

**We Already Know**

- ✓ Plants grow in soil
- ✓ Land on earth is covered with soil

**We Will Learn About**

- ✓ Soil formation
- ✓ What the soil contains
- ✓ Layers of soil
- ✓ Types of soil
- ✓ Importance of soil
- ✓ Crops

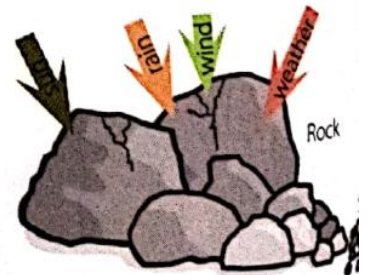
Soil is the upper layer of earth on which the plants grow.

**Activity 1**

- Pick up soil from a garden. Keep it on a white sheet of paper. Examine its colour. Feel it with your fingers. Does it feel smooth or rough?
- Separate out the different things that are present in it – there may be parts of plants and animals as well as small stones.
- Examine the grains of soil under a magnifying glass – can you see them clearly or are they too small to be separately seen?
- Pick up soil from other places – a playground, seashore or shore of a river if there is one near your house etc and examine them in the same way.

**HOW DOES SOIL FORM?**

Long ago the land was mostly solid rock. The action of sun, wind, flowing water and changes in weather over several years weakened the rocks. These rocks broke into small pieces. These pieces further broke to form tiny grains of soil.



Formation of soil





Suppose there were only rocks on the earth and no soil. What do you think would have happened?

(Reflective Thinking)

WHAT DOES SOIL CONTAIN

Soil is made up of the following main parts:

- Tiny pieces of **rock**.
- Rotted plant and animal parts called **humus**. Humus is dark brown or black in colour. It provides nutrients to the soil and makes it fertile. Fertile soil is very good for growing plants. Normally, the darker the soil, the more humus it contains.
- **Water** is trapped in the empty spaces between soil particles, also known as **pore spaces**. This water is used by plants.
- **Air** is also trapped between the soil particles.

Activity 2

Aim: To show that soil contains water.

Materials required: soil sample, bowl, metal plate, stove

Procedure: Take some soil from a garden and place it in the bowl. Heat the bowl on a stove. Hold the metal plate over the bowl. Observe the lower surface of the plate.

Observation: You will observe tiny drops of water on the surface of the plate. When the soil is heated, the water in it evaporates and settles on the cool surface of the metal plate. This shows that soil contains water.



Soil contains water

Activity 3

Aim: To show that soil contains air.

Materials required: soil sample, jar, water

Procedure: Take some soil in a jar. Pour some water over the soil.

Observation: You will immediately see some bubbles coming out of the soil. These are air bubbles. The air present in the spaces between the soil particles escapes in the form of bubbles.



TYPES OF SOIL

Soils found in different places are different. This is because they are made from different kinds of rocks. Some kinds of rocks break into very small pieces. Others break into larger pieces. The colour of soil depends on the minerals present in the rocks.

The main types of soils are as follows.

Sandy soil is rough. It is mostly yellow or light brown in colour. It mostly contains particles of sand. These particles are large and can be easily seen. The pore spaces are large, and water quickly flows out through these spaces. Therefore, sandy soil cannot hold much water and remains dry. Very few plants can grow in it. Sandy soil is found in deserts and on seashores.



Sandy soil

Clayey soil is mostly grey in colour. It is made up of very small particles and therefore feels smooth. The pore spaces are very small, and water cannot easily flow out through them. Therefore, clay soil holds a lot of water and remains wet and sticky. There is not much air between the particles. Most plants cannot grow well in clay soil. Clay soil is used for making pots and toys.

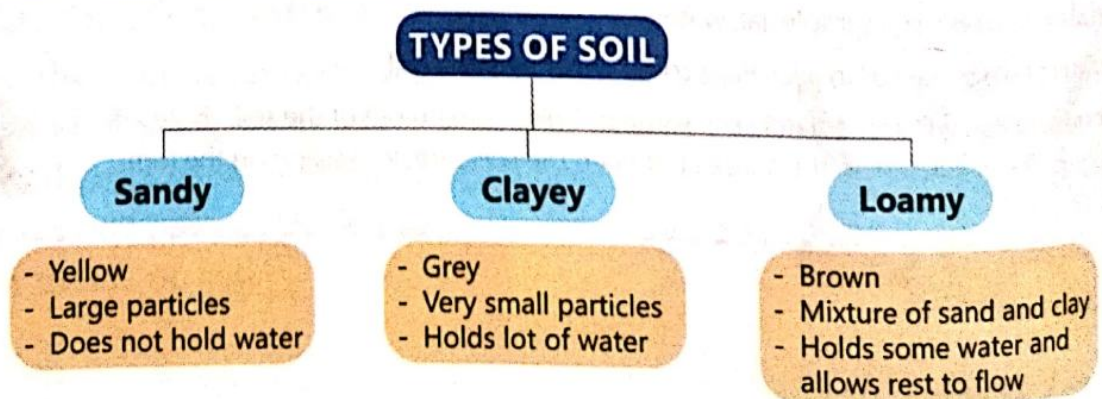


Clay soil

Loamy soil is a mixture of sand and clay and is brown in colour. The pore spaces in loamy soil are smaller than in sandy soil. It can, therefore, hold both water and air and is often damp. It also has a lot of humus in it. It is the best type of soil for growing plants. Loamy soil is usually found in forests, gardens and parks.



