage were abolished by making laws that banned them. The law that banned the use of magic for cheating people was first enacted in Maharashtra. Receiving a dowry has been banned by law.

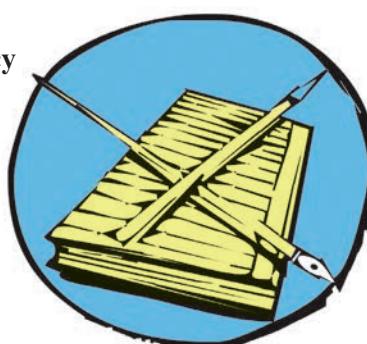
Wrong customs and traditions cause the neglect of some sections of society. They have no access to education, therefore, they do not get opportunities of development. They have no means of livelihood. Therefore, they have to face poverty. Poverty and lack of education are the two big obstacles in our society. We can only make progress together if we get rid of these obstacles.

Protecting our environment

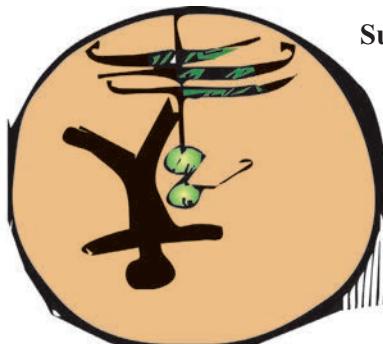
Just as laws are necessary to maintain equality and justice in society, laws are also required for the protection of the environment. We are dependent on nature in many ways. Most of our needs are fulfilled by nature. Natural resources should be available in enough quantities for the needs of our future generations. Therefore, we must conserve these natural resources. We must use them carefully.

Our Social Issues

Illiteracy



Superstition



Child marriage



Child labour



Do you know ?



- Caste discrimination, gender inequality and lack of education for women were some of the big obstacles in our society. Mahatma Jotirao Phule, Rajarshi Shahu Maharaj and Dr Babasaheb Ambedkar tried to get rid of these obstacles. Savitribai Phule had to fight a great battle for women's education. Her colleague, Fatima Sheikh, provided her with valuable assistance in this fight. Maharshi Dhondo Keshav Karve also did great work to promote women's education.

The work of all these social workers was instrumental in bringing about positive change in our society.

What we have learnt –



- Rules made for people are changed from time to time.
- Rules in the olden days were in the form of religious traditions and social customs.
- Laws are made to combat inhuman and undesirable traditions and customs.

Exercises

1. Fill in the blanks.

- (a) Our society works according to certain
- (b) The Constitution of Independent India abolished
- (c) Wrong customs and traditions cause the of some sections of society.

2. Answer in one sentence.

- (a) Why are rules made?
- (b) Which values have been a part of our social life since ancient times?
- (c) What are the big obstacles in our society?

3. Answer in short.

- (a) Which unjust customs have been banned by law?
- (b) Why do we need to make laws for the protection of the environment?

Activity

Make a list of the rules you follow in the following situations.

- (1) At the time of the School Assembly.
- (2) During the lunch break.
- (3) On the playground.
- (4) In the school library.

* * *

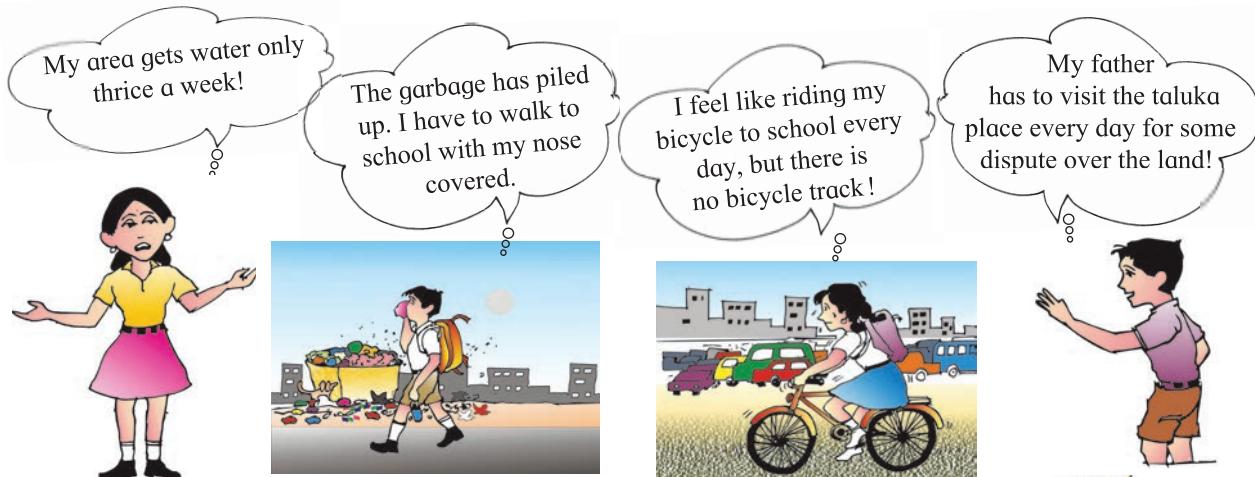


7. Let us Solve our own Problems

Can you tell ?



What problems can you identify from the following picture?



Issues in civic life

We encounter many problems in our civic life. These problems cause us inconvenience. Sometimes our life is thrown into disorder. If we turn a blind eye towards problems, they become worse. So it is best to solve them in time. The problems faced by people in cities and villages can be called problems or issues in civic life. It is important to be able to identify such issues. One person alone cannot solve such problems. They can be solved through everyone's efforts and co-operation.

Solving disputes

Disputes arising over various issues in our towns and villages can also be a problem. The well-being of a village is affected by constant disputes. It leads to loss of unity and obstructs the progress of the village. If the disputes are not serious, they can be solved locally by speaking to the parties involved. However, if the dispute is not solved in this way, it has to be taken to the appropriate bodies or the courts.

Do you know ?



Since 2007, the 'Mahatma Gandhi Dispute-Free Village Mission' is being implemented in our State. The aim of this scheme is that villages should be able to solve their own disputes through peaceful discussions. This method of solving disputes increases harmony in the village. Villages which have solved their disputes by using this method also get a peace award. In cities, Mohalla committees help to solve disputes.

Problem solving

Have you heard about these attempts at solving problems ?

Hiware Bazaar : In the village of Hiware Bazaar in Ahmadnagar district, water shortage was a big problem. This problem was solved with the help and participation of the villagers. The problem of animal feed was also solved. Now, Hiware Bazaar has lush green surroundings.

- Many villages face water shortage. Find the reasons for this and suggest solutions.

Cleaning a village through ‘shramdaan’: The people of Khudawadi village in Osmanabad district cleaned their village through ‘shramdaan’ or voluntary contribution of labour. They decided that everyone should help in cleaning the village. First, the waste water was dealt with. The garbage was used to make manure using vermiculture. A toilet was built in each house.

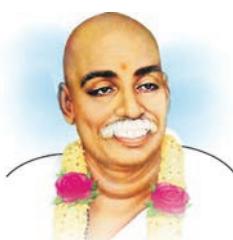
Sant Gadgebaba used kirtans to stress the importance of keeping the village clean. He told the people that we cannot make progress without cleanliness, education and self-reliance. He showed people how to clean the village through his own actions.

Rashtrasant Tukdoji Maharaj explained the importance of cleanliness through his ‘Gram Geeta’.

‘मिळोनी करावी ग्रामसफाई । नाली, मोरी ठायीठायी ।
हस्ते परहस्ते साफ सर्वहि । चहूकडे मार्ग ।’



Sant Gadgebaba



Rashtrasant
Tukdoji Maharaj

- Newspapers carry several articles about ‘shramdaan’. Collect these articles. Discuss the things that can be achieved through it.

Can you tell ?

- (1) Do you think that there should be a group of peacekeepers in your school?

- (2) What criteria will you use to select these peacekeepers?
- (3) Which rules will you include in the rulebook for these peacekeepers?
- (4) What methods should peacekeepers use to solve your disputes?
- (5) How did you understand that disputes can be solved peacefully?

For a society to be peaceful, the basic needs of all of its sections need to be met. Each person must get the necessary security. The exploitation in society must stop. Inequality must decrease. Everyone must have the right to participate in public life. By learning the importance of peace and by using peaceful methods, we can create a peaceful environment in our family, school and community.

Do you know ?



In order for peace to spread worldwide, and for nations to be able to strive for the development of their people, 21 September has been designated by the UN as ‘International Peace Day’. On this day, in New York, where the United Nations have their headquarters, a bell is rung at 10 o’clock in the morning. This is followed by a few moments of silence. This bell has been made from coins given by people from around 60 nations.

If you would like to know more about this, visit the following website :

<http://www.internationaldayofpeace.org>

Always remember –



If there is peace in the family, school and society, everyone will benefit. Peace contributes significantly to progress. It creates scope for advances in various fields like business, industry, education, art, literature, entertainment, science and technology. In this way, peace becomes a social value rather than a personal need.

What we have learnt –



- Everyone has a responsibility to solve problems in civic life.
- Problems can be solved if everyone co-operates.
- Dialogue and discussion can help solve disputes.
- Disputes can be solved peacefully.
- If there is peace in the family, school and society, everyone benefits.
- Peace is a social value.

Exercises

1. Fill in the blanks.

- (a) Turning a blind eye towards problems makes them.....
- (b) It is important to be able to identify

2. Answer in one sentence.

- (a) What is meant by issues in civic life?
- (b) How can problems in civic life be solved?
- (c) Name the great personalities that stressed the importance of cleanliness.

3. Answer in short.

- (a) Explain the concept of cleaning the village through ‘shramdaan’.
- (b) How can a suitable environment for peace be created?

4. What will you do in the following situations?

- (a) The class leader wishes to maintain quiet in the classroom.

- (b) For some unavoidable reason, the maths teacher is unable to attend class today.
- (c) During a match, a dispute has arisen between the two teams on the playground.

Activities

1. Write a letter to your local representatives about the garbage problem in your area and discuss the problem with them in person.
2. Find out who you should contact if stray dogs are a problem in your locality. Find information about solutions for the stray dog problem.

* * *



8. Public Facilities and My School

Can you tell ?



- (1) Which public facilities are available inside and outside your home?
- (2) Which of the facilities do you use?

We all use public services and facilities. Water supply, electricity supply, health services, education and transport are some important public services. These services are meant for everyone. The services, the organizations that provide them and we ourselves are all part of a system. Our school is also a part of that system.

Try this.



Put a ✓ in front of all the services available at your school.

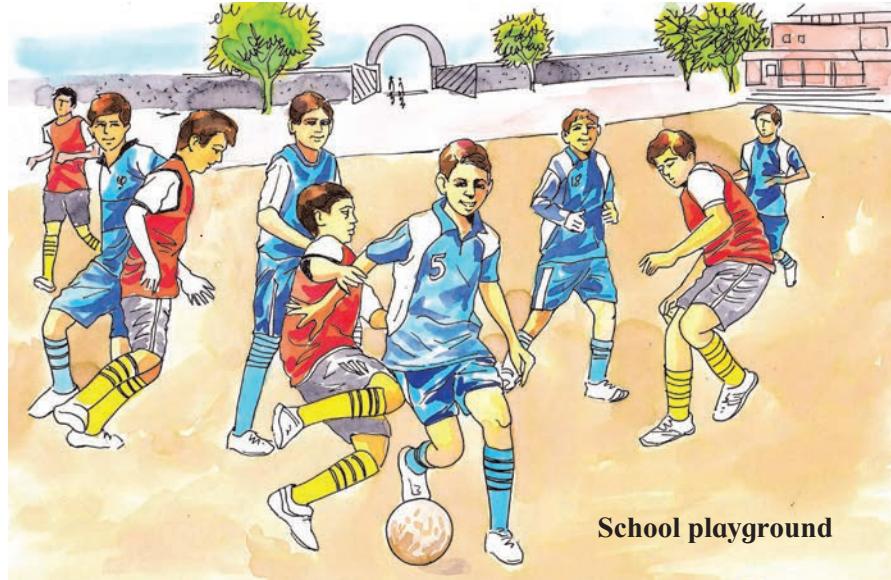
Sufficient classrooms	Library
Girls' toilet	Electricity supply
Boys' toilet	Laboratory
Drinking water	Study corner
Ramp	Computer class
Playground	Medical facility
Midday Meal Scheme	Counselling Centre
School fence	Insurance Scheme

Various facilities are available to us in our school. Similar facilities are also available outside the school. Bus and railway are public facilities of transport. We also use several other public services and facilities such as the postal service, telephone, fire brigade, police, banks, theatres, parks, gardens and swimming pools. We must use these facilities responsibly.

The school is our world outside our house. We like our school just as we like our home. Each school has its own unique identity. Find out the unique features of your school and prepare a poster.

Sample Poster

Name of the school	
Year of establishment	
Founder	
Motto	
Emblem	
Number of students : Girls Boys	
Number of classrooms	
Colour of uniform	
Noteworthy accomplishments	
Awards received	



School playground

School is for everyone. Each child has the right to go to school and learn. This is called the right to education. According to the Right to Education Act, every child between the ages of 6 and 14 must go to school and complete primary education. For children with special needs, the upper age limit is 18 years of age instead of 14.

Role of the community in the development of a school

Many people and institutions help to set up a school. Many parents, past students, writers, artists, sportspersons, scientists and industrialists lend a hand in the growth of a school. A school is given assistance in the construction of classrooms,

libraries, laboratories, and procurement of sports equipment by various sections of society. The community has a role in the development of a school.



Library



Astronomical centre

Read and discuss.



Agents of cleanliness

A school can also help in the development of a community or to solve

a problem. In order to develop habits of cleanliness among the people, the children of a school became agents of cleanliness. Backed by the school, they launched a cleanliness drive in the village. They prepared posters asking people not to spit in the streets and to dispose of garbage properly. They presented street plays and convinced the residents of the importance of cleanliness. Thus, the school had a part in obtaining the 'Clean Village' award for their village. It helped the village to build its unity.

Can you tell ?



- (1) Which topics were discussed in a parent-teacher meeting that you could observe?
- (2) Which important decisions were made at this meeting?
- (3) Did your friends' parents all attend this meeting?
- (4) How did you realize that all parents are treated alike at your school?

All schools have a Parent Teacher Association and a Mata Palak Sangh. They



A student welcomes parents

bring about a dialogue between parents and teachers. Parents can help in various activities of the school.

The school respects all parents alike. We must also inform our parents about the happenings in the school. We learn with the help of both teachers and parents. Their interactions are to our benefit.

Try this.



Write an application to the school administration requesting that parents be allowed to run the school for a day. Organize this event after you have obtained their permission. Send your experiences to the children's section of the local newspaper.

Always remember –

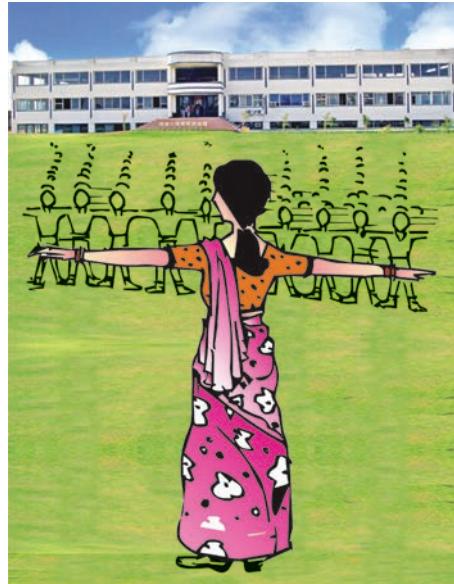


Education is a fundamental right of every child.

Parents' participation



A parent teaches music



A parent conducts a drill

What we have learnt –



- We must use public services and facilities responsibly.

- Schools lend a hand in the development of the community.
- Every child has the right to go to school and learn.

Exercises

1. Fill in the blanks.

- We must use facilities
- The school is our outside our house.
- The has a role in the development of a school.

2. Answer in one sentence.

- Which are the important public services?
- What right does each child have?

3. Answer in short.

- Which public services do we use?
- Why should schools have Parent Teacher Association and Mata Palak Sangh?

4. Write what will happen –

- If boys and girls are not given an equal right to education.
- If the community does not help the school.
- If public services and facilities are not used responsibly.

Activity

Make a list of the people who have helped your school and write what benefits their assistance has given you.

* * *



9. Maps – our Companions

The land in our environment is not of the same height everywhere. This unevenness gives rise to various land shapes creating different landforms such as mountains, valleys, plateaus, plains and islands. You have studied this in the third chapter.

For a proper understanding of our environment, it is necessary to study the physical or natural set-up of the land.

In Standard IV, when we learnt about maps, we saw a 5000-year-old map. This means that man has felt the need to make maps since ancient times. At that time, maps were mainly used in wars. While fighting a battle, it is important to have detailed knowledge of the terrain. It helps in working out strategies of defeating the enemy. Maps were very useful for this purpose.

Taking into account the differences in their height, shape, etc., various landforms can be shown on a map. There are different methods of showing these landforms on a map. Let us look at these methods.

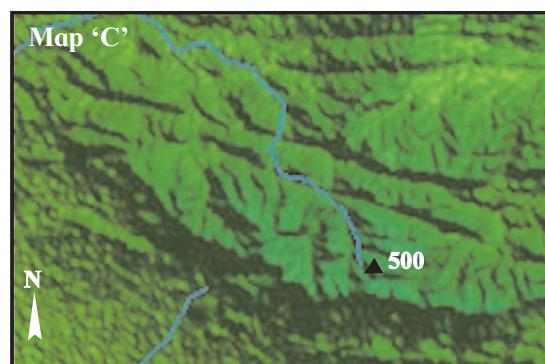
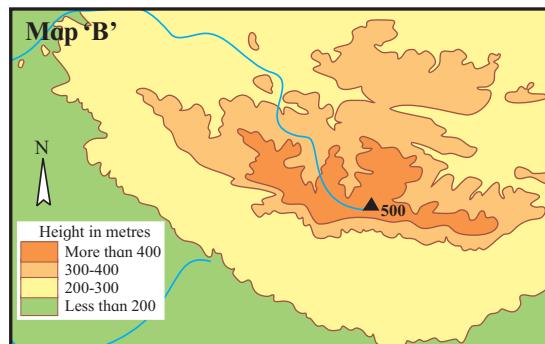
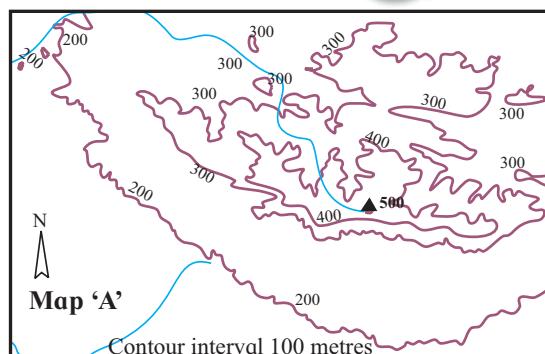
Try this.



You are going to a fort for your school trip. You travel by bus to a certain

point and then get off. The fort is on a hill. To reach the fort, you have to cross another hill and also a valley. Show the two hills and the valley in the blank box given on this page. How will you show that the valley is deep and the mountain is high?

Can you tell?



Study the maps shown above. All three maps show the same area, but they look different. Study the maps and answer the following questions.

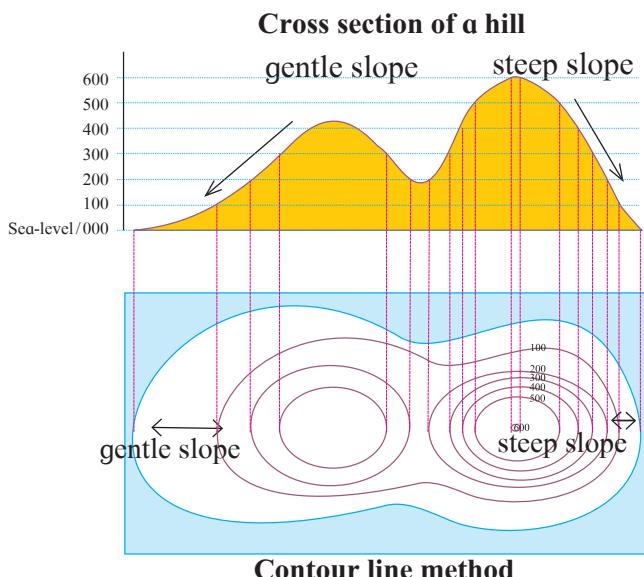
- In map A, how has the height of the land been shown?

- Why have colours been used in map B?
- How is map C different from the other two maps?
- In which direction is the highest point in maps A, B and C?
- In which map can the landforms be seen most clearly?

The length and width of a landform can be easily shown on a piece of paper. However, the height and depth cannot be shown as easily. There are different methods of showing the elevation or height of the land.

- (1) Contour line method
- (2) Layer tinting method
- (3) Digital elevation model

(1) Contour line method : This method is used to show the unevenness of landforms on a map. The height of the land is measured from sea-level. Next, points of the same height are identified. Their position is marked accurately on the map. These locations are joined with a line. Such lines are called contour lines. See map A. In the map, lines are drawn, each joining places of a specific height. This way, the relief of the land can be easily shown. It helps us to understand the slope of the land and the height of different places.



Observe the given diagram. Note that when there is less distance between the contour lines, the slope is steep whereas if the distance is great, the slope is gentle.

(2) Layer tinting method : This method is based on contour lines. In this method, the spaces between contour lines are filled with colour. Each colour indicates a specific height. For example, water bodies are coloured blue, whereas the adjoining land is coloured dark green. Land higher than that is coloured a light green, next higher land is coloured yellow, and so on.

Study the given colour index. Note how the colours change with the height. The colours between the contour lines show up the difference in the physical set-up. See map B.

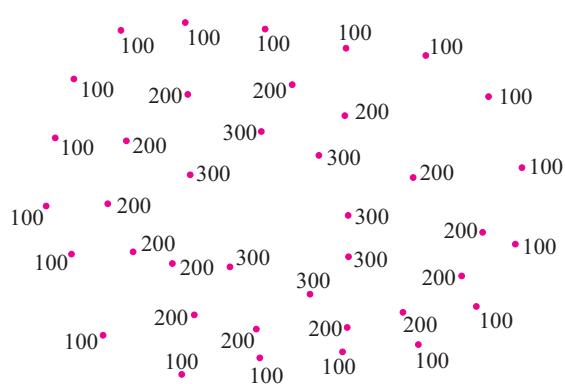
Height in metres
More than 4880
3660 to 4880
1380 to 3660
600 to 1380
300 to 600
150 to 300
75 to 150
0 to 75
0 to -75
-75 to -150
Less than -150

(3) Digital elevation model : This is the most modern method. In this, the information obtained through man-made satellites is presented with the help of computers. See map C. In it, we can directly observe the differences in the height of landforms.

Maps made using the above methods help us to understand the physical set-up of a region. In other words, they give us an idea of its height, relief and slope. Using computers, we can even find the height of each point on a digital map.

Physical maps can be used in military operations, tourism, drawing up mountaineering routes, in making regional development plans, etc.

Use your brain power!

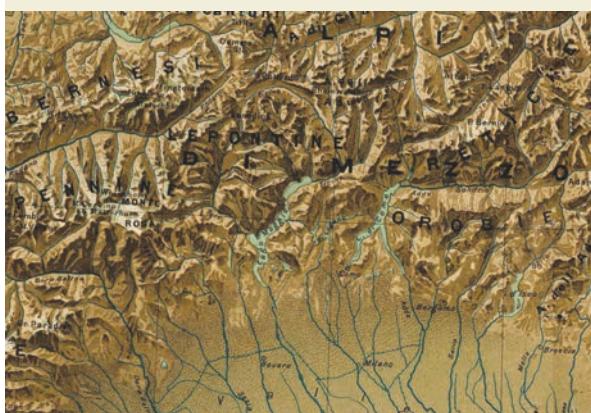


Places of different heights are shown in the above box. Find and join the dots that show places of the same height. What method of showing the landforms on a map have you used here? Write the answer in the box below.

Do you know?



Nowadays, many modern methods of making maps have been developed. Previously, relief was shown using the 'hill shading' technique. The map given below is an example of this.



Use your brain power!



A map made by the layer tinting method is given in another chapter. Find the map and write its caption in the blank box below.

Try this.



- Make an outline map showing various places in your neighbourhood or school.
- Exchange your outline maps with those of your friends.
- Make lists of what you understand and do not understand in your friends' maps.
- Discuss these things with one another.

Think about why you did not understand some of the things your friends had shown in their maps.

Many people use maps. Many components are shown in maps or outline maps. If these components are shown on different maps in different ways, it will be difficult to understand them. Therefore, standard signs and symbols are used to make the map easy to read. These symbols and signs are universally used for specific components. That is why, everyone can understand them.

Conventional signs : Signs are used to show various things on a map as per convention. These are in the form of letters or geometrical shapes, for example, lines, circles, triangles, dots, etc.

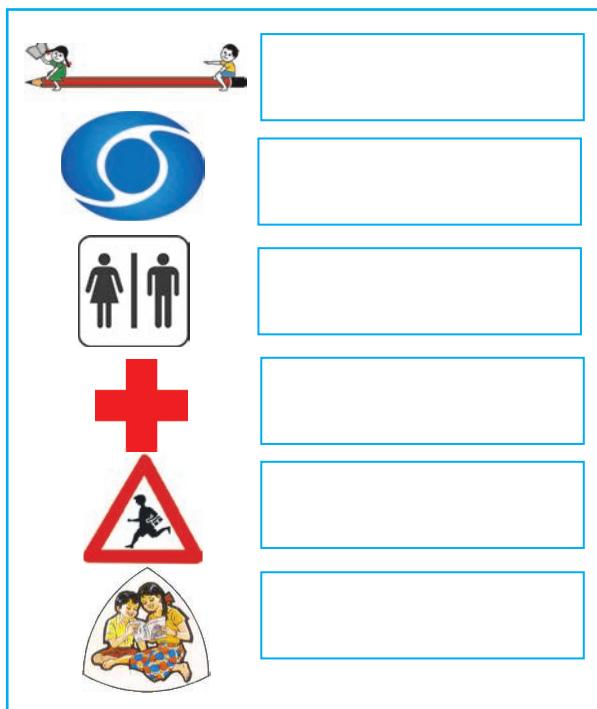
Conventional symbols : Symbols are used to show various things on a map as per convention. Symbols are miniature drawings of the respective objects. For example, temples, mosques, forts, etc.

The use of signs and symbols in a map helps the reader to get exact information about the places on the map. A list of the things that the signs and symbols represent is given in the key to the map.

Can you tell?



Identify the following signs and symbols and write their names in the boxes.



Study the list of some of the symbols used by the Survey of India while making maps.

PO Post Office

Harbour

Lighthouse

Fort

Burial ground

International boundary line

	1967	Battlefield
		Railway
		Well
		Spring
	200	Triangulation mark
		Settlement
		Grass
	500	Contour line
		Lake
		Road
		Mine
		Reserved forests

Do you know?



The ‘Survey of India’ is the foremost mapmaking institute in India. It was established in 1767. This institute has made a large number of topographic maps of the Indian subcontinent on various scales by conducting field surveys. These maps are known the world over for their accuracy. The institute’s headquarters are in Dehradun in Uttarakhand.



Use your brain power!



