NORTH POINT SENIOR SECONDARY BOARDING SCHOOL
WORKSHEET
CLASS - V
EVS

LESSON 1

Growing Plants

Learning Objectives

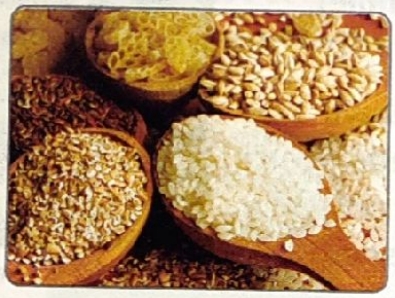
After completing this chapter, you will be able to :

- describe the importance of plants
- name different parts of a seed
- describe germination of seeds
- describe dispersal of seeds
- list different practices of agriculture

Use **Cordova Smart Class Software** on the **smart board** in class to understand the structure of seed and explore the ways of seed dispersal. Also, to know about vegetative propagation and agriculture.

Plants form a major part of our environment. We all depend on plants to survive. They help us in many ways. **They give us food to eat, medicines to cure, oxygen to breathe and fibres for cloth. Therefore, plants are called our green friends.** We cannot live without plants. So, we must grow more and more plants and should take care of them. More plants would mean a continuous supply of plant products to meet our needs.

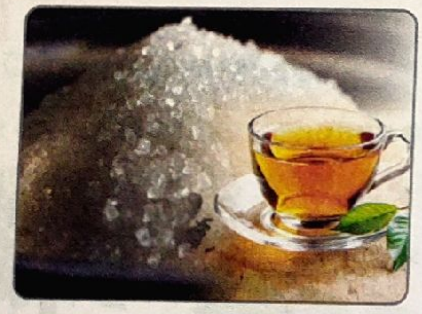
cotton



grains and pulses

fruits and vegetables

Plants – Our Green Friends



sugar and tea

medicine and oil

wood

We depend on plants for many things.

We know that most plants produce a large number of seeds. These seeds germinate and grow into new plants. New plants can also grow from other parts of plants like stems, roots and leaves. In this chapter, we will learn how new plants grow from seeds and other parts of plants.

GROWING NEW PLANTS FROM SEEDS

A single plant produces many seeds. But, all seeds do not grow into new plants because

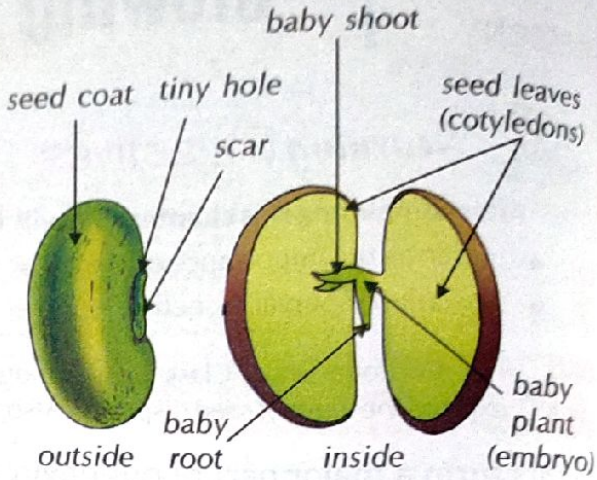
- some seeds are eaten up by birds, rats and other animals.
- some of them may get destroyed by wind and rain.
- Some do not get sufficient air, water or warmth.

Structure of a Seed

Seeds of different plants are of different shapes and sizes. A seed consists of the following parts.

1. Seed coat

The thick outer covering of the seed is called the **seed coat**. It protects the seed. On the side of the seed, there is a **scar**. This is the place where seed is attached to the fruit. On the top of scar, there is a tiny hole. This hole allows water to enter inside the seed.



Structure of bean seed

2. Seed leaves (Cotyledons)

Inside the seed coat, fleshy seed leaves or cotyledons are found. Food for the baby plant **(embryo)** is stored in seed leaves. The baby plant lies between cotyledons. It contains **baby root (radicle)** and **baby shoot (plumule)**.

