

Reproduction In Living Things

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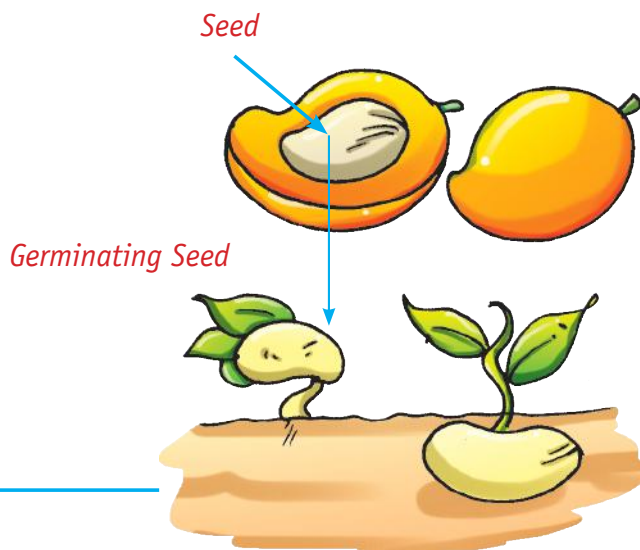
All living things reproduce. **Reproduction** is the process of producing young ones. It means producing again. Both plants and animals reproduce their kinds. Reproduction in plants and animals takes place through different processes. Reproduction in plants takes place through seeds.

PLANTS REPRODUCE THROUGH SEEDS

A plant produces so many seeds. All these seeds do not grow into new plants. Some seeds are not fully grown when separated from parent plants. Such immature seeds do not grow into plants. Other seeds are destroyed by wind or rain, or eaten by animals, insects and birds. Some seeds do not get enough water or air. All these seeds do not germinate.



Tree



Germination

The process of development of a seed into a seedling is called **germination**.

Do You Know ?

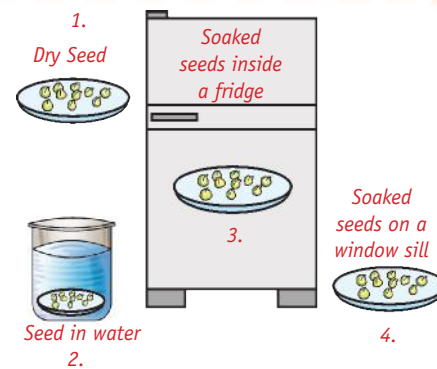
Cocodemer coconut is the biggest seed. It weights up to 20 kg.

Activity 1

Take four plates. Take some gram seeds. Put some dry seeds in **Plate 1**. Keep it on a window sill. Put some soaked seeds in **Plate 2**.

Soak them in water. Keep this plate also on the window sill. Put some soaked seeds in **Plate 3**.

Put it inside a refrigerator. Put some soaked seeds on a moist cotton in **Plate 4** and keep it also on the window sill. Keep the cotton moist all the time. Now, note the result after 2-3 days. This will be as following :







Seeds in **Plate 1** do not germinate due to absence of water. Seeds in **Plate 3** do not germinate as there is no warmth.

Seeds in **Plate 4** do not germinate as they do not get air. Seeds in **Plate 2** get air, water and warmth, so they germinate.

Seeds require air, water and warmth to germinate.

Seeds need air to breathe. They absorb water so that the food stored in them is

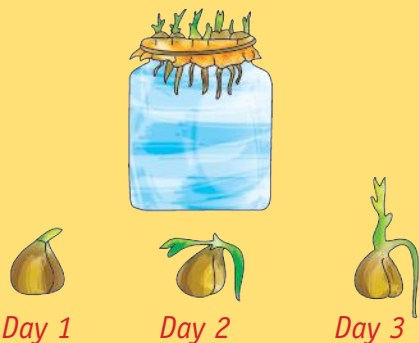
Plate No.	Conditions the seeds got	Conditions the seeds didn't get	Did the plant grow ?	Why ?
1.	 air warmth	water	No	Water is needed for germination
2.	 air water warmth		Yes	Availability of air, water and warmth.
3.	 air water		No	Warmth is needed
4.			No	Air is needed

available in soluble form. It also helps to break the seed-coat to let the baby plant come out. Warmth is needed for the cells of the seeds to become active.