Jasbir and Manjeet are reading a map. They do not understand the following signs and symbols.

(1) Will you help them by writing the meanings of each sign and symbol ?

PQ Post office (sign)



..... ()



..... ()



..... ()



..... ()



..... ()



..... ()

(2) Sign or symbol? Write in the brackets.

Try this.



Make an outline map of your neighbourhood or school like you did before. First decide the signs and symbols you will use. Use them in the map. Do you now understand each other's outline maps better?

What we have learnt –



- Introduction to landforms
 - Methods of showing physiography
 - The use of colours to show height
 - The use of conventional signs and symbols

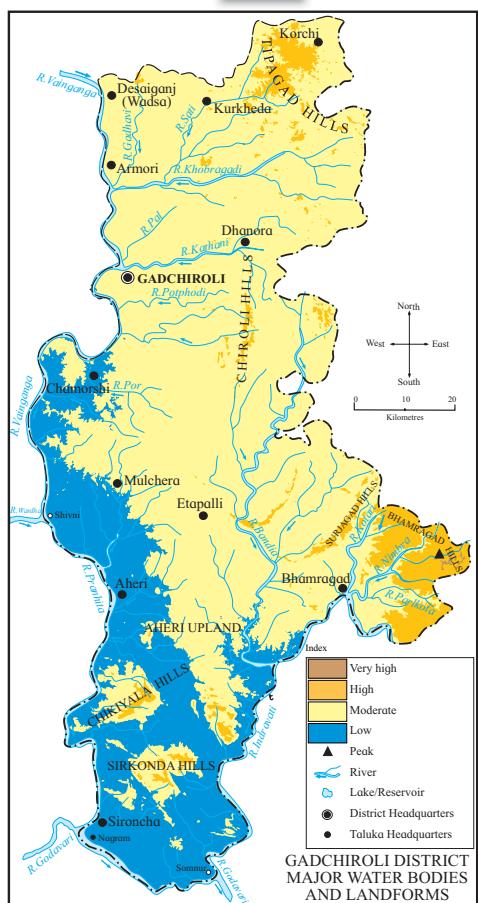


Exercises

- 1. Make a list of the various landforms in your surroundings. Draw one of the landforms in your notebook using one of the methods of showing landforms.**
 - 2. In the following sentences, underline the words that represent landforms and prepare signs or symbols for them.**
 - (a) Sonali lives just beyond Mount Takmak.
 - (b) Nilesh has gone on a trip to Gharapuri Island.
 - 3. Prepare signs and symbols for the following components :**

House, hospital, factory, park, playground, road, hill, river.
 - 4. The given map shows height through the use of colours. However, one colour representation is wrong. Write which colour would be correct in its place.**

Activity : Study the relief maps of familiar areas. With the help of your teacher, make two-dimensional maps on paper.



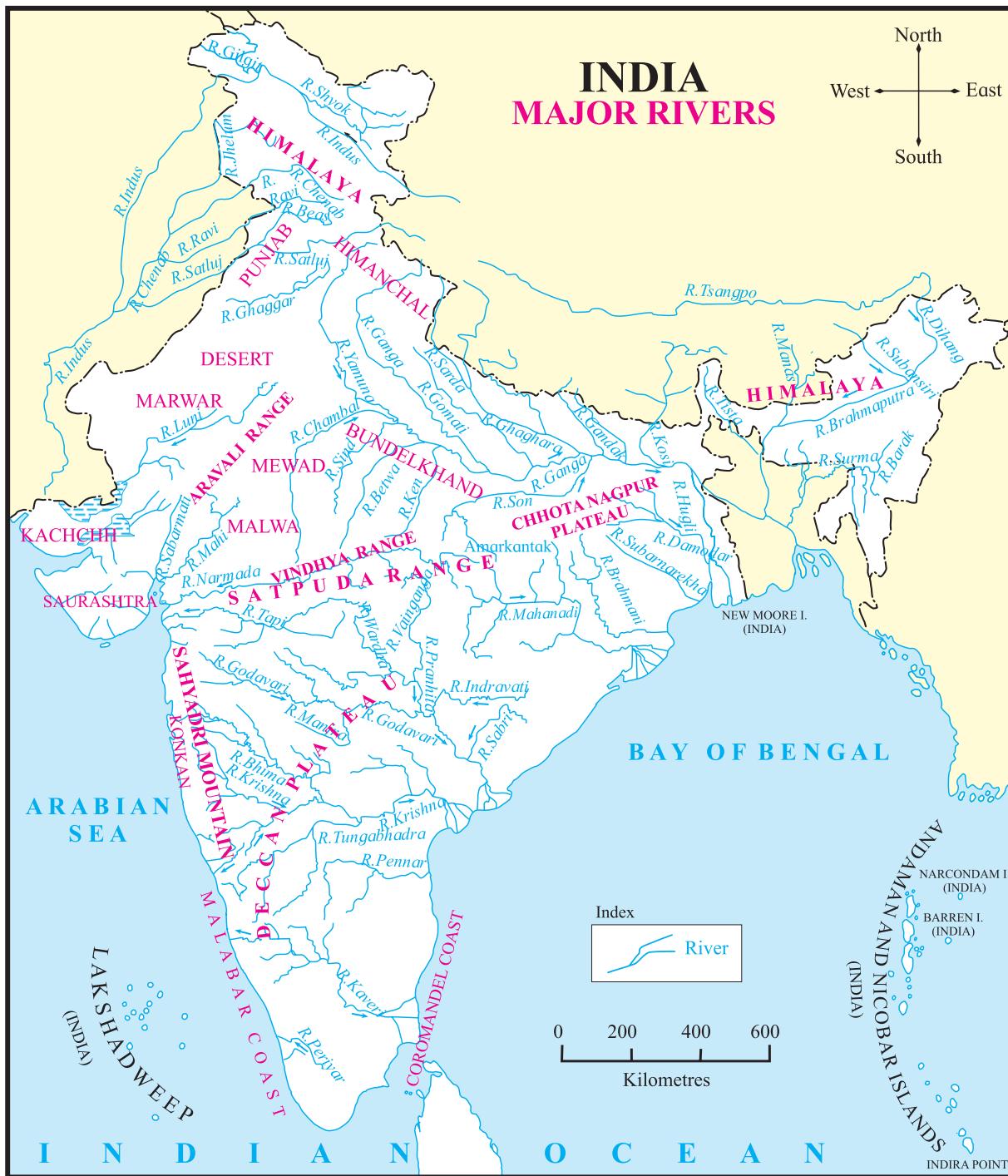
10. Getting to Know India

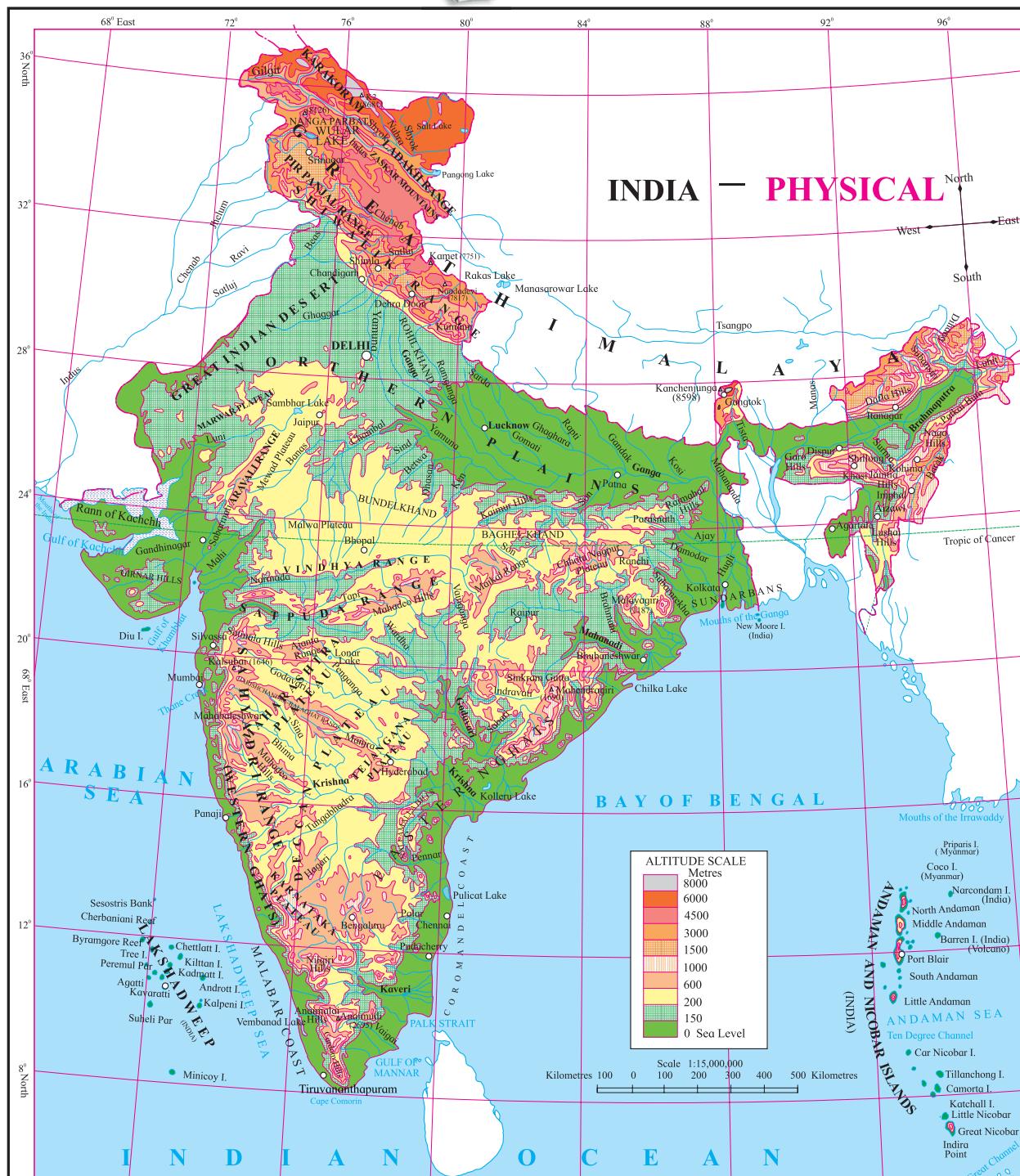
Make friends with maps !



Look at the map of India given below. It shows the different rivers in India. You must be familiar with some of the names. They are often mentioned in patriotic

songs. Our country is rich with many rivers, mountains, and plateaus. Some of them have been shown on the map. Which of the names given on the map seem familiar ? Where have you read about them ? On the map, encircle the names you know.





Study the physical map of India carefully and answer the questions.

- (1) Find the mountains and name them.
- (2) Name the hills shown on the map.
- (3) Find and name the plateaus in the map.
- (4) Which rivers originate in the Himalayas and join the Indus? Consider the height

and write the direction of their flow.

- (5) Write the names of the major rivers which flow into the Coromandel Coast.
- (6) Study the course of the Ganga, Narmada, Vainganga, Godavari and Kaveri rivers. Note the slope of the land in each basin and write the direction of the slope.

- (7) Find the lakes on the map and name them.
- (8) Find and name the gulfs and the direction in which they are located with respect to India.
- (9) Study the water bodies on the three sides of India. Find their names and write the direction in which they are located.
- (10) Find the Lakshadweep, Andaman and Nicobar Island groups and write the names of some of the islands.
- (11) Which river basin is located in the northern plain of India?

We learnt about the physical set-up of India with the help of the map and the questions given with it.

Our country comprises various rivers, mountains, plateaus, plains, islands, etc. The Indian subcontinent is surrounded by water on three sides and tapers towards the south. This part is called the Indian peninsula. Our northern border is defined by the lofty Himalaya ranges. Our country has forests, plains and deserts.

The expanse of our country is large. The height above sea-level varies and goes up even beyond 8000 metres. Therefore, the weather conditions change from region to region. This gives rise to a wide variety of plants, animals and birds. Similarly, there is also a difference in the crops cultivated. Wheat is a primary crop in the north. Rice is a primary crop in the south and along the coast. Jowar is produced on a large scale in central India. This diversity has a significant effect on our lifestyle, customs, traditions and culture.

People of many different castes, tribes and religions live in our country. Many different languages are spoken. We also see differences in food, clothing and festivals and celebrations in the different regions.



Forest region



Desert region



Plains



Mountainous region



Marshy region



OUR COUNTRY INDIA



Study the political map of India given above and answer the questions.

- Find our State. Colour it with your favourite colour and write the name of its capital.
- Which is the northernmost State?
- Which is the southernmost State?

- Colour the States to the north-east in different colours. Write their names and the names of their capitals.
- Colour the largest State in yellow and circle its capital.
- What do the names in red letters show?

India is a democratic republic. The capital of India is New Delhi. Considering the area, Rajasthan is the largest State in India. It is followed by Madhya Pradesh. Maharashtra is in the third place. Goa is the State with the smallest area.

Try this.



Let each person in the class choose one State. Use the following points to collect information about the State.

- (1) Social and cultural features : language, festivals, clothing, dance forms, etc.
- (2) Geographical features : landforms, water bodies, forests, etc.

You can take the help of the school library, newspapers, magazines, the internet, television and your teacher to find this information.

Do you know?



Apart from the Indian mainland, several groups of islands are also included in the Indian territory.

- (1) The Lakshadweep islands in the Arabian Sea.
- (2) The Andaman and Nicobar islands in the Bay of Bengal.
- (3) The coastal islands near the Indian mainland.



Seafort : Janjira

Use your brain power !



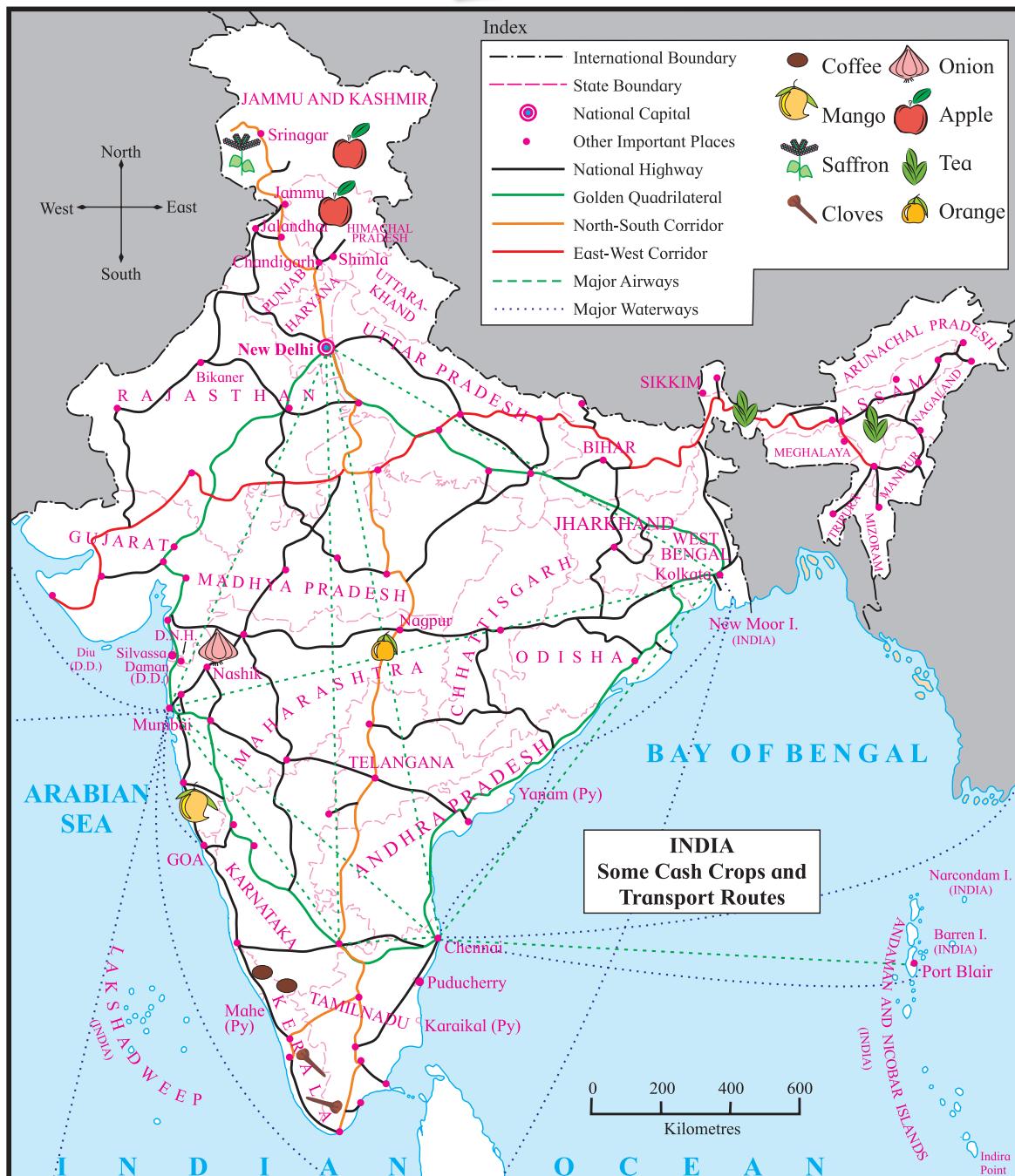
- (1) Which is the State next to us which was formed in 2014 ?
- (2) How many States are there in India ?
- (3) In which State is the Great Indian Desert mainly located ?

Now make charts of the information you have collected and put them up in the classroom. While doing this, do not forget the Union Territories. In this way, you will have a display of each State and Union Territory (UT) in your classroom.

We also notice differences in the crops produced in the different regions. Let us find out where the coffee, tea, oranges, mangoes, etc. that we see in the market come from, and how they reach us. See the map on the next page.

All these islands have strategic locations from the defence point of view. Long ago, forts were built on some of these islands off the coast of Maharashtra to safeguard the coast. These historical forts are known as sea forts. We can see several such forts along the Konkan coast.

Make friends with maps !



Study the map given above carefully. This map shows some of the cash crops and transport routes in India.

Answer the questions given below with the help of the map.

- (1) From where will we obtain saffron? Trace the most convenient route.

- (2) In which States is tea grown?
- (3) Find the route taken to bring cloves into our State and trace it.
- (4) Find the States in which apples are grown. Circle their names.
- (5) Find the route to deliver oranges from Nagpur to Bikaner and trace it.

- (6) Find a route to deliver coffee and mangoes to West Bengal and trace it.
- (7) How will you send onions from Maharashtra to Arunachal Pradesh?

What's the solution ?



Harsh and Tanishka live in Mumbai. They want to see the Andaman and Nicobar islands. First they are going to see their uncle in Chennai. After that, they will visit the islands. To make this trip, which of the routes on the map on page 49 will they have to take? Will you help them by tracing this route on the map?

Always remember –



There is a diversity of plants, animals and birds in our country. We can easily see this in forested regions. We must preserve this diversity.

What we have learnt –



- We studied India with the help of maps.
- We studied the landforms and water bodies in India.
- Through activities, we obtained information about the various languages, clothes, festivals and other features of India.
- We identified some crops and transport routes in India.

Exercises

1. Correct the following statements and write them in your notebook.

- There are coffee plantations in Himachal Pradesh.
- Konkan lies in the eastern part of India.
- Tripura is the smallest State in India.
- The Sabarmati river flows through Madhya Pradesh.
- The Sahyadri mountains are located in Andhra Pradesh.

Activities

- Collect information and pictures about any one State along the northern boundary of India.
- Make a presentation : ‘I am the State of speaking.’
- Find out which languages are spoken in your surroundings. Mention the States/region to which they are related.

2. Make a chart of the States and the rivers flowing through/in them.



11. Our Home and Environment

Try this.



A



B



C



D



E



F

On the way to your school, or market, or when you travel to another town, you see many things. Observe carefully the houses that you see. Note the construction, shape, building material and other aspects of the different houses. Do some of the houses resemble the specimens shown above ?

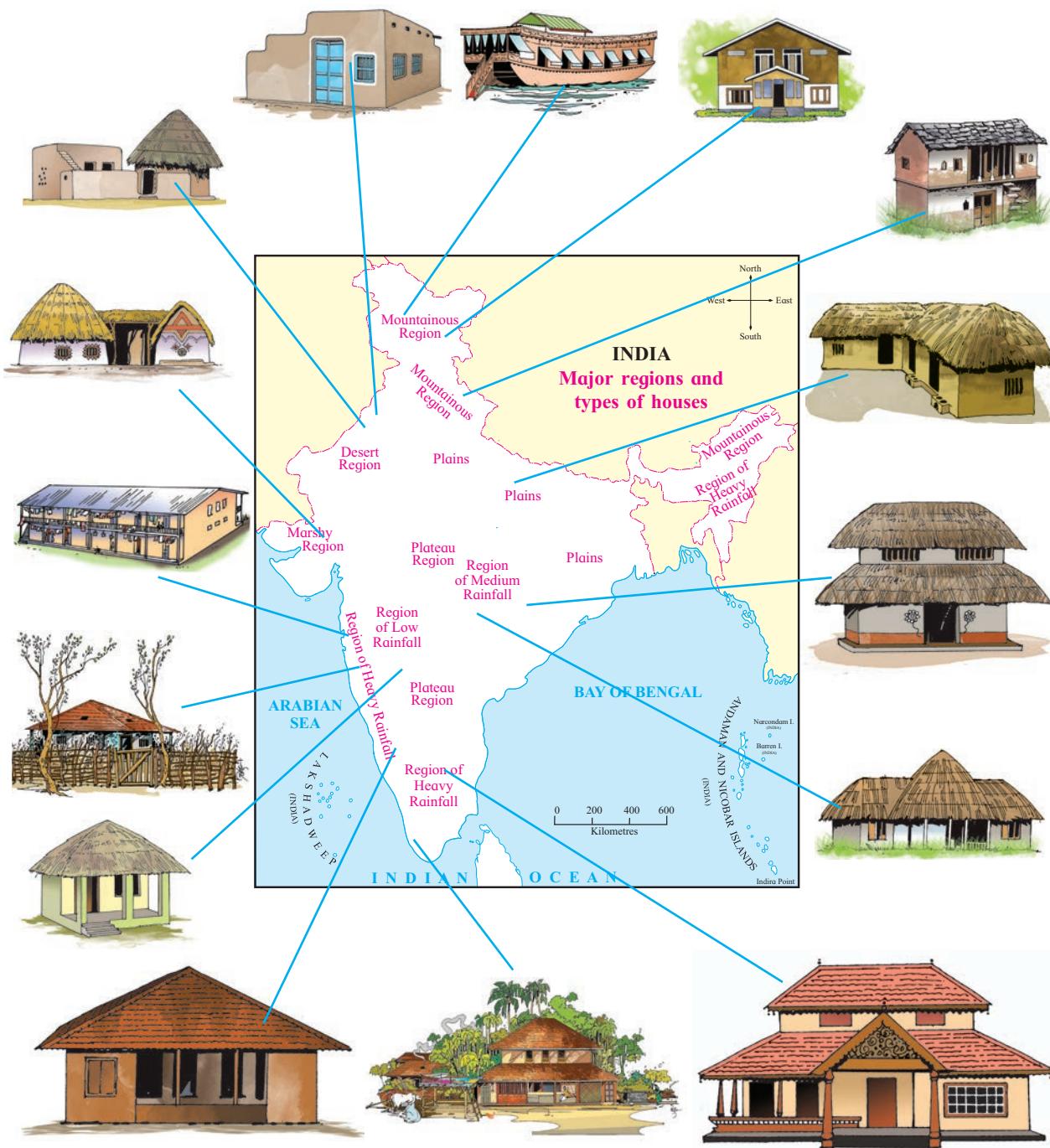
- (1) What materials are used for building houses ?
- (2) Compare any two types of houses that you saw and note down the differences.
- (3) What are the different things from which a house gives us protection ?
- (4) In what way are the houses 'A', 'B' and 'C' different ? Which of them appears to be the safest ?

- (5) Which of the above houses are mainly seen in cities ? Which are seen mainly in the rural areas ?
- (6) Think about your own environment and the climate there and choose the most suitable house for yourself by putting a '✓' in the box near the picture.

We saw different types of houses in the pictures. Their main uses can be listed as follows:

- * A shelter
- * A resting place
- * Protection against the sun, the wind, the cold and the rains
- * Protection from wild animals
- * Keeping ourselves safe from anti-social elements.

Make friends with maps !



The above figure shows a map of India and the types of houses that are common in the respective regions since ancient times. Note how the construction or structure of the houses changes from region to region.

(1) Regions of heavy rainfall

- (2) Regions of medium rainfall
- (3) Regions of low rainfall
- (4) Desert regions
- (5) Marshy regions
- (6) Mountainous regions
- (7) Plains.

(a) Observe the map and the pictures of houses and complete the following chart.

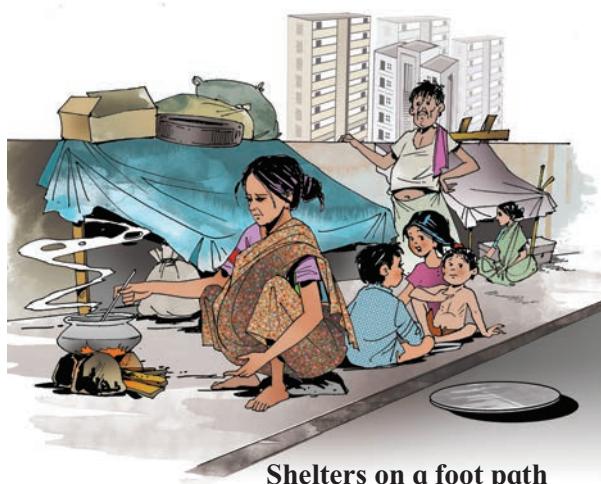
Sr. No.	Region	Type	Shape / Construction	Building material	
				Roof	Walls
1.	Plains	Flat-roofed house	Rectangular	Wood, earth	Stone, earth
2.					
3.					
4.					
5.					

(b) Find and note down the reasons why these differences occur in the construction of houses according to the regions.

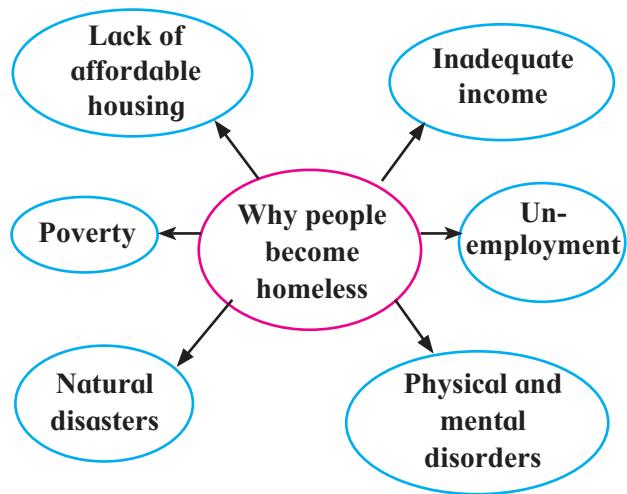
People build houses to suit the climate of their region, using the natural resources that are available. Differences in the construction and building materials give rise to the different types of houses.