Cotyledons protect the baby plant.

Seeds like **gram**, **pea** and **bean** have two cotyledons and are called **dicot seeds**. Seeds like **rice**, **maize** and **wheat** have only one cotyledon and are called **monocot seeds**.


Pea seeds
(dicot seeds)

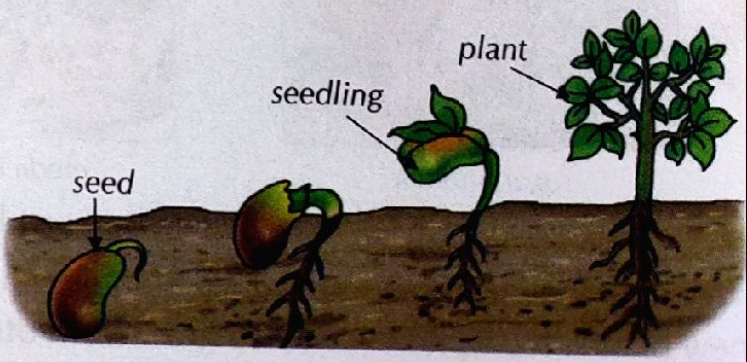

Wheat seeds
(monocot seeds)

Activity

Soak a bean seed overnight. Open it and identify its parts.

Germination of Seeds

When seeds get enough water, air and sunlight (warmth), they grow into new plants. **The growth of baby plant (embryo) within a seed to form seedling (young plant) is called germination.** Air helps the germinating seed to breathe. Water softens the seed coat, making it easy for the plantlet to come out. Sunlight provides the warmth for the activity of the cells during germination.



Germination of seed

In the beginning of germination, the seedling gets its food from the cotyledons. Pores in the soil allow air to reach the seed. The roots come out first and grow downwards into the soil. Later, the shoot comes out and grows upwards towards sunlight. After using up the food stored in cotyledons, seedling gets water and nutrients from the soil. Newly formed leaves prepare the food for the growing plant.

The seed gets water, air, and warmth. → Seed coat breaks and the baby plant grows. → Roots and shoot develop in baby plant and form seedling or young plant. → Plant grows and leaves develop in it. Cotyledons shrink and disappear.

Stages of germination in a seed

DISPERSAL OF SEEDS

The scattering of seeds away from the mother plant is called dispersal of seeds. Dispersal of seeds is necessary for the better growth of plants because if all the seeds fall at one place they would not get sufficient nutrients, water, sunlight and space to grow.

We know that plants are fixed to soil and cannot move on their own. Therefore, nature has provided some methods by which the seeds of plants get scattered to large distances. Seeds are dispersed by **wind**, **water** and **animals** including human beings. These are called **agents of dispersal**. Some seeds also get dispersed by explosion of fruits.

1. Dispersal by Wind

Some plants have very small and light seeds. These seeds also have **wings** or **hair**. When wind blows, they are easily carried away from the parent plants. ***Madar***, **hiptage** and **cotton** seeds are dispersed by wind.

cotton seed
(with hair all around it)

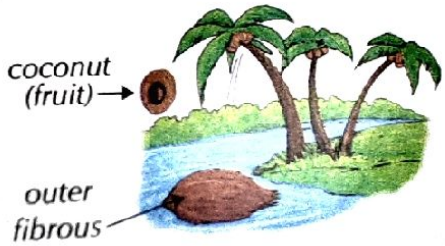
madar seeds
(with a tuft of hair)

hiptage seeds
(winged seeds)

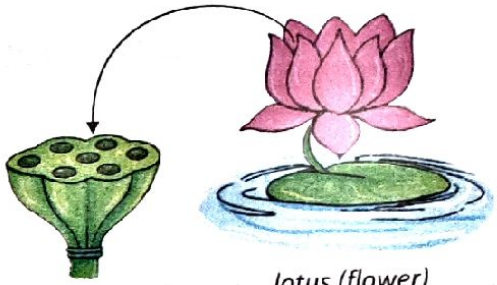
Seeds dispersed by wind

2. Dispersal by Water

The **lotus** fruit has a spongy part and the **coconut** has thick fibrous coat, which enable them to float on water. So, when a coconut falls from a tree into water, it floats and travels with the water waves to far-off places.



