



Social Science

Our Environment

Textbook in Geography for Class VII



राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
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Foreword

The National Curriculum Framework (NCF), 2005, recommends that children's life at school must be linked to their life outside the school. This principle marks a departure from the legacy of bookish learning which continues to shape our system and causes a gap between the school, home and community. The syllabi and textbooks developed on the basis of NCF signify an attempt to implement this basic idea. They also attempt to discourage rote learning and the maintenance of sharp boundaries between different subject areas. We hope these measures will take us significantly further in the direction of a child-centred system of education outlined in the National Policy on Education (1986).

The success of this effort depends on the steps that school principals and teachers will take to encourage children to reflect on their own learning and to pursue imaginative activities and questions. We must recognise that, given space, time and freedom, children generate new knowledge by engaging with the information passed on to them by adults. Treating the prescribed textbook as the sole basis of examination is one of the key reasons why other resources and sites of learning are ignored. Inculcating creativity and initiative is possible if we perceive and treat children as participants in learning, not as receivers of a fixed body of knowledge.

These aims imply considerable change in school routines and mode of functioning. Flexibility in the daily time-table is as necessary as rigour in implementing the annual calendar so that the required number of teaching days are actually devoted to teaching. The methods used for teaching and evaluation will also determine how effective this textbook proves for making children's life at school a happy experience, rather than a source of stress or boredom. Syllabus designers have tried to address the problem of curricular burden by restructuring and reorienting knowledge at different stages with greater consideration for child psychology and the time available for teaching. The textbook attempts to enhance this endeavour by giving higher priority and space to opportunities for contemplation and wondering, discussion in small groups, and activities requiring hands-on experience.

The National Council of Educational Research and Training (NCERT) appreciates the hard work done by the textbook development committee responsible for this book. We wish to thank the Chairperson of the advisory committee for textbooks in Social Sciences, at the higher secondary level, Professor Hari Vasudevan and the Chief Advisor for this book, Vibha Parthasarathi for guiding

the work of this committee. Several teachers contributed to the development of this textbook; we are grateful to their principals for making this possible. We are indebted to the institutions and organisations which have generously permitted us to draw upon their resources, material and personnel. We are especially grateful to the members of the National Monitoring Committee, appointed by the Department of Secondary and Higher Education, Ministry of Human Resource Development under the Chairpersonship of Professor Mrinal Miri and Professor G.P. Deshpande, for their valuable time and contribution. As an organisation committed to systemic reform and continuous improvement in the quality of its products, NCERT welcomes comments and suggestions which will enable us to undertake further revision and refinement.

Director

New Delhi
20 November 2006

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The following are applicable to all the maps of India used in this textbook

1. © Government of India, Copyright 2006
2. The responsibility for the correctness of internal details rests with the publisher.
3. The territorial waters of India extend into the 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.
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8. The spellings of names in this map, have been taken from various sources.



Nirmalya Chakraborty, College of Art, New Delhi

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1 Environment

After the long vacation, when Ravi started going to school again, he noticed that the only playground next to his school was dug up. People said that a huge building with many flats will be constructed there. Ravi was almost in tears, when he realised that the big playground with its soft grass, marigolds and butterflies is gone for ever. He shared his feelings with his classmates. In the assembly, the Principal too sadly observed, "See how our environment is changing."

In the class Ravi asked his teacher, "What is environment?" "Whatever you see in your surroundings," said the teacher.

Ravi thought aloud, "That means, the school building, tables, chairs in the classroom, even that open field, the road, the garbage, my friends – all are parts of our environment!"

"Yes" said the teacher, "but wait..... Some objects are created by nature – for example, mountains, rivers, trees, animals. Others are made by people – for example roads, cars, clothes, books".

Now work in pairs. Make a list with your classmate sitting next to you, of the creations of nature and by human beings.



Ravi, Paramjeet, Jessy, Mustafa, Asha were all excited about making the list. "Why is our environment changing?" asked Iqbal. "It's all because of our needs. They are



Environment is our basic life support system. It provides the air we breath, the water we drink, the food we eat and the land where we live.

How do human beings modify this natural environment? The car fumes pollute the air, water is collected in a pot, food is served in vessels and land is used to build factories.

