



# Reproduction in Plants

## Prior Knowledge

*In the previous classes, I have learnt that*

- Living organisms produce their own kind by reproduction.
- Each part of a plant has a specific function to help it survive.
- All plants do not have flowers and not all flowers become fruits.
- Seeds germinate to give rise to new plants.

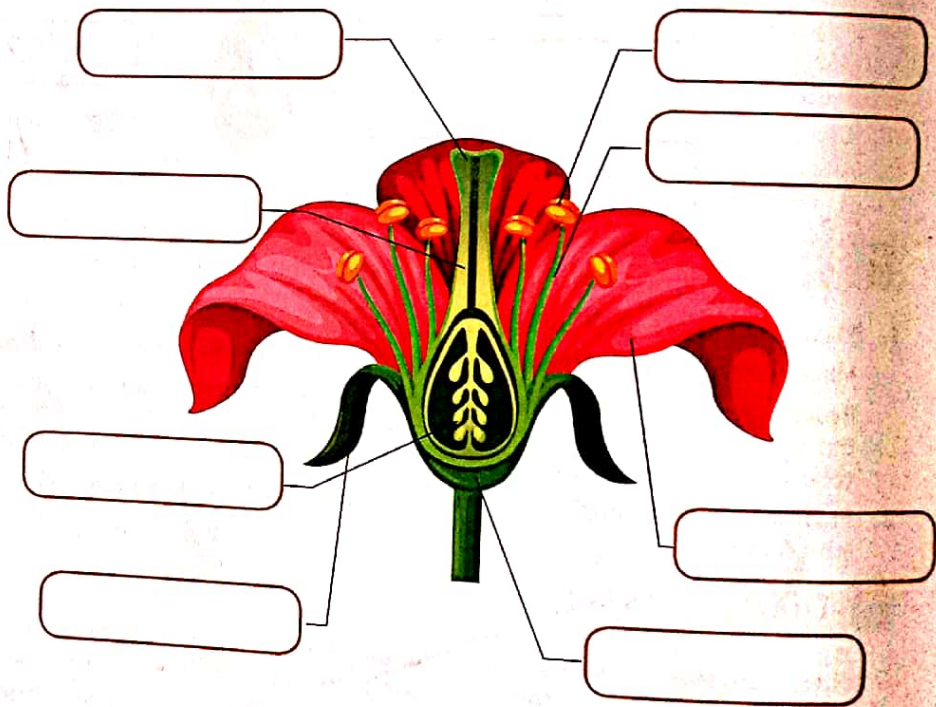
## Learning Objectives

*In this chapter, I will learn about:*

- Various methods of asexual reproduction
- Vegetative propagation in plants
- Sexual reproduction in plants
- Pollination
- Importance of seed dispersal

## Let's Get Going

Label the diagram given below.



Answer these questions.

1. Which parts of the flower make up the pistil?  
\_\_\_\_\_
2. How many stamens does this flower have?  
\_\_\_\_\_

*The process by which organisms produce young ones of their own kind is called reproduction. This helps in continuation of life and in increasing the population of a given species. Let us learn more about reproduction, especially in plants.*



## ASEXUAL REPRODUCTION

Living organisms reproduce in two modes—asexual reproduction and sexual reproduction.

*The kind of reproduction in which only a single parent is involved is called asexual reproduction.*

The offspring are exact copies of the parent. Different forms of asexual reproduction are seen in microorganisms and plants. Examples are budding, fragmentation, spore formation and vegetative propagation.

### Budding

This method of asexual reproduction is seen in microorganisms such as yeast and bacteria.

A small bulb-like projection called a **bud** is produced on the surface of the parent organism. This bud grows until it detaches

(separates) from the parent to live as a new organism (Fig. 11.1). The detached bud then grows into a new individual that is identical to the parent organism.