Water, food, clothing and shelter are the basic needs of every human being. However, these needs are not fulfilled in the case of each and every person. Then the following situations arise –

Around us, we see many people who lack shelter. They seek shelter at the roadside, on footpaths, under bridges, in tumbledown buildings, in railway or bus stations and even on open grounds. Many people are forced to be ‘homeless’ because they have insufficient or no means of livelihood.



A section of our society being homeless is a social problem. That is why, the government implements many schemes to provide homes to the homeless. In some of the cities, the government makes ‘night shelters’ available to the homeless.



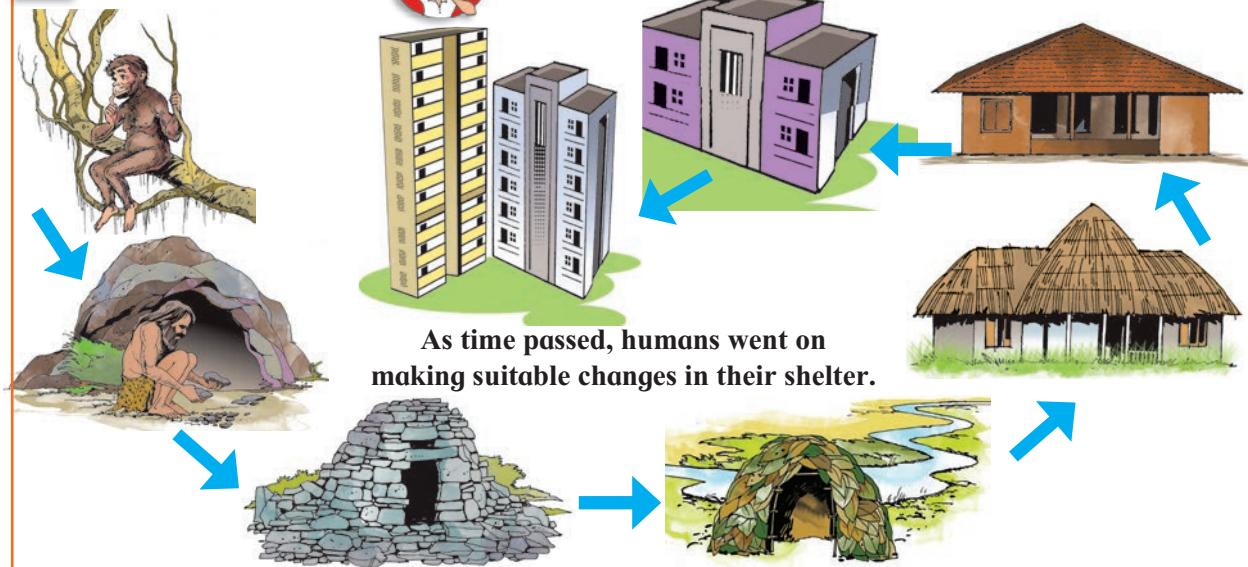
We all have a right to clean potable water, sufficient food, a safe shelter and education.

What's the solution ?



Construction work is going on opposite Ajit’s house. That means constant loud noise and a lot of dust in the air. Ajit and his family have to suffer this all the time. What can Ajit do to find a way out of this problem ?

Do you know?



Try this.



Visit a place where construction work is going on. List the materials that you see there. Obtain information about the pollution in that area.

Material	Original source
Bricks	
Cement	Limestone
Iron	
Wood	
Water	
Rubble	
Glass	Sand
Floor Tiles	
Sand	
Roof Tiles	
Tin Sheets	

Compare your own list with your friends' lists. Find the original sources from which construction material is obtained and note them down in the above chart.



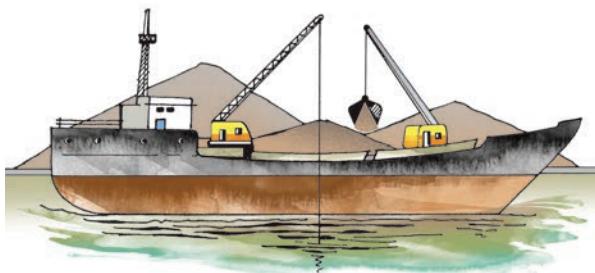
Visit to a construction site

Always remember –



Though there are so many different types of houses, everyone is attached to their own house. It is not only the walls and doors and windows and the roof that make up a house. It is the people who live in that house and their love and affection for one another that turns a house into a home.

Use these pictures to discuss how environmental pollution affects us.



A launch extracting sand



Felling trees and forests



Quarrying



Forest fire



Drawing excess water

The population of the world is increasing all the time. That is why, houses are being built in large numbers. Natural resources have to be used in very great quantities to build these houses. They are obtained using the methods listed below. These methods are harmful to the environment and lead to the pollution of air, water and soil and also cause noise pollution.

- Digging up hills for quarrying
- Extracting sand from seashores and riverbeds
- Extracting stone and earth from the ground
- Drawing out excessive amounts of groundwater
- Felling trees to clear land
- Filling up ponds, lakes, streams, rivers, creeks and low-lying areas to reclaim land.

Because of growing urbanization, land which was previously being used for agriculture and similar other purposes is now being used to build roads and to raise settlements. When this leads to shortage of agricultural land, forestland is used for

agriculture. Trees are felled in great numbers and forests are reduced.

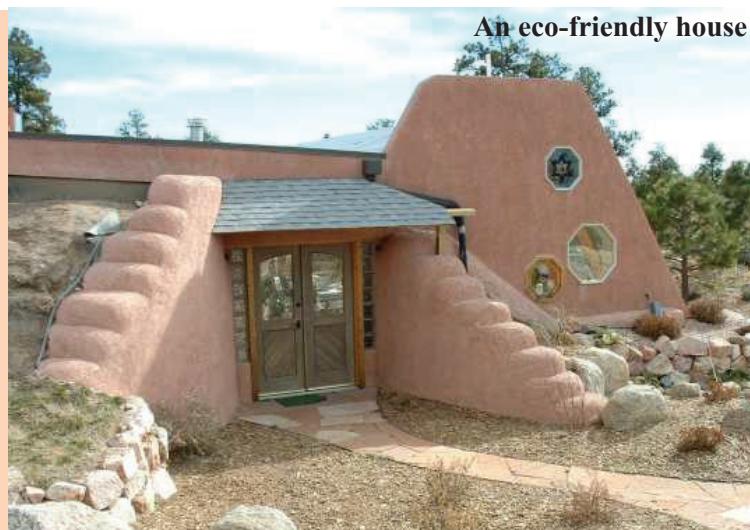
Energy is needed to produce construction material. It is used on a very large scale to prepare bricks from soil, cement from limestone, glass from sand and so on.

Where does the energy come from? It is produced using natural fuels like coal, natural gas or mineral oil. These natural fuels can be used only once. They get consumed when we use them. Moreover, burning these fuels leads to air pollution. It takes lakhs of years for these sources of energy to form in nature. That is why, it is necessary to bring into use other sources of energy such as solar energy or wind energy which are available in plenty and which do not cause pollution. These are non-exhaustible sources of energy.

All living things need shelter. Like humans, some other living things also build shelters using various materials in their environment. But last year we saw that their shelters are eco-friendly and temporary. We should also be able to make permanent houses that are eco-friendly.

Some characteristics of eco-friendly houses –

- Minimum consumption of natural resources
- Use of non-exhaustible sources of energy such as biogas, wind energy and solar energy
- Recycling of water
- Recycling of garbage
- Avoiding artificial materials and artificial colours
- Provision for natural light and ventilation in the house



Do you know ?



Underwater shelters

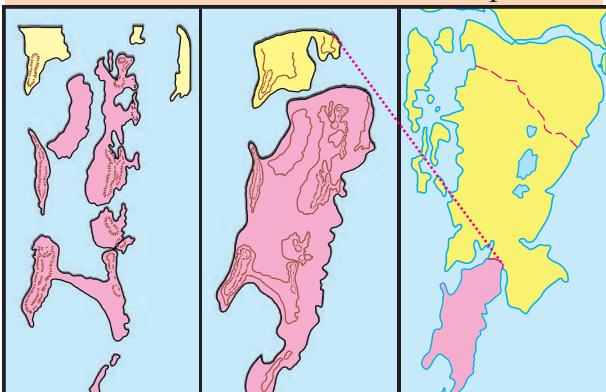


Water tourism has now become an important occupation. In some places, there are underwater shelters for tourists. From these shelters, we get a direct view of the sea-bed and the amazing marine life. Such shelters are observed in the coastal regions of Europe and North America.

Do you know ?



The city of Mumbai comprises seven islands. The portions of water bodies between them were filled with stone and earth to create land. Later, settlements, roads and industries were developed on



Group of seven islands

Mumbai city

Brihanmumbai metropolis

this land. Because this 'reclaimed' land is in a low-lying area, it easily gets water-logged when there is a heavy downpour.

What we have learnt –



- We observe a variety in the types of house construction in regions of different climate.
- Houses are built to suit the climate of that region.
- Different materials, all obtained from nature, are used to build houses.
- We should be judicious in using energy.
- It is necessary to increase the use of non-exhaustible sources of energy.
- It is necessary to build eco-friendly houses.
- We must take care that the environment is not harmed.

Use your brain power!



For what purpose do birds use their nests ?

What's the solution ?



What can we do to build houses without harming the environment ?

Discuss your solutions in the class.

Exercises

- 1. (a) Which of the following houses would be suitable in a mountainous region?**
Put a '✓' in the appropriate box. Give reasons for selecting that house.



- (b) What materials will you mainly use for building a multi-storeyed house? Choose the correct option.**

- (a) Mortar / coal / cement / bricks
- (b) Cement / bricks / cotton / iron
- (c) Iron / cement / mortar / bricks

- 2. Arrange the following considerations from the most to least important in house-building.**

- (a) Luxury
- (b) Structure
- (c) Climate

- 3. Write the following.**

- (a) List the eco-friendly things in your house.
- (b) Which of the gadgets in the house can be run on solar energy ?

- 4. What are the types of pollution that can be observed at a construction site ?**

Activities

- (1) Prepare a model of an eco-friendly house.
- (2) Prepare and present a street play with the help of your teacher to raise public awareness regarding the prevention of any kind of harm to the environment.
- (3) With people's participation, hold an exhibition to display the significance of the biodiversity in your area.

* * *



12. Food for All

Can you tell?



- (1) Which vegetables do we get around the time of Diwali? Which fruits? Which grains?
- (2) What are the seasons for jowar, bajra, rice, mangoes, oranges and jackfruit?
- (3) Which parts of plants do we use as food?

Agriculture

Agricultural seasons : We get food from plants. For that purpose, we sow grains in fields and plant fruit trees in orchards. About 60% of the land of our country is in use for agriculture. There are two main agricultural seasons in our country.

The season from June to October is called the kharif season. In this season, the crops are watered mainly by the rain.

The season from October to March is the rabi season. In this season, rainwater that has soaked into the soil, the retreating monsoons and dew are the sources of water for the crops.

In addition, some crops are grown from March to June. These are called summer crops.

Can you tell?



Which is the season for growing rice?

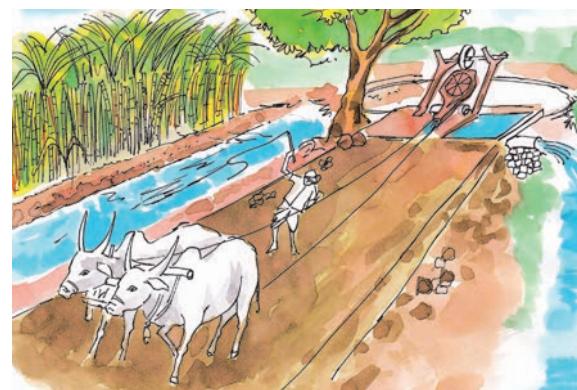
Agricultural work : Every farmer wishes to get a good harvest. A good harvest provides a good income. Fertile land, good quality seeds and fertilizers, and availability of water are essential for a good harvest. It is also necessary to carry out the tasks of tilling the land. The crop in

the field must be protected and the harvested crop must also be stored safely. All of these processes are important.

The population of our country is increasing, and still the needs of all the people are being met. This has been possible because of modern improved methods of agriculture.



Traditional agriculture : In the traditional methods of agriculture, ploughing, tilling, etc. were done with the help of oxen. A 'mot' (a huge leather bag) driven with the help of oxen was used to



draw water from the well. Harvesting, threshing, etc. was done by the members of the farmer's family themselves with the help of oxen. However, farmers now carry out all these tasks with the help of machines.



Ploughing the land

Improved methods of agriculture

Improved seeds : Earlier it was customary to preserve the seeds of one harvest for sowing in the next season. Those seeds did not have a high yield. Nowadays, improved seeds are developed through research. They are available in the market for every crop such as jowar, rice, groundnut, wheat, etc. These have a higher yield. They can resist pest attacks. Some varieties become ripe for harvesting in a shorter period of time while some give a high yield even with a low water supply.

Modern methods of irrigation : Crops grow well if they are watered at the right time. Water from rivers, lakes and wells is used for irrigation in addition to rainwater. Greater quantities of water are stored by building dams and bunds on rivers to obstruct the flow of water downstream. This also helps to raise the levels of groundwater.

Crops were traditionally watered through canals. However, much water from the canals is lost due to evaporation and seepage into the ground. Now, certain improved methods of irrigation are used which provide enough water to the plants and at the same time, help to save a lot of water.

Drip irrigation and sprinkle irrigation are two of these modern methods.



Drip irrigation



Sprinkle irrigation

The drip irrigation method makes use of pipes with holes. This ensures that the required amount of water drips only near the plants. Thus, full use is made of the available water.

Sprinkle irrigation makes use of sprinklers of different sizes that spray water directly on plants.

Find out.

- (1) Names of two varieties of improved seeds of jowar.
- (2) Who helped the farmer to drive the ‘mot’?
- (3) How is groundwater lifted these days?

Fertilizers

If the same crops are grown repeatedly in a field, the fertility of the soil decreases. Then we have to add fertilizers to the soil to restore its productivity. Fertilizers provide the required nutritive substances to the crop. There are two kinds of fertilizers, natural and chemical.

Natural fertilizers are called manures. They are obtained from materials available in nature like green waste and animal dung.

Chemical or artificial fertilizers are mixtures of different chemical substances in specific proportions, useful for agriculture. In traditional agriculture, organic manures such as compost were used. Chemical fertilizers came to be

used for quicker growth and higher yields. However, the harmful effects of the use of these fertilizers soon became clear. The overuse of chemical fertilizers leads to accumulation of excessive chemicals in the soil. This lowers the fertility of the soil and reduces its productivity.

Overwatering makes the land saline and fallow. This is seen especially in the parts where water is available in plenty, as for example, near dams or on river banks.

If land becomes saline and fallow, it has to be tested to find out which substances it lacks. The fertility can be restored by adding these substances. It is a costly and time-consuming procedure. Therefore, it is better to avoid excessive use of fertilizers and water.



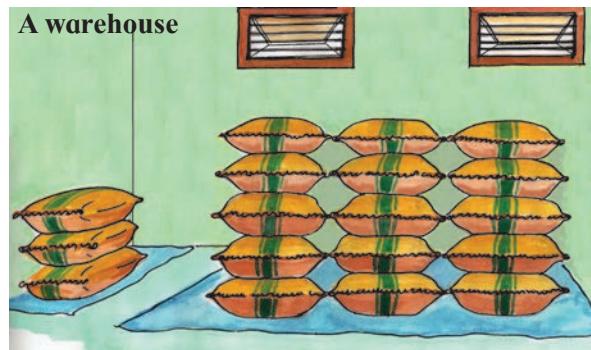
Spraying insecticides

Protection of crops : Diseases and pest attacks can damage crops in the fields. As a remedy, insecticides and pesticides are sprayed on crops or certain chemicals are rubbed on the seeds before sowing.

Storage of grain : Storing the harvested crop safely is as important as

increasing the production. What steps are taken for this purpose?

The grain is dried well in the sun and filled in sacks. The sacks are then stocked in the house or, after selling, in warehouses or shops. Stored grain can get damaged in two ways. Mice, rats and insects can spoil the grain to a great extent. Also, if the grain is stored in a closed and damp space, it catches fungus and becomes unfit for eating.



To prevent such damage by pests, chemicals are sprayed at the place of storage or all around it. Neem leaves are mixed in the grain. Some protective chemicals that can be mixed with the grain are also available in the market. Their smell repels insects. Storage places are always kept dry and airy to prevent fungus formation.



Neem leaves

Use your brain power!



What is the advantage of storing grain in wattle and daub baskets?

Food storage and conservation of environment

Like humans, other living things also store food. Each of them has a different way of doing it. Insects like ants store food. Bees collect nectar from flowers and store it in a honeycomb, in the form of honey. Squirrels store seeds. Because these animals store food, it is available to them when they need it.



Food storage



All the time, plants are busy producing the food they need. Even so, there are some plants that store food. You are familiar with bulbs of plants such as onions and garlic, and tubers such as potatoes, ginger, etc. They are all parts of the stem of the plants. Radishes, sweet potatoes, beetroots are the roots of their plants. These plants store food in their stems or roots. We, too,

store food in our homes according to our needs.

In India, due to the improved methods of cultivation, we now produce plenty of foodgrains. The production exceeds the demand. The surplus foodgrain is stored in huge warehouses.



Sometimes, production is affected by a disaster such as floods, drought, a cyclone or hailstorm. At such times, the stored surplus grain can be used for the people. It can also be used for people displaced due to disasters like an earthquake.

Visit to a Fair Price shop : Visit a Fair Price shop to understand the rationing system (public distribution system). Observe the different kinds of grains available there and if possible, the types of ration cards.

The green revolution : Today our country is self-reliant as far as production of foodgrains is concerned. We are also able to export the surplus grain. The tremendous increase in foodgrain production in our country was achieved during the 'Green Revolution'. It was brought about by the joint efforts of scientists, people working for the spread of science and farmers. The credit for the research that led to improvement in the seeds of wheat and rice that resulted in the Green Revolution in India goes to Dr M. S. Swaminathan.



Dr M. S. Swaminathan

Food security : Food is a basic need. Many countries have made laws to ensure that every person gets sufficient food according to their need. These laws are known as Food Security laws. In 2013, our country too enacted a Food Security Law. It has made it possible to fight ills like malnutrition, starvation and deaths due to hunger.

Agricultural assistance programme : Through this programme, farmers are given proper information and guidance about the latest technology, irrigation facilities, improved seeds, use of fertilizers and pesticides, etc. They can also get weather forecasts and other agriculture related information from these assistance centres.



A farmer asking for information from an agricultural assistance centre

In addition, agricultural schools have also been started for farmers. Members of a farmer's family can learn about new technology at these schools. Agricultural Produce Marketing Committees hold exhibitions too for farmers.

The agricultural department of the government, agriculture universities, television, newspapers and various periodicals work for the spread of modern methods of agriculture. Now, it is possible for all farmers to use these modern methods to increase production. The whole country benefits from these efforts.

Do you know ?



Organic farming : Farming that relies on natural (organic) materials is called organic farming. It is a form of traditional agriculture. In this method, the nutritive substances in the soil are retained. The organic pesticides used in this method have no harmful effects on those who eat the produce. The grain grown by this method is nutritious and also good to the taste. That is why, farmers have begun to opt for organic farming methods.

Organic farming involves use of manure obtained from plants and animals. These manures consist of fish and bone meal, animal excreta as well as decomposed remains of plants and animals.

Always remember –



- (1) Crops should be watered only as much as necessary.
- (2) Care should be taken when using chemical fertilizers and pesticides. Their overuse should also be avoided.

What we have learnt –



- There are two main agricultural seasons - the kharif and the rabi season.
- Using improved methods of farming leads to an increase in production.
- Farmers can get information about modern agricultural technology through Agricultural Assistance programmes.

Exercises

1. What's the solution ?

The plant in the pot is not growing well.

2. Use your brain power !

What is the purpose of storing foodgrain in our house?

3. Find and correct the incorrect statements.

- (a) There is only one method of farming.
- (b) India is an agricultural country.
- (c) Use of improved seeds does not lead to higher yields.

4. Answer the following questions.

- (a) What are the advantages of using improved seeds?
- (b) Which are the modern methods of irrigation? What are their advantages?
- (c) Describe the 'drip irrigation' method.
- (d) What are the reasons due to which growing crops are damaged?
- (e) What is done to avoid the damage to crops?
- (f) What causes the fertility of the soil to diminish?
- (g) What changes has modern technology brought about in the methods of farming?
- (h) What methods are used to preserve foodgrain?
- (i) How is water made available for farming ?

5. Match the following.

'A' Group

- (1) Grain stored in a damp place

'B' Group

- (a) Prevents growth of fungus on the grain

- (2) Grain stored in dry air

- (b) Prevents insect infestation

- (3) Adding proper chemicals to the stored grain

- (c) Fungus attack

Activities

1. Make a note of the day when the grain stored in your house was purchased.
2. Obtain seeds of five types of grain, put them in separate packets and stitch them to a large sheet of paper. Write all you know about each foodgrain.
3. With your teachers, visit a farm where modern methods of agriculture are used.

* * *



13. Methods of Preserving Food

We need wheat, rice, pulses, etc. throughout the year. But their crops get ready only at certain times of the year. In order to have the grain available throughout the year, one season's crop must be stored and protected till the next season.

Different foodstuffs are produced in different places. They have to be made available in good condition to people at long distances. For example, it must be ensured that eggs, milk and milk products remain in good condition during transport from the dairy or poultry farm till they reach their users.



Different fruits and vegetables are available in abundance in different seasons. They also taste their best in that season. To prevent these large quantities of fruit and vegetables from getting spoiled and to enjoy them all year round, we make efforts to preserve them.

Various kinds of *papads*, jams and pickles, onions, fish and *masalas* are prepared and preserved for the whole year in many homes. Nowadays, we can buy such ready products in the market, too.



Papad, kurdai



Pickles and jams

To avoid having to go to the market for provisions again and again, we store what we need for several days in our house. If the food prepared for one meal is not finished, then, we use certain methods of keeping it from spoiling, in order to have it again the next time or the next day.

Can you tell ?



Talk to the elderly people in your family to find the answers to the following questions, with reference to the foodstuffs mentioned below :

Milk, vegetables, grains, flours, sugar, jaggery.

- (1) When do we say that the foodstuff is spoiled? What changes are seen in it?
- (2) Is the time in which foodstuffs get spoiled different in different seasons?
- (3) Which foodstuffs spoil most quickly?

- (4) What measures are taken to keep the foodstuffs in the house in good condition, for as long as possible?

If we know the reasons why foodstuffs go bad, we would know what to do to keep them from spoiling. From the information you obtained you must have gathered the following :

- (1) In winter, i.e. in the cold weather, foodstuffs keep longer. If they are kept in a refrigerator or kept cold on ice, they keep even longer.
- (2) Grains are dried in the sun before storing. Onions and potatoes are kept to dry in the open air in summer and then stored in a dry place.
- (3) If we boil milk it does not get spoiled immediately. Curries and vegetable preparations are brought to a boil to prevent them from spoiling till the next meal.
- (4) Milk, mango pulp are foods that spoil quickly.
- (5) Our food has to be kept away from ants, cockroaches, other insects, mice, rats and cats.

Try this.



- (1) Divide a chapati into three pieces.
- (2) Put one piece in a closed box.
- (3) Roast the second piece on a hot pan to make it crisp without charring it. Let it cool and put it in a box.
- (4) If possible, put the third piece in a box and put it in the fridge.

Observe these pieces every morning and evening for two-three days.

What do you see ?

We see white, black or greenish fibres like cottonwool growing on the piece of chapati placed in the closed box. It also starts smelling. Whereas, for several days, we see no such changes in the crisp piece of chapati or the one that was put in the fridge.

Why is this so ?

The cottonwool-like fibrous growth on the chapati is a kind of fungus. A fungus is a type of micro-organism.



Fungus as seen through a microscope

Spores of the fungus are present in air and water. The chapati in the box created favourable conditions for the growth of the fungus – availability of food, water, air and warmth. That is why, the fungus grew on the chapati in the box.

Food and micro-organisms

You know that micro-organisms are present all around us in the air as well as in water. Usually, air, moisture and warmth are available where food is kept. It means that it is always possible for micro-organisms to grow rapidly in our food or foodstuffs. We cannot see them, but if they begin to grow, our food gets spoiled. Such spoiled food can cause a stomachache, diarrhoea, vomiting, etc. The nutrition value of such food is also reduced. Sometimes, it can even threaten life.

Methods of food preservation

Drying : When we dry foodstuffs, their water content is lost. This method is used to preserve foodstuffs like *papads*, *kurdai*, *sandage*, wheat, daals, etc.



Cooling : When food is placed in a refrigerator, micro-organisms do not get the warmth they need for growth.



Boiling : When foodstuffs are boiled, the micro-organisms in them get destroyed.



Placing in airtight cans : When foodstuffs are preserved in airtight containers, the micro-organisms are first destroyed and it is ensured that water or air will not enter the foodstuff.



It means that to preserve foodstuffs, the micro-organisms in them should be destroyed. Also, they must be placed in conditions in which micro-organisms will not grow again.



Try this.



Make a pickle.

Materials required : A glass jar, a knife, a spoon, 7-8 lemons, a quarter bowl of salt, 2 teaspoons red chilli powder, $1\frac{1}{2}$ bowl sugar.

Procedure : Clean and dry the jar. Cut each lemon into 8 pieces. Put these pieces in the jar and add salt, sugar and chilli powder. Mix the ingredients well with a dry wooden or steel spoon. Tie a clean piece of cloth over the mouth of the jar and keep it in the sun for about 10 days. Stir it every day with a clean dry spoon. Your hands too should be clean and dry. Enjoy your pickle.

Preservatives : Certain substances are added to jams and pickles to preserve them for a long time. They are called preservatives. Sugar, salt, asafoetida (*hing*), mustard, oil and vinegar are examples of preservatives.

Do you know ?



Much of the variety in the tastes of our foods is due to spices. Every spice has a different flavour or taste. They have strong tastes and flavours and are therefore used in very small quantities.

Spices can be dried and stored for a long time. They can be mixed and powdered to make many different *masalas*. Different spices are obtained from specific parts of different plants.



Spices

Always remember –



When buying food in sealed bags or boxes, make sure you check the expiry (Use before) date printed on it.

What we have learnt –

- If pickles, jams, *papads*, etc. are made in the right season, they can be enjoyed for the whole year.
- If air, water and warmth are available, micro-organisms grow rapidly in foodstuffs. Some micro-organisms cause the foodstuffs to get spoiled.
- Drying, cooling, boiling and canning foodstuffs as also adding preservatives to them are the different methods of preserving food.

Exercises

1. What's the solution ?

- (a) The *papads* have become soft and moist.
- (b) Fruits like mangoes, amlas, guavas and vegetables like peas onions, tomatoes, fenugreek are needed all year round. They are available in plenty only in certain seasons.

2. Use your brain power !

Semolina (*shevaya*) do not get spoiled for a very long time. But *kheer* made from them spoils easily. Why is this so ?

3. Find and correct the wrong statements.

- (a) When something is boiled, the micro-organisms in it are destroyed.
- (b) Our food does not get spoiled when micro-organisms begin to grow in it.

(c) Foodstuffs dried in summer cannot be used for the rest of the year.

(d) Foodstuffs get warmth when put in a fridge.

4. Answer the following questions.

- (a) What are the different methods of preserving food ?
- (b) Why do we avoid eating food that has got spoiled ?
- (c) Why do we make jams from fruits ?
- (d) What are preservatives ?
- (e) Find out the names of the different spices. Also find out which part of their plant they are.

