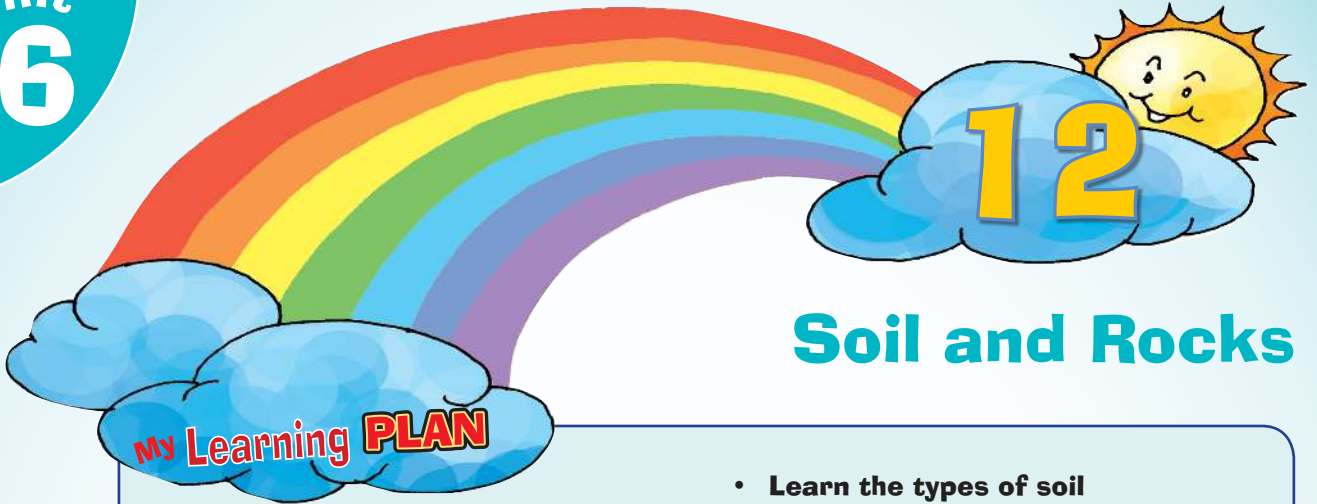




Soil and Rocks

- Know how soil is formed
- Understand what soil contains
- Learn the types of soil
- Understand the importance of soil
- Know about rocks



WARM-UP

1. Identify the plants growing in the farm.



1. M _ _ Z _

3. B _ _ _ _ L

2. S _ _ _ R _ _ _

4. B _ _ A _ _

You have already learnt that plants need certain things to live and grow—water, sun and **soil**. This chapter takes a closer look at soil.

SOIL

The earth is made up of several layers. Each layer consists of different materials. The topmost layer of the earth is called soil. Scoop out a fistful of soil from the garden and feel it. Do you feel some grains and sticky mud? Soil is a mixture of minerals, water, air and other substances. Soil is also home to many small animals, like earthworms.

How Soil Is Formed

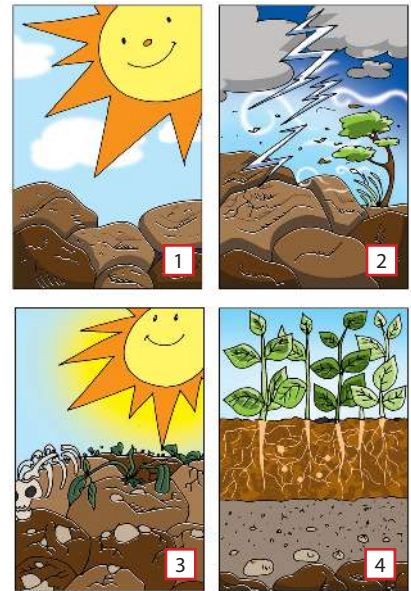
The process of soil formation takes place over hundreds of years.