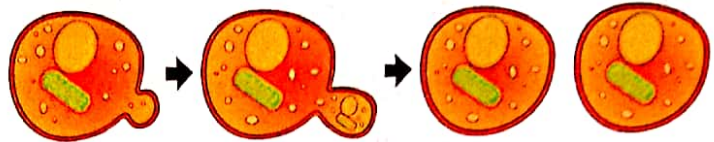


Fig. 11.1 Budding in yeast

### Let's Try



**Aim:** To observe budding in yeast

**Materials required:** Baker's yeast, warm water, sugar and microscope

**Procedure:**

1. Dissolve two spoons of sugar in warm water.
2. Add a pinch of baker's yeast to it and shake the mixture.
3. Leave the mixture undisturbed in a warm room for a day.
4. Then take a drop of this solution on a slide and observe it under a microscope.

**Observation:** Yeast cells with buds forming on them can be seen under a microscope.

### Fragmentation

Fragmentation is commonly seen in algae such as *Spirogyra* and *Oscillatoria*. The filament-like body breaks into smaller fragments and each fragment then develops into a new organism (Fig. 11.2 and Fig. 11.3).

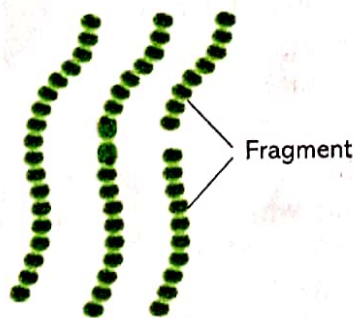


Fig. 11.2 Fragmentation in *Oscillatoria*

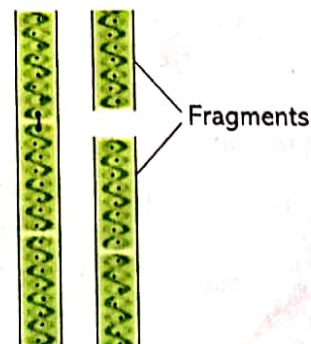


Fig. 11.3 Fragmentation in *Spirogyra*



## Spore Formation

This mode of reproduction is observed in fungi such as moulds and mushrooms and in some non-flowering plants such as ferns and mosses. **Spores** are tiny, spherical, single-celled structures that grow into new individuals. They have a hard, protective coat for protection and remain dormant when conditions are unfavourable. In plants, spores are produced in specialised structures called **sporangia** (singular: sporangium) as shown in Figure 11.4. Spores germinate when conditions are favourable and form new plants.



Fig. 11.4 Sporangia of moss

## Vegetative Propagation in Plants

A type of asexual reproduction in plants where the new plants grow from the vegetative parts of the plant such as the root, stem and leaf is called **vegetative reproduction**. The new individual possesses exactly the same characteristics of the parent plant. Vegetative reproduction in plants can take place naturally or can also be carried out by artificial means.

### Vegetative propagation by natural methods

Roots, stems and leaves of some plants develop vegetative buds. These vegetative buds grow into new plants when separated from the parent plant.

#### Propagation from roots

The roots of some plants such as sweet potato and carrot are swollen due to the food stored in them. These roots are called **tuberous roots**. These roots have small buds on them that develop into new plants when buried in the soil (Fig. 11.5).

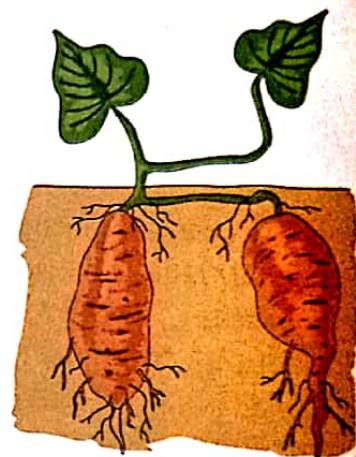


Fig. 11.5 Vegetative reproduction in sweet potato

#### Propagation from stems

New plants can grow either from underground stem or from horizontal aerial stems.

##### From underground stems

Some plants have underground stems that are swollen to store food. These underground stems have buds that can grow into new plants. Some examples of reproduction through underground stems are given below.