coconut



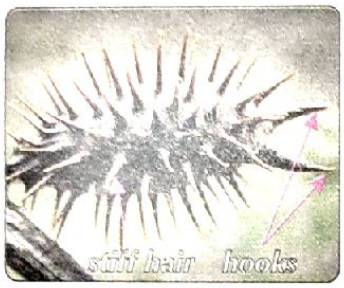
Dispersal of seeds by water

3. Dispersal by Animals

Animals and human beings eat fruits like apple, mango and watermelon and throw away their seeds. These seeds on getting favourable conditions grow into new plants. Seeds of some plants like **burdock**, ***Xanthium* (or cocklebur)**, **tiger-nail** and **spear grass** have hooks or spines. They get attached to the body of animals or clothes of human beings and are carried to other places. These seeds also grow into new plants.

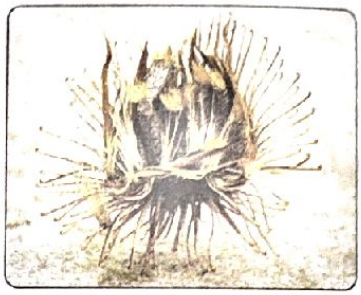
Know More

- Squirrels bury nuts to eat during winter and they often forget. These nuts may grow into new plants.
- When birds and animals eat fruits or seeds, some of the undigested seeds pass out intact in their excreta. Thus, seeds are dispersed to other places.



Xanthium seed

tiger-nail seeds

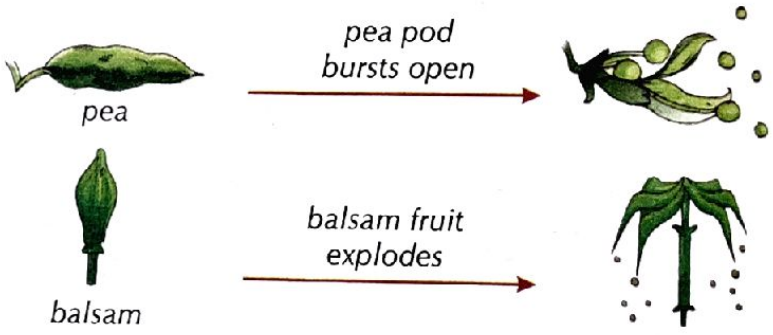


burdock seed

Seeds dispersed by animals

4. Dispersal by Explosion

Some fruits burst open or explode when they become dry. The force of explosion helps the seeds to scatter away. This is called dispersal by explosion. **Poppy**, **pea** and **balsam** seeds get dispersed by explosion.



Seeds dispersed by explosion of fruits

Multiple Choice Questions (MCQs)

Tick (✓) the correct answers:

1. A baby plant is called _____.
   (a) cotyledon ◯ (b) embryo ◯ (c) shoot ◯
2. Which of the following seeds is dispersed by wind?
   (a) cotton ◯ (b) coconut ◯ (c) bean ◯
3. Which of the following is not an agent of dispersal of seeds?
   (a) water ◯ (b) wind ◯ (c) soil ◯

GROWING NEW PLANTS FROM OTHER PARTS OF THE PLANT

New plants can also be grown from their vegetative parts like roots, stems and leaves. This method of growing plants from their vegetative parts is called **vegetative propagation**.

1. New Plants from Roots : Roots of some plants, such as **carrot, dahlia, beetroot, radish, turnip** and **sweet potato**, can produce new plants. Let us perform the following activity to see how does a new plant grow from a root.