Human beings make cars, mills, factories and manufacture containers. This is how human beings modify natural environment.

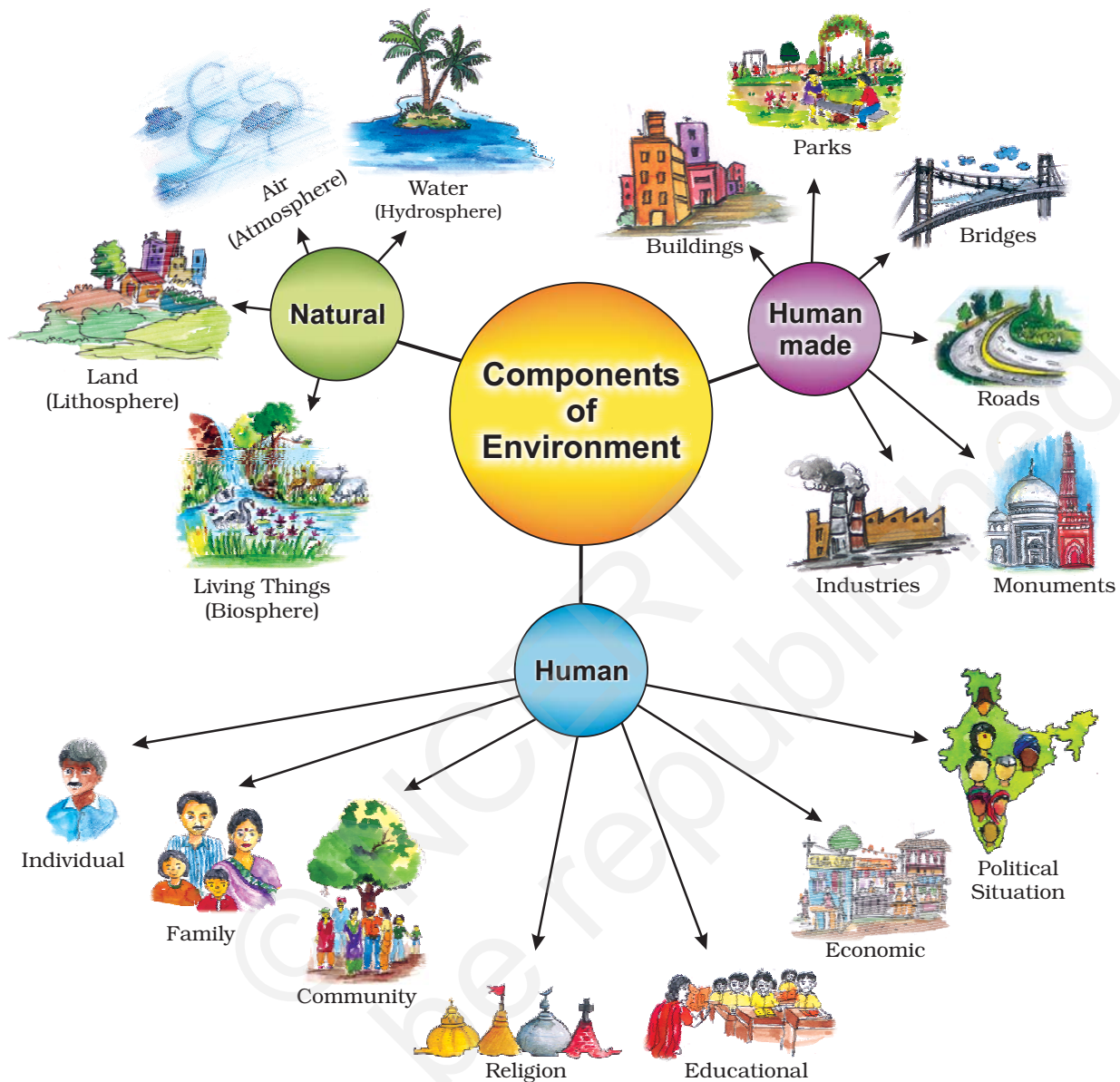


Fig. 1.1: Components of Environment

increasing day by day; we are therefore modifying and at times even destroying our natural surroundings”, the teacher replied.

Biotic
The world of living organisms. e.g. plants and animals.