**Tubers:** Take a potato and observe it closely. Do you see small depressions on it? These are called eyes. These eyes have buds that can grow into new plants (Fig. 11.6). When a piece of potato with an eye is cut and planted in the soil, it grows into a new plant.

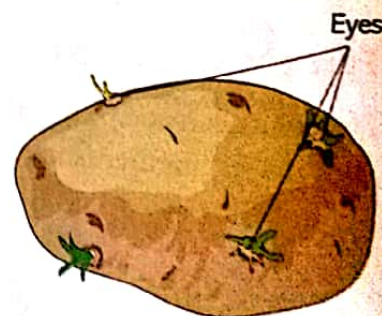


Fig. 11.6 A potato tuber

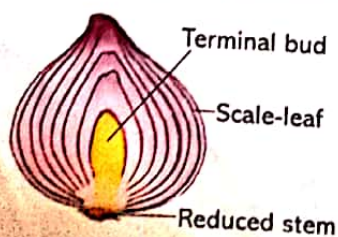


Fig. 11.7 An onion bulb

**Bulbs:** In an onion bulb, the stem bears a terminal bud, which grows into a new plant (Fig. 11.7). Fleshy scale leaves that store food surround the bud. Other plants that reproduce from bulbs are garlic, lily and tulip.

### Let's Investigate

Some underground stems look very much like roots. How can you tell the difference? Find out.



**Corms:** Corms are underground swollen stems. Corms have buds in the axils of their scaly leaves. These buds grow into new plants. Some plants that reproduce from corms are colocasia (Fig. 11.8), yam and crocus.



Fig. 11.9 A ginger rhizome

**Rhizomes:** Rhizomes are underground stems that grow horizontally under the ground. New plants grow from the nodes with the shoot growing upwards. Some plants that reproduce from rhizomes are water lily, turmeric and ginger (Fig. 11.9).



Fig. 11.8 Colocasia

### Let's Try

**Aim:** To observe the growth of a new plant by vegetative reproduction in potato

**Materials required:** Two pots with soil (labelled A and B), a potato and water

**Procedure:**

1. Cut two small portions from the potato along with the eyes.
2. Bury them in pot A and water them regularly.
3. Cut another piece of the potato without the eye and bury it in pot B.
4. Water both pots regularly and observe them for a week.

**Observations and conclusions:** New shoots appear in pot A but not in pot B. This is because the eyes are vegetative buds that can sprout into new shoots.

### From horizontal stems

Some examples of vegetative reproduction from horizontal stems are given below.

**Runners:** A runner is a slender branch that creeps some distance away from the mother plant on the ground. Roots grow at the nodes of a runner which grows into a new plant. Some plants that reproduce through runners are woodsorrel (*Oxalis*) and grass (Fig. 11.10).

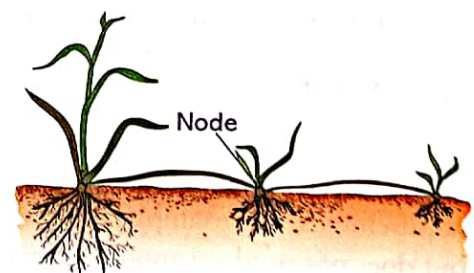


Fig. 11.10 Grass

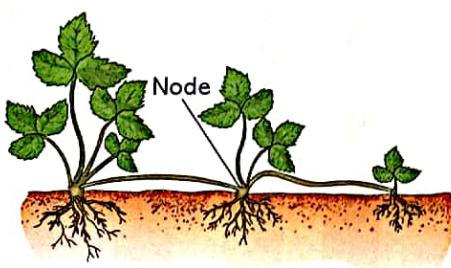


Fig. 11.11 Wild strawberry

**Stolons:** A stolon is a slender lateral branch that initially grows upwards from the base of the main stem, then droops to touch the ground and grows roots at the node. Buds that are produced at this node grow into new plants. Some plants that reproduce through stolons are jasmine and wild strawberry (Fig. 11.11).