Stages in Germination

Activity 2

Soak some gram seeds in water. Compare them with dry gram seeds. Notice that a soaked seed is swollen because it has absorbed water. Its seed-coat has become soft.



Now, put these soaked seeds on a piece of wet cloth tied over the mouth of a jar. Note the stages of germination after day 1, 2 and 3. On day 1 a tiny shoot will come out. On day 2, the root grows downward and the shoot grows upward towards sunlight. This is a seedling. On day 3, it becomes bigger and the seed-leaves shrink.

Stages in germination

DISPERSAL OF SEEDS

Plants cannot move. Their seeds are scattered by wind, water and animals. The process of scattering of seeds away from the mother plant is called **dispersal**. Wind, water and animals are the agents of dispersal.



Dispersal by wind

1. **Dispersal by Wind** : Seeds of cotton, madar and hiptage are light. They have hair or wings. They can be easily dispersed by wind.

Do You Know ?

The poppy plant has a capsule that works like a salt and pepper shaker. When wind shakes the capsule, the seeds fall out of its holes.

2. **Dispersal by Water** : The lotus fruit has a spongy part. Coconut has fibrous cover. Both can float in water. Thus, their seeds are dispersed by water.



Dispersal of seed by water



Dispersal of seed by Explosion

3. **Dispersal by Animals** : Some seeds with hooks or spikes stick to the hairy skin of animals and are dispersed. Birds swallow some seeds which come out unharmed in their droppings. Human beings and animals eat fruits and scatter their seeds.

WAYS OF PLANT REPRODUCTION

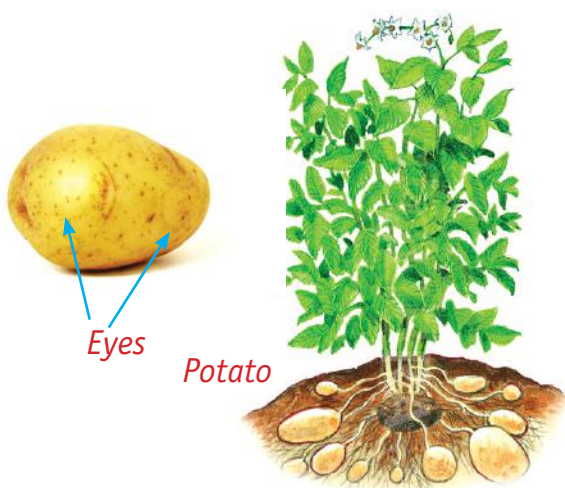
Flower help plants to reproduce. A fruit is formed from a flower. Fruits contain seeds. New plants grow from seeds. Seeds are dispersed by wind, water and animals.

Vegetative Propagation

The reproduction, multiplication or propagation of new plants with the help of any part of parent plant is called **vegetative propagation**. It is done through root, stem or leaf, and the vegetative parts of the plant.



Multiplying by using Stem



The roots of sweet potato are swollen due to food. On its body are several depressions each called an eye. From an eye a new potato plant is formed.

Potatoes, onions and ginger are underground stems. If you put an onion, a piece of potato or a piece of ginger in the soil, a new plant will come out from each of these pieces.