Hot and cold weather conditions help in the formation of soil. Rain, sun's heat, wind and ice can cause the rocks to crack and break up into smaller pieces.

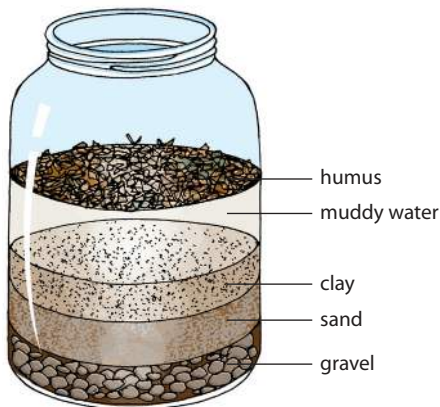
The smaller pieces keep breaking down till a powdery mass is formed. This powdery mass has pieces of rocks, air, water trapped inside, and other living and non-living materials. This is soil.

Besides rock pieces, soil also has **humus**. When plants and animals die, they decompose or break down and get mixed with the soil forming humus. Plants grow well when there is a lot of humus in the soil.

A1



▲ soil formation



▲ layers of soil

What Soil Contains

Soil contains many other things.

Take a glass jar with a wide mouth. Dig out some soil from the garden and put it in the jar. Pour some water into the jar and stir it. Put it aside for a few minutes.

A2

You will see that the soil has formed several layers. The bottom layer is made up of small stones called **gravel**. Above this are particles that are much smaller than gravel. These are **sand** particles. Above the sand particles is another layer of very small, fine particles. They are so small that you cannot

see the particles separately. This is **clay**. On top floats the **humus**.

A3

Types Of Soil

Soil found in different places have different colours and textures.

The soil which contains mostly clay particles is called **clayey soil**. It is soft and very smooth to touch. It is generally found near riverbeds. When this soil is baked, it becomes hard. It is used to make toys, flower pots, idols, etc.



▲ potter making clay objects

The clay particles are very small. So they stick together and they can hold a lot of water. There is very little air in the clayey soil.

Soil that contains a lot of sand particles is called **sandy soil**. It is rough to touch. It is found on the seashore and also in deserts. It is used to make glass.

Sand particles are large in size and have a lot of space between them. These spaces contain air. Water can easily pass through this space. Plants do not grow well in sandy soil.

Loamy soil contains a mixture of clay and sand. It has enough air for the plants to breathe. It can also hold water. In addition, loamy soil has humus. So plants grow well in loamy soil.

Importance Of Soil

Soil is very important for the growth of plants. It gives them water and minerals. Minerals are like food for plants. The soil can be made more **fertile** by adding **manure**. Manure is a mixture of animal dung and decaying leaves of plants and trees.



Info Bits

Earthworms are very good for the soil. They increase the soil fertility.

Soil takes hundreds years to form. Hence, it is our duty to protect soil. Soil can be protected by planting more trees.

Animals like worms, mites, bacteria and moles live under the soil. In their own ways, they all improve the nature of soil.

ROCKS

All rocks are useful but some are very precious to us. Rocks can be of different types. **Granite** is a very hard rock. It is used in buildings. **Diamond** is the hardest rock on the earth. It is very precious and is used in making jewellery. **Marble** is used to make statues.



▲ rock

Is there any part of your classroom or any object (floor, writing board, etc.) that is made up of a type of rock? Name it.

soil: the topmost layer of the earth

humus: the mixture of soil that is formed by decomposition of dead plants and animals

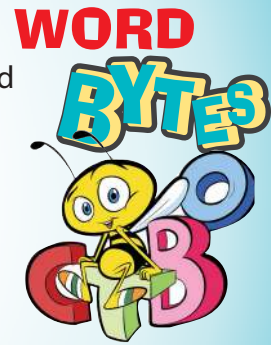
clayey soil: soil that has fine clay particles

sandy soil: soil that has sand particles in large quantity

loamy soil: soil that is a mixture of clay and sand

fertile: soil which is capable of producing healthy crops

manure: mixture of animal dung and decaying leaves of plants and trees



- Soil is formed when rocks break due to the effect of wind and water.
- Soil is made up of gravel, sand, clay and humus.
- Soil can be of different types. Sandy soil, clayey soil and loamy soil are common types of soil.