Abiotic
The world of non-living elements. e.g. land.

From the above conversation you understand that the place, people, things and nature that surround any living organism is called **environment**. It is a combination of natural and human made phenomena. While the natural environment refers to both **biotic** and **abiotic** conditions existing on the earth,

human environment reveals the activities, creations and interactions among human beings.

NATURAL ENVIRONMENT

Land, water, air, plants and animals comprise the natural environment. You are familiar with the meaning of lithosphere, hydrosphere, atmosphere and biosphere from your previous class. Let us learn some more facts about these domains.

Lithosphere is the solid crust or the hard top layer of the earth. It is made up of rocks and minerals and covered by a thin layer of soil. It is an irregular surface with various landforms such as mountains, plateaus, plains, valleys, etc. Landforms are found over the continents and also on the ocean floors.

Lithosphere is the domain that provides us forests, grasslands for grazing, land for agriculture and human settlements. It is also a source of mineral wealth.

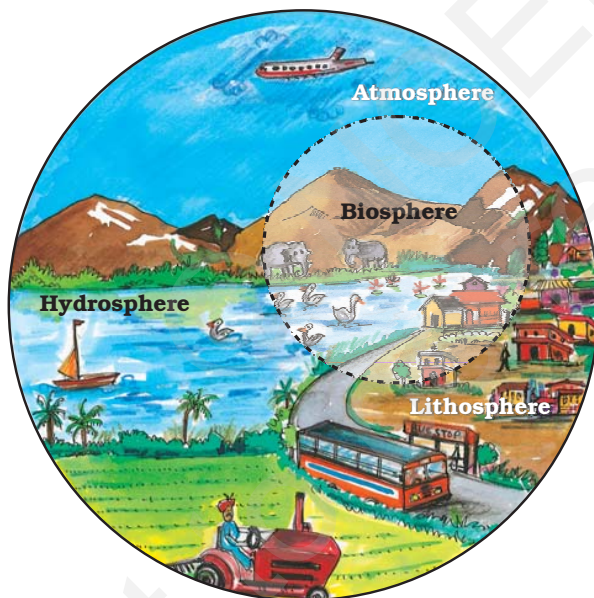


Fig. 1.2: Domains of the Environment

The domain of water is referred to as **hydrosphere**. It comprises various sources of water and different types of water bodies like rivers, lakes, seas, oceans, etc. It is essential for all living organisms.

The **atmosphere** is the thin layer of air that surrounds the earth. The gravitational force of the earth holds the atmosphere around it. It protects us



Word Origin

Environment: French word *Environer/ Environner* meaning “neighbourhood”.



Let's do

Look at your surroundings. Make a list of uses that the land in your neighbourhood is being put to.



Let's do

Where does the water you use in your home and school come from? Make a list of different uses of water in our daily life. Have you seen anyone wasting water? How?



Let's do

Observe the sky while coming to school. Make a note whether the day is cloudy, rainy, sunny, foggy etc.



Glossary

Ecosystem: It is a system formed by the interaction of all living organisms with each other and with the physical and chemical factors of the environment in which they live, all linked by transfer of energy and material.



Let's do

Sketch or bring photographs of your place like the students in the story.

from the harmful rays and scorching heat of the sun. It consists of a number of gases, dust and water vapour. The changes in the atmosphere produce changes in the weather and climate.

Plant and animal kingdom together make **biosphere** or the living world. It is a narrow zone of the earth where land, water and air interact with each other to support life.

What is ecosystem?

At an NCC camp that Ravi's class was attending, Jessy exclaimed, "What a heavy downpour. It reminds me of my home in Kerala. You should come and see how it pours and pours and pours over the lush green fields and coconut plantations."

Heera from Jaisalmer exclaimed, "We get no rains. We see only 'kikar' and sand, as far as the eyes can see." "But you also find camels", said Ravi.