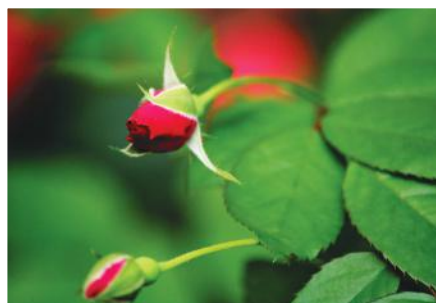
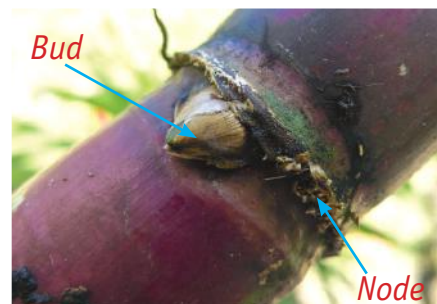
There are **buds** in these pieces that grow into new plants. Put these pieces in water and a new plant will grow from each of these. Put a baby plant into a pot or in a bed of soil and it will grow.

An onion is called a **bulb**. Bulb is a bud which is shaped like a bulb. Flowers of gladioli, lilies and tube-roses grow from bulbs.



Multiplying through Stem-cuttings

The sugar-cane has a bud at every node. There are dot-like structures around every node. These form the root. Buds form the stem part of the new plant. Sugar-cane cuttings having two nodes and one internode form a new plant.



By taking a cutting from a plant and putting it into soil, we get a new plant. Roses are multiplied through cuttings. Rose-cuttings are planted during the rainy season. The

cuttings grow into plants and reproduce flowers by November or December. Plants grown by cutting grow faster than plants grown by planting seeds.



Grafting

This method is used in improving the quality of the parent plant. The cutting from a good variety is put on the cut portion of the plant whose quality has to be improved. This cutting becomes a part of the plant in due course. Fruit plants are improved by grafting.

Test your Self

1. How do seeds disperse by wind ?

2. Name the flowers which grow from bulbs.

3. Explain layering and give an example.

Layering

Jasmine plant is grown by a method known as layering. A healthy branch from the parent plant is bent. The bent portion is partly buried in the soil. Roots develop at this position and a new plant is formed.



Multiplication by using Leaves

Each leaf of the Bryophyllum plant has several notches. Each notch has a bud which forms a new plant. Thus, one leaf multiplies into many plants. This is an example of vegetative propagation.

New plants growing from a leaf

Reproduction of Plants with Weak Stems

Small grass plants have very weak stems. They cannot stand up erect. Grass creeps along the ground. Side branches grow out of the creeping stem. They separate and grow into new plants. They are called runners as they seem to run on the ground. New plants are formed by cutting these runners. Thus, plants spread like a green carpet on the ground.



Grass runner



ANIMAL REPRODUCTION

Animals reproduce by laying eggs or giving birth to babies like them. Mammals give birth to babies. Birds lay eggs from which young ones take birth.

Mammals give Birth to Babies

Most mammals give birth to babies which soon become big and strong. Bitch gives birth to puppies. Cow gives birth to calves. Some animals give birth to one baby,

Some to two, some to four and some to six babies. Goat gives birth to two to four babies.

Do You Know ?

A whale looks like a fish but it is a mammal. It breathes with its lungs. A whale keeps coming up to the surface of water. It does so only to fill its lungs with air.



Cow



Calf



Bitch



Pup

Bitch gives birth to six to eight puppies. These babies are fed on their mother's milk.

Egg-laying Animals

Fish, frogs, snakes and birds do not give birth to babies. They lay eggs. Their young ones come out of the eggs. Thus, they reproduce by laying eggs.



Birds

Birds such as crows, eagles, sparrows, hens and peahens etc. lay eggs. Eggs have hard shells which protect the young ones inside them.

Ostrich, a large bird, also reproduces by laying eggs. Ostrich eggs are the biggest eggs.

Birds make nests to lay eggs. They sit on the eggs to keep them warm. This is called **incubation**. After a few days, the eggs hatch into young birds.

