

About the Lesson

- Reproduction by seeds
- Vegetative reproduction



2 Reproduction in Plants

Reproduction means — to produce a young one of the same kind. All the living beings produce babies to extend their family line. Plants too reproduce just like animals. All the living beings reproduce in their own ways. Reproduction in plants is of two kinds :

1. Reproduction by seeds
2. Vegetative Reproduction

1. Reproduction by Seeds

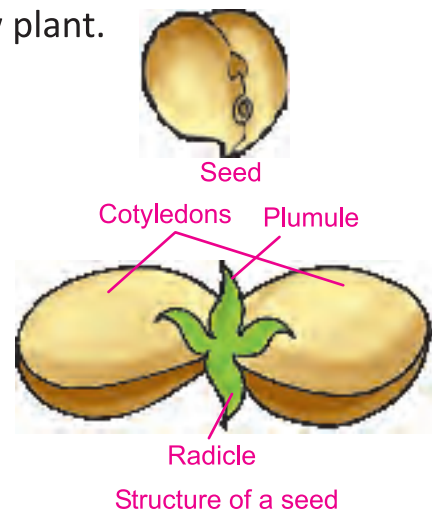
Most of the plants reproduce by seeds only. Except non-flowering plants, all the plants produce seeds. Seed is that part of the plant which contains a new plant in the form of an embryo. The seed sprouts to give birth to a new plant.

Structure of seed : To understand the structure of a seed, take a gram and soak it overnight. You will see a small hole in it. The seed absorbs water through this hole only. Now, remove the outer covering or the **seed coat** carefully. You will see two light yellow coloured structures inside. These are the **cotyledons**.

Now, open up these cotyledons. After opening both the cotyledons, you see one more structure. This is an **embryo**. Its pointed white part is **radicle** which forms the roots of the future plant. The upper yellow part of the embryo is the **plumule**. This forms the stem part of the plant.

When the seed sprouts, the young plant gets its food from the seed only.

Germination of seeds : Every seed has a small plant inside it which gets its food from the seed only. The seed coat protects the plant. When the seed comes in contact with humidity, the seed coat becomes soft. First, the radicle of the plant comes out and grows downwards. After this, to receive sunlight, the plumule grows upwards. Then come the green leaves. This small baby plant is called **sapling**. This young plant grows to become a proper plant.



Structure of a seed



Strange But True

- * Seeds such as gram and pea have two cotyledons whereas wheat and corn have only one cotyledon each.



Germination of seed

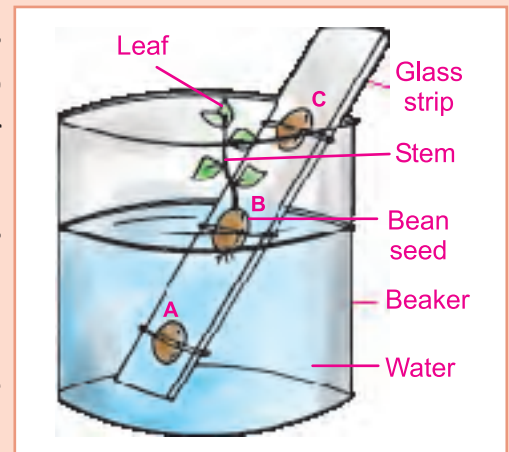
Required conditions for germination : Three things are of utmost importance for germination of the seeds – air, water and correct temperature. If any one of the thing is lacking, the seed will not germinate. Let us conduct an experiment.

Experiment

Take three bean seeds A, B and C. Tie them on a glass strip at equal distance. Take a glass beaker and fill it up to half with water. Now put the glass strip in the beaker in such a way that seed A is completely submerged, seed B is half in water and half in air while seed C is completely in the air. Let the beaker remain in the sun for some days. Observe it after 5-6 days.

You will observe that seed B has germinated while seeds A and C have not.

The reason for this is that seed A received only water but no air and proper temperature. Seed C got air and temperature but no water. Seed B got water, air and proper temperature. Hence, it germinated.



Do all the seeds germinate? : A plant produces many seeds but not every seed is germinated. Some are eaten by animals, some are destroyed by air and water. Some are undeveloped and cannot give birth to a plant. Many seeds do not get necessary conditions for germination. Only those healthy seeds which get favourable conditions in correct measures get germinate and grow into new plants.

Dispersal of Seeds

The scattering of seeds over a large area is called **dispersal**. We know that plants do not move, so they cannot disperse their seeds themselves. Most of the seeds are dispersed by natural means or agents.

Seeds are dispersed by the following agents :

- **By air :** Some seeds are very small, light, and have soft hair or wings. These are dispersed by air. Cotton, dandelion and madar are some such seeds. Such seeds have

light hair and are blown away by the air from one place to another. When the seeds fly in the air, their hair act as a parachute.

- **By water :** The seeds of plants, growing in or near water, are dispersed by water. The outer covering of such seeds is spongy and fibrous, which helps them to swim. Coconut and lotus are prime examples.

Coconut flows away in water for a long distance. When its outer cover is removed by water, the seeds come out.

The lotus fruit is spongy which flows for a long distance. The outer cover is removed by water and the seeds come out.

- **By animals :** Man, animals and birds eat the fruits and spread the seeds far and wide.

The seeds of some vegetables and fruits are very small. Animals eat such seeds but cannot digest them. These seeds come out with excreta. These get germinated on getting the proper conditions.

Some seeds have hard hair or hooks on them. These stick to the hair and wings of animals or birds and clothes of humans and are dispersed all over. Seeds of Xanthium, gokhru and urena are dispersed in this manner.