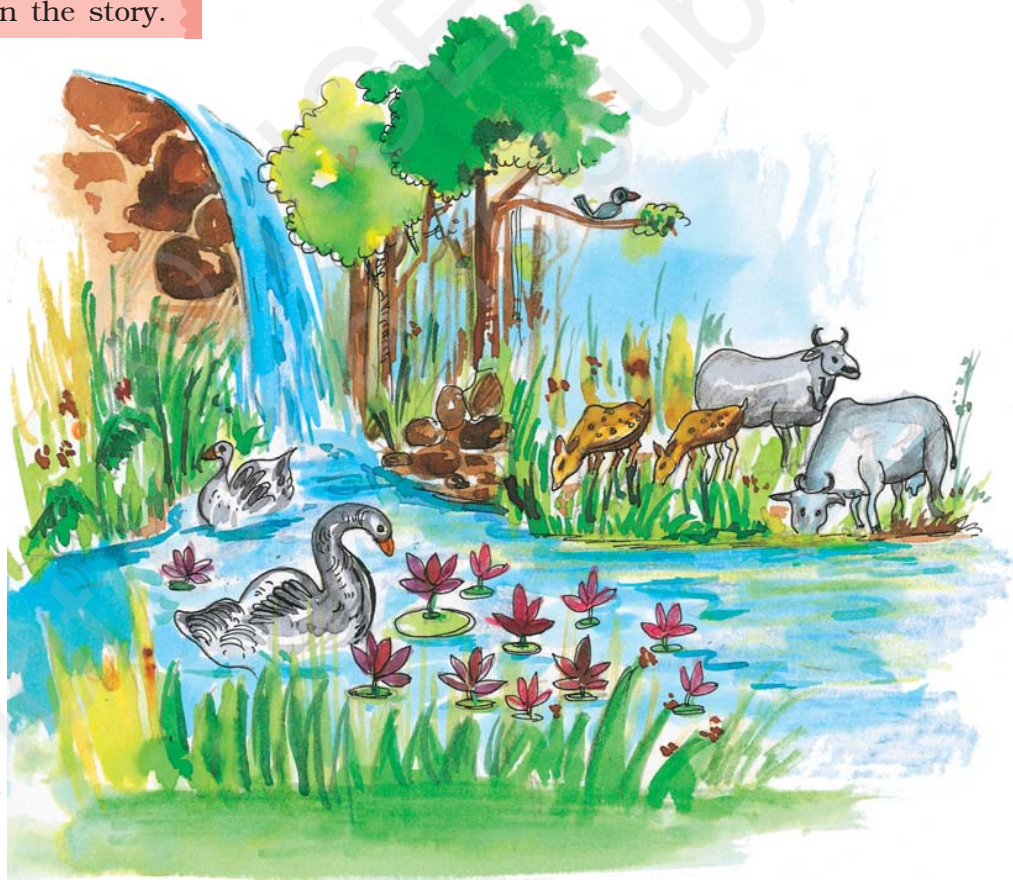


Fig. 1.3: A Pond Ecosystem

Heera says, "Not just camels. If you visit our desert, you will see snakes, lizards and many insects too."

Ravi wondered, "Why do the animals, the vegetation and the way people live vary from place to place? Are they all related to each other?"

"Oh yes, very much so", the teacher replied.

All plants, animals and human beings depend on their immediate surroundings. Often they are also interdependent on each other. This relation between the living organisms, as well as the relation between the organisms and their surroundings form an ecosystem. There could be an ecosystem of large rain forest, grassland, desert, mountains, lake, river, ocean and even a small pond.

Do you think the park in which Ravi and his friends played formed an ecosystem?

HUMAN ENVIRONMENT

Human beings interact with the environment and modify it according to their need. Early humans adapted themselves to the natural surroundings. They led a simple life and fulfilled their requirements from the nature around them. With time needs grew and became more varied. Humans learn new ways to use and change environment. They learn to grow crops, domesticate animals and lead a settled life. The wheel was invented, surplus food was produced, barter system emerged, trade started and commerce developed. Industrial revolution enabled large scale production. Transportation became faster. Information revolution made communication easier and speedy across the world.

Have you ever thought why you love eating a juicy watermelon in summer and hot roasted peanuts in winter? A perfect balance is necessary between the natural and human environment. Humans must learn to live and use their environment in a harmonious way.

Nurie, a girl from Mizoram from Ravi's class often talks about the lush green surroundings of her place. Seeing Ravi upset at having lost his playground, Nurie invited him to visit her home state during the coming vacation. Ravi's teacher asked the students to draw the landscape, houses and activities of the people and places they visit during the holidays.