Activity

Visit, obtain and share information.

1. A cottage industry producing pickles, *papads*, sherbets, etc.
2. A milk-chilling plant, or a fish, fruit refrigeration/cold storage unit.

14. Transport

Try this.



Children, let us try an experiment.

Choose a friend's house, park, shop or school that is one kilometre away from your home.

- (1) On the first day, walk to your chosen place.
- (2) On the second day, ride to it on your bicycle.
- (3) On the third day, take an automobile.

While doing this, always take your school bag with you. Use the same route for all three journeys.

Now, note down the following.

1. The time taken for each journey on each of the three days.

2. Which journey took the longest time and which took the shortest time?
3. On which journey did you have to carry your own things?
4. Which was the most comfortable journey?
5. On which journey did you have to use fuel?
6. On which journey were you most bothered by smoke and noise?

From your answers, you will see that walking takes the most time and you have to put in labour to carry your own things. Using a vehicle saves time and effort.

You must have also realized that we need to use fuels in automobiles. This

causes air and noise pollution. It means that different modes of transport have different advantages and disadvantages.

In today's high speed world we have to depend on several modes of travel and transportation of goods. Modern means of transport have many advantages.

- Work gets done sooner.
- Time and effort are saved.
- Trade is facilitated.
- Different parts of the world are now connected due to transport facilities.
- The transport of goods even on a global level has become simple and easy.
- As so many things are easily available, the lifestyle of people has improved.
- The facilities of tourism, health, education, etc. have become speedier.

Due to the various means of transport, the world has come closer.

Have a class discussion on the advantages of transportation.

Can you tell ?



- Study the pictures and note the answers to the following –
 1. Where have the children stopped?
 2. Why have they stopped there?
 3. What are the children doing?
 4. What is troubling them?
- State the difference between the plants close to the road and those far away from the road, based on the following points.
 - (a) Freshness of leaves.
 - (b) Colour of leaves.
 - (c) Appearance of plants.

From the observations above, you must have realized that there is constant traffic on busy roads. Due to the burning of fuel in the vehicles they constantly emit smoke and some poisonous gases. These gases mainly include carbon monoxide, nitrogen dioxide and sulphur dioxide. Similarly, minute particles of carbon and lead are also released into the air. An excess of these substances lowers the quality of air in the environment. This is what we call air pollution.

Air pollution affects animals and plants in the following ways :

- Trachea, lung and eye disorders, e.g. burning of the eyes.
- The leaves of plants shrivel up and fall. Sprouts get scorched. The growth and development of plants is affected adversely.
- Constant traffic through forest areas can harm the habitat of plants and animals living there. The wild animals in these forests begin to migrate elsewhere.
- The constant sounds of vehicles create noise on a large scale. It causes ill effects such as restlessness, irritability, headaches, lack of concentration, psychological disorders, etc.

If there are traffic jams, air and noise pollution in that area increases.

Traffic accidents cause injuries, deaths and damage to the vehicles.

Have a class discussion on the harmful effects of transportation.

Can you tell ?



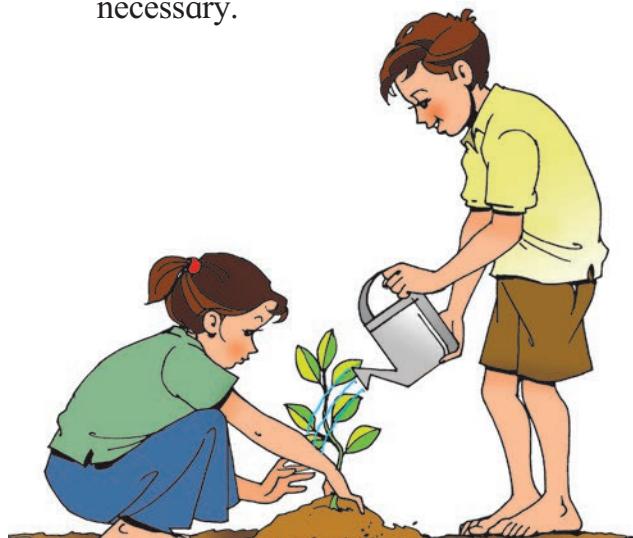
- (a) Walking
- (b) Riding a bicycle
- (c) Using a private vehicle
- (d) Using public transport

Which of the above options will you choose on the following occasions ?

- (1) Going to study at a friend's house who lives nearby.
- (2) Going to your school which is about one kilometre away.
- (3) Taking materials to a science exhibition in another town.
- (4) Going to a wedding in the next town.

From this, we realise that we should cultivate habits such as walking short distances or riding a bicycle for slightly longer distances. In this way, we can avoid the use of fuel-burning vehicles and reduce pollution. At other times, using public or private transport can save time and effort. In this way, we can reduce the severity of the harmful effects of transportation. The following are some more remedies for reducing pollution.

- (1) Using fuels that cause less pollution.
- (2) Timely maintenance and repair of vehicles.
- (3) Using public transport as far as possible.
- (4) Using private vehicles only when necessary.



Tree plantation

- (5) Planting trees, especially indigenous or local varieties like banyan, peepul, neem, karanj, etc. and caring for them. These trees adapt easily to the local environment and help in enhancing biodiversity.
- (6) Avoiding fuels that cause pollution; using fuels such as LPG or CNG for vehicles.



Do you know?



Have a class discussion on the remedies for pollution due to transport.

Always remember –

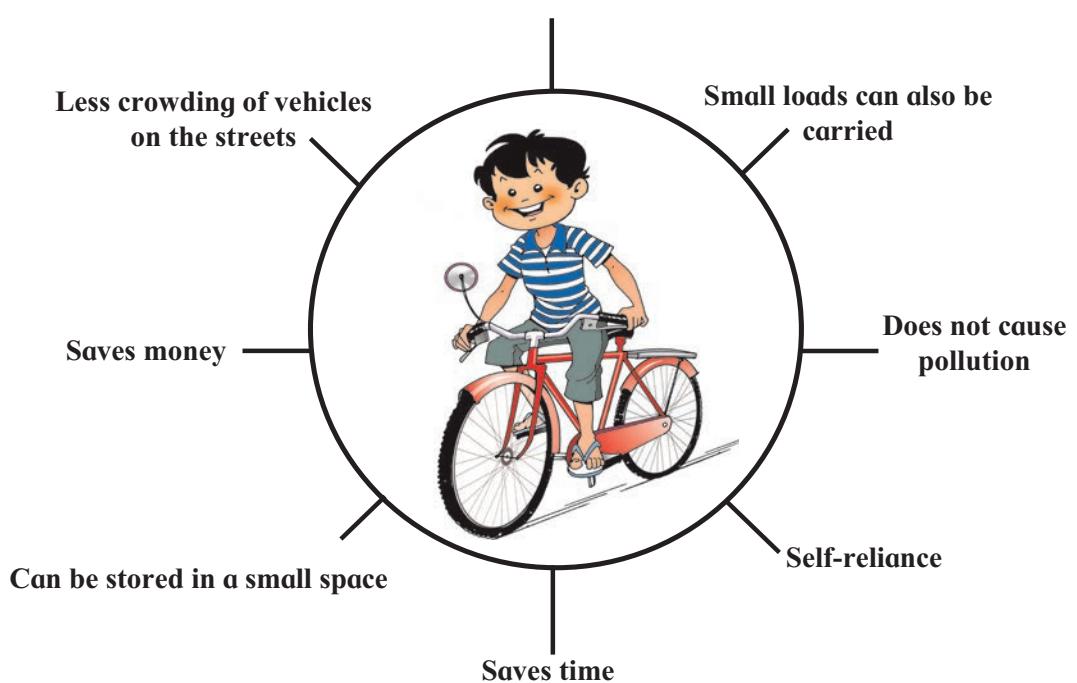


Our environment is sensitive. That is why, pollution has destructive effects on it. These effects are harmful for all living things, including us. It is very necessary to prevent pollution.

In these modern times, we use cars, ships and aeroplanes that run on fuel. In the olden days, ships did not use such engines. They had sails which helped to use the force of the wind. They were called sailing ships. In those days, people travelled all over the world on these ships.

Advantages of using a bicycle

Physical exercise



What's the solution ?



Rohan and Sania always walk to school. Their school is thirty minutes away from their house. There is a cultural function at their school today. Their grandmother will accompany them to the function. But she gets tired easily because of her age. Which of the options listed below would you suggest for taking her to school?

- (1) Walking (2) Autorickshaw
- (3) Bus (4) Scooter (5) Car

What we have learnt –



- The beneficial and harmful effects of transportation.
- Judicious use of means of transport.
- The danger to nature due to the pollution caused by various means of transport.
- Remedies for various types of pollution.

Exercises

1. Write five sentences on how you have benefited from transport facilities.
2. List four other facilities that have become available in the local area due to transport facilities.
3. Suggest four solutions to reduce the burden on the local transport.
4. Find the area in your locality with the least pollution. Why is this the least polluted area?
5. Write the full forms of CNG and LPG.



6. (a) In the above picture, which vehicle is causing pollution?
(b) What remedy will you suggest to reduce the pollution caused by this vehicle?

Activities

1. Spread the message of prevention of pollution through a street play.
2. Collect pictures of vehicles that run on electricity and on solar energy.

* * *

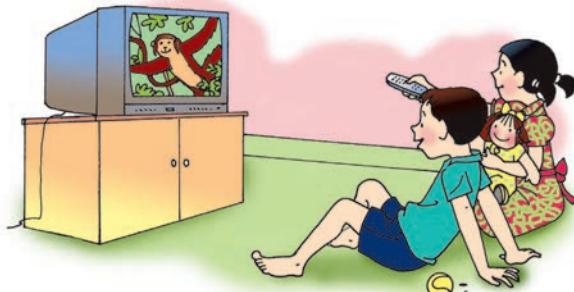


15. Communication and Mass Media

Can you tell ?



- (1) We watch TV programmes on many different channels. Where do they come from?



- (2) We talk to others on our mobile phones. What makes communication on a mobile phone possible?



In the first chapter, we learnt about launching of spacecraft and artificial satellites. Artificial satellites are used in modern methods of communication. The signals are delivered very quickly from one point to another. For example, (1) We can watch the live telecast of any event going on in any part of the world, for example, football or cricket matches. (2) With the help of mobile phones, we can directly talk to people in other countries. (3) The President or Prime Minister can address the entire nation at the same time over the radio or TV.



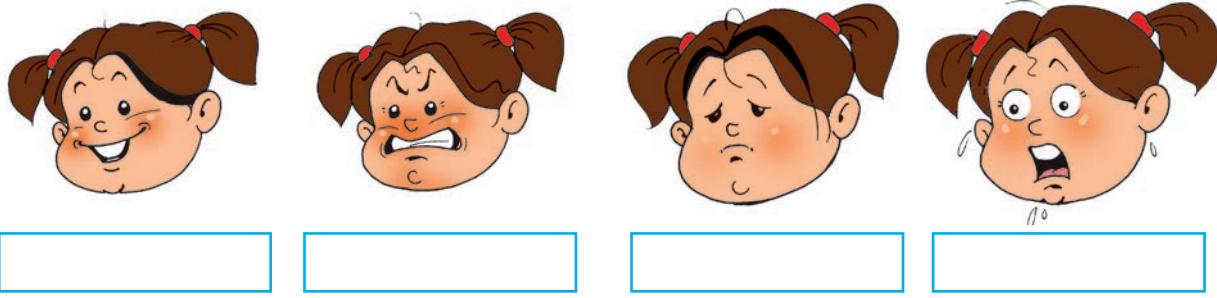
Artificial satellites are launched into space by means of rockets. They are useful for communication.

Do you know ?



In India, we use artificial satellites for communication. These satellites are called the Indian National Satellites (INSAT).

Can you tell ?

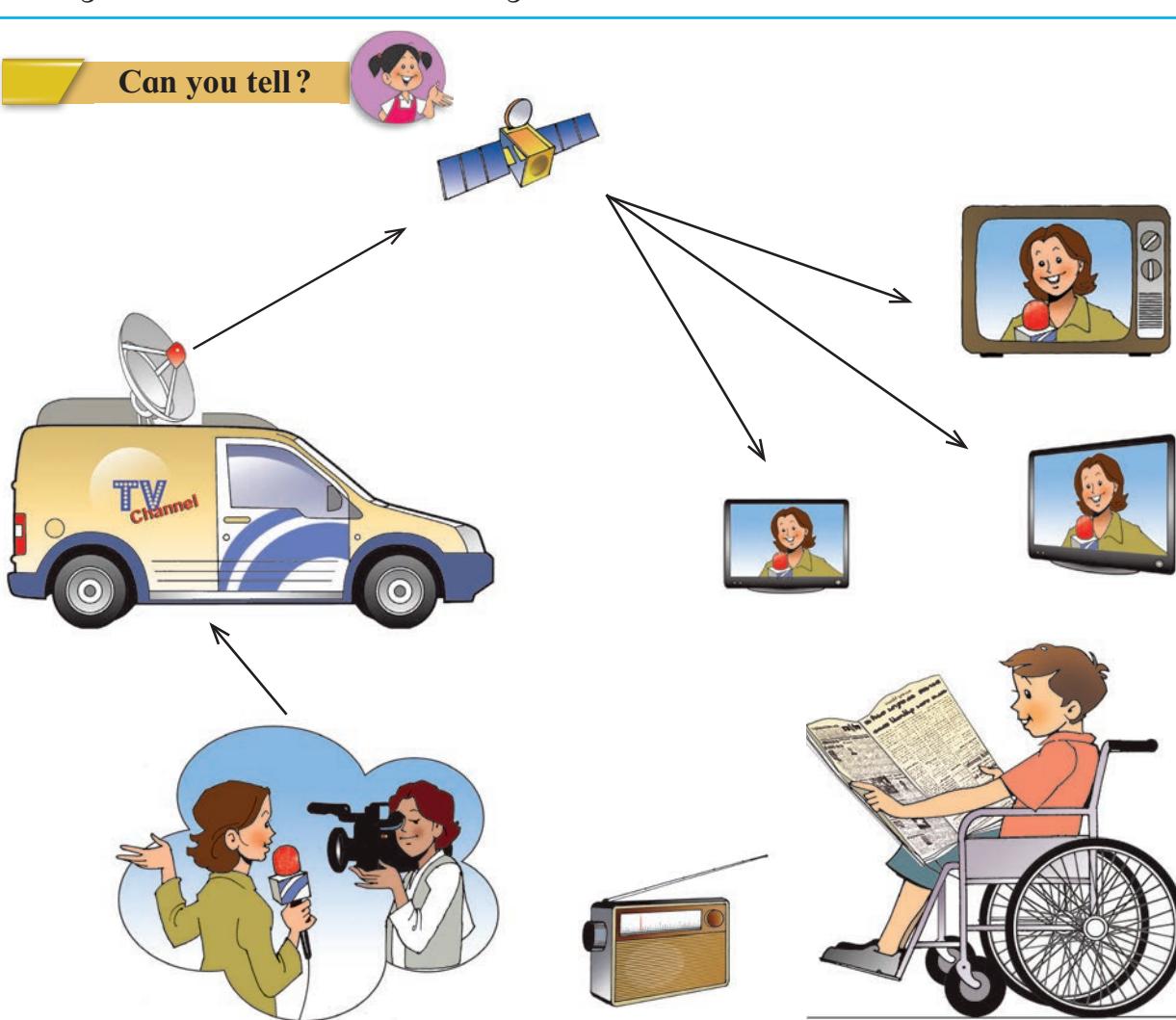


Study the pictures given above. Write the name of the emotion that you see on each face in the box below it.

We can understand a person's feelings by looking at the expression on their face. The expression on a person's face and other gestures communicate a message to

us. We receive messages or information through communication. The exchange of information is called communication. Information broadcast is also a part of communication. Information is useful for constructing knowledge.

Can you tell ?



Study the pictures on the opposite page. In the box below, write the names of the means of communication that are being used.

.....
.....
.....

Note down the different kinds of information you can obtain from a newspaper.

- Educational ● -----
- ----- ● -----

Advantages of telecommunication and mass media

1. We can easily contact people far away from us.
2. The time and effort spent in exchanging information can be saved.
3. They help to raise awareness about issues such as environmental balance, gender equality and cleanliness.
4. People can be forewarned about natural disasters like storms, tsunamis, floods, etc.
5. They build awareness about health, educational facilities, good things happening in society, etc.
6. They help in successful implementation of government schemes launched for the benefit of people.
7. Awareness can be raised about matters related to food, clothes, shelter, education and health. This improves people's way of life.
8. Mass media help in the expansion of trade and industry.

Disadvantages of telecommunication devices

1. Excessive use of the television, computer or mobile phones causes disorders of the eyes, ears and back. Psychological disorders and isolation, etc. are also possible.
2. We get all sorts of information through television channels and the internet. There are instances of this information being misused to disturb the peace and order in society.
3. Time spent on watching television leads to the neglect of outdoor sports and physical fitness. This has an adverse effect on physical health.

What's the solution ?



When Amod, who is in the fifth standard, comes home after school, he visits several websites on his computer. He never misses his favourite TV shows. He plays games on his mother's mobile phone all the time. He is always sitting at home. Lately, his appetite has decreased. He is drowsy and has put on weight.



Amod's mother is worried about him. When will she feel better?

Always remember –



Telecommunication devices should be used properly and sensibly. We must be careful not to use them excessively.

Do you know ?



Audio-visual communication –
We cannot see each other when we talk on the telephone. New communication technology has now made this possible on a mobile phone, to see the person we are talking to.

What we have learnt –



- Introduction to the means of communication.
- Use of space launch technology for telecommunication.
- Introduction to mass media.
- Advantages and disadvantages of the use of mass media.

Exercises

1. Write down the educational uses of mass media.
2. How were messages communicated before we began to use the telephone ?
3. What difference has the computer made to your life ?

Activities

1. Make a table in your notebook as shown below and enter in it the different kinds of information obtained from different TV channels.

Sr. No.	Channel	Programme	Use
1.			
2.			
3.			

2. Visit a radio station and gather information about the kind of work carried out there.
3. Discuss the educational programmes on the National Geographic, Discovery, Dnyanadarshana, and other channels.

* * *



16. Water

Can you recall ?

1. What happens when a spoonful of sugar, sawdust and soil are added to a glass of water?
2. Which are the three states of water?
3. What is done to make drinking water clean and safe?

Pollution of water

Try this.



While it is raining, collect some of the rainwater directly in a clean container placed in the open. Also collect some of the rainwater that is flowing over the ground. Observe and compare the two.

What difference do you see? What is the reason for that?

When other substances get mixed with water, it becomes impure. Some of these substances float in the water. So, the water looks unclean or muddy. Some substances dissolve in the water and we cannot see them. If the substances that have got mixed with the water are harmful for living things, we say that the water has become polluted. Rivers, lakes are our sources of water. How does their water get polluted?

Can you tell ?



List the substances that are mixed in the waste water drained out of the kitchen and bathroom in your house.

Disposal of waste water

The waste water of a city or town is collected and let into a water body at a convenient location. The waste water from residential buildings as well as from factories and industries contains many kinds of impurities. Some of these dissolve in the water while some do not.



A polluted water body

Sewage water can carry micro-organisms that spread diseases. Waste water from industries is more likely to contain poisonous substances. If all this waste water is let into water bodies as it is, the water bodies become polluted and that is dangerous. Such water cannot be used for drinking or for any other purposes. That is why, it is compulsory for factory-owners to treat the water before letting it out. Similarly, sewage and other waste water of towns and cities is processed for purification before letting it into a water body. This helps to prevent pollution of water.

Flowing water of rivers gets purified to some extent by natural processes also.

Before water is supplied to a town or city, it is purified.

Do you know?



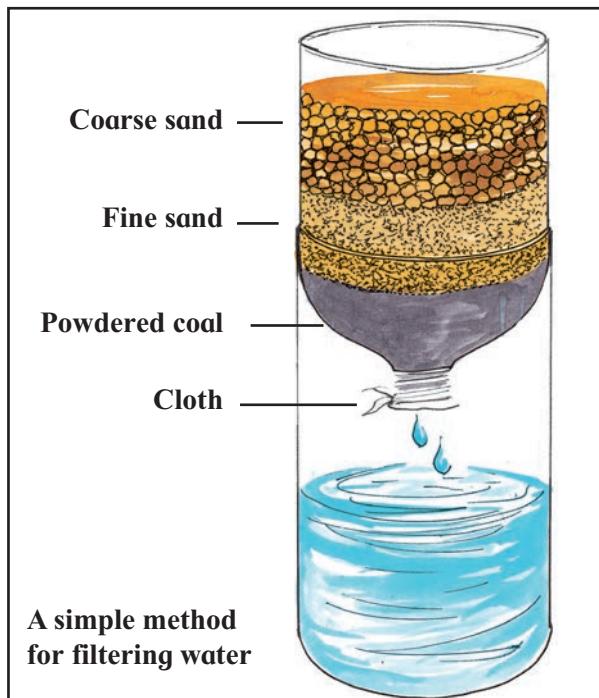
If large quantities of impurities get mixed with river water, the natural process of purification cannot keep pace. The proportion of oxygen dissolved in the water is reduced. And this is a threat to the aquatic living things.

Purification of water

Try this.



Take a plastic bottle. Tie a clean piece of cloth over its mouth. Cut off the base of the bottle. Hold the bottle upside down. Pour some powdered coal into it. Then add fine sand, and, lastly, coarse sand to make three different layers inside the bottle as shown in the diagram.



Place the bottle on its lower cut off portion as shown in the figure. Now, pour some muddy water containing some rubbish, slowly into this bottle.

Observe the water that flows into the base of the bottle. It appears clean. Of course, you have learnt that there could be micro-organisms in it.

Water-works

Visit the nearest water-works along with your teacher. Obtain permission to interview an official there to learn about the purification process. You may ask the following questions.

1. What source of water is used for the public water-supply system?
2. How many litres of water are purified every day?
3. What processes are used to make the water clean, transparent and germ-free?
4. In what order are these processes carried out?
5. What is done to rid the water of bad smells?

Do you know ?



While travelling, we often buy bottled drinking water. The bottles are available at places like bus stands and railway stations. Read the information about the water given on the bottle and tell others about it, too.

The date of bottling and the period for which the water can be safely used is printed on the bottle. It is important to read this information when buying a bottle. Once you have opened it, the water should not be kept for very long. The empty bottle must be crushed and thrown into a garbage bin, so that it cannot be reused.

Can you tell ?

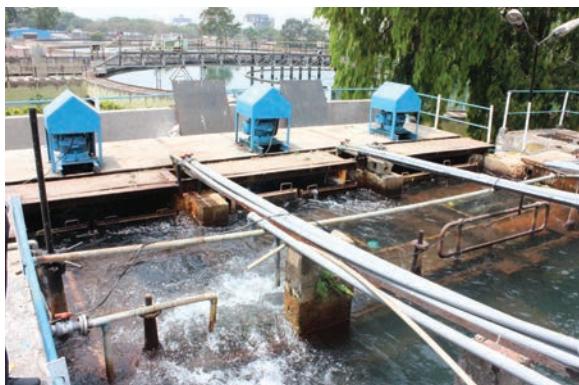


If, at some place, it did not rain for a very long period of time, what would be its effect on the life of the people there?

Water purification processes at the water-works



Settling- The water from the water source is allowed to stand in large tanks. Alum is also used to help the process of settling.



Oxygenation : Air and water are allowed to mix with the help of pumps. This causes oxygen from the air to dissolve in the water.



Filtration : Water is filtered using a filtration machine.



Chlorination : Chlorine is mixed in the water to kill the germs in it.

Photographs Courtesy :
Parvati Water-works. PMC, Pune.

Famine

Water evaporates continuously. That is why, places where it does not rain for a long time, experience a drought. At such places, the water level falls in rivers, wells, lakes, bunds and dams. Some of these may even go dry. The land also dries up due to evaporation. Humans and animals suffer from scarcity of water. There is no water for agriculture. This condition is called a famine. A famine is a natural disaster.

Grain and fodder become scarce during a famine. You may have read about a famine in our State, or country or in another part of the world. People living there have to face a lot of hardship. Animals and plants in those parts also suffer.

The government temporarily moves people and animals from famine-stricken areas to safe places where they can be provided with water, foodgrain and fodder. Fodder camps are set up to take care of domestic animals.

What's the solution ?



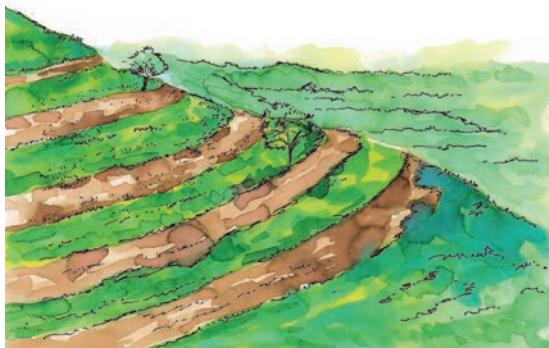
Your class will be visiting a lake which is far away from the city. Arrangements have to be made for the day's drinking water.

Water management

Rain brings us water again and again. But, we get rain for only four months in a year. If rainwater is not stored, we will not have water for our daily needs after the rains.

To meet the whole year's need for water, rainwater must be stopped. When it is stopped, it percolates into the soil. As the ground water storage increases, trees get water. Wells, too, get enough water and the land can be cultivated.

Several methods are used to make rainwater seep into the soil. Large dams can be built. But that may not be possible in all places. In that event, the government and the people come together to undertake several works such as building smaller reservoirs, contour bunding, stopping the water of the smaller streams by constructing bunds or *bandharas*, etc.



Continuous contour trenches (CCT)

In some places, wells are dug in river beds to allow water to collect in them. Rainwater falling on roofs of houses is drained into large tanks placed beside the building. Using all such methods helps us to store as much water as possible.



A bund on a stream

It is very important to use water carefully, to stop rainwater from flowing away, to make it seep into the ground or to collect it in tanks.

Taking steps to ensure that rainwater will be available even in the period after the rainy season is called 'water management'.



Storing rainwater in tanks



Making rainwater seep into the soil

Obtain information and discuss –

What methods of water management are being used in your surroundings?

Always remember –



Water is life. Use it judiciously.

What we have learnt –



- When substances that are harmful for living things get mixed with water, it becomes polluted.
- Before waste water is let into water bodies, it is processed in many ways to prevent their pollution.
- Before the water is supplied to the public, the dissolved and undissolved substances in it are separated at the water-works and the germs in it are destroyed.

- If it does not rain for a long time, it leads to drought and famine.
- Famine conditions affect humans as well as animals and plants of that region.
- Water management means stopping or storing water or letting it percolate into the ground to make it available even after the rainy season.

Exercises

1. What's the solution ?

Soil in a garden gets washed away with the water due to the slope of the land.

2. Use your brain power !

How should roads and footpaths be built to make rainwater seep into the ground ?

3. Answer the following questions.

- What conditions prevail during a famine?
- What works are undertaken to make water available even after the rainy season?
- Why is it necessary to stop rainwater?
- What is meant by water management?

4. True or false? Correct the wrong statements.

- We get rainwater throughout the year.
- During a famine, the government moves people and animals temporarily to safe places.