Snakes, Turtles, Frogs, Lizards and Crocodiles

These also reproduce by laying eggs. Their eggs are also protected by shells. Their eggs get warmth from the Sun. The shells of some eggs are hard. The shells of other eggs are tough and leathery. In the form of yolk, eggs store food for the young animals.

Do You Know?

Turtle Shells can be very strong. A turtle's shell can withstand a weight 200 times greater than its own weight.



Frogs lay eggs. Eggs hatch into **tadpoles**. Tadpoles grow into frogs. A tadpole looks more like a fish than a frog.

Butterfly, Housefly, Cockroach and Mosquito

All these insects lay eggs. The egg hatches into a wriggling creature called **larva**. The larva of a butterfly is called **caterpillar**. It looks very different from the parent insect. The larvae (plural of larva) are very active. They eat a lot and grow fat. Thus, a larva grows into a **pupa** (plural pupae). The pupa grows into an insect.



Egg

Caterpillar

Pupa

Butterfly

Life-Cycle of a Butterfly

Test your Self

1. Name any two mammals.

2. Name any two egg-laying animals.

3. Define incubation.

PARENTAL CARE

Unlike plants, animals take good care of their babies. They provide them shelter, food and protection from enemies. Mammals and birds give exemplary care to their young ones. But snakes, lizards, frogs and insects do not take care of their young ones.



Know the Keywords :

Seedling	: A baby plant coming out of a seed.
Germination	: Process by which a seed produces a seedling.
Cotyledons	: The leaves of the seed that contain food for the baby plant.
Seed-coat	: The thick outer covering of the seed which protects the baby plant.
Dispersal	: The process of scattering of seeds to different places.
Mammal	: An animal with hair, fed with mother's milk.

Point to Remember

- Plants are very important for us in various ways.
- Plants reproduce in different ways. Some plants reproduce by seeds, roots, stem, leaves and spores.
- Germination means development of a seed into a seedling.
- Some essential factors for germination are : air, water and suitable temperature.
- Seeds are dispersed by wind, water, explosion and human beings and animals.
- Animals reproduce by directly giving birth to the young ones or by laying eggs.
- Mammals give birth to young ones. The mother suckles her young ones.
- Some insects, like the butterfly and housefly, have four stages of development, viz, the egg, larva, pupa and adult.

EXERCISE TIME

A. Multiple choice questions (MCQs).

Tick (✓) the correct option :

1. Which of the following methods is not used for reproduction in plants?
a. Cutting b. Budding c. Layering
2. Which one of the following features differentiates plants from animals?
a. Growth b. Growth of damaged parts c. Need food
3. Which of the following animals does not reproduce by laying eggs?
a. Sparrow b. Ox c. Lizard

4. Which of the following animals gives birth to young ones?

a. Elephant

b. Birds

c. Ostrich

B. Tick (✓) the correct and cross (X) the incorrect ones :

1. Lizards give birth to babies.
2. Snakes take care of their young ones.
3. Butterflies lay eggs to produce babies.
4. New plants are grown from seeds.
5. Grafting creates better plants.

C. Fill in the blanks :

1. Eggs of frogs hatch into _____.
2. Birds lay eggs in _____.
3. Grass is a _____ plant.
4. Onion is a _____.
5. Jasmine plant is reproduced by _____.

D. Name two of the following :

1. Egg laying animals.
2. Animals giving birth to babies.
3. Plants reproduced from bulbs.
4. Plants multiplied by stem-cutting.
5. Plants reproduced through seeds.

E. Answer the following questions :

1. What is reproduction?
2. Who are mammals?
3. What is vegetative propagation?
4. What is germination?
5. How is the yolk of egg helpful to the young ones?



Creative Work

- Watch reproduction of some pet animals and keep record of young one's birth and parental care.
- Observe reproduction among fish in an Aquarium.
- Watch nesting, laying eggs and parental care among birds.
- Observe grafting of new plants in your garden.
- Observe cutting of roses by your gardener.
- Grow a plant from an onion bulb.