- **By explosion :** Fruits such as peas and lady's finger burst when ripe and their seeds are spread around. When these fruits ripen, their upper covering becomes hard and stiff. It bursts with the increase in pressure. The seeds are dispersed all around. The scattering of seeds in such a manner is called explosion.



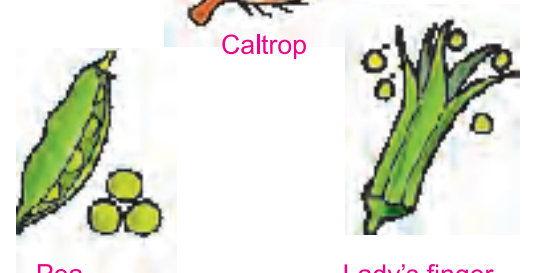
Dandelion Cotton Madar



Lotus Coconut



Xanthium Tiger nail



Pea Lady's finger

2. Vegetative Reproduction

The reproduction which takes place from any part of a plant other than seed is called vegetative reproduction. Many plants reproduce in this manner. Such reproduction is of many types. Some such methods are :

- **Stem cutting :** Sugar cane, grapes and rose are some plants which are reproduced by their **stem cuttings**. The stem cutting has small buds on them. The cutting is sown in

watered soil in such a way that the bud part stays above the ground. After some time, new branches come out of these buds and turn into new plants.



Stem cutting of Rose

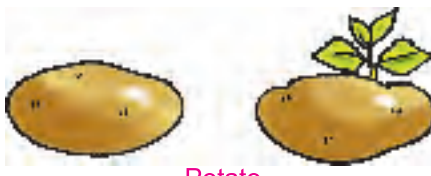


Stem cutting of sugar cane

● **By stems** : The stems of some plants are underground. These stems have buds or eyes on them. When these stems are sown under the soil, new plants come out of the eyes. Potato and ginger are two such plants.



Ginger



Potato

Strange But True

* The sweet potato which we eat is not a fruit but it is stem.



● **By roots** : Plants like sweet potato and banana are reproduced by their roots. The roots become swollen by storing food. The new plant is born of this root only.

● **By buds** : Plants like onion and lily are reproduced from their buds. These plants have ball like underground stems called bulbs. These bulbs have buds which give rise to new plants.



Onion



Lily



Chrysanthemum

Strange But True

* The leaves of plants like Victoria amazonica can grow up to 1.5 metres. These leaves are so strong that a child can stand on it.

● **By leaves** : The leaves of begonia and bryophyllum are very thick and spongy. On the edges of these leaves are buds which give rise to new plants.

● **By spores** : Plants like ferns, moss and mushroom do not have flowers. In the lower part of their leaves, bag like sporangia are located. These bags ripen up and burst and spores spread around. These give rise to new plants.



Bryophyllum



Fern



Mushroom



Moss



Looking Back.....

- ❖ Reproduction in plants takes place through seeds and the body parts.
- ❖ Leaving aside the non-flowering plants, most of the plants reproduce by seeds only.
- ❖ The outer covering of the seed is called the seed coat and the part inside is called a cotyledon.
- ❖ The embryo lies between the cotyledons. The white pointed part is the radicle and the upper yellow part is the plumule.
- ❖ For a seed to germinate, it needs air, water and correct temperature.
- ❖ The scattering of seeds far and wide is called dispersal.
- ❖ Most of the seeds are dispersed by natural mediums or agents such as air, water, animals and bursting.
- ❖ The reproduction which happens by any body part is called vegetative reproduction.



Exercise



A. Tick (✓) on the correct option : (MCQs)

1. How many kinds of reproduction do plants have ?
 (a) One (b) Two (c) Many
2. What is the outer covering of the seed called ?
 (a) Seed coat (b) Cotyledon (c) Radicle
3. For germination of seeds, how many things are required ?
 (a) One (b) Three (c) Five
4. Which part of a sweet potato do we eat ?
 (a) Root (b) Fruit (c) Stem

B. Answer the following questions :

1. What do you mean by reproduction ? How does reproduction occur in plants ?
2. Explain the structure of a bean seed. Also draw its diagram.
3. What all things are required for the germination of seeds ? Explain with an experiment.
4. Why don't all the seeds get germinated ?
5. What are the different agents of dispersal of seeds ? Explain in brief.
6. What is vegetative reproduction ? Explain the process of stem cutting.
7. How is reproduction carried out by spores ?

C. Fill in the blanks :

1. _____ protects the seed.
2. Only some healthy seeds germinate on getting _____ conditions.
3. The pieces of stems are called _____.
4. Some plants have _____ inside _____.
5. The new plants of potato are born of _____.

D. Write Yes or No :

1. Does the embryo inside the cotyledons develop into a new plant ? _____
2. Do cotton seeds are light, hairy and have wings ? _____
3. Is the dispersal of seeds of some plants also possible by animals ? _____
4. Do plants of sweet potato grow from buds ? _____
5. Do the flowers bloom on mushrooms too ? _____

E. Match the following :

- | | |
|---------------|-----------------------------|
| 1. Dandelion | Dispersed by bursting. |
| 2. Coconut | Reproduced by stem cutting. |
| 3. Peas | Reproduced from buds. |
| 4. Sugar cane | Dispersed by air. |

Creative Task

Do the following :

1. Take a bean seed. Wrap it in a wet cloth and keep it overnight. In the morning, take it out and observe its internal structure. Tell about your observation to your friends.
2. Take a potato and a ginger. Sow them in soil in two separate pots. Water the plants everyday. Observe the process of their reproduction.



Investigation :

For more information, log on to : en.wikipedia.org/wiki/plant-reproduction