



## 7. Rocks and Rock Types



### Do it yourself !



Figure 7.1

Observe the pictures in figure 7.1 and answer the following questions.

- What is the hill in ‘A’ made up of?
- What is being done in ‘B’?
- What do we see in ‘C’?
- Is there any relationship between the three things shown above?
- For what purpose do we use the things shown in A and C?



### Do it yourself !

From the hills, river-beds or the land in your vicinity, collect rock specimens of different types, shapes, colours, etc. Observe the rock specimens and note down the following.

- Place where the rock was found.
- Colour of the rock.
- Spots on the rock and their colour.
- Weight of the rock (estimated; heavy / light).
- Hardness of the rock (hard / brittle / medium).
- Structure of the rock (Uniform grains/ layers / hollowness).
- Porosity of the rock (porous / non-porous).

Show the rock specimens and your notes to the teacher. Discuss them.

### Explanation

We have seen last year that the earth’s crust is hard. It is made of rocks and soil.

Rocks are found on land surface and also below it. **Rocks** are a mixture of different minerals formed by natural processes in the lithosphere.

The properties of rocks depend on the constituent minerals and their proportion, as well as on the formation process. Silica, aluminium, magnesium and iron are the major rock-forming **minerals**. There are other minerals, too, in different rocks.

### \* Types of rocks

There are three types of rocks according to their formation process:

- **Igneous Rocks** / Primary Rocks
- **Sedimentary Rocks**
- **Metamorphic Rocks.**



### Do you know?

The interior of the earth has very high temperature. As a result, the material in this part is in the molten state. Sometimes this material gets released through the fissures in the crust. This is called a volcano. Lava, gases, dust, ashes, etc. are thrown out during volcanic eruptions.

### \* Igneous Rocks

When the molten material, known as **magma** within the crust and **lava** on the surface, cools down, it solidifies giving rise to rocks. These are known as igneous rocks.

As these rocks are formed out of the material from the interior of the earth, these are also referred to as primary rocks. Mostly these rocks appear hard and homogeneous. These are heavy as well. We do not get fossils in these rocks.

The Maharashtra Plateau and the Sahyadris are formed out of igneous rocks. **Basalt** is a major example of igneous rock. See figure 7.5.



### Do you know?

Pumice is an example of igneous rock. This is formed out of volcanic froth. It is a porous rock. As its density is quite low, it can float on water.

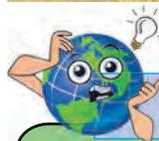


Figure 7.2 : Pumice Stone

Most of the hill forts in Maharashtra have lakes or elephant yards. Actually, these are old quarry sites. Rock was extracted from these sites and used for the construction of the fort and other buildings. In the pits and dugouts left behind after rock extraction, water was allowed to accumulate and these lakes, tanks etc. were created.



Figure 7.3 : Reservoir on a Fort



### Use your brain power!

What rock was used for building the forts in Maharashtra ? Why ?

### \* Sedimentary rocks

Due to continuous variations in the temperature, rocks develop cracks. Similarly, the water percolating through rocks dissolves the soluble minerals. This leads to the weathering of rocks. They get disintegrated or decomposed. That is, they get reduced to pieces. These rock particles get transported by rivers, glaciers, wind, etc. towards low lying areas and are deposited there. One after the other, layers of sediments get deposited in this way. The upper layers exert heavy pressure on the lower layers. This leads to compaction of material and development of sedimentary rocks.

One can easily see layers in the sedimentary rocks. While layers are getting deposited the remains of dead animals or plants get buried in these layers at times. Therefore, one may find fossils in sedimentary rocks. Sedimentary rocks are generally brittle and lightweight. Most of them are porous.

Sandstone, limestone, shale, corals, etc. are sedimentary rocks. One may find coal seams in sedimentary rocks.

## Fossils

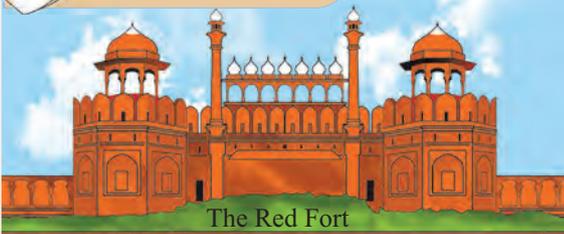
The buried remains of dead animals or plants become subject to heavy pressure. As a result their impressions get marked in the rocks. At times the buried animals or plants get petrified. These are called fossils. The study of fossils provides information about the life in that period.



Figure 7.4 : Fossils



### Do you know?



The Red Fort

Near Jaipur city in Rajasthan, red sandstone is found. This is a type of sedimentary rock. This rock was used for the construction of the Red Fort at Delhi. As sandstone is relatively soft, it is easy to carve in it.

## \* Metamorphic Rocks

Volcanic activity and other earth movements constantly take place on the earth. While these are occurring, the igneous or sedimentary rocks in that region are subjected to tremendous pressure and heat. This leads to changes in the nature as well as the chemical composition of the

original rocks. The crystals in the original rocks get re-crystallized. This means, the rocks get metamorphosed. The rocks formed through such a process are called metamorphic rocks. These rocks do not contain fossils. These rocks are heavy and hard. Study the table given below and try to understand the metamorphosis.