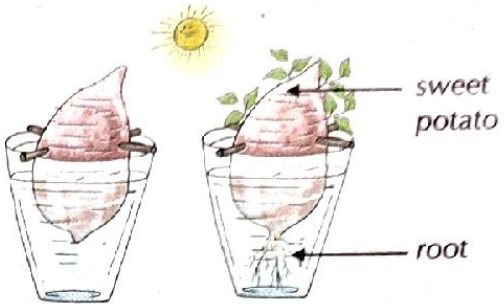
Activity

*(Use **Cordova Smart Class Software** on the **smart board** in class to perform this activity.)*

Aim : To grow a new plant from the root of sweet potato

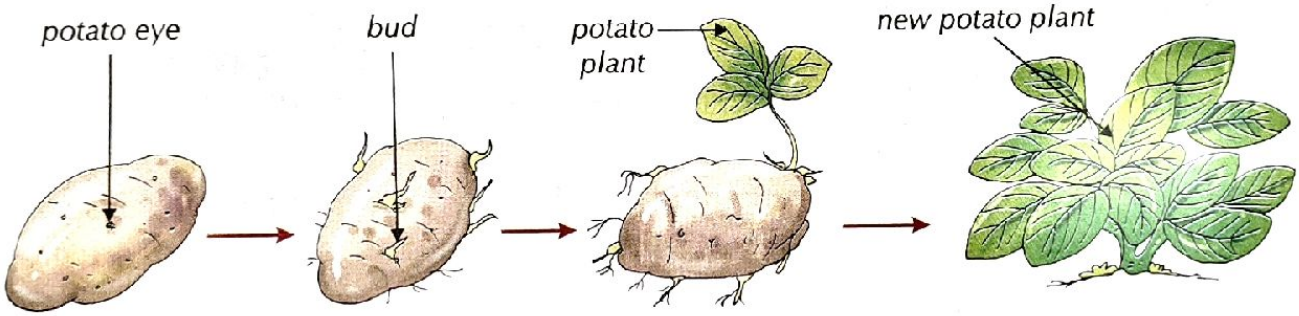
Method : Take a sweet potato and place it in a glass filled three-fourths of water with the help of some tooth -picks as shown in the figure given alongside. Keep this glass in an open space, so that it can get fresh air and sunlight. After a few days, a new plant grows out of it.

Conclusion : Some roots can grow into new plants.



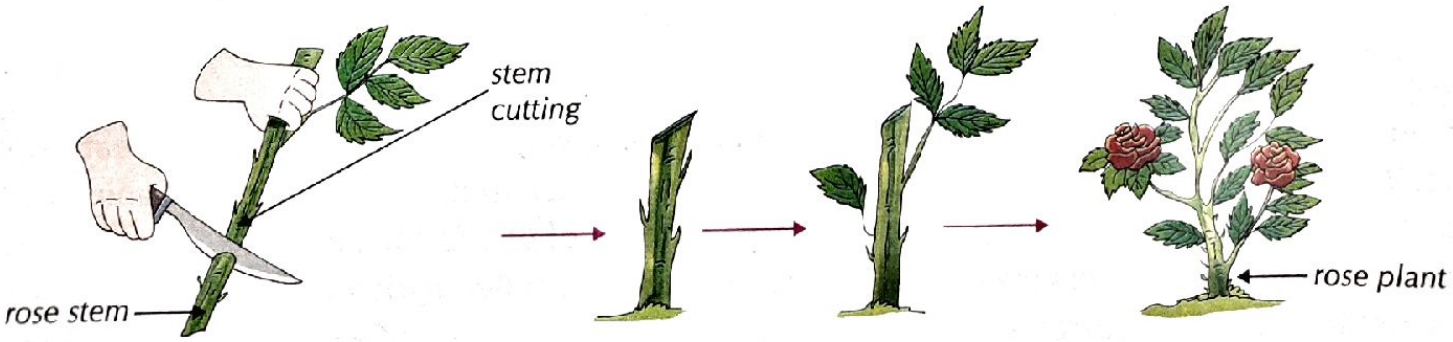
New plant grows from root.

2. New Plants from Underground Stems : Underground stems, like **onion, ginger** and **potato**, can grow into new plants. Potato and ginger have buds on their surface. Each bud grows into a new plant under suitable conditions. The buds of potato are called **eyes**. Any piece of a potato with an eye can grow into a new plant.