Do you know?

On 5 June every year the World Environment Day is celebrated.



Glossary

Barter System:

It is a trade in which goods are exchanged without the use of money.



Let's do

Talk to some elderly person in your neighbourhood and collect information about—

- The trees in his/her neighbourhood when he/she was your age.
- The indoor games he/she played.
- His/her favourite fruit at your age.
- How did they make themselves comfortable during hot summers and cold winters?

Display your answers on a wall/bulletin board.



1. Answer the following questions.

- (i) What is an ecosystem?
- (ii) What do you mean by natural environment?
- (iii) Which are the major components of the environment?
- (iv) Give four examples of human made environment.
- (v) What is lithosphere?
- (vi) Which are the two major components of biotic environment?
- (vii) What is biosphere?

2. Tick the correct answer.

- (i) Which is not a natural ecosystem?
(a) Desert (b) Aquarium (c) Forest
- (ii) Which is not a component of human environment?
(a) Land (b) Religion (c) Community
- (iii) Which is a human made environment?
(a) Mountain (b) Sea (c) Road
- (iv) Which is a threat to environment?
(a) Growing plant
(b) Growing population
(c) Growing crops

3. Match the following.

- (i) Biosphere (a) blanket of air which surrounds the earth
- (ii) Atmosphere (b) domain of water
- (iii) Hydrosphere (c) gravitational force of the earth
- (iv) Environment (d) our surroundings
(e) narrow zone where land water and air interact
(f) relation between the organisms and their surroundings

4. Give reasons.

- (i) Man modifies his environment
- (ii) Plants and animals depend on each other

5. Activity.

Imagine an ideal environment where you would love to live. Draw the picture of your ideal environment.



2 Inside Our Earth

The earth, our homeland is a dynamic planet. It is constantly undergoing changes inside and outside. Have you ever wondered what lies in the interior of the earth? What is the earth made up of?

INTERIOR OF THE EARTH

Just like an onion, the earth is made up of several concentric layers with one inside another (Fig. 2.1). The uppermost layer over the earth's surface is called the **crust**. It is the thinnest of all the layers. It is about 35 km. on the continental masses and only 5 km. on the ocean floors.

The main mineral constituents of the continental mass are **silica** and **alumina**. It is thus called **sial** (*si-silica* and *al-alumina*). The oceanic crust mainly consists of silica and magnesium; it is therefore called **sima** (*si-silica* and *ma-magnesium*) (Fig. 2.2).

Just beneath the crust is the mantle which extends up to a depth of 2900 km. below the crust.

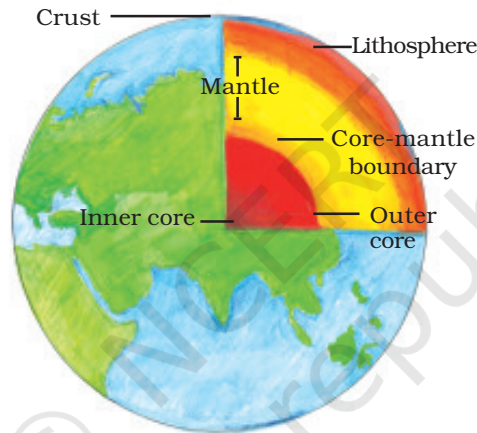


Fig. 2.1: Interior of the Earth

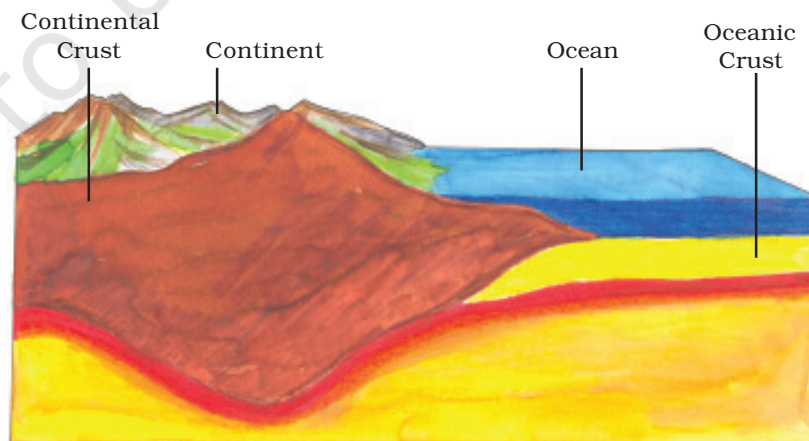


Fig. 2.2: Continental Crust and Oceanic Crust



Do you know?