REVIEW ZONE

A Tick (✓) the correct answer.

1. Which of the following types of soil can hold a lot of water?
a. sandy b. clayey c. loamy d. gravel
2. Which of the following is the hardest rock on the earth?
a. diamond b. granite c. marble d. sandstone

B Choose the suitable word from the following and fill in the blanks.

water sand minerals gravel clayey humus clay

1. soil can be used to make flower pots and toys.

- Loamy soil is a mixture of and
- Plants grow well when there is a lot of in the soil.
- Plants obtain and from the soil.

C State whether the following statements are TRUE or FALSE.

- Soil is formed from of rocks.
- Soil has sand and clay particles.
- All plants grow well in clayey and sandy soil.
- Humus is harmful for plants.
- Granite is a hard rock.

D Decode the hidden words below using the codes. Then arrange the words in the correct order to know the hidden fact. *Some of the letters have been decoded for you.*

Secret Code:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

Fact:

	H					L				I			Y	I								
20	8	5		23	15	18	12	4	19	15	9	12	4	1	25	9	19					
	B							D		N			F				C		B			
15	2	19	5	18	22	5	4	15	14	6	9	6	20	8	4	5	3	5	13	2	5	18

E Answer the following questions.

- How is soil important?
- What does soil consist of?
- How do rocks change into soil?
- Why is loamy soil good for growing plants?



HOTS CORNER

- Why do farmers add cow dung to the soil?
- What is the difference between soil and dirt?

3. Imagine that you are a farmer. You want to grow carrots in your field. But the soil in your field has very little humus. How will you make the soil fertile to grow your crop?



ENHANCE YOUR LIFE SKILLS



1. Some animals like earthworms live in soil. Worms help in mixing all the parts of the soil. So they are helpful for the soil. The worm tunnels allow water and air to reach the underground soil. Earthworms also take in soil while feeding on plants and other food. After eating, the worms leave behind castings which add some substances or nutrients to the soil. These nutrients are helpful for the growth of plants.

Purchase some earthworms from nurseries or gardening stores. Take a flower pot and sow few kidney beans seeds in it. Release the earthworms in the flower pot. Do not forget to water the soil and keep it moist. Without water the plant will not grow and the worms will die.



ONLY A CLICK AWAY

1. Look at the soil map of India on the following link.

<http://www.mapsofindia.com/maps/india/soilsofindia.htm>

Find out which soil is found in the different states of India. Also, find out which type of soil is found in your city/town and which crop grows best in this soil.



ACTIVITY BAG

1. Take a piece of chalk and crush it. What do you get? There are some big and some small pieces. There is also some powdery chalk dust. Now, sprinkle some water on it. You will get a paste with some lumps of chalk in it. This is roughly the process by which soil is formed.

Activity
1

2. Water a plant in a pot. Do you see bubbles coming out? These bubbles are formed because soil contains air.

Activity
2



3. Dig out some soil from the garden, place it in a metal container. Cover it with a plate. Heat it. What do you see on the inner side of the plate?

Activity
3



These vapours are formed because **soil contains water**.

4. Take a few samples of different types of rocks, such as, chalk, marble, granite, coal and slate. Heat these rocks. Which one breaks on heating? Freeze them in a refrigerator. Are there any changes in the rocks? Put them in water. Which ones float and which ones sink?



▲ chalk



▲ marble



▲ granite



▲ coal



▲ slate

Teacher's Notes

- Teacher can take the students on a field trip and show the kind of soil in their area.
- Answers to Warm-up: 1. MAIZE; 2. SUGARCANE; 3. BRINJAL; 4. BANANA.