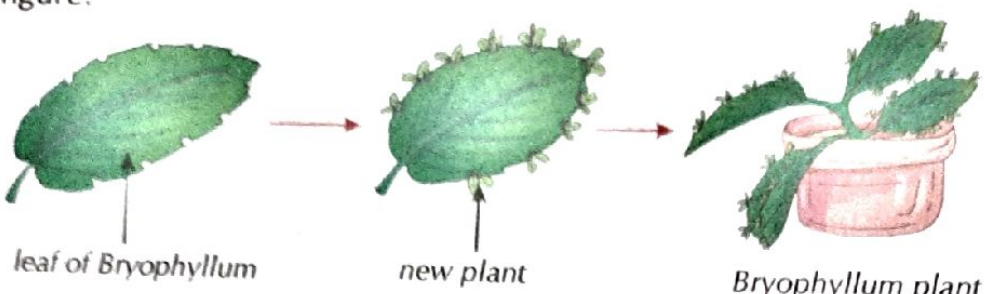
New plant grows from underground stem.

3. New Plants from Stem : In some plants, like **rose, *Hibiscus*, cotton, money plant** and **sugar cane**, new plants grow from small pieces of stem of the parent plant. These pieces are called **stem cuttings** and they have one or two buds on them. If you plant a stem cutting into the soil, after a few days, it grows into a new plant as shown in the figure given below:



New plant grows from stem cutting.

4. New Plants from Leaves : Plants like ***Bryophyllum*** have buds on the edges (margins) of their leaves. When such leaves are kept in moist soil, these buds produce new plants as shown in the figure:



leaf of *Bryophyllum* — *new plant* — *Bryophyllum plant*

New plant grows from leaf.

DO You Know?

Strawberry plants have long stem that run along the ground. These are called runners. New plant grows from these runners.

Runner

Multiple Choice Questions (MCQs)

Tick (✓) the correct answers:

1. We can grow a new plant from carrot. It is an example of growing a plant from its
   (a) leaf. ◯ (b) stem. ◯ (c) root. ◯
2. Which of the following plants grows from stem cutting?
   (a) rose ◯ (b) *Bryophyllum* ◯ (c) sweet potato ◯
3. In the *Bryophyllum* plant, buds are present in the _____.
   (a) leaves ◯ (b) stem ◯ (c) roots ◯

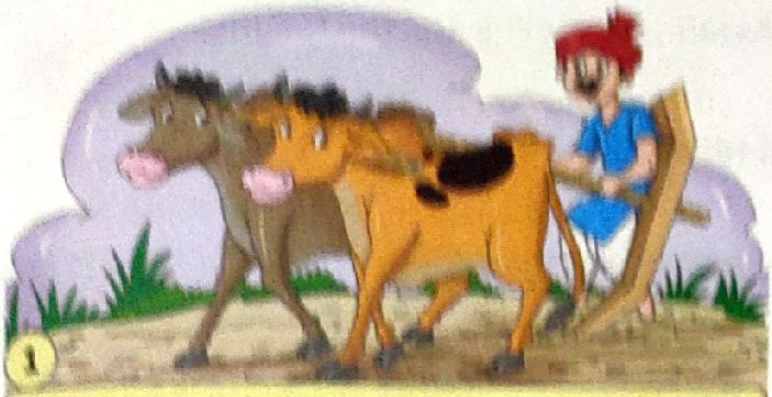
New Plants from Spores

Some plants such as ferns and mosses do not have flowers. They do not produce seeds. They produce tiny **spores** and each spore can grow into a new plant. In ferns, spores are present in special structures called **sori** on their leaves.

Fern plant — Leaf showing sori — Germinating spore

AGRICULTURE

In our daily life, we eat different types of food including vegetables, fruits, pulses, meat, eggs, etc. We also wear different types of clothes. We get all these things from plants and animals. To get these things, in sufficient quantities, a large number of plants and animals are needed. **The mass production of plants for food and other purposes is called agriculture.** Here, we are only discussing the agricultural activities related to plants. Various stages of agriculture are as follows:



1 **Ploughing :** It helps to loosen the soil.

