HOW DO ORGANISMS REPRODUCE?

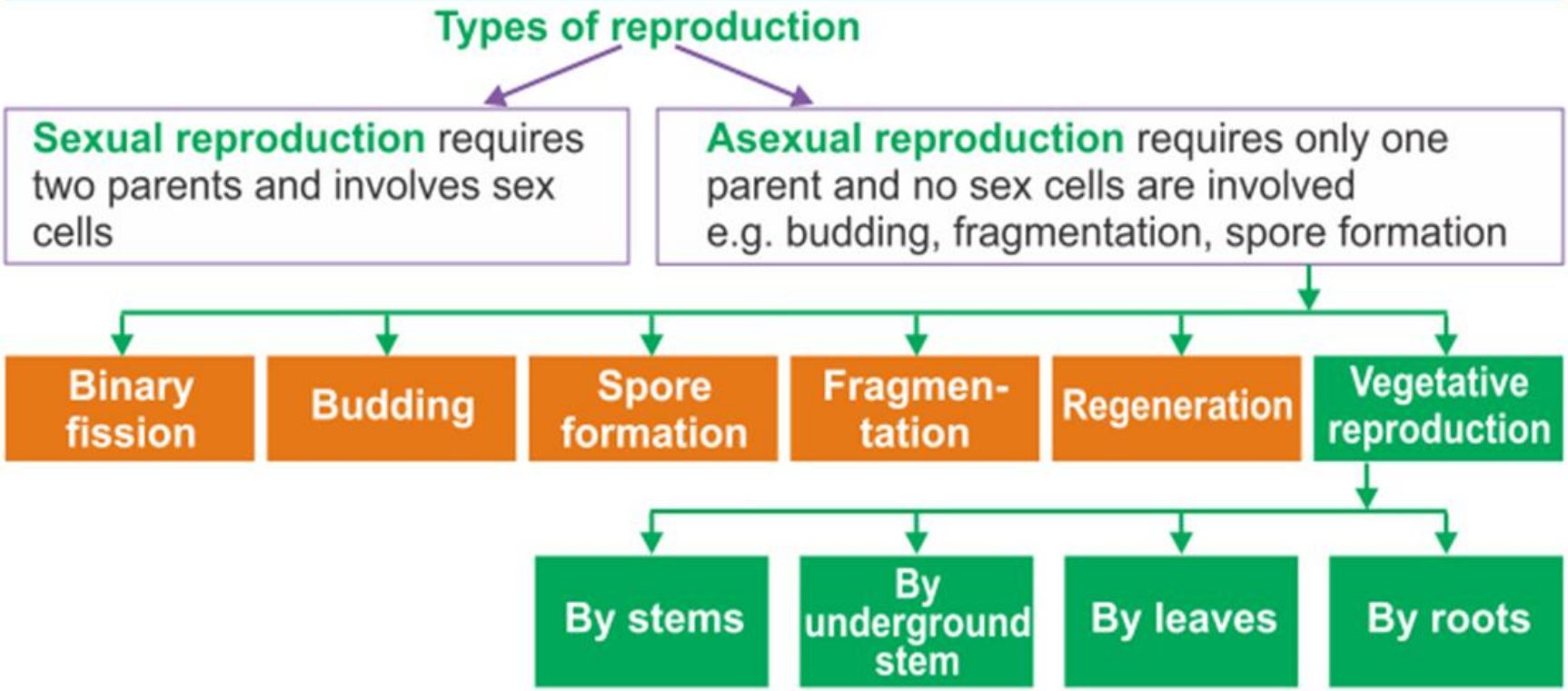
Asexual Reproduction

Presented by

Dr Sanjoy Deka

Types of Reproduction

Reproduction- The process by which cells and organisms produce young ones of the same kind.