Activities

- From your friends or elders, or from newspapers, find out in which year a famine had occurred in our State and what measures were undertaken to tide over that period.
- Collect pictures of flowing water and stagnated water.

* * *



17. Clothes – our Necessity

Can you tell ?



Observe the pictures given below carefully. Choose the clothes you would like to have and circle them.



In the box, write the total number of clothes you selected.

Does the number of clothes you have chosen tally with that of your friends?

- (1) On which days will you wear the clothes you have chosen?
 - (2) How many times in a day will you change your clothes?
 - (3) Do you think you should have other clothes besides the ones you have chosen? If so, write how many in the box.
 - (4) Apart from the clothes, which other things would you like to wear?
 - (5) Will you lend your clothes to your friends?
 - (6) Which clothes that you see in the advertisements would you like to wear?
- We like to wear many different types of clothes and we wish to own them as well.

Try this.



Visit people in your surroundings who often take shelter at places like railway or bus stations, brick kilns, open grounds, etc. Discuss the following points with them and make notes.

- (1) What is the total number of clothes they have?
- (2) What do they wear in the summer?
- (3) What kind of clothes do they wear in winter?
- (4) What clothes do they use during the monsoon season?

(5) What do they wear to functions and festivities?

(6) How many times in a day do they change their clothes?

- What did you realise from the activity above?

Can you tell ?



Repeat the first ‘Can you tell?’ activity and make new notes in your book. While doing this, keep in mind your need and write the number of clothes you choose, in the box.

Are your answers in the second activity the same as in the first?

- After this activity, we may find that the number of clothes we wish to have is rather large. Wanting clothes and really needing them are different things. Wanting things when we do not need them is simply desire, not necessity.

We see many advertisements on TV, hoardings, etc. and we are attracted towards the clothes shown in them. This attraction can turn into greed.

Discuss : Need and greed for clothes.



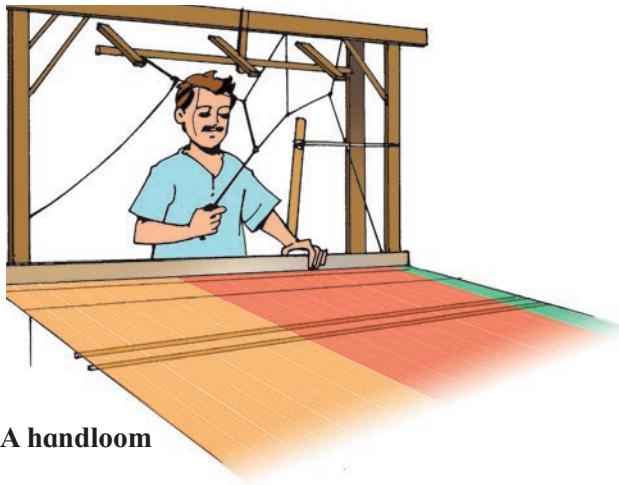
Use your brain power !

Rohan and Sania have many clothes, but they do not wear many of them. Now they are wondering what they should do with all these clothes. Help them to solve their problem.

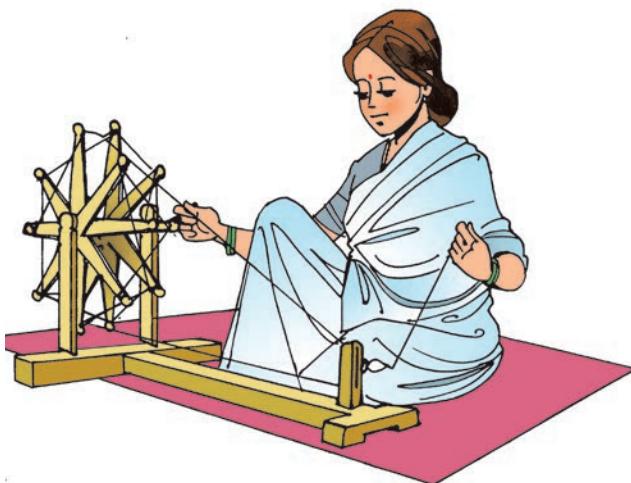
Try this.



For teachers : For this activity, visit the nearest centre of textile industry with the students and arrange an interview with the skilled workers there.



A handloom



A charakha (spinning wheel)

During the interview, obtain information about the following points.

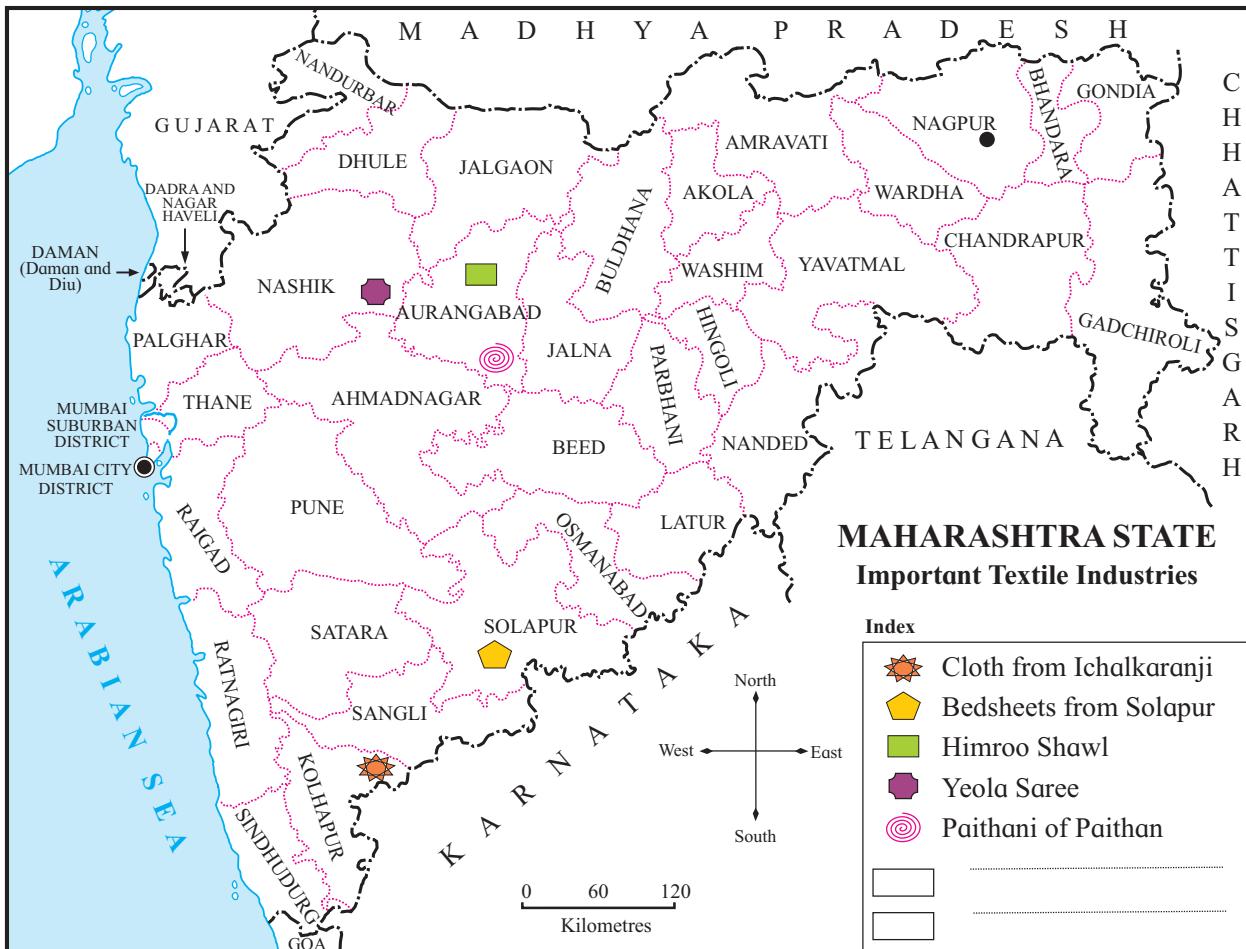
1. What industry is this?
2. What is the product of this industry?

3. What raw material is used to produce this fabric?
4. Where does the raw material come from?
5. In what form is the raw material obtained?
6. Where is the finished product sent for sale?
7. In which season are these textiles mainly used?
8. What kinds of workers are needed for this industry?
9. Where do these workers come from?
10. In what way have centres of textile industry changed since the olden days?
11. What problems are encountered in this industry?

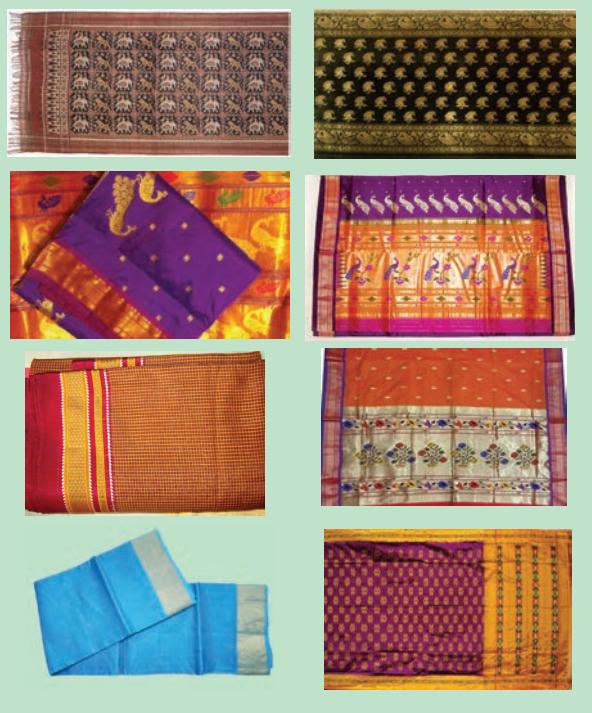
We obtained information about the textile industry centres by asking the questions given above. Now let us see examples of the textiles that are the specialities of Maharashtra like the Paithani of Paithan and Yeola, Himroo shawls from Aurangabad, bedsheets and bedspreads from Solapur, handloom and powerloom cloth from Ichalkaranji, etc.

You will understand this better from the map on the next page.

To the index of the map, add the textile industries that you know of but are not shown here. Mark them at the appropriate places on the map.



Do you know?



Lucknow chikan, Kashmir silk, Benarasi silk, Kadiyal, Pitambari, Pochampalli, Narayanpet, Kanjivaram, Patola and Mysore silk are some types of sarees. These sarees from different parts of India showcase the diversity of our country.

Try this.



To find out more about the different varieties of clothes, visit a clothes market with your parents. Discuss the points given below, with the people there and make notes.

1. Look at the variety of clothes and make a list of their names.



- Which of these clothes are meant only for children, for adults or for aged people?
- Find out about the various types of sarees.
- Note down the names of places famous for their sarees.
- Spot the names of places/regions in the

names of the sarees and mark those places/regions on the map given above.

Thus we note that a variety of fabrics and costumes have come into use due to the diverse climatic conditions in different parts of the countries. With better transport facilities, they have become available in all places. This diversity in clothes is a part of the diversity in our country.

Try this.



Talk to the elderly people in your family or locality to obtain this information :

- What clothes did they wear during their childhood? Make a list of the clothes they name.
- Take the list to a cloth/garment shop and see which of the clothes in your list are available there.
- Find out which of the clothes are not worn any more.
- Find out the places where these clothes used to come from.
- Find out why these clothes went out of use.

Find out if there have been changes in clothing due to tradition and in the course of time.

Do you know?



During the evolution of man, his body went through many changes. One of the changes was the reduction in the amount of body hair. As a result, he began to need protection from the elements in certain weather conditions. Thus arose the need for clothes.

We can see a variety in the clothes used through the ages. In prehistoric times, man did not wear clothes. Later, he began using the bark and leaves of trees. After that, he began to hunt and used the skins of the animals he had killed. After he learnt to make yarn from materials like cottonwool, he began to use cotton cloth in a variety of ways. You will see this progression in the pictures given below.

Always remember –

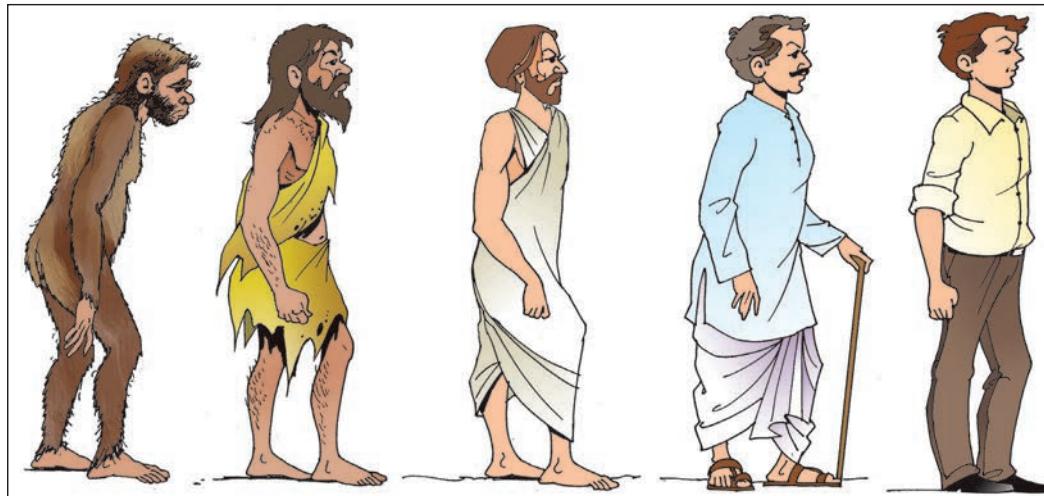


Nature has given us enough to fulfill everyone's needs. However, nature cannot quench man's greed. Man must give priority to his needs and not desires. Only then will nature be able to take care of us all.

Do you know?



Mumbai was famous worldwide for its textile mills. The humid weather on the island facilitates the manufacture of long thread for making cloth. That is why, Mumbai became a big centre for the textile industry. The flourishing cloth industry attracted workers from all over the country who came and settled here. From then on, Mumbai became an important hub for financial activity in India.



Our clothing changed with time

Use your brain power!



What we have learnt –



The clothes worn in different regions of the country are different depending on the local climate. Collect pictures of traditional clothes worn in Jammu and Kashmir, Rajasthan, Maharashtra and Kerala. Discuss the climate of those areas based on the pictures.

- Wanting things you do not need is desire, not necessity.
- We must use things only as we need them.
- Several regions in our country have a tradition of producing fabrics characteristic of the place.
- We learnt about the diversity in clothing in our country with the help of maps.

Exercises

1. Write the names of those objects in the list below that you would like to own.

- (1) Water bottle
- (2) Ball
- (3) Marbles
- (4) Laptop
- (5) Flower pot
- (6) Mobile phone
- (7) Bicycle
- (8) Scooter
- (9) Photoframe
- (10) Tiffin box

Which of these objects will you use yourself?

2. Make a note of the clothes you would choose to wear on a ‘traditional day’.

3. The names of some States are given in the table below. Write the names of the fabric or garments they are famous for.

State	Fabric/Garment
Maharashtra	
Gujarat	
Punjab	
Odisha	
West Bengal	
Karnataka	

Activities

- (1) Visit a fabric/garments exhibition nearby. Obtain information about the utility of the clothes on display.
- (2) Visit your local Khadi Gramodyog centre. Find out about the types of clothes and where they are made.

* * *



18. The Environment and Us

Can you tell ?



With the help of the questions below, explain what would happen if forests are cleared on a large scale.

1. Will water and food sources for living things grow or dwindle? Why?
2. Will the living things look for shelters elsewhere or stay on? Why?
3. Will the space occupied by the plants and animals increase or decrease? Why?
4. Will the number of living things increase or decrease? Why?

Deforestation

The population of the world is now close to six hundred crore. Man is developing new technology to meet the needs of all these people, and is using up more and more land and water resources for this purpose.

Open spaces are required on a very large scale for agriculture, housing, industry, and for building roads and railways. Forests are cut down to make place for them.



A road

Marshy or low-lying areas are filled to reclaim the land.



Railway

The environment provides shelter to different kinds of living things. There are many types of plants in forests. Birds build their nests in trees. Animals like the bear, deer, monkey, elephant, tiger all live in the forest, i.e. they find shelter in a forest. All their needs are met in the forest. If forests are reduced, biodiversity is also depleted.

Use your brain power !



If a dam is built at a particular place, what changes will be seen in the environment?

Can you tell ?

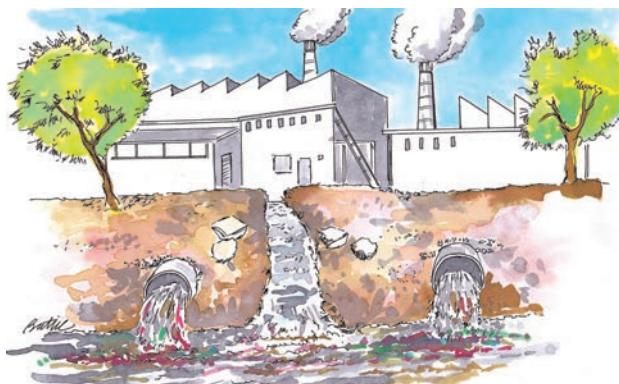


Time and again, we hear news of certain animals and plants facing the threat of extinction. Reasons for the threats are also given. Collect such news items. Fill in that information in the following chart and display it in your class.

Animal or plant	What was the ill effect ?	Reasons given in the news

Pollution

You have seen how water sources get polluted if waste water is let into them without processing.



Waste water flowing out from a factory into the surroundings

Waste water is also given out from factories into their surroundings. If water from such polluted sources keeps soaking into the soil, the soil becomes infertile.



Waste water from factories enters water bodies

Chemical fertilizers and pesticides are used on a large scale for agriculture. They seep into the soil or finally flow into rivers with rainwater.

Due to several such reasons water and soil get polluted. This is dangerous for the plants and animals there. Their number reduces and eventually they die out altogether, that is, they become extinct.

Can you tell ?



- (1) What could be the reasons of air pollution ?
- (2) What are the different purposes for which fuels such as petrol, diesel, kerosene, natural gas, coal and wood are used ?

Fuel is used in all homes. Besides, there are big industries and factories in which fuel is used in great quantities.

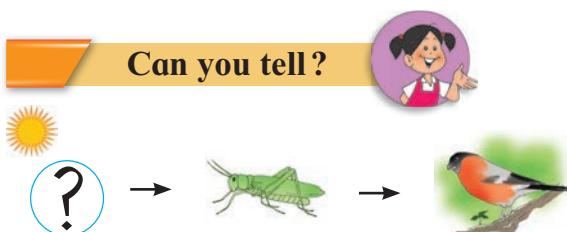


Poisonous gases spouting out of chimneys of factories

On the one hand, tremendous quantities of carbon dioxide enter the air due to burning of fuels. On the other hand, due to large scale deforestation, the number of trees available for absorbing this carbon dioxide is dwindling. As a result, the proportion of carbon dioxide in the air is rising continuously. When the proportion of carbon dioxide in the air rises, it leads to rise in temperature. We see such a temperature rise in all parts of the world.

Besides, when fuels are burnt in vehicles, they give out certain poisonous gases as well as smoke. Industries also let out some poisonous gases into the air. This leads to air pollution on a very large scale.

Can you tell ?



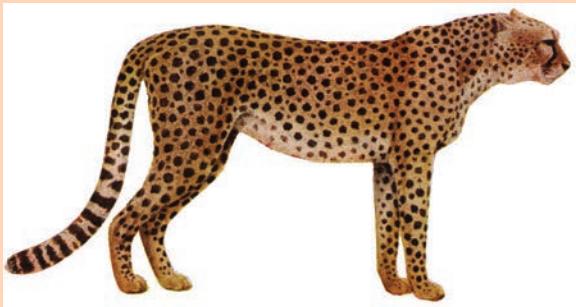
You see a food chain in the picture above. One of the links is missing. What effect will it have on the grasshopper? On the bird? What picture should there be in the blank space? If this living thing really died out, what would be the threat to the entire living world? Discuss your answers in the class.

The need to maintain environmental balance

Due to human intervention in nature, large scale changes are taking place in the air, water and land. Also, these non-living or abiotic components are getting polluted. As a result, the existence of living things is threatened, while several living things have already become extinct. If one factor of the environment is damaged, its relationships with other factors also get affected, and environmental balance is disturbed. From time to time, some of the living things on the earth become extinct. But today this process is taking place at a much faster rate. This is a threat for the whole living world.

Do you know ?

If the different types of plants and animals become extinct one by one, many of the links in the different food chains will be lost. Many scientists believe that this will affect the entire living world on the earth and the balance in nature will collapse.



Indian cheetah - An extinct animal

Our needs and the environment

Food, water and clothes are the needs of all people. We use a lot of things to meet these needs. Besides, we use many means and devices for the purpose of studies, sport, hobbies and entertainment. We even stock up these things so that they will be available to us whenever we need them. All these things are obtained by using materials from our environment. All the people in the world have similar needs and desires. As a result, the environment is being degraded rapidly.

We need to be aware that we ourselves are a part of nature. If the balance of nature is disturbed, it will adversely affect human beings, too.

We need to take steps to prevent the degradation of the environment. The steps should mainly include using our means frugally and recycling used articles. Such measures should be practised sincerely by each and every person.

Let us resolve !

Let us all ensure that no action on our part will cause pollution or cause harm to living things. Let us make all possible efforts for the conservation of the living world.

Speak your mind and discuss.

- How much stock of the necessary things should we keep with us?
- Discuss with respect to each of the following : water, food, clothes.

Global efforts for protection of the environment

Several projects are being implemented at the international level to maintain the balance in nature. It is important to raise the awareness of people all over the world about the threat to environmental balance. Many countries of the world are enacting laws that will help to prevent the pollution of air, water and soil.

Efforts to maintain biodiversity

Biodiversity parks : An area which is reserved for the purpose of protecting and conserving the biodiversity of a region is called a ‘biodiversity park’. In these parks, biodiversity is both preserved and studied. People visiting such a park enjoy being close to nature. This leads to more concern for nature.

National parks : Some areas which are important for the protection and conservation of wildlife are reserved for them. For example, the Kaziranga National Park, the Tadoba National Park.

Sanctuaries : Certain forest areas are reserved for the protection and conservation of a particular animal or plant. Such a reserved area is called a sanctuary. For example, the Radhanagari Sanctuary for bisons.

If the plants on the earth are destroyed the numbers of animals also fall. That is why it is necessary to protect plants in

forests. If deforestation is stopped, and instead tree plantation is stepped up, animals that depend on plants will get protection and thrive.





Mayani lake has formed due to a dam built on the Chand river in Satara district. Flamingos from the Siberia region in northern Asia migrate to this lake. Here, they build nests and lay eggs. Once the baby birds grow big enough, they return with them to Siberia.

In the recent past, as the water level in the dam had fallen, the flamingos had stopped coming. However, the lake has now been declared a sanctuary for birds.



Flamingos and their nests

There is a Maldhok (Great Indian Bustard) sanctuary at Nannaj in Solapur district. These huge weighty birds are famous for their graceful gait. These birds live in open grasslands. They feed on insects.



Great Indian Bustard – male

As they are hunted for their meat and their eggs, their number is fast dwindling. Maharashtra State has declared the Nannaj area a sanctuary for the Great Indian Bustard. Deer are also found in these grasslands.



A female bustard and deer

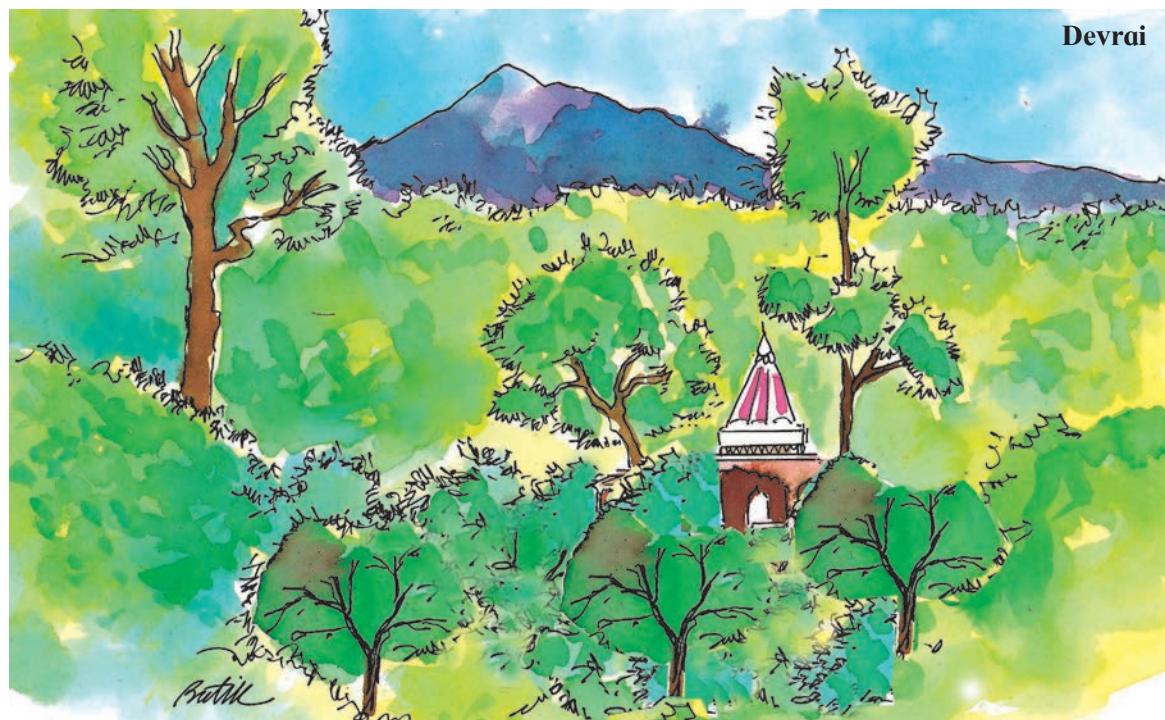
About 50 km from Pune on the Pune-Ahmadnagar highway, the village of Morachi Chincholi is famous for its peacock population. The old, well-looked after tamarind trees here have created a favourable environment for the birds. Peafowl have found sanctuary in this village.



Devrais - a boon for all living creatures !

Indian culture gives importance to the protection of forests. The Devrai is an example. People believe that a Devrai is really a jungle reserved for god. No tree or plant in a Devrai is ever cut. That is why, all trees in a Devrai are safe even today.

Maharashtra has many Devrais. In Madhya Pradesh, they are known as 'Sharanvan'. Devrais give shelter not only to the plants but also to the animals that live there. Hence, Devrais can be called the sanctuaries of ancient times.



Devrai

Always remember –

Nature provides enough for every man's need, but not for every man's greed.

What we have learnt –

- There are inter-relationships between all living and non-living things in the environment.
- Different kinds of plants, animals and micro-organisms are found in different regions.



- The balance between the cycles of the various gases in the atmosphere, the water cycle and food chains has been maintained for thousands of years.
- Pollution of water is a threat to aquatic plants and animals.
- We shall all have to make efforts to stop the degradation of the environmental balance caused by human intervention.
- Devrahs, Bio-diversity Parks, National Parks and Sanctuaries are created for the conservation of plants and animals.

Exercises

1. What's the solution ?

Rivers and lakes are filled with water hyacinth.