2 **Manuring :** Manure is added to provide nutrients to the soil.

3 **Sowing seeds :** Healthy seeds are sown in soil. Plants grow from seeds.

4 **Irrigation :** It supplies sufficient water to plants for growth.

5 **Spraying pesticides :** It kills the pests and protects the crops.

6 **Harvesting :** When the crop is ready, it is cut and gathered.

Plants of the same kind grown on a large scale, at a particular place, during a particular tim are called a crop. For example, crop of wheat means all plants grown in the field are of wheat.

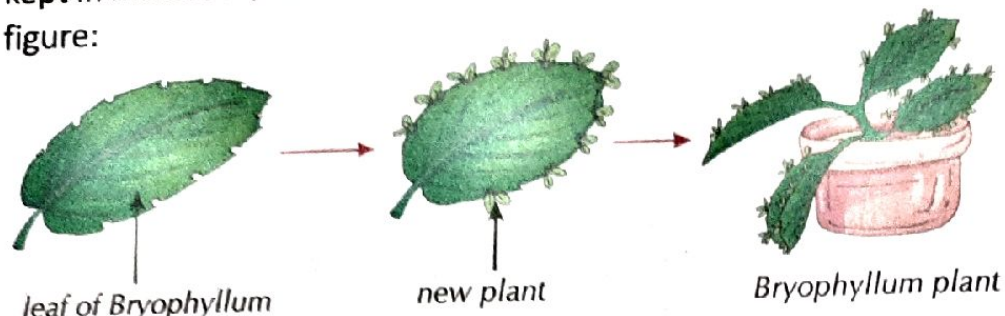
The soil of a particular place and season affect the growth and development of crops. Let us see how.

1. Soil

Soil is an important factor for the growth of plants. A crop grows well in one kind of soil bu poorly in another. For example:

- **Rice** and **jute** grow better in **loamy** and **clayey** soils which can hold plenty of water.
- **Wheat** need **alluvial** soil rich in humus.
- Cotton plants grow best in the **black soil.**
- *Jowar* and *bajra* are grown in **sandy** soil found in Rajasthan.

4. New Plants from Leaves : Plants like ***Bryophyllum*** have buds on the edges (margins) of their leaves. When such leaves are kept in moist soil, these buds produce new plants as shown in the figure:



leaf of Bryophyllum *new plant* *Bryophyllum plant*

New plant grows from leaf.

DO You Know?

Strawberry plants have long stem that run along the ground. These are called runners. New plant grows from these runners.

Runner

Multiple Choice Questions (MCQs)

Tick (✓) the correct answers:

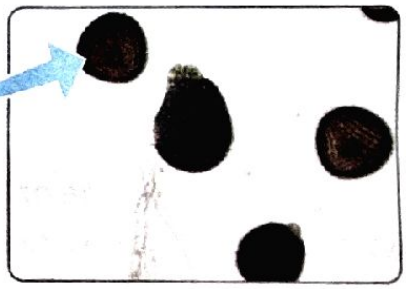
1. We can grow a new plant from carrot. It is an example of growing a plant from its
   (a) leaf. ◯ (b) stem. ◯ (c) root. ◯
2. Which of the following plants grows from stem cutting?
   (a) rose ◯ (b) *Bryophyllum* ◯ (c) sweet potato ◯
3. In the *Bryophyllum* plant, buds are present in the _____.
   (a) leaves ◯ (b) stem ◯ (c) roots ◯

New Plants from Spores

Some plants such as ferns and mosses do not have flowers. They do not produce seeds. They produce tiny **spores** and each spore can grow into a new plant. In ferns, spores are present in special structures called **sori** on their leaves.