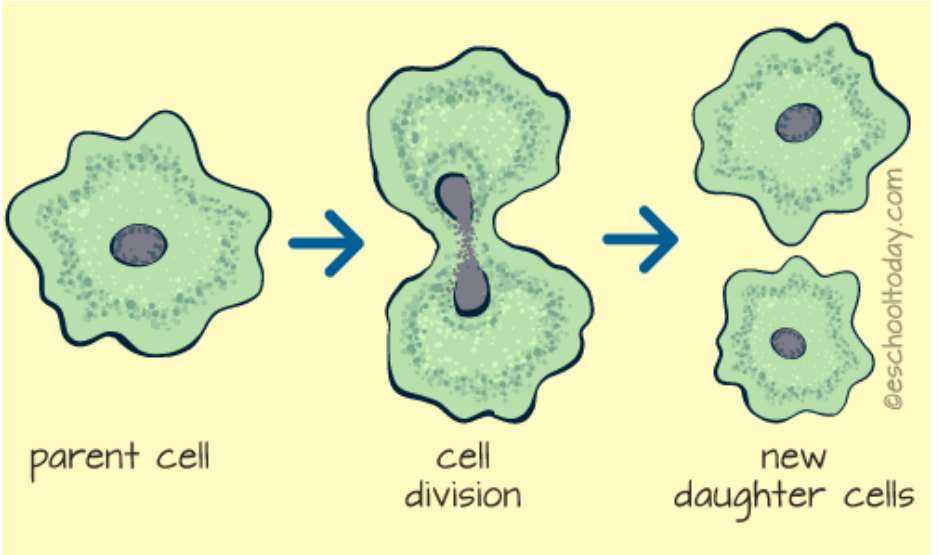


Artificial vegetative propagation – Apart from natural vegetative reproduction, there are certain artificial methods of vegetative propagation like Cutting, Layering, Grafting and Tissue culture which have more advantages.

Fission

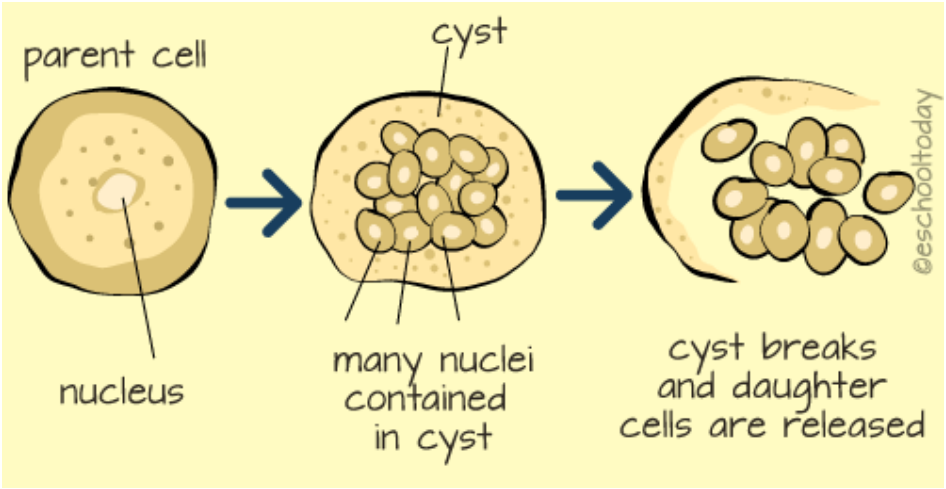
Binary Fission

Example: Bacteria, Protozoans like Amoeba

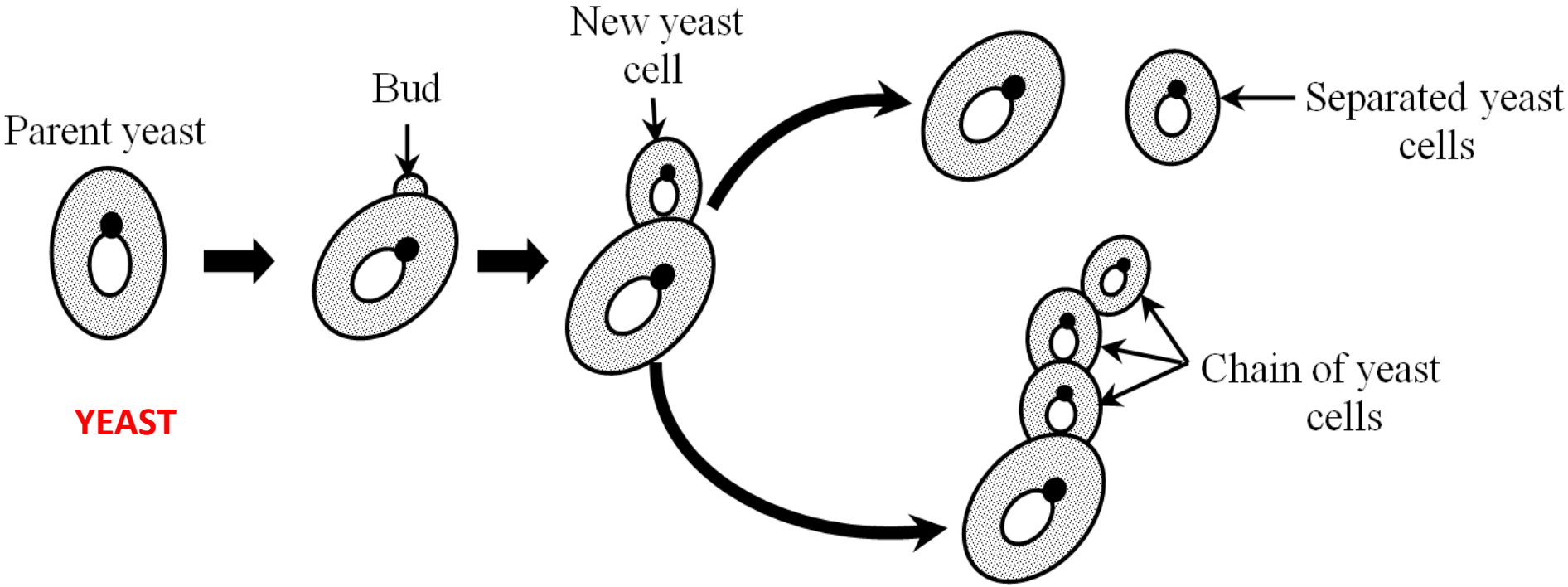


Multiple fission

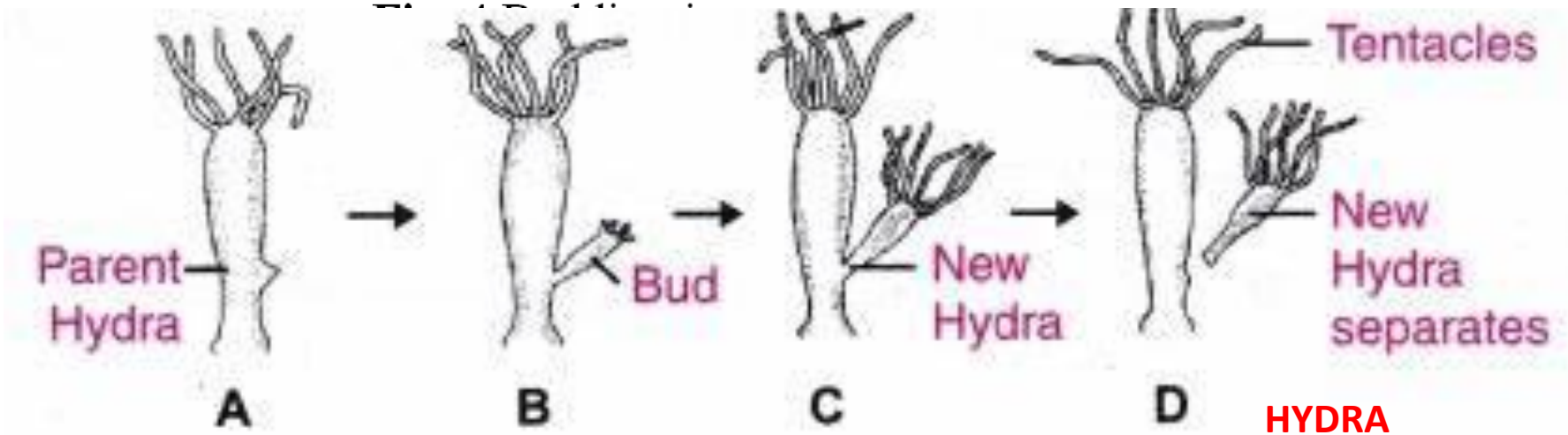
Example: Plasmodium



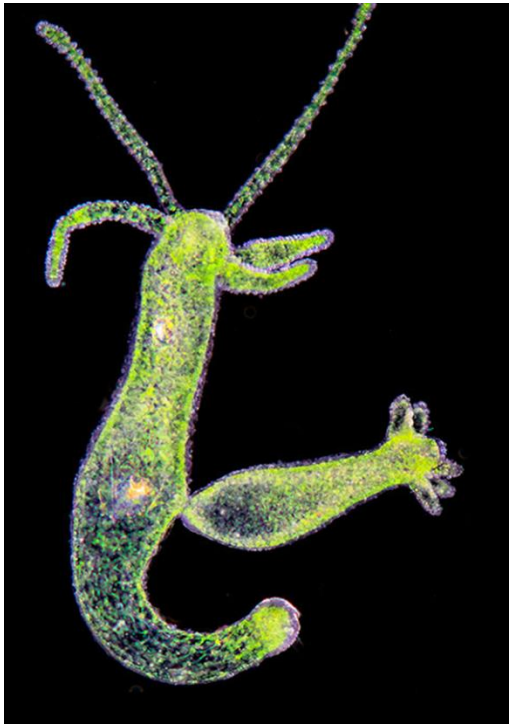
Budding