- The deepest mine in the world, is in South Africa. It is about 4 km. deep. In search for oil engineers have dug a hole about 6 km. deep.
- To reach to the centre of the earth (which is not possible!) you will have to dig a hole 6000 km. deep on the ocean floor.



Do you know?

- The crust forms only 1 per cent of the volume of the earth, 84 per cent consists of the mantle and 15 per cent makes the core.
- The radius of the earth is 6371 km.



Word Origin

Igneous: Latin word *Ignis* meaning fire.

Sedimentary: Latin word *sedimentum* meaning settle down.

Metamorphic: Greek word *metamorphose* meaning change of form.



Glossary

Fossils: The remains of the dead plants and animals trapped in the layers of rocks are called fossils.

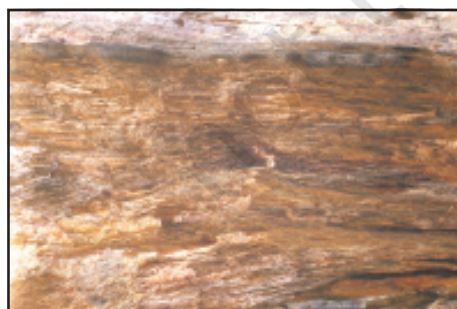


Fig. 2.3: Sedimentary rock turned into a Metamorphic rock

The innermost layer is the core with a radius of about 3500 km. It is mainly made up of nickel and iron and is called **nife** (*ni* – nickel and *fe* – ferrous i.e. iron). The central core has very high temperature and pressure.

ROCKS AND MINERALS

The earth's crust is made up of various types of rocks. Any natural mass of mineral matter that makes up the earth's crust is called a **rock**. Rocks can be of different colour, size and texture.

There are three major types of rocks: **igneous rocks**, **sedimentary rocks** and **metamorphic rocks**.

When the molten magma cools, it becomes solid. Rocks thus formed are called igneous rocks. They are also called **primary rocks**. There are two types of igneous rocks: **intrusive rocks** and **extrusive rocks**.

Can you imagine lava coming out from the volcanoes? Lava is actually fiery red molten magma coming out from the interior of the earth on its surface. When this molten lava comes on the earth's surface, it rapidly cools down and becomes solid. Rocks formed in such a way on the **crust** are called **extrusive igneous rocks**. They have a very fine grained structure. For example, basalt. The Deccan plateau is made up of basalt rocks. Sometimes the molten magma cools down deep inside the earth's crust. Solid rocks so formed are called **intrusive igneous rocks**. Since they cool down slowly they form large grains. Granite is an example of such a rock. Grinding stones used to prepare paste/powder of spices and grains are made of granite.

Rocks roll down, crack, and hit each other and are broken down into small fragments. These smaller particles are called **sediments**. These sediments are transported and deposited by wind, water, etc. These loose sediments are compressed and hardened to form layers of rocks. These types of rocks are called **sedimentary rocks**. For example, sandstone is made from grains of sand. These rocks may also contain fossils of plants, animals and other micro-organisms that once lived on them.

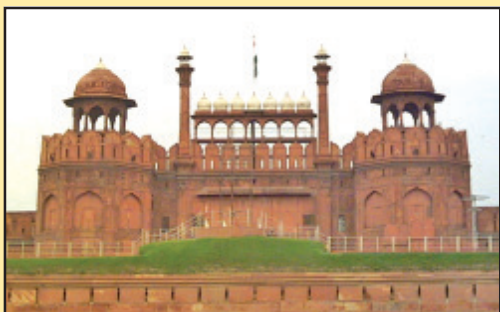
Igneous and sedimentary rocks can change into metamorphic rocks under great heat and pressure (Fig. 2.3). For example, clay changes into slate and limestone into marble.