Type of Rock	Original Rock	Photograph (Specimens)	Metamorphosed Rock	Photograph (Specimens)
Igneous	Granite		Gneiss	
Igneous	Basalt		Amphibolite	
Sedimentary	Limestone		Marble	
Sedimentary	Coal		Diamond	
Sedimentary	Sandstone		Quartzite	
Sedimentary	Shale		Slate	

Coal gets metamorphosed when it undergoes heavy pressure and intense heat. After coal gets

metamorphosed into diamond, its price increases. We burn coal while we use diamonds as ornaments.



**Do you know?**



Bhedaghat

- The Taj Mahal at Agra is built in marble. Marble is a metamorphic rock. This rock was brought from mines in Makrana in Rajasthan.
- One realizes while taking a boat ride in River Narmada through Bhedaghat gorge in Madhya Pradesh that the river has cut its gorge through marble rock. At sunrise, sunset and during full moon nights, these river banks present an enchanting scene.

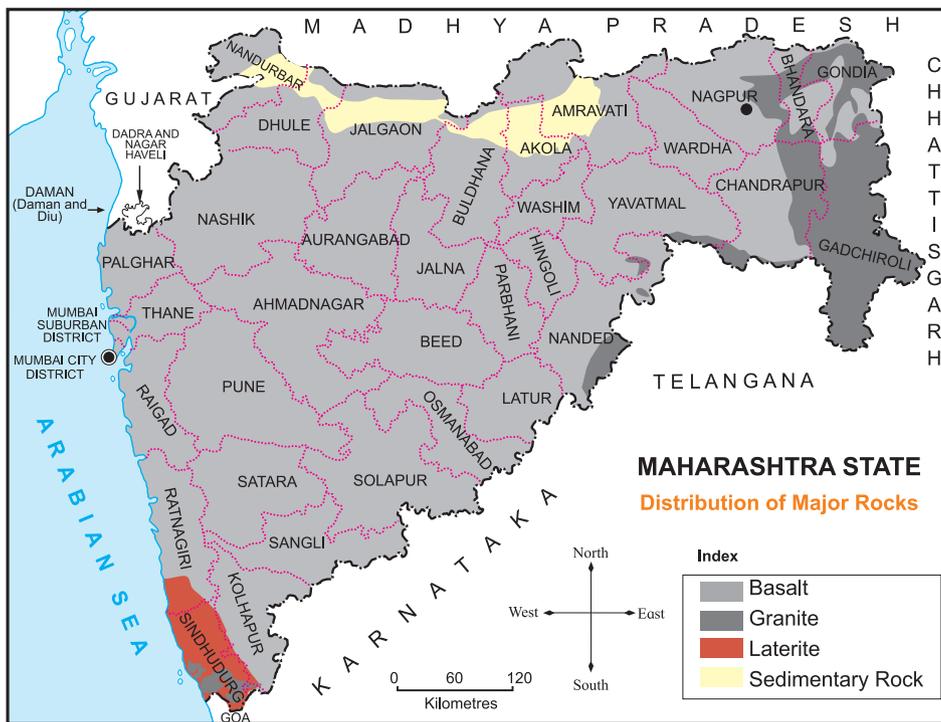


Figure 7.5 : Distribution of Major Rock Types in Maharashtra

Figure 7.5 shows the distribution of major rocks in Maharashtra. List the districts in Maharashtra where rocks other than basalt are found. The basalt rock formed out of volcanic eruption has spread over a vast region of our State. Granite rock is found in the eastern parts and in South Konkan. Laterite is found in South Konkan.

Because of thick and extensive layers of basalt, Maharashtra does not have large reserves of mineral wealth. Therefore, mining activity is concentrated in South Konkan and in eastern Maharashtra.



### Use your brain power!

Find the meaning of this line from a famous marathi poem:

‘राकट देशा, कणखर देशा, दगडांच्या देशा ।’

### \* Laterite

In the coastal region of Konkan in Maharashtra, we find laterite rock. It is found specially in Ratnagiri and Sindhudurg districts.



### What will you do!

Ajit is interested in sculpting. He wants to prepare a sculpture of Dr. A. P. J. Abdul Kalam. He cannot decide which rock he should use for this, igneous, sedimentary or metamorphic? What will be your advice ?



### I can do this!

- Understand the type of rocks.
- Tell the use of rocks.
- Tell the distribution of rocks in Maharashtra.
- Compare rock types.



### Exercises



(A) How is sand that flows in a river formed? Collect some information about where the sand comes from.

(B) Which of the following monuments are built in igneous rock?

- (1) The Taj Mahal      (2) Fort Raigad  
(3) The Red Fort      (4) Ellora Sculpture

(C) Find the differences between–

- (1) Igneous and sedimentary rocks  
(2) Sedimentary and metamorphic rocks  
(3) Igneous and metamorphic rocks

(D) Which types of rocks are predominantly found at the following locations?

- (1) Central Maharashtra    (2) South Konkan  
(3) Vidarbha

### \* Activity

- Collect rock specimens from your surroundings and also during your travels. Classify them with the help of your teacher. Make a small museum of rocks for your school and place your specimens there. Keep a note of the place from where you have collected them. (See a specimen display on page 65.)
- Visit the historical sites in your surroundings, e.g., hill forts, masonry dams, land forts, bastions, *wadas*, temples, mosques, etc. and observe with the help of your teacher, the rock used for their construction.



### Websites for reference

- <http://www.geography4kids.com>
- <http://www.rocksforkids.com>
- <http://www.science.nationalgeographic.com>
- <http://www.classzone.com>