2. Use your brain power !

What would happen if no kites (birds) are left in a particular region? Which living things would increase in number? Which would decrease?

3. Answer the following questions.

- What is meant by migration?
- Describe the lifecycle of birds.
- Give two causes of air pollution.
- For what purpose do we use land obtained by clearing forests ?

4. Give reasons.

- It is important to conserve the living components of the environment.
- The numbers of wild animals are falling day by day.

5. True or false ?

- Dead plants and animals are abiotic components.

- It is necessary to conserve biodiversity.

6. Classify the following as natural or man-made.

Soil, horse, stone, water hyacinth, book, sunlight, dolphin, pen, chair, water, cottonwool, table, trees, brick.

Activities

- Collect information about the work of WWF – World Wide Fund for Nature.
- In the activity on page 89 you studied some news items. Find out what is done in your neighbourhood to prevent such harm to living things.

* * *



19. Constituents of Food

Can you recall ?

What is meant by diet? For what purposes do we need food? What are the different tastes that foodstuffs have? How do we experience these tastes?

You have learnt that foodstuffs have constituents that are useful to us in different ways. Let us learn some more about the constituents of food.

Carbohydrates

Try this.

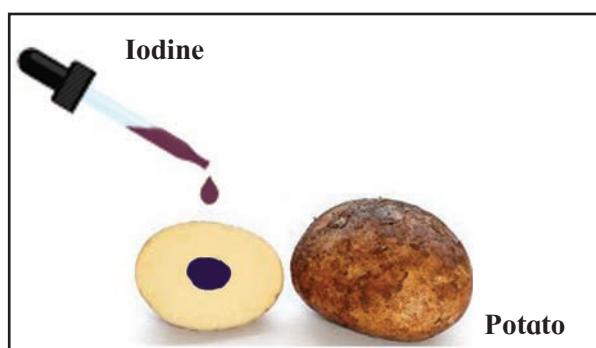


Materials : A piece of a potato, tincture of iodine, a dropper.

Procedure : Add some water to a tincture of iodine to dilute it. Using a dropper, put a few drops of it on the piece of potato and observe.

What do you see?

The piece of potato turns a blackish blue.



Starch : Starch turns blackish blue when it comes in contact with iodine. So we can infer that there is starch in the potato. Sago and sweet potato also contain starch. Cereals like jowar, bajra, wheat,



Starchy foods

rice contain a lot of starch. We obtain flour from these grains. These grains form our staple diet. We get energy from starchy foods. Our body uses this energy for different kinds of work. This energy also keeps the body suitably warm.

Do you know ?



When the starchy foods we eat are digested, sugars are formed. These sugars burn slowly in all parts of our body, releasing energy. In other words, sugars formed by the digestion of starch act as fuel for our body.

Use your brain power !



Why do we feel hungrier in winter than we do in summer ?

Can you tell ?



- (1) What substances do we use to give our food a sweet taste?

(2) Of the foods that we eat raw, which ones are sweet?

Sugars : Food-stuffs that taste sweet contain different kinds of sugars. For example, we can obtain jaggery and table sugar from sugarcane because it contains a sugar called sucrose. Ripe fruits like mango, banana, chickoo as also honey and milk also contain various kinds of sugars. They, too, give us energy.



Try this.



Materials : A fine sieve, some whole wheat flour.

Procedure : Sift the flour.

What do you see?

Most of the flour falls through the sieve. But some larger particles are left on the sieve.

Fibre : When grain like jowar, wheat is ground into a flour, the particles in the flour are not all alike. When the flour is sifted, we find the larger particles left behind on the sieve. These particles are fine pieces of the skin or bran of the grain.

Bran is a fibrous substance. In the process of digestion, fibre has a special function. Fibrous substances help the food to move forward in the alimentary canal at the right speed. The undigested food is of no use to the body. Fibre helps to form stool from this undigested food. Fibre is also called ‘roughage’.



Fruits and vegetables, especially their skins, whole grains and pulses are all sources of fibre in food. If our food does not contain enough fibre, it can lead to constipation.

Up to now we have learnt about three types of substances present in our food – starch, sugar and fibre. These substances are together called carbohydrates. The most important use of carbohydrates is to provide the body with energy.

Carbohydrates		
Starch	Sugars	Fibre

Use your brain power!



Threads get stuck between the teeth when we eat certain types of mangoes. Which kind of carbohydrate are they?

Try this.



Materials : Two sheets of white paper, a printed page, a little cooking oil.

Procedure : Rub a little oil on one of the white sheets. Now place the sheets on the printed page, one by one, and try to read the matter through each sheet.

What do you find ?

You cannot read the matter through the ordinary sheet, but you can see through the oiled sheet of paper. The oil makes the paper translucent.

Fats

Oil is a fatty substance. Paper becomes translucent when a fatty substance is applied to it. Paper becoming translucent is a sign of the presence of fats in the foodstuff kept on it.

Fats in our food also provide energy to our body. They give twice as much energy as carbohydrates. But, we include a smaller quantity of this constituent in our diet. Cream, butter, ghee, oil are examples of fats. Nuts, meat, egg yolk also contain fats.

The fats we eat get stored in our body. If food is not available for some time, the body can get energy from the stored fats.

There is a layer of fat under our skin. It gives shape to the body and like

a blanket, also prevents loss of heat from the body.



Fatty substances

Can you tell ?



Why are boxes of fragile articles like TV, refrigerator, light bulbs, glasses, mirrors packed with corrugated cardboard, thermocol or bubble wrap ?

The cardboard, thermocol or bubble wrap protect the fragile articles. Even when the boxes shake, fall or get hit, the articles inside are not damaged. Similarly, the layer of fat in the body protects our internal organs. An injury from outside does not at once cause damage to our bones or other internal organs.

Use your brain power !



Why do we use a padding of cloth under a mortar when we place it on the floor and pound something in it?

Can you tell ?



Suppose a wall is to be built. The cement, sand, water is all there but the mason says the most important material is still missing. What can that be?

Proteins

Just as stones and bricks are the building blocks needed for a wall, proteins are the building blocks of our body.

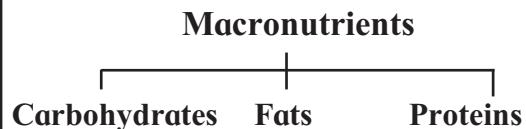
The body undergoes wear and tear continuously. Sometimes, it gets injured. But, the healing and repair of our body goes on all the time without our being aware of it. Proteins are necessary for that purpose. Proteins are required in plenty during the growing years of a person's life.



Major sources of protein

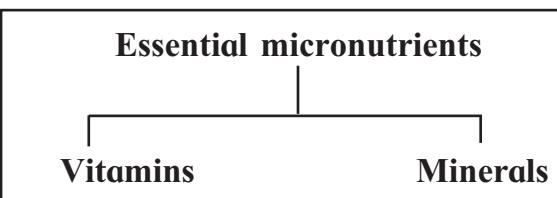
All the different daals, pulses, groundnuts, milk and milk products like yoghurt, khoya and paneer, eggs, meat and fish are rich sources of proteins. To get the required proteins, our daily diet should include daals, pulses as well as milk and milk products.

Our body requires carbohydrates, fats and proteins in large proportions. These food constituents are called macronutrients.



Vitamins and minerals

In addition to the macronutrients, we need certain food constituents in very small quantities. These micronutrients are vitamins and minerals.



Vitamins : The different vitamins are named using the letters of the alphabet. For example, vitamins A, B, C, D, E and K are the most important vitamins. Although we need vitamins in very small quantities, a lack or deficiency of any vitamin results in serious disorders. For example, a deficiency of vitamin 'A' over a long period results in night-blindness. A deficiency of vitamin 'D' results in weak and brittle bones. Vitamins give us the ability to resist diseases.

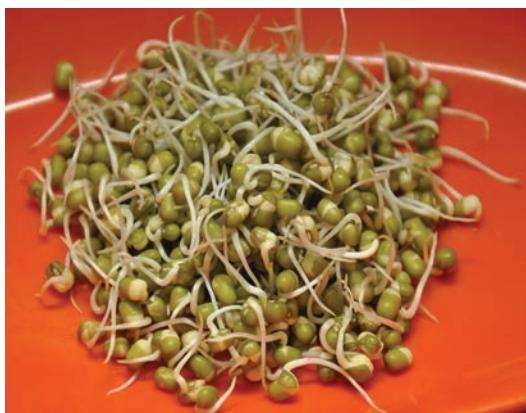
Minerals : Iron, calcium, sodium, potassium are examples of minerals that are essential for the body. They are needed in very small quantities but they have an important part to play in all the necessary functions of our body.

For example, iron is necessary for carrying oxygen to different parts of the body. If there is a deficiency of



Sources of vitamins and minerals

iron in the blood, the body does not get enough supply of oxygen, and one feels constantly weak and tired. This condition is called ‘anaemia’. The mineral calcium makes our bones strong.



Sprouted green gram

All kinds of fruits, vegetables, green leafy vegetables, sprouted pulses, their skins and the bran of cereals and pulses

are all sources of vitamins and minerals. That is why, as far as possible, we should eat fruits with their skins and we should not sift flour to throw away the bran.

Can you tell ?



What are the preparations that are served as mid-day meals in schools?

A balanced diet : What do we tell about ourselves when we say, ‘I am fit and fine’?

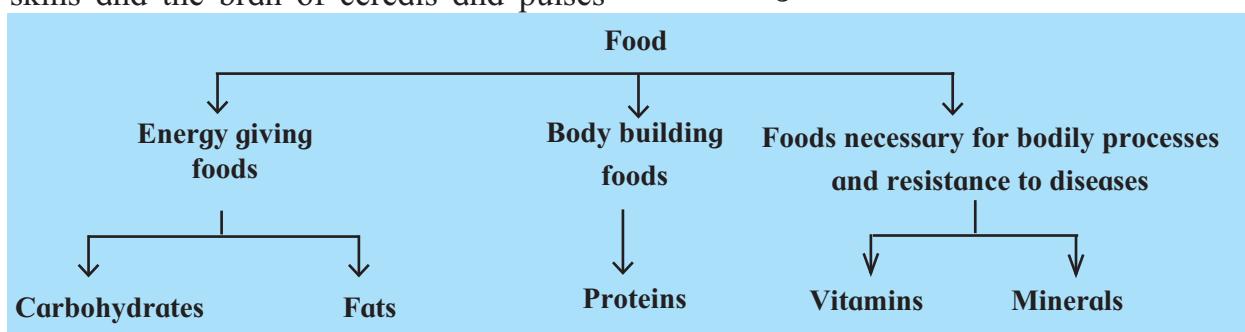
Being fit and fine means that we have enough strength and energy to study, play and carry out all our tasks quite easily, our body is growing well and we do not fall ill every now and then.

We all wish to be in good health. For good health, our body should get all the different constituents of food, namely, carbohydrates, proteins, fats, vitamins and minerals in the right quantities. A diet which provides all these constituents in the right quantities is called a ‘balanced diet’.

Use your brain power!



1. Do we get all the different constituents of food from a meal that consists of a green veg *thaalipeeth* eaten with yoghurt?
2. Which food constituents do we get from the ingredients used to make *bhel*?





Do you know ?



One eatable - Many constituents

- From every food item in our diet we get several constituents of food.

For example,

Chikki or Gud-dani : From the nuts, proteins, fats and carbohydrates, and from the jaggery, sugar and iron.

Banana : sugar, some minerals and fibre.

Boiled eggs : proteins, fats, some vitamins and minerals.

- We need variety in our diet to get all the types of food constituents.

Nourishment and malnutrition

For our body to be well-nourished, we must get all the different food constituents in the right quantities. If a person's diet lacks some constituents over a long period of time, that person does not get proper nourishment. Malnutrition has serious consequences for the person's health.

For example, if a person does not get enough carbohydrates and proteins, their growth is stunted. They feel constantly tired. They cannot cope with their studies or games or other tasks. Deficiencies of vitamins or minerals cause some specific disorders.

There are some misconceptions about diet. If a child eats sweets, chocolates, cakes, fried stuff, etc. and grows fat, some people think that the child is healthy. But if you eat only one kind of foodstuff, your body does not get all the necessary food constituents. Such a person would be malnourished.

Always remember –



It is better to eat freshly prepared food items that will make for a balanced diet rather than snack on tempting, readymade foods you see in the market.

What we have learnt –



- The body gets energy from carbohydrates.
- Proteins are necessary for the growth of the body as well as for the repair of the wear and tear of the body.
- Our body gets energy from fats, too.
- Although our body needs vitamins and minerals in small quantities, a deficiency of any of them can lead to a disease or disorder.
- Fruits, vegetables and their skins, cereals and pulses are all sources of fibre.
- From each of the food items that we eat, we get more than one food constituent.
- If the diet does not include all the food constituents in the right proportions, it leads to malnutrition. Malnutrition has serious consequences for a person's health.

Exercises

1. What's the solution ?

The body requires an adequate quantity of proteins.

2. Use your brain power !

Why are children told to drink milk every day?

3. Give two sources of each of the following food constituents.

(a) Minerals (b) Proteins (c) Starch

4. Fill in the blanks.

(a) in our food give us the ability to resist diseases.

(b) Calcium makes our bones

(c) Foodstuffs that taste sweet contain various kinds of

(d) A diet that provides all the constituents of food in the right proportions is called a diet.

5. Answer the following questions.

(a) Of what use are the sugars that we get from the digestion of starch ?

(b) Name the sources of fibre in our diet.

(c) What are carbohydrates ?

(d) What is meant by malnutrition ?

6. Match the following.

Column A	Column B
(1) Fats	(a) Jowar
(2) Proteins	(b) Oil
(3) Vitamins	(c) Bran of cereals
(4) Minerals	(d) Pulses
(5) Starchy foods	(e) Iron

Activities

1. Collect pictures of foods from which we get a variety of food constituents.
2. Obtain information about the meals served to the children at an *Anganwaadi*. Tell others about it.

* * *



20. Our Emotional World



Try this.



Note your feelings about the following and write them down.

- (1) Your own behaviour from the time you wake up in the morning till you go to bed.
- (2) Pictures of natural disasters in the newspaper.
- (3) News about a cricket match in the newspaper.
- (4) Anger at your classmates.
- (5) The tricks that jokers play in a circus.

Human nature has many different aspects. Sometimes, a person gets very angry; at other times, he is ready to forget and forgive easily. At times, he is jealous; at times he is loving. Sometimes, he acts selfishly, but sometimes he is willing to make a sacrifice for others and comes forward to help. Anger, joy, sorrow, jealousy, disappointment, fear, etc. are all emotions.

Coping with our emotions

Just as man is able to think, he is also emotional. We should be able to strike a balance between our thoughts and emotions. When someone hurts us, we feel sad. This is natural; however, we should know how bad to feel about it. If someone does something wrong, we get angry; however, we must not lose our temper. It is natural to desire something but we must not be greedy for it. If we think properly, we can control our emotions. Emotional adjustment involves coping with your emotions, being able to control them and expressing them in a reasonable manner.

When we learn to cope with our emotions, our personality becomes balanced, our ability to understand others increases and we can overcome adverse conditions. Then we become free from faults such as blaming others unnecessarily, calling them names and not being able to tolerate their success. We become happy and our ability to relate to others improves. We learn not to be stubborn.

Can you tell ?



What would you do ?

- (1) Ranjit and Abhay are fighting over who gets to sit on the first bench. They are both very angry. They are close to throwing each other's bags.
- (2) Hemant wants to take part in the kabbadi competition, but he is shy. He is nervous about telling it to the teacher.
- (3) Rekha accidentally took Nisha's notebook home.

Anger is an emotion just like happiness or sadness. All of us get angry about something at some point of time. We get angry if something does not happen according to our wishes, or if we are insulted. Similarly, we also get angry if we see someone being ill-treated. If we get angry very often, or if we cannot control our anger, it can have adverse effects on our body and mind. We become short-tempered and stubborn. Our attitude of co-operation and understanding decreases and we hurt others. We face consequences such as headaches, loss of sleep and dullness.

Can you tell ?



Are the following persons coping well with their emotions ? Put (✓) if they are, put (✗) if they aren't.

- Ramesh told Suresh that Amit had said something bad about him. Suresh decided to react only after confirming the facts.

- Chhaya and Meena usually make equal progress in their studies. The teacher praised Chhaya's essay. This made Meena angry and she decided not to speak to Chhaya.
- Dinesh took Manoj's pen and pencil from his bag and hid them. Later, he said, 'Sorry' to Manoj and promised not to do it again.
- Sunita wanted to go to the market with her mother, but for some reason, her mother had to leave early. Sunita was angry with her mother. But later, she asked her mother the reason why she had to leave early. Her anger subsided when she learnt the reason.

Awareness of our own flaws

Children are often heard to say 'My handwriting is beautiful', 'I am good at maths', 'I like science' or 'I like poetry'. This means that people's likes and dislikes and capabilities can be different. Just as we gradually understand what we can do, we must also understand what we are not able to do. We may be good at some subject, art or sport and just as bad at another. We must know our flaws as well as our talents, so that we can improve upon them. Just because we are unable to do something, it does not mean that we stop trying to excel at what we can do.

We can change.

No person is entirely good or entirely bad. We must always think about the good qualities or virtues in our friends first. We must help each other to get rid of our flaws. If we speak about our flaws as openly as we speak about our talents, it will be to our advantage.

Once we know the flaws in our nature, we must try to correct them ourselves.

Neha talks the most in her group. Her friends began to avoid her since they never got a chance to speak. Neha realized this. Then, she began to watch out how much she spoke. She told her friends herself, "Stop me if I talk too much." Gradually, Neha began to listen to others and brought about a change in her own behaviour.

Can you tell ?



- (1) Manoj says, "I'm going to school!" and instead goes to the playground to play. Is this correct ?
- (2) What will you tell a friend who has a habit of borrowing things and not returning them on time ?

Aspects of our nature that bother us and others can be changed. However, we ourselves must try hard to change them. Otherwise, these aspects may take the shape of flaws in our personality.

What we have learnt –



- Emotions must be expressed. There must be a balance between our thoughts and emotions.
- Anger must be controlled, otherwise it can have adverse effects on our mind and body.
- We must be aware of our flaws as well as our talents.
- We can try to correct the flaws in our nature.

Exercises

1. Fill in the blanks.

- (a) Just as man is able to think, he is also
- (b) We must always think about the in our friends first.

2. Answer in one sentence.

- (a) How does a balanced personality develop?
- (b) Why does our attitude of co-operation and understanding decrease?
- (c) What must we do after we have found the flaws in our nature?

3. Answer in short.

- (a) What is meant by 'coping with emotions' ?
- (b) What are the harmful effects of anger ?
- (c) Why must we know our flaws ?

4. Write how you will react :

- (a) Your teacher does not listen to you.
- (b) Your parents ask for your opinion while making decisions.
- (c) Your friend got a big prize.
- (d) Your classmates praise you.
- (e) Rohan insulted you in class.

5. What will you do in this situation?

- (a) Rohini won a prize in an essay competition.
- (b) Kavita refused to eat her tiffin because she was angry.
- (c) Veena keeps herself to herself at school.
- (d) Makarand says, "I can't help it if I have a stubborn personality".

Activity : Complete the following table. Figure out your own personality with the help of your teacher.

No.	Characteristic	Self-observation			
		Always	Often	Sometimes	Never
1.	I get very angry.				
2.	I talk continuously.				
3.	I help others.				
4.	I show concern for others.				
5.	I fight a lot.				
6.	I appreciate others.				
7.	I cry if someone says something bad about me.				
8.	I like to be happy.				

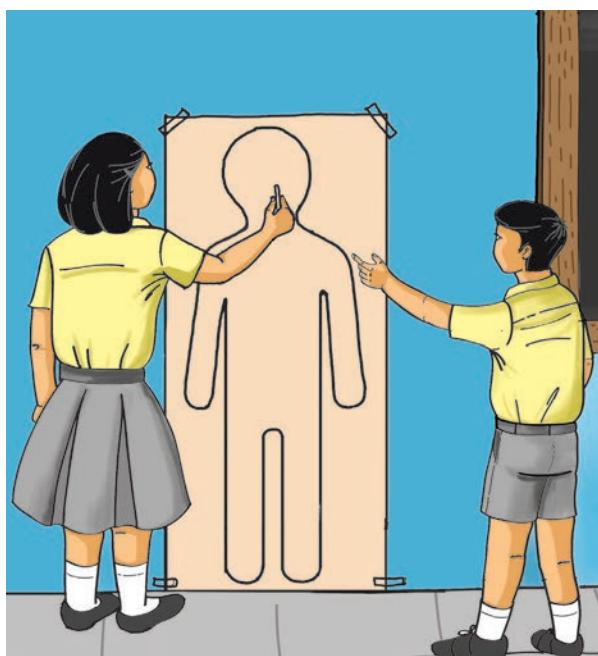
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21. Busy at Work - our Internal Organs

Can you recall ?

Take a large sheet of thick paper, about the height of a child in the class. Put it on the wall as shown in the picture and secure it with tapes. Ask one student to stand against it and another to draw the outline of the body.



Now get other students to point out the right places of the following organs within the outline – the brain, lungs, heart and stomach.

Now recall the following details about each of the organs.

1. In which cavity of the body is it situated?
2. What is its function?
3. Which are the bones that protect it?

Can you tell ?



What bodily needs or sensations do you become aware of even though you are reading a book?

Processes like respiration, digestion go on inside the body continuously with the help of certain organs. Let us learn something about these processes and the organs that carry them out.

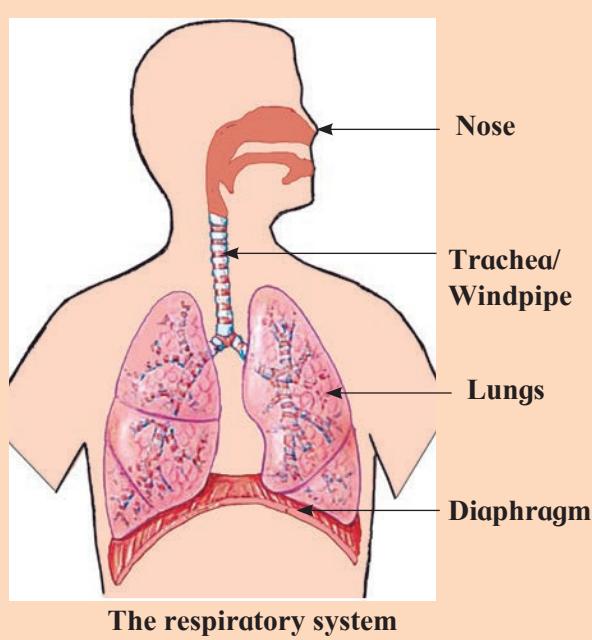
Try this.



Use a watch to count how many times you breathe in one minute when you are sitting comfortably. From this, work out approximately how many times you breathe in an hour.

Respiration

We need air, water and food to live. It is necessary for the body to get a continuous supply of oxygen. We get this oxygen from the air, through breathing. That is why we breathe continuously. In our body, there are organs that carry out the work of respiration. Read their names in the diagram on the next page and also their description.



The diagram above shows our respiratory organs. When we inhale, the air from outside goes into the trachea and through its branches, into the lungs. In the lungs, these branches divide further into smaller and smaller branches. At the end of the last branches, there are air sacs or alveoli.

Between the thoracic cavity and the abdominal cavity, there is an organ like a flexible sheet. It is called the diaphragm.

The diaphragm and its movement

When the diaphragm moves downward, we breathe in and the incoming air fills the alveoli in the lungs.

When the diaphragm moves upwards, air in the lungs is pushed out.

Exchange of gases

When the outside air reaches the alveoli, the oxygen in it passes into the thin blood vessels around the alveoli. With the blood, it is carried to all parts of the body. At the same time, the carbon dioxide that is brought by the blood

from all parts of the body enters the air in the alveoli. When we exhale, the carbon dioxide is also given out with the air.

In this way, an exchange of oxygen and carbon dioxide gases takes place in the alveoli.

Do you know?



Dust and smoke particles may be present in the air in the atmosphere. There may even be disease producing micro-organisms. They are harmful for the body.

The inner lining of the respiratory organs has fine hairlike structures called cilia. On this inner lining, there is also a layer of a sticky substance called mucus. The dust and smoke particles stick to this substance. Thus, the harmful substances in the air cannot reach the lungs.

Try this.



- Count how many times you breathe in one minute just after you have run a hundred metres.
- Get someone else to count how many times you breathe in one minute while you are asleep. What is the difference in the two counts?

The effects of smoking

If one keeps smoking over a long period of time, the toxic substances in the smoke collect in the respiratory tract. As a result, the air that enters the lungs is not sufficiently purified and the impurities in the air begin to accumulate in the lungs. As a result, the efficiency of the lungs is reduced. The likelihood of getting diseases of the lungs increases.

The solid particles in the tobacco smoke from the cigarette or bidi form a sticky layer inside the alveoli. This reduces the amount of oxygen supplied to the body. In addition, some toxic substances in the tobacco also enter the alveoli. These ill effects lead to diseases of respiratory organs including life-threatening diseases like lung cancer.

Passive smoking

If there are people around us who smoke, then we may have to face the consequences of smoking even if we do not smoke ourselves.

That is why, there is now a ban on smoking in public places.

A new word :

Gland - An organ that secretes a certain substance.

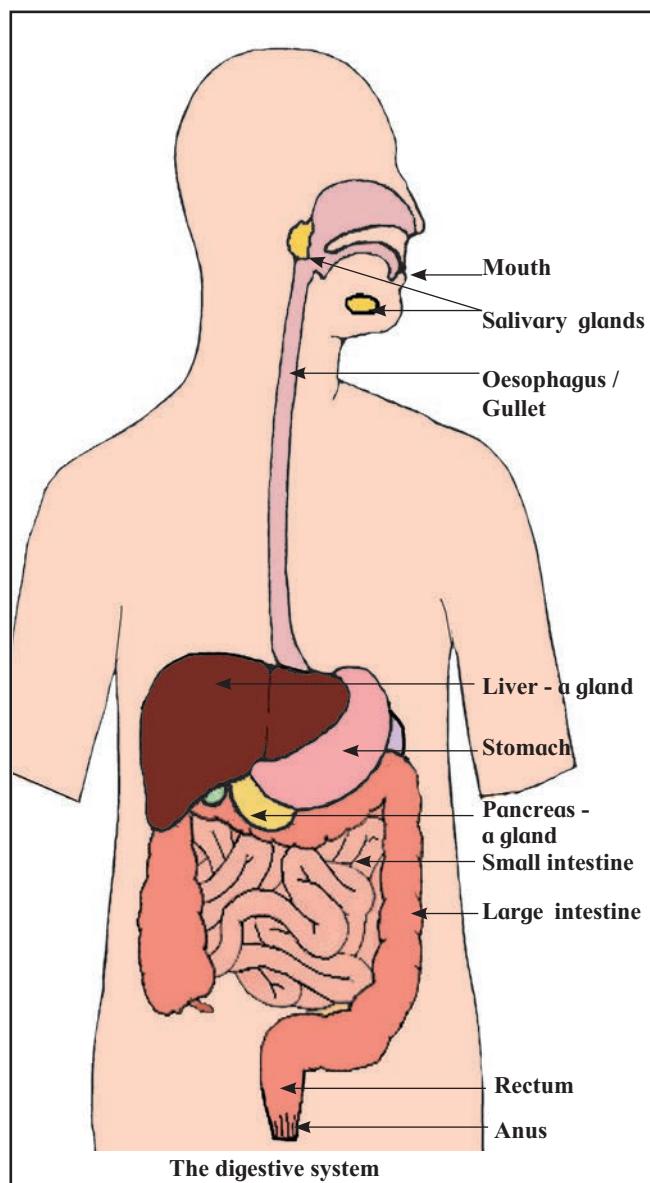
Digestion

Let us now learn something about the alimentary canal, the digestive organs and their functions.