Rocks are very useful to us. The hard rocks are used for making roads, houses and buildings. You use stones in many games. For example, seven stones (*pitthoo*), hopscotch (*stapu/kit kit*), five stones (*gittt*). Find out some more such games by asking your grand parents, parents, neighbours, etc.



Let's do

Collect pictures of some monuments and find out which are the rocks used to build them. Two pictures have been collected for you.



The Red Fort is made of red sandstone



The Taj Mahal is made of white marble

You will be surprised to know that one type of rock changes to another type under certain conditions in a cyclic manner. This process of transformation of the rock from one to another is known as the **rock cycle**. You have already learnt when the molten magma cools; it solidifies to become igneous rock. These igneous rocks are broken down into small particles that are transported and deposited to form sedimentary rocks. When the igneous and sedimentary rocks are subjected to heat and pressure they change into metamorphic rocks. The metamorphic rocks which are still under great heat and pressure melt down to form molten magma. This molten magma again can cool down and solidify into igneous rocks (Fig. 2.4).

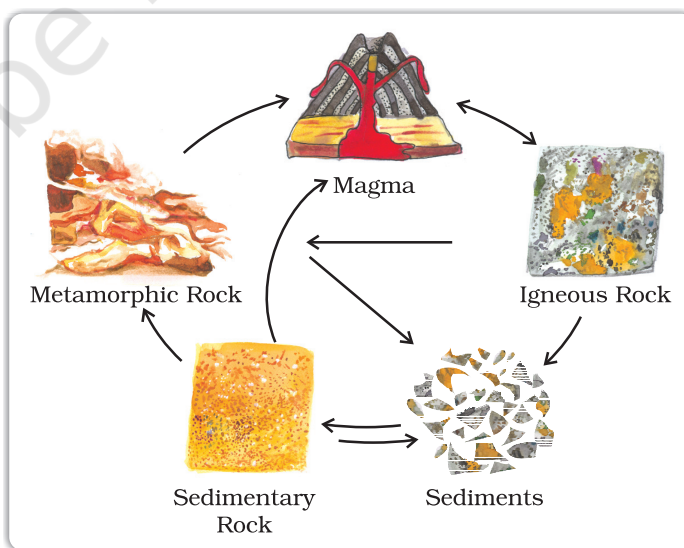


Fig. 2.4: Rock Cycle



Let's do

What are the minerals found in your state?

Collect some samples to show in your class.

Rocks are made up of different minerals. Minerals are naturally occurring substances which have certain physical properties and definite chemical composition. Minerals are very important to humankind. Some are used as fuels. For example, coal, natural gas and petroleum. They are also used in industries – iron, aluminium, gold, uranium, etc, in medicine, in fertilisers, etc.



1. Answer the following questions.

- (i) What are the three layers of the earth?
- (ii) What is a rock?
- (iii) Name three types of rocks.
- (iv) How are extrusive and intrusive rocks formed?
- (v) What do you mean by a rock cycle?
- (vi) What are the uses of rocks?
- (vii) What are metamorphic rocks?

2. Tick the correct answer.

- (i) The rock which is made up of molten magma is
(a) Igneous (b) Sedimentary (c) Metamorphic
- (ii) The innermost layer of the earth is
(a) Crust (b) Core (c) Mantle
- (iii) Gold, petroleum and coal are examples of
(a) Rocks (b) Minerals (c) Fossils
- (iv) Rocks which contain fossils are
(a) Sedimentary rocks
(b) Metamorphic rocks
(c) Igneous rocks
- (v) The thinnest layer of the earth is
(a) Crust (b) Mantle (c) Core

3. Match the following.

- | | |
|---------------|---|
| (i) Core | (a) Earth's surface |
| (ii) Minerals | (b) Used for roads and buildings |
| (iii) Rocks | (c) Made of silicon and alumina |
| (iv) Clay | (d) Has definite chemical composition |
| (v) Sial | (e) Innermost layer |
| | (f) Changes into slate |
| | (g) Process of transformation of the rock |

4. Give reasons.

- (i) We cannot go to the centre of the earth.
- (ii) Sedimentary rocks are formed from sediments.
- (iii) Limestone is changed into marble.

5. For fun.

- (i) What are the minerals most commonly used in the following objects?
- (ii) Identify some more objects made up of different minerals.