Fern plant

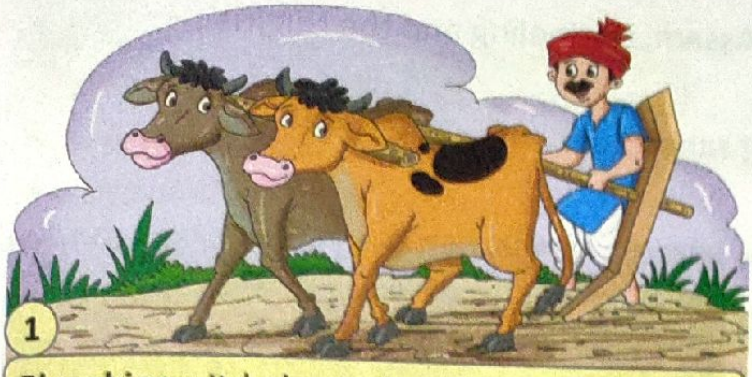
Leaf showing sori



Germinating spore

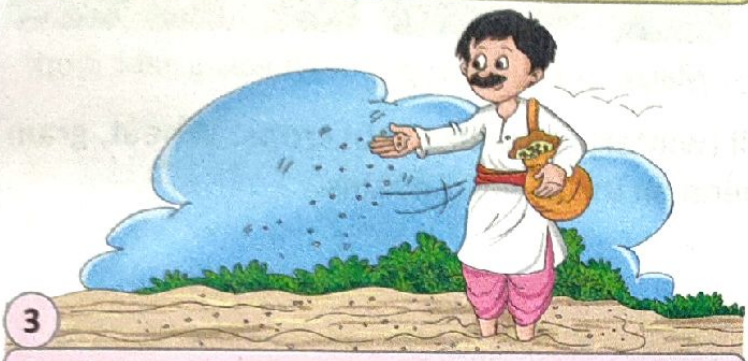
AGRICULTURE

In our daily life, we eat different types of food including vegetables, fruits, pulses, meat, eggs, etc. We also wear different types of clothes. We get all these things from plants and animals. To get these things, in sufficient quantities, a large number of plants and animals are needed. **The mass production of plants for food and other purposes is called agriculture.** Here, we are only discussing the agricultural activities related to plants. Various stages of agriculture are as follows:



1 **Ploughing :** It helps to loosen the soil.

2 **Manuring :** Manure is added to provide nutrients to the soil.



3 **Sowing seeds :** Healthy seeds are sown in soil. Plants grow from seeds.

4 **Irrigation :** It supplies sufficient water to plants for growth.

5 **Spraying pesticides :** It kills the pests and protects the crops.

6 **Harvesting :** When the crop is ready, it is cut and gathered.

Plants of the same kind grown on a large scale, at a particular place, during a particular time are called a crop. For example, crop of wheat means all plants grown in the field are of wheat.

The soil of a particular place and season affect the growth and development of crops. Let us see how.

1. Soil

Soil is an important factor for the growth of plants. A crop grows well in one kind of soil but poorly in another. For example:

- **Rice** and **jute** grow better in **loamy** and **clayey** soils which can hold plenty of water.
- **Wheat** need **alluvial** soil rich in humus.
- Cotton plants grow best in the **black soil.**
- *Jowar* and *bajra* are grown in **sandy** soil found in Rajasthan.

- **Tea plants** need **moist soil** of hilly regions like Assam, Darjeeling and the Nilgiris.
- Maize plant needs **alluvial soil** to grow.
- **Coconut** trees grow well in **coastal area** having **sandy soil.**

2. Seasons

A particular crop may grow well in one season and may not grow that well in another season. So, different crops are grown in different seasons.

- **Crops that are grown from June to October (summer) are called kharif crops. Rice, maize** and **cotton** are kharif crops. These crops depend on the monsoon rains.

Maize, a kharif crop

Wheat, a rabi crop

- **Crops that are grown from November to April (winter) are called rabi crops. Wheat, gram** and **pea** are rabi crops. These crops do not depend on the monsoon rains.

DO You Know?

Besides favourable climatic conditions, plants also require manure and fertilisers to improve the growth and increase the yield. Dead and decaying plants, animal wastes and cow dung are commonly used as manure. Urea, potash, nitrates and superphosphates are some common fertilisers.