Loamy soil





Activity 4



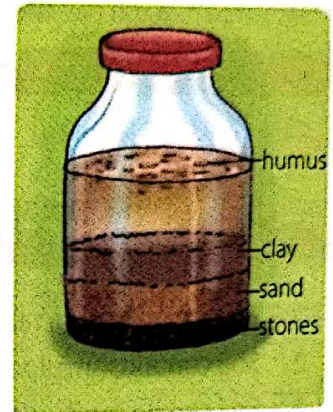
Aim: To separate the soil into different layers.

Materials required: Garden soil, soil samples from the playground, farm, seashore and riverside, some water, a glass bottle with lid

Procedure: Take some garden soil. Put it in an empty bottle. Pour water in the bottle. Put the lid on and shake the bottle for about a minute. Allow it to stand undisturbed for 10-15 minutes.

Observation: After letting the soil and water mixture stand for a while you can see that the soil has settled down into different layers. The small stones, called **gravel**, will sink to the bottom. The sand will settle next. The clay, which has the smallest particles will be above the sand. Some portion keeps floating on top. This is the humus.

Repeat the procedure with soil samples from different places.



THE IMPORTANCE OF SOIL

Soil is important for all living things.

- Plants take water and minerals from the soil to grow and make food. Humans and all other animals depend on the food made by plants.
- Some animals such as ants or earthworms make their home in the soil.
- Almost everything that we use in our homes comes from soil or from plants that grow in the soil. We depend on the soil for metals, plastics, clothes, petrol, furniture and a number of other things around us.

CROPS AND SOIL

A **crop** is any plant that is grown in large areas to get food and other things. Examples are rice, wheat, *bajra*, sugar cane and cotton.



Manure

Different plants need different types of soil to grow well. Some such as *bajra* need sandy soil. Others such as rice need clay soil. Most plants such as sugar cane and wheat grow well in loam. Farmers add **manures** and **fertilisers** to soil to make it fertile. Plants can then grow better and crops give greater yield. Manures contain a lot of humus.



Rice crop

Manure: Rotted form of animal and plant waste
Fertiliser: Artificial substances containing nutrients for plants





Good to Know

Earthworms are the farmers' best friends. They help in loosening up the soil. They also make the soil rich by feeding on the plant and animal matter present in the soil and converting it into manure. The more earthworms a soil has, the healthier it is.



IN BRIEF

1. The action of sun, rain, wind, and changing weather causes rocks to break down to form soil.
2. Soil contains small rock pieces, humus, water and air.
3. Soil can be sandy, clayey or loamy. Most plants grow best in loam.
4. We depend on the soil for food and many other things.
5. Different crops grow well on different types of soil.



Exercises

Objective Type Questions

A. Multiple choice questions.

1. Rocks break into smaller pieces due to:

a. flowing water	b. weather changes	c. wind	d. ☒ all of these
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2. Which of these has the smallest pieces?

☒ a. Clayey soil	b. Sandy soil	c. Humus	d. Loam
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3. Which of these is the lightest?

☒ a. Humus	b. Sand	c. Clay	d. Gravel
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4. Which of these is obtained from things we get from the soil?

a. Plastics	b. Metals	c. Petrol	d. ☒ All of these
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5. Which of these animals lives in the soil?

☒ a. Earthworm	b. Owl	c. Butterfly	d. All of these
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B. Write T for True statements or F for False statements.

1. Long ago there was only soil on the earth, and no rocks. f
2. Different kinds of rocks break to produce different kinds of soil. T



3. Humus is made from rocks.
4. Clay has the largest rock pieces.
5. We depend on the soil for most of our needs.
6. The colour of soil depends on the minerals present in rocks.

F
F
F
T
T

C. Match the following.

1. Humus
2. Pore spaces
3. Loam
4. Sand
5. Crop

c
d
e
b
a

- a. Plant grown in a large area for food and other things
- b. Soil with large pore spaces
- c. Rotted parts of plants and animals
- d. Empty spaces between the soil particles
- e. Mixture of sand and clay

D. Fill in the blanks.

1. When rocks break up into very small pieces, soil is formed.
2. The darker the soil, the more humus it contains.
3. The colour of soil depends on the minerals present in it. (minerals)
4. Sandy soil has the largest particle size, followed by **loamy** and **clayey** soils.
5. All plants grow well if manure is added to the soil.

Theoretical Questions

Answer the following questions in brief.

1. What causes rocks to break?
2. How is soil formed?
3. Why do most plants grow well in loam?
4. Name four things we get from soil.



Thinking Skills

21st CS

1. If rocks had not broken down, there may not have been plants and animals on the earth. Why? Because, there would be no soil.
2. Why do gardeners like loam?
Because, it is the best type of soil for growing plants.