The alimentary canal

The food we eat is digested in our body. That is, substances that can mix with the blood are formed from the food. This process takes place in different parts of a long and flexible tube inside our body. This tube is called the alimentary canal. The upper end of this tube is the mouth and the lower end is called the anus.

Even if there is a continuous tube going from the mouth to the anus, the shape of this tube is not the same in all its parts.



The different parts of the alimentary canal have different structures and functions. These different parts are called the digestive organs. Certain glands outside the alimentary canal assist the process of digestion.

Digestive organs

The process of digestion begins as soon as food is taken into the mouth.

The teeth, tongue and saliva all help to convert food into a soft moist ball called a bolus which is easy to swallow. The bolus passes through the oesophagus into the stomach.

The stomach is shaped like a bag. Here, the food is churned. The digestive juices in the stomach bring about some digestive processes. At the same time, some disease producing germs in the food are also destroyed. The food changes into a thin slurry in the stomach. Then it passes into the small intestine.

The small intestine of an adult is about 7 metres long. The digestive juices in the intestine bring about several digestive processes. The secretions of some glands also help the process of digestion. As a result of all these digestive processes, certain substances are produced. These are useful to the body and can mix with the blood. In the small intestine, they are absorbed into the blood. The remaining substances pass into the large intestine.

The large intestine of an adult is about one and a half metres long. Here, much of the water in the remaining substances is absorbed into the body and faeces or stools are formed.

The faeces collect in the rectum for some time. Later, they are expelled from the body through the anus.

Do you know ?



1. A sufficient quantity of water is necessary for the processes of digestion to take place properly as well as for the food to keep moving through the alimentary canal. If one does not drink enough water, one becomes constipated, i.e. one passes hard stool or does not pass it regularly.

None of the other tasks in the body can go on without water. The water that is absorbed during digestion is the water that is used for all other processes in the body. That is why it is so important to drink adequate quantities of water.

2. The upper ends of both the oesophagus and the windpipe open in the throat next to each other. When food is swallowed, the windpipe remains closed. But, when we eat in a hurry, the food may enter the windpipe and cause us to choke on it. That is the reason why we must not eat in a hurry. We must also avoid speaking and eating at the same time.

Do you know ?



- If we want healthy teeth, we need to look after them. Every tooth has a covering of enamel which protects the delicate inner parts of the tooth. Enamel is the hardest substance in our body. But, if we do not keep our teeth clean, even this enamel corrodes and teeth decay.
- While having our meals, we enjoy many different tastes and flavours. We sense them using our tongue and nose. But, sometimes we find that a food item tastes or smells bad. It may be because the food is spoilt. One should pay attention to such changes in food. In case the food has really gone bad, one can avoid eating it.

Can you tell ?



Name the organs that bring about respiration.

Systems in the body

You have seen how several organs work together to bring about respiration. If even one of these organs does not function properly, the process of respiration will not be completed. A group of organs which work together to carry out a function of the body is called a system. Thus, the nose, trachea, lungs and the diaphragm together make up the respiratory system.

Use your brain power !



Name the organs of the digestive system.

Energy for the body

As a result of respiration, oxygen enters the blood in the body and spreads to all parts of the body.

Substances formed in the process of digestion also mix with the blood and reach all parts of the body. Of these, some substances act as fuel for the body.

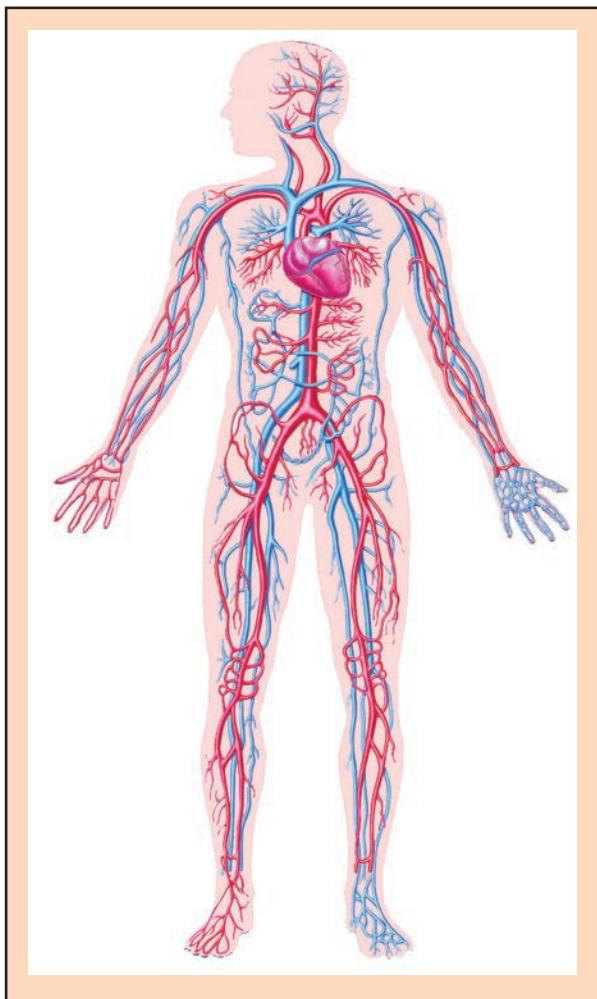
When the oxygen in the blood reaches the different parts of the body, it helps the slow burning of these substances, giving energy to the body. The body uses this energy to carry out all its tasks.

Circulation of blood

The blood carries the oxygen obtained from the air and the energy-giving substances in our food to all parts of the body. But, what keeps the blood flowing?

You know that the heart continually contracts and relaxes for this very purpose. A network that consists of tubes or ‘vessels’ that carry blood away from the heart and those that bring blood back to the heart is spread throughout the body.

The process of keeping the blood flowing through all parts of the body is called ‘blood circulation’. Apart from oxygen, blood carries innumerable other substances from one part of the body to another all the time. That too is made possible by the circulation of blood. The heart and the network of blood vessels together form the ‘circulatory system’. As long as we are alive, the process of blood circulation goes on continuously, day and night.



The circulatory system

Can you tell ?

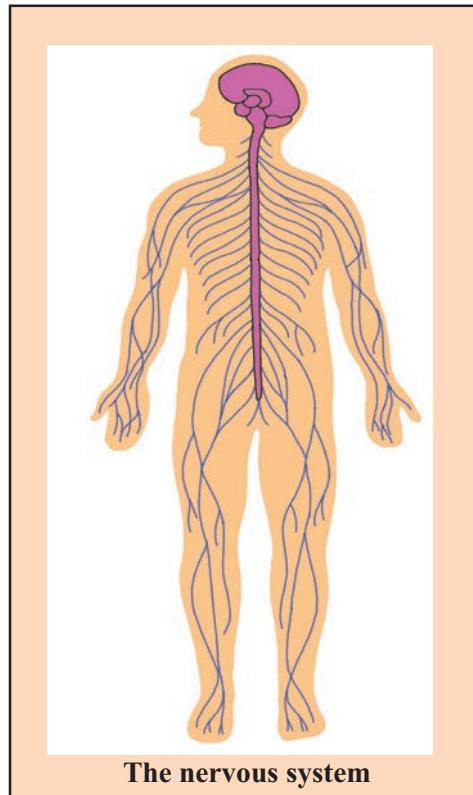


1. How do we know that we are hungry and that we should now eat?
2. How do the salivary glands come to know that there is food in the mouth and it is time to secrete saliva?
3. What makes respiration and blood circulation go on all the time, and the processes of digestion happen at the right time?

The nervous system

The functions of the respiratory, circulatory and digestive systems are vital for the body. They have to be carried out ceaselessly. There are some tasks that we carry out only when we like, for example, speaking, running, studying, playing, etc.

You have learnt that co-ordination means paying attention to all the different functions and ensuring that they all occur at the right time and in the right manner. Maintaining this co-ordination is the function of the brain. There is a network that connects the brain with all the different parts of the body. This is a network of nerves that carry messages to and fro between the brain and the parts of the body. The brain and the network of nerves are together called the nervous system. The nervous system functions to co-ordinate all our bodily functions.



The nervous system

Do you know ?



Drinking alcohol has many ill effects on the body. It affects the nervous system leading to loss of control over the movements of the body and lack of co-ordination. That is why, it is dangerous to drive after drinking alcohol.

If one keeps drinking alcohol for a long period of time, it causes ulcers on the inner lining of the digestive organs. It can also seriously affect the functions of the liver and kidneys.

Use your brain power!



Which systems work together to provide the body with energy?

Other systems in the body

We have learnt something about the respiratory system, the digestive system, the circulatory system and the system that co-ordinates the functions of all the systems – the nervous system. Besides these, there are several other systems in our body.

For example, the skeletal system gives support and shape to the body and protects the important organs inside it. The excretory system expels the waste substances that are formed in the body.

The working of all these systems is extremely complex, but it is important to have information about them.

Always remember –



If the function of any one of our systems is disturbed, it affects all the other systems in the body too.

What we have learnt –



- A group of organs that together carry out some function of the body is called a system.
- The nose, trachea, lungs and diaphragm are organs that form the respiratory system.
- The mouth, oesophagus, stomach, small intestine, large intestine, rectum and anus and certain glands outside the alimentary canal are the organs of the digestive system.
- Other systems like the circulatory system, the skeletal system, the excretory system also take care of other important functions of our body.
- The nervous system co-ordinates all the functions of the body.
- For us to lead a healthy life, all our systems must function smoothly.

Exercises

1. What's the solution ?

A person has fainted and a crowd of people has surrounded him.

2. Use your brain power !

- (a) Why do we sometimes choke suddenly while eating ?
- (b) How is the air that we inhale purified in our body ?

3. Fill in the blanks.

- (a) gas is transported to all parts of the body.
- (b) The stomach is like a

4. Match the following.

Group A	Group B
(1) Lungs	(a) Circulation
(2) Stomach	(b) Respiration
(3) Heart	(c) Co-ordination
(4) Brain	(d) Digestion

5. Answer the following questions

- (a) Name the systems that carry out the different functions of the body.
- (b) Describe how the exchange of oxygen and carbon dioxide gases takes place in the lungs.
- (c) Why do we call saliva a digestive juice ?

6. Choose the appropriate word from the brackets.

(circulation, trachea, diaphragm)

- (a) Respiration takes place because of its up and down movement.
- (b) The process of keeping the blood flowing continuously throughout the body.
- (c) Air that enters through the nose passes into this tube.

Activity

Arrange a quiz competition in the class based on the names of organs and their functions.

* * *



22. Growth and Personality Development

Can you tell ?



Do the clothes and shoes you wore as a baby fit you now?

Try this.



Read the information about yourself entered in your report card and fill in the following table.

	STD I	STD II	STD III	STD IV	STD V
Height					
Weight					

All living things eat and grow physically. Similarly, we, too, grow in height and weight from birth to adulthood. You will see this also from the information that your friends enter about themselves. Some of them will be more than you in height or weight while some will be less. But, they will all have gained in height and weight since they were in Std I or II. This is because the first 18 years are the growing years for all boys and girls.

Can you tell ?



- (1) Can an infant feed itself?
- (2) Can a two-year old child fold clothes neatly?
- (3) When do they learn to do these tasks?
- (4) Which of the following things have you learnt to do? Which ones have you yet to learn?

- (5) Name the things you can do which are not seen in the list.

Skipping on a rope, writing an essay, combing your own hair, making tea, learning a song / poem, swimming, telling a story, cycling, giving a speech, counting money, tidying your house, using a computer, playing field games, climbing a tree, etc.



Skills and efficiency

Small babies cannot do anything for themselves. If they need something, they can only cry and beat about with their legs and arms. But soon, they begin to get control over some of their movements and develop co-ordination between different movements. For example, they learn to turn their head and look at something they choose. If they recognize someone, they smile. They learn to grip and hold things and then to take them towards their mouth.

As they learn to control and co-ordinate their movements on their own, they begin to do several other tasks – for

example, picking up things, holding a spoon and hitting it on a plate to make a noise.

Achieving control of one's movements to learn to do something new is called 'learning a skill'.

What does everyone feel when a baby says her first word or takes a step for the first time? What do they do?

As a baby learns various skills, the baby and everybody is happy. They praise the baby. The baby does the same things again and again. Thus, she gets a lot of practice with those skills and her strength also builds up. Slowly, she begins to do the newly learnt tasks more easily and without making mistakes. That is, her efficiency increases.

Every day, we keep learning. That makes it easier to learn new skills. For example, once the child is able to hold something, she can learn to throw a ball. After learning to walk, the child learns to do more difficult things like running, hopping on one leg, or catching a ball. These new tasks also include activities that

are a part of our daily routine such as eating with one's own hands, washing one's own face, having a bath, dressing oneself, etc.

Development

As we grow, our height and weight increases. With age our physical strength also increases. At the same time we keep learning new skills. In this way, every individual makes progress. This is called 'development'.

Observe.

Try to observe a cow or a cat to find out all that she does for her young ones and also all the things that the calf and the kitten learn to do on their own.

These animals learn from their mother, the skills of obtaining their food, protecting themselves from the sun and rain, and from their enemies. After that, they begin to live independently.

Animals learn only a certain number of skills in their life. In comparison, human beings go on learning many more things throughout their life.



Children at play

Find out.

How many years does it take the young ones of the tiger/elephant to start living independently?

Compare.

Can you : play football, lagori/seven tiles, cook a meal, press clothes, shop for provisions, nurse a person who is ill, write a summary?

We are allowed to drive a motor vehicle, vote in an election only after a certain age.

Use your brain power!



Many skills have been mentioned in this lesson up to now. Can you do without learning some of them? Which ones are necessary for any person?

Think about it.

1. Which are some of the tasks you like to do? Which ones would you like to do in future?
2. What things would you like to do just for recreation?
3. What would you like to do daily when you grow up?

Some of the early skills like walking and running come with age, without having to be taught. However, we have to be taught many of the skills we learn later. We learn many skills from our parents, teachers and other adults.

The greater the number of skills we learn, the less is our dependence on others. Even so, it is not as if we do every one of our tasks ourselves. For example, not all

people stitch their own clothes. Nor does everyone grow their own food. But, we must all learn to take the responsibility for doing our personal tasks ourselves.

Use your brain power!



Sayali is in the sixth standard. They are going on a picnic. Sayali's Aai is going to make laadoos for the whole class. But she needs Sayali's help. What can Sayali do to help?

Did you take the list?

Yes. I've put it in the bag.





Which of her skills will she use to help her mother?

Heredity

How tall does one grow?

You know that our height grows till we are about 18 years old. Think of people you know who are 18 or older. Of these people, how many are very much taller or shorter than their parents?

Our looks, our built and other physical characteristics are like those of our parents. People of one family show similarities in many ways. Some of our features or traits are like those of our grandparents, or our parents' siblings. That is why, sometimes, people who know them recognize us even if they have never met us before.

Being born with certain features or traits in common with the members of our family is ‘heredity’. These are our ‘inherited’ traits.

However, even though many of our traits are like those of our family members, no one has any control over which traits we will inherit and which we will not.

Read and reflect.

An industrialist had worked hard to expand his business. He had three assistants. He conducted an experiment to decide whom to make the head of his factory after he retired. He gave five lakh rupees to each of them, and told them to do whatever they thought best with the money. After a year, he called them and asked them to report how they had used the money.

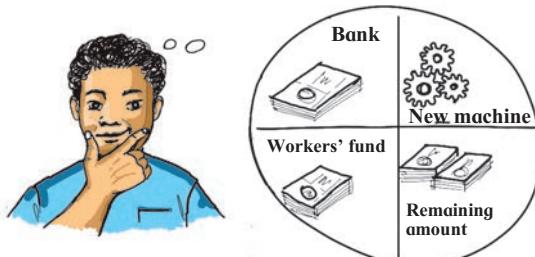
First assistant : I have kept the money safe. It cannot fall into anyone's hands. I can bring it back to you whenever you say.



Second assistant : This year, I doubled the amount of the yearly bonus we give our workers. I also gave them all a feast. All the workers were very happy. I think I used the money really well.



Third assistant : With part of the money you gave, I bought a better machine. So,



our production grew fivefold. Our product is also of better quality and the demand for it has also grown.

We made a profit of 25 lakhs in just about eight months. So I used 10 lakhs to build a canteen that the workers needed. I have put 5 lakhs in the Workers' Welfare Fund and I think I shall use the remaining 10 lakhs to buy one more machine.

You can easily guess who the industrialist chose as his successor.

What is the moral of this story?

For better personal development ...

We inherit the ability to learn many skills. The growing age is the time to recognize these abilities and to develop our skills. Developing our skills helps us to live an independent, useful and enriching life.

A good diet

You know that food is necessary for growth. However, in certain circumstances, a growing child does not get the various food constituents in adequate proportions. This leads to malnutrition, affecting the growth of that child, for example, a person does not grow as tall as they would have been. Even if such a person gets a good diet later on, it is of no use for the growth of the body.

Other factors that support growth and development

Along with nutritious food, adequate exercise is also necessary for growth and development. Lack of exercise also affects growth adversely.

One must also be careful to study well, avoid addictions and their ill effects, develop hobbies, take part in sports and

learn new skills. If we take care to do all this, it leads to good development.

Whether boy or girl, each person has every right to get the opportunity to make progress and enrich their own life.

Each one has a unique personality

In your class, there must be some children who are good in studies while others are good at games and sports. Some sing well and some like to act in plays.



Every person is different from all others. Our physical and mental make-up is not the same as that of anyone else.

Our personality develops through our interests and efforts – what we like to do and what we practise every day.

During the growing years, we also learn to tell what is good and what is bad. Our personality can be said to be excellent only when we put good thoughts into practice.

Always remember –

We do not learn good values only to write about them in the exams. They must be reflected in our behaviour.



What we have learnt –



- We grow in height and weight right from birth till we reach adulthood.
- A newborn baby cannot do anything for itself.
- We learn many skills from our parents, teachers and others.

- We see similarities in people of the same family. Even so, every person is unique.
- The more the skills we learn, the less we depend on others.
- We can live an independent, useful and enriched life with the help of skills.

Exercises

1. What's the solution ?

Kabir wants to be a professor of zoology. What can he do today to prepare for that?

2. Use your brain power !

- What skills do we already have before we learn to ride a bicycle?
- Suman wishes to run a restaurant of her own in the future. Which of the skills she is learning today will be of use in her future occupation ?

3. Answer the following questions.

- What is meant by heredity ?
- What differences do we see between children in pre-primary classes and children in Std V ?
- What changes take place in us from birth till adulthood ?
- Name any three skills you have acquired.
- What is meant by physical growth ?

4. True or false ?

- A baby gradually learns to perform newly learnt tasks without making mistakes.
- At birth, we already have all skills.
- We cannot manage all our tasks entirely by ourselves.
- Our height increases from birth till we grow old.

Activity

Observe the young one of a pet cat or dog, or a bird, insect or any other animal in the surroundings from its birth till it becomes an adult. Keep notes regarding the following points :

Growth, height, development, skills, etc. Write an interesting story based on your observations.

* * *



23. Infectious Diseases and how to Prevent them

Can you tell ?

- (1) When your friends fall while playing and get hurt, does anyone tell you, 'Don't go near them, you will also get hurt'?
- (2) Suppose your mother has a headache. Do you also get a headache if you go near her?



- (3) When is it that you are told not to go near a sick person, not to use their utensils for eating or drinking; not to use their hankies, towels or clothes?

Infectious diseases

Mother's burns or Grandpa's backache are not passed on from them to others.

However, one has to take care to stay away from people who are ill with the flu (influenza), cold, ringworm, scabies, chickenpox. These diseases spread from one person to the other. Such diseases are called infectious diseases.

What causes these diseases?



They are caused by micro-organisms. Every infectious disease is caused by a specific micro-organism or germ. When the germs of a particular disease enter the body and begin to grow, the person gets the disease.

How is one person's disease passed on to another person?

When a person has a cold, the germs from his body spread in the air when he coughs or sneezes. When these germs enter other people's body, they can also get the disease. That is, the disease spreads.

Typhoid spreads when its germs are passed on by a person ill with typhoid to another person.

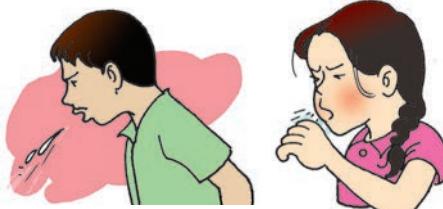
Spread of infectious diseases

What are the different ways in which infectious diseases spread?

Spread of disease through air

The germs of a disease like influenza are present in the spit or saliva of the person who has the disease. When he coughs, spits or sneezes, they enter the air with the tiny droplets of saliva or spit. When other people breathe in that same air, the germs enter their bodies.

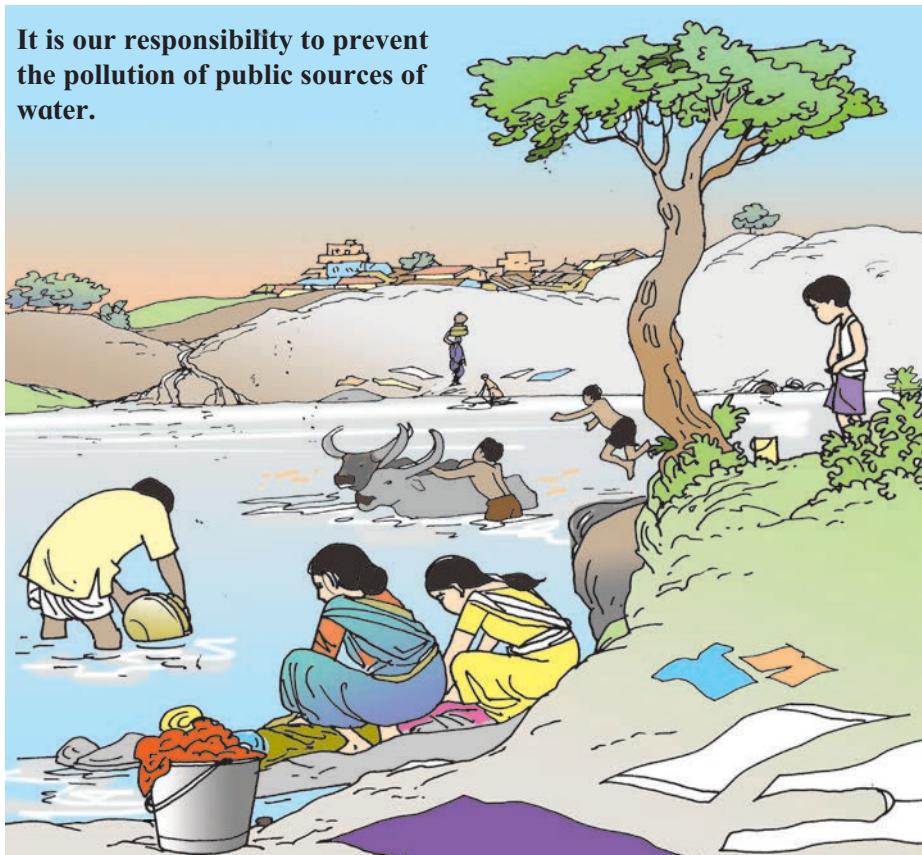
Diseases of the throat and the chest spread through the air, for example,



Do not cough or spit in the open

tuberculosis, swine flu, etc. That is why we are told to cover our nose and mouth when we cough or sneeze.

It is our responsibility to prevent the pollution of public sources of water.



Spread of disease through water

Can you tell ?

What different activities are going on in the above picture ?

The germs of diseases of the intestines like typhoid, cholera, diarrhoea as also of jaundice, are present in the faeces of the affected person. If the faeces get mixed with water the germs in it also enter the water. If another person drinks water which has been contaminated by these germs, they enter his intestines too, and that person can get the disease. To prevent the spread of disease in this manner, it is best to avoid washing clothes and bathing in the water sources or defecating on the banks of the water, etc.

Spread of disease through food

Can you tell ?

What do you see in the picture below ?

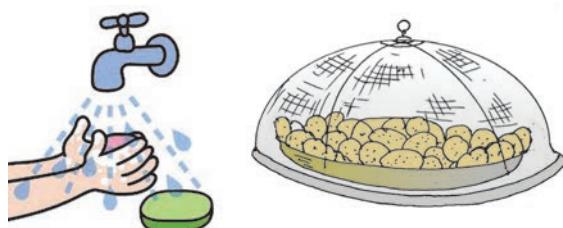


You may have heard of a number of people getting ‘gastro’ or diarrhoea after eating contaminated food at a function. Diseases spread through food also. This is also called food poisoning.



A feast on an open ground

You have seen flies sitting on dirt. When they sit on the faeces of a person who has an intestinal disease, the germs of the disease stick to their legs. When the same flies sit on our food, the germs enter the food. If we eat that food, the germs enter our body and we can get the disease. That is why it is important to always keep our food covered.



Wash your hands clean. Keep food covered.

Food is handled while preparing or serving it. If someone who has an intestinal disease handles or serves food without washing his hands properly, the germs sticking to his hands can enter the food. Food contaminated in this way can also cause disease. One must avoid eating it. Maintaining cleanliness everywhere is beneficial for our health.

Can you tell ?



What steps will you take to ensure that dust and flies do not settle on the food in your house?

Keeping food covered ensures that flies cannot sit on it, dust and other rubbish in the surroundings also cannot enter it. This prevents the micro-organisms from entering the food and the spread of disease is also prevented.

The spread of disease by insects

You may be aware that one can get malaria from the bite of a certain kind of mosquito. When this type of mosquito bites someone who has malaria, the malaria germs in that person's blood enter the mosquito's body with the blood it sucks. If this mosquito bites another person, the malaria germs enter that person's body too and he too can get malaria. Insects like mosquitoes and fleas spread disease. That is why, we must stop such insects from breeding.

Spread of disease by direct contact

Ringworm, scabies are diseases that affect the skin. Their germs are found on the skin. If someone else comes in contact with the skin of a person having this disease or wears his clothes then that person can get that skin disease too. That is why, it is better to avoid sharing clothes.

An epidemic of a disease

Germs of diseases like the flu or conjunctivitis spread quickly through the air. So, many people can get such diseases all at one time. If the water of a common source is contaminated by germs of a disease like cholera, then there is the danger of all those who drink that water getting the disease. If, at some place, mosquitoes breed in large numbers then many people there can get malaria.

When many people in one area get the same infectious disease all at the same time, we say that there is an epidemic of the disease.

Air, water, food and insects are the mediums through which diseases spread. Hence, if everyone takes care to ensure that the germs do not enter our food, water or air and to prevent the breeding of insects that spread disease, it is possible to prevent a disease from becoming an epidemic. For this, it is important for all of us to make cleanliness a habit.

Prevention of infectious diseases

Can you tell ?



Why should you not go to school if you have conjunctivitis ?

To prevent diseases from spreading through water, it is purified at the water-works. In smaller towns and villages, bleaching powder is added to community sources of water to kill the germs and make the water safe for drinking. When there is an epidemic of gastro or jaundice, people are advised to boil water before drinking it.

To prevent mosquitoes from breeding, we must ensure there is no stagnant water in the surroundings. But, if that is not possible, insecticides have to be used. Thus diseases like malaria can be prevented.



A breeding-ground for mosquitoes

People who have a serious infectious disease like tuberculosis or swine flu are quarantined. There are separate wards in hospitals for people with infectious

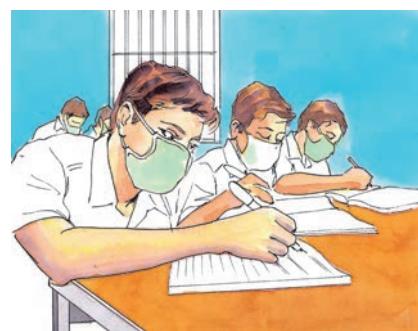
diseases. Clothes and utensils used by the patients are washed with germicides. The spittle of a person who has tuberculosis is collected in a vessel and covered with a germicide like phenyle. Such precautions help to prevent the disease from spreading to others.

To prevent the spread of diseases through air, people should cover the mouth when sneezing or coughing and avoid spitting in the open. If it is necessary to be with such a patient, a mask should be worn to cover the nose and mouth.

If someone in the family gets an infectious disease, the government health department should be informed so that necessary steps for preventing the spread of the disease can be taken.



Measures for preventing the spread of disease



Vaccination

When there is an epidemic of a disease, does every person in the area get the disease ?

When disease producing micro-organisms enter our body, the body resists the disease or fights the germs. That is why,

many times we do not get a disease even if germs enter our body.

Another way to prevent disease is vaccination. Our body develops resistance to a particular disease if we are vaccinated against it.

Soon after a baby is born, she is given the tuberculosis vaccine. When the baby is one and a half months old, she is given vaccinations against diphtheria, whooping cough, tetanus and polio. Two more doses of these vaccinations are given at intervals of one month.



Vaccination

The vaccines for diphtheria, whooping cough and tetanus are combined into a triple vaccine and given as an injection. The polio vaccine is given orally.

Public health service facilities

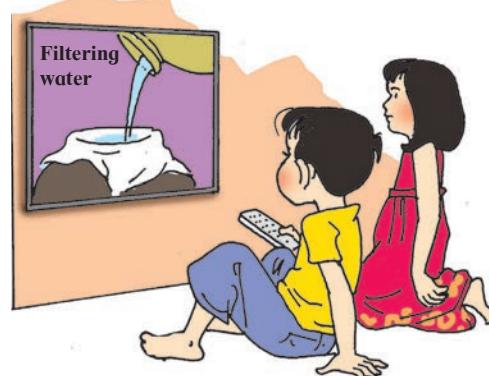
To prevent the spread of infectious diseases and epidemics, health and community welfare programmes are undertaken at the national level.

Community programmes for vaccination are also undertaken as part of national health schemes. Children are given the vaccines by trained people. Special camps are arranged for this purpose.

Primary Health Centres have been established at the village level. There are also facilities like mobile dispensaries, ambulances and a Welfare Fund for the disabled. Services like the examination of

urine and blood, X-ray, ultra-sound and other scans are also available through the health programmes. Thus, patients can get the service they need without delay.

People are also educated about the right methods of handling drinking water and food. They are urged to maintain cleanliness in their surroundings. It is now forbidden by law to spit in a public place. The purpose of this ban is to prevent the spread of diseases. Mass media are also used for raising public awareness about health and hygiene issues.



Public awareness programme on TV

Do you know ?



At one time it was believed that diseases are caused due to the anger of gods, evil spirits or due to black magic. The remedies prescribed for these were also inhuman. However, science has shown that diseases are caused by micro-organisms and these beliefs are false.

Micro-organisms are a kind of living things. All micro-organisms do not cause disease. Some micro-organisms are useful to us. They bring about the conversion of milk into yoghurt and the fermentation of the batter for idlis, dosas, etc.

Always remember –



Cleanliness, a balanced diet and vaccination are essential for the prevention of infectious diseases.

What we have learnt –



- Diseases caused by micro-organisms are called infectious diseases.
- Micro-organisms that cause disease are also called germs.

- Every infectious disease is caused by a specific micro-organism or germ.
- Infectious diseases spread through water, food or air, by direct contact or through insect bites.
- If care is taken to prevent germs from entering the body, the spread of disease can be prevented.
- If many people in a place get a disease at the same time, it is called an epidemic.
- Vaccination is an excellent method of preventing disease.

Exercises

1. What's the solution ?

You are very hungry, but the food has been left uncovered.

2. Use your brain power !

Which method of preventing the breeding of mosquitoes will you recommend for your surroundings – not allowing water to stagnate or spraying insecticides on the water ? Why ?

3. Answer the following questions.

- (a) What is an infectious disease ?
- (b) What are the mediums of the spread of diseases ?
- (c) What happens when there is an epidemic of a disease ?
- (d) What is vaccination ?
- (e) Make a list of the vaccinations that are given to a newborn baby.

4. True or false ?

- (a) Intestinal diseases spread through air.
- (b) Some diseases are caused by the anger of the gods.

5. Classify the diseases given below as diseases that spread through food, through water and through air.

Malaria, typhoid, cholera, tuberculosis, jaundice, gastro, diarrhoea, diphtheria.

6. Give reasons.

- (a) When there is an epidemic of cholera, we should drink boiled water.
- (b) We should not allow puddles of water to stand in our surroundings.

Activity

Use the points given below to write down the information about an epidemic that has occurred in your area.

Name of the disease, the micro-organism causing it, the medium through which it spreads, steps taken to prevent its spread.

* * *



24. Substances, Objects and Energy

Can you tell ?



Write a few lines on the blackboard with a chalk. Now observe the chalk.



What change do you see in the chalk?

Wipe the board with a duster and then tap the duster against the table.

What do you see?

The chalk has become smaller and when the duster was tapped, particles of chalk fell off from it. These particles were of the same colour as the piece of chalk.

This tells us that when you wrote on the board, particles of the chalk stuck to the board and when you wiped the board, they came off.

Try this.



Take small pieces of candy sugar or coal and pound them in a mortar.

What do you notice?

When you pound the coal or the sugar, it turns into a powder, that is, into small particles.

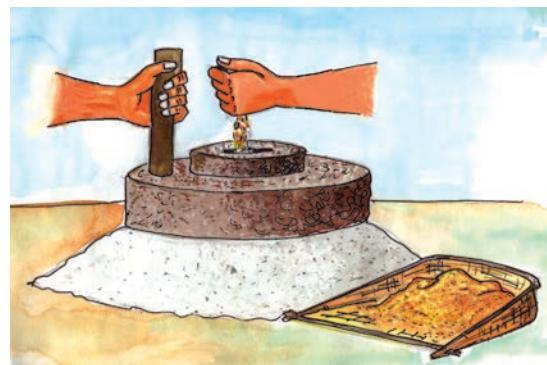


Pounding pieces of coal

All substances we see around us are made up of very tiny particles. You must have seen how sawdust or particles of wood fly when the wood is cut with a saw.



Sawing wood



Grinding

When iron or copper is made smooth with a file, we get particles of iron or copper. All substances like pencil, chalk, paper, wood, wheat grains, iron, copper, coal are all made up of fine particles.

The small particles of various substances that we can see are themselves made up of many tinier particles. These tiny particles are so small that they are not visible to our eyes. Lakhs of particles of any substance must come together to form a particle that can be visible to us.

Use your brain power!



What are the small particles that can be seen in a beam of light that enters a dark room?

Do you know?



The theory that all substances are made of minute particles was proposed long ago by Kanaad Maharshi.

Kanaad Maharshi was born in the 6th century BC at Prabhaas Kshetra near Sorati Somnaath in Gujarat. His given name was Uluk. He proposed that all things in the world can be classified into seven categories. He was also the first to suggest that every object in the universe is made up of minute particles. He named that tiny particle, 'peelav'.

Can you tell ?



If there is a sudden shower, we take shelter under a roof at the roadside. Even though the rain does not fall on us directly, we get wet to some extent. Why?

The raindrops that fall on the road, bounce off and break up into droplets. These droplets are also made up of tinier particles of water. They make us wet. It means that liquids are also made of small particles.

Use your brain power!



- (1) Make a list of all the everyday substances that we use in the form of a powder.
- (2) Naphthalene balls are placed in warm clothes. After some days, why do the clothes also smell of naphthalene?
- (3) Naphthalene balls are also placed in toilets. Why do they become smaller after a few days?

Naphthalene is continuously being converted into small particles in the gaseous state. Such small particles from the balls settle on the clothes. So, the clothes too smell of naphthalene. As the particles leave the naphthalene balls, the balls grow smaller in size and slowly disappear.

Particles of rangoli are fine like a flour. Rangoli colours are also available in the form of grains.



Use your brain power!



Suppose you do not have rangoli powder. What things can you use as an alternative?

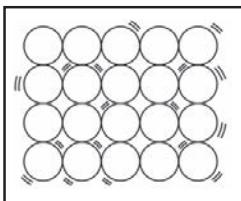
The states of substances : Water is found in nature in three states - solid, liquid and gaseous. In all the three states, the individual particles of water remain the same. However, the arrangement of the particles in each of these states is different.



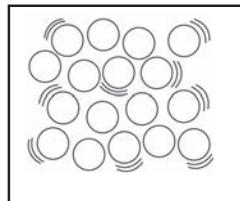
Ice



Water



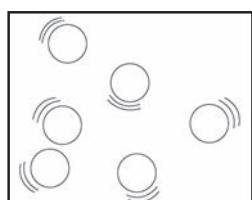
Particles in a solid



Particles in a liquid



A cloud



Particles in a gas

As a result, we see differences in the properties of solids, liquids and gases. All substances in nature have a particulate form, i.e., they are made up of particles. In nature, every substance occurs in a specific state. Accordingly, that substance is called a solid, liquid or gas. For example, aluminium and coal are solids, kerosene and petrol are liquids while nitrogen and oxygen are gases.

Different substances have different properties. Substances may differ with respect to properties like hardness, transparency, colour, smell, solubility in water, etc.

Substances and objects

Can you tell ?

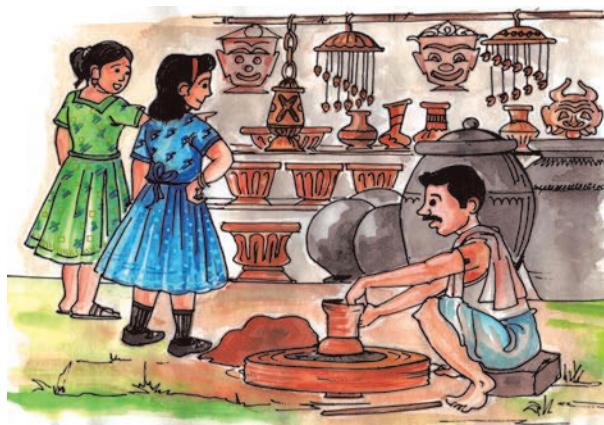


Asmita went to buy an earthen pot. There she saw many things kept for sale.

How did she identify what she needed?

From what substance had the potter made all the things?

What is the difference between a substance and an object?



Objects have a definite shape. Their parts are put together in a particular way. Objects are made from substances.



Look at the objects in the picture above. What substance are they all made from?

Energy

Can you tell ?



We make useful objects from a variety of substances. Another use of substances is that we get energy from some of them.

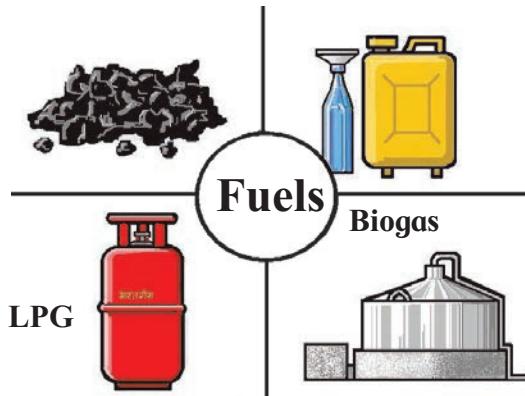
There is a car. Its tank is full of fuel but it does not move. Why is that?

When we have run a long distance, we feel tired. We have to stop. Why is that?



'Energy' is required to do work. The capacity of a body to do work is called energy.

When petrol or diesel burns in a motor vehicle, energy gets released. When the petrol is finished or if it stops burning, the vehicle too stops running. When something burns, energy gets released in the form of heat. You have learnt that in our body too energy is obtained by the burning of certain substances.



Many machines can be run using fuels. Coal, diesel, CNG, LPG, petrol are all substances from which energy is obtained in the form of heat.

When a person or vehicle moves, heat energy gets converted into motion. Energy in the form of motion is called kinetic energy.

All moving things have kinetic energy. For example, when the wind blows, the windmills turn, and sailing boats and clouds move from one place to another. This work is possible only because of the kinetic energy of the wind.



Which other machines you know use kinetic energy to do certain tasks? How do they get this kinetic energy?

A ceiling fan, a mixer-grinder, a water pump are machines in which kinetic energy is used. They get kinetic energy from electricity. Electricity is also a form of energy.

Find out

What is the original source of energy for the electricity produced at a thermal power station?

Use your brain power!



What uses of heat energy do we see in our daily life?

Other forms of energy

We use several devices in which work is done using, not heat, but other forms of energy. For example, we use electricity to run the TV. In it, the electricity is converted into light and sound energy. In a solar cooker or solar water heater, solar energy is used.

Plants use sunlight to prepare their own food. In this process, energy from sunlight is stored in the food substance they make. These are the substances that burn in our body and give us all the energy we need for various purposes.

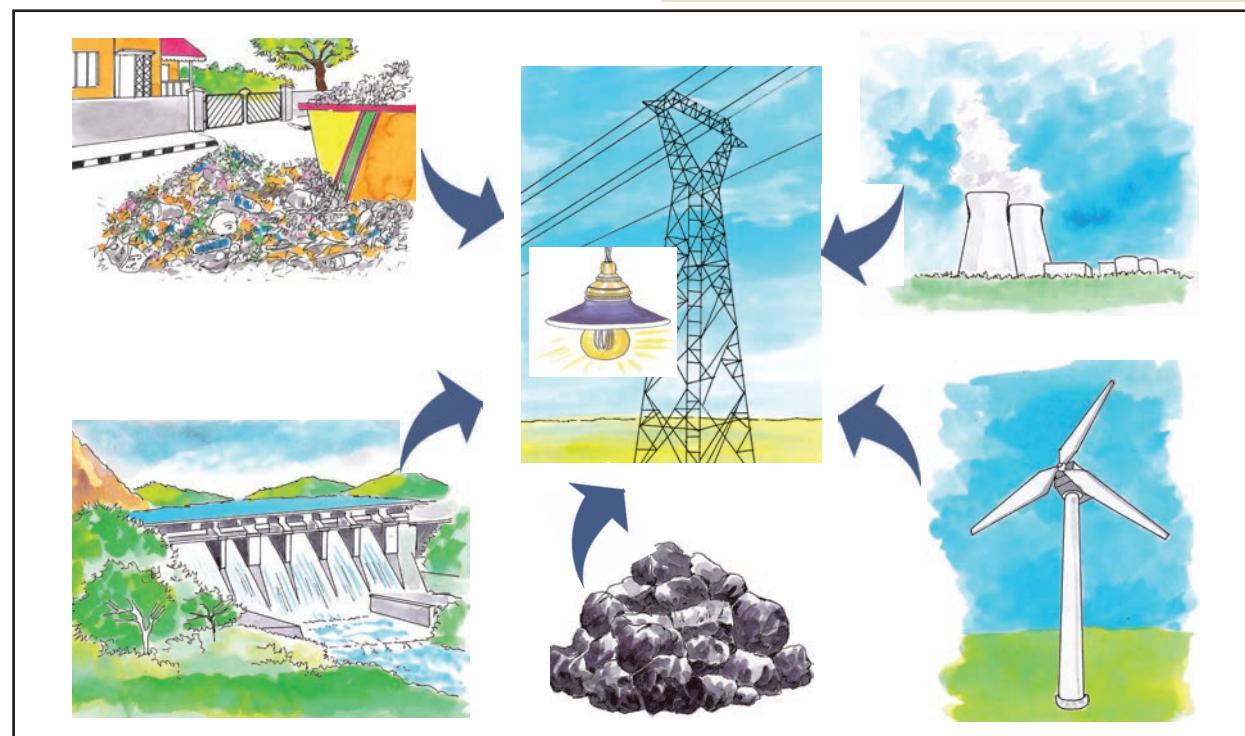
When we burn substances like coal, mineral oil, the stored energy they contain is converted into heat energy.

Sources of energy : We use various forms of energy such as heat, light, sound, electricity and kinetic energy to do different tasks. In today's world, our main sources for all these forms of energy are fuels and electricity. And to produce electricity, many power stations use fuels.

Do you know ?



Stores of coal and mineral oil on earth are limited. In future, we will have to use mainly solar energy and atomic energy for the purpose of producing electricity.



Do you know ?



There are batteries which produce electricity using sunlight. They are called solar batteries.

The heat of the sun, flowing water, and wind do not get depleted. Besides, they do not cause pollution when used to produce electricity. But, producing electricity by these methods is expensive. And in any method of electricity generation, resources from the environment have to be used. Hence, making a habit of using the minimum amount of electricity is necessary in today's world.

Always remember –



Sunlight, wind and water are non-exhaustible sources of energy. They must be used to the maximum extent as alternative sources of energy.

What we have learnt –



- Every substance we see around us is made of minute particles.
- We can make different objects from the same substance.
- Substances are in the solid, liquid or gaseous state.
- The capacity of a body to do work is called energy.
- All moving things have kinetic energy.
- Various forms of energy such as heat, light, sound, electricity are used to do different kinds of work.
- Sunlight, wind and water are non-exhaustible sources of energy.



Exercises

1. What's the solution ?

- We need to make a sherbet quickly for some guests. But we only have sugar candy in the house.
- We need to rub salt on a corncob but only salt crystals are available.

2. Use your brain power !

- Why do tablets of camphor decrease in size day by day?
- How do we save fuel by using public transport?

3. Answer the following questions.

- When and why do clothes smell of naphthalene?

- In which states is water found in nature?
- What is the difference between the solid, liquid and gaseous states of a substance?
- What is meant by energy?

Activities

- Make different kinds of articles from clay.
- Visit a wood workshop and observe the work being done there.
- Obtain some information about the power generation plants in Maharashtra and present it in the classroom.

25. Community Health and Hygiene

Read and discuss

There was havoc as 150 people in the area where Radha lives were suddenly affected by food poisoning. Some of the residents made great efforts to secure emergency medical help immediately. Radha, too, stayed up late that night. She was so stressed that she could not take part in the story-telling competition in her school the next day. She did feel bad about missing the chance but she had the satisfaction of having helped the victims of food poisoning.

What do you think are the reasons for such emergencies?

Do you think that the incident of food poisoning occurred because people were careless about hygiene?

It is necessary to be alert about health and hygiene. Do you agree that the health of the entire community is as important as one's own health?

Community health

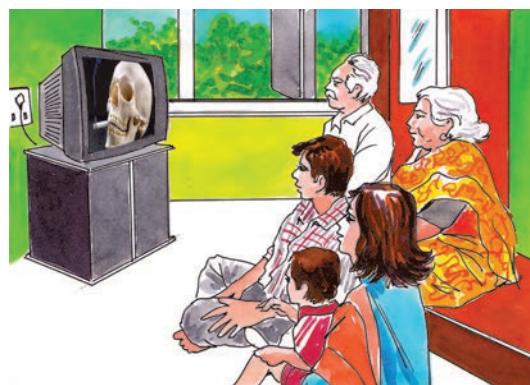
Nutritious food, personal hygiene, exercise and pursuit of hobbies lead to excellent health and good personal development. Just as we take care of our own health, we must make efforts to ensure good health for all. Everyone in our society should be able to live the kind of tension-free and happy life that we wish for ourselves. Good community health and hygiene can be achieved through habits of cleanliness and good health on the part of all individuals in a community.

Pollution, squalor, epidemics of infectious diseases, addiction, insect-borne

diseases are all threats to community health. To nurture community health is to protect the general public from such diseases and to make a happy and healthy life possible for all.

Importance of community health

The people of a country are the most important factor in a country's progress and development. Their health can be protected if they have a clean environment, nutritious food, safe drinking water and good medical facilities. Mass media are used under community welfare programmes to educate people about issues such as taking care of drinking water and food.



People are urged in every possible way to keep their surroundings clean. It is a legal offence to spit in public places. The aim of this ban is to prevent the spread of diseases.

What are the threats to the health of the community?

There are several threats to community health. An important threat is carelessness regarding hygiene. From the actions given below, mark those that are harmful with a cross and write the explanation in your notebook.

1. Burning old tyres
2. Spitting anywhere on the road

- | | |
|--|--------------------------|
| 3. Using public toilets | <input type="checkbox"/> |
| 4. Looking after domestic animals | <input type="checkbox"/> |
| 5. Following doctor's instructions in cases of infectious diseases | <input type="checkbox"/> |
| 6. Washing your hands before a meal or snack | <input type="checkbox"/> |
| 7. Throwing the garbage from your house on to the road | <input type="checkbox"/> |

Speak and write.

Some important factors that are harmful for community health are mentioned below. For example, polluted water, malnutrition, etc. How each of these factors harms community health is given in the first box in front of it. Some suggested remedies are mentioned in the next box. Add other ill effects and remedies to the respective boxes.

Polluted water :	Cholera, -----
	Safe water supply, -----
Malnutrition :	Higher numbers of child deaths, -----
	Nutritious diet
Pollution :	Danger to the environment,-----
	Protecting the environment,-----
Ignorance and Superstition :	Oppression, deception, ---
	Scientific temper, -----
Addictions :	Unhappy family life, -----
	Deaddiction programmes, --

Wholesome living

If we take care of our health, it is possible for us to lead a wholesome life. Keeping ourselves happy and taking an interest in things, avoiding feelings of hatred and envy and doing what is necessary to maintain physical health helps us to achieve this end. If people of a society live a healthy and wholesome life, social tensions also decrease and feelings of friendship can be nurtured.

Tobacco consumption

Names of tobacco products such as *gutka*, cigarettes, *bidis*, *masheri*, *mawa*, *panmasala*, etc. are often heard. We also see many people consuming tobacco in different ways. All these are harmful for our health. At first, a person may chew tobacco casually at someone's urging. But this may lead to addiction. The person becomes dependent on tobacco and cannot give up the habit.

When people develop this habit, they become restless if they do not get tobacco. They are not able to pay attention to anything else. They have to have tobacco in the mouth all the time. When the habit reaches this stage, it is called an addiction.

People addicted to tobacco spit here and there all the time and make their surroundings dirty.

III effects of tobacco addiction

- Ulcers in the mouth.
- The ulcers develop into bigger wounds. The person may develop tumours.
- A lot of time and money has to be spent on treatment. If the wounds do not heal, the person has serious problems. This can eventually lead to cancer.
- Tobacco entering the digestive organs leads to complaints related to them. The constant presence of tobacco in the

digestive organs can cause cancer of any of those organs.

- A person who develops cancer in this way has to take very painful treatment. Even after that, one cannot be sure that the cancer will be cured.

Alcoholism

Drinking alcohol also has adverse effects on the body. Addiction to alcohol is called alcoholism.

- Alcohol makes a person drowsy and confused. One loses control over one's actions.
- Alcoholism causes diseases of the liver, intestines and urinary bladder.
- Addiction to tobacco or alcohol are both very bad habits. It is best to stay away from these vices. Never be negligent about health.
- The condition of the addict becomes pathetic, and the addict's family too has to suffer with them. There is no telling how much money will be required for treatment. Besides, everyone is put to great trouble and a lot of time and efforts are wasted. The family gets deprived of health and happiness and is ruined.
- We must be aware that an addict destroys the entire family.



Beware !

Chewing tobacco, smoking cigarettes or *bidis*, taking snuff, rubbing *masheri*

on the teeth, smoking tobacco through a *chillum*, *hookah*, cigar, pipe or cheroor are all extremely harmful.

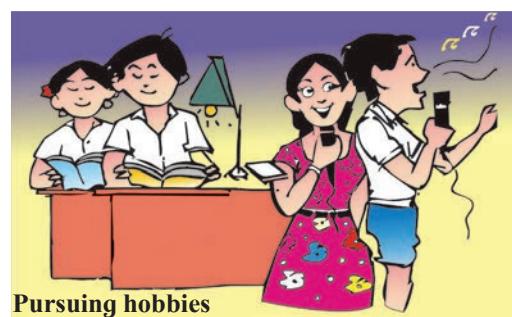
Besides alcohol and tobacco, people also fall prey to some other addictions such as the addiction to drugs like cocaine, heroin, etc. These addictions can totally devastate your life.

Drugs, tobacco and alcohol use – an invitation to death

Tobacco, drugs and alcohol produce a state of intoxication. Addiction to any of them eventually kills you. Every person should beware of the ill effects of these addictions and strictly stay away from them. There are people who lure others into smoking, drinking or trying out drugs. On no account should we give in to their pressure.

If a person starts getting addicted to smoking or drinking or taking drugs, the help of counsellors or doctors should be sought immediately to rid the person of the habit.

One should eat regularly and take up sports and other hobbies. One should be firm in avoiding any addiction.



Try this.

All of us have certain habits. Some such habits are mentioned below. Put them into three groups – good habits, bad habits and pointless habits.

1. Informing your family members where you are going and when you will be back.
2. Telling the truth.
3. Fiddling with one's hair, a pencil, etc. all the time.
4. Biting one's nails.
5. Making the school bag ready the night before.
6. Frequently forgetting one's umbrella, raincoat, pencil, pen, etc.
7. Putting a limit on TV time and sticking to it.

Use your brain power !

What bad habits will you guard against while trying to achieve your aim or interest in life?



Always remember –



Learn to say 'No!' firmly in order to avoid bad habits.

What we have learnt –



- Each person should put in efforts to maintain the community's health.
- We must be alert with respect to matters of public health.
- Wholesome living leads to good personal and social health.
- One needs to be firm with oneself to avoid bad habits.

Exercises

1. Fill in the blanks.

- (a) A healthy and wholesome life leads to feelings of
- (b) Constant presence of tobacco in the digestive organs can lead to cancer of
- (c) leads to diseases of the liver, intestines and urinary bladder.
- (d) The most important factor in the country's progress and development are its
- (e) Good community can be achieved through habits of hygiene and good health.

2. True or false? Correct the wrong statements.

- (a) Pollution, squalor, epidemics, addictions and insect-borne diseases are all beneficial for community health. (-)
- (b) There is a ban on spitting in public places. (-)

- (c) A nutritious diet, personal hygiene, exercise and pursuit of hobbies lead to excellent health. (-)
- (d) We cannot live a wholesome life if we take care of our health. (-)

3. Answer the following questions.

- (a) How can you achieve excellent health?
- (b) What factors are a threat to community health?
- (c) What are the ill effects of chewing tobacco?
- (d) What are the ill effects of alcoholism?

Activity

Write and present a short play on preventing addictions in society.



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**Maharashtra State Bureau of Textbook
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