Protection of Crops and Storage of Grains

Birds, squirrels, moles, pests like locusts, caterpillars and grasshoppers, damage the crops. Various plant diseases also affect the crops. So, crops need protection from them before and after harvesting.

Farmers spray various **pesticides** and **insecticides** to protect crops from insects and other harmful pests. They protect the crops from grazing animals by proper fencing. **Scarecrows** are kept in the crop fields to scare away birds. Grains and seeds should be stored properly after harvesting the crops to protect them from rats, insects and other animals.

Scarecrow in the field

KEY WORDS

Seedling	:	young plant coming out of baby plant (embryo) from a seed
Seed coat	:	outer covering of a seed that protects the baby plant
Crops	:	plants of the same kind grown on a large scale at a particular place and time
Insecticides	:	chemicals used to destroy harmful insects of plants
Seed dispersal	:	scattering away of seeds from the parent plant
Agriculture	:	the mass production of plants for food and other purposes
Germination	:	the growth of a baby plant within a seed to form seedling

Points to Remember

- Plants are very useful for us in many ways.
- New plants are grown from seeds.
- A seed has seed coat, seed leaves or cotyledons and a small baby plant inside it.
- Air, water and warmth are necessary for germination of seeds.
- Seeds have to get scattered or dispersed to ensure that they do not grow too close to one another.
- Seeds are dispersed by wind, water, animals and by the explosion of fruits.
- A new plant can also grow from stems, roots, leaves and spores. This is called vegetative propagation.
- The growth and development of plants depend on type of soil, climate and season.
- Crops that are grown in winter season are called rabi crops while the crops that are grown in summer season are called kharif crops.
- Crops need to be protected from grazing animals, birds, insects, rats, etc., before and after harvesting.

Exercises

*(Use **Cordova Smart Class Software** on the **smart board** in class to do these exercises.)*

SECTION - A

Class Response

A **Oral Questions:**

1. Name the different parts of a plant from which a new plant may grow.
2. How does water disperse the seeds?
3. Why do we spray insecticides on crops?

B **Science Quiz:**

1. Name two plants that grow from their underground stems.
2. Name the crops that are grown in winter season.
3. Which part of a seed contains food for the baby plant?

Worksheet

A **Multiple Choice Questions (MCQs):**

1. *Xanthium* seeds are mainly dispersed by _____.

   (a) air ○ (b) animals ○ (c) water ○

2. Which of the following is a rabi crop?
   (a) wheat ◯ (b) rice ◯ (c) maize ◯

3. Which of the following plant grows from spores?
   (a) fern ◯ (b) rose ◯ (c) *Bryophyllum* ◯

4. Which of the following helps to loosen soil?
   (a) manuring ◯ (b) ploughing ◯ (c) harvesting ◯

B Fill in the blanks:

1. _____ are called our green friends. (Plants/Seeds)
2. _____ store food for the baby plant. (Stems/Cotyledons)
3. Dispersal of balsam seeds takes place by _____. (water/explosion)
4. _____ helps to add nutrients in the soil. (Irrigation/Manuring)

C Match the following:

Column A	Column B
1. kharif crop	(a) seedling
2. rabi crop	(b) coconut
3. seed dispersed by explosion	(c) rice
4. baby plant	(d) pea
5. seed dispersed by water	(e) wheat

D Identify the seeds and write their names in the spaces provided:



1. _____ 2. _____ 3. _____

SECTION - B

A Multiple Choice Questions (MCQs) Scientific/Practical skills:

1. If we want to grow a new *Bryophyllum* plant, we need to search its buds on the
   (a) roots. ◯ (b) stem. ◯ (c) leaves. ◯

2. In fern, a _____ can grow into a new plant.
   (a) spore ◯ (b) leaf ◯ (c) root ◯

B Very Short Answer Questions:

1. Name the parts of a seed.
2. Name two seeds which are dispersed by animals.
3. Name two seeds that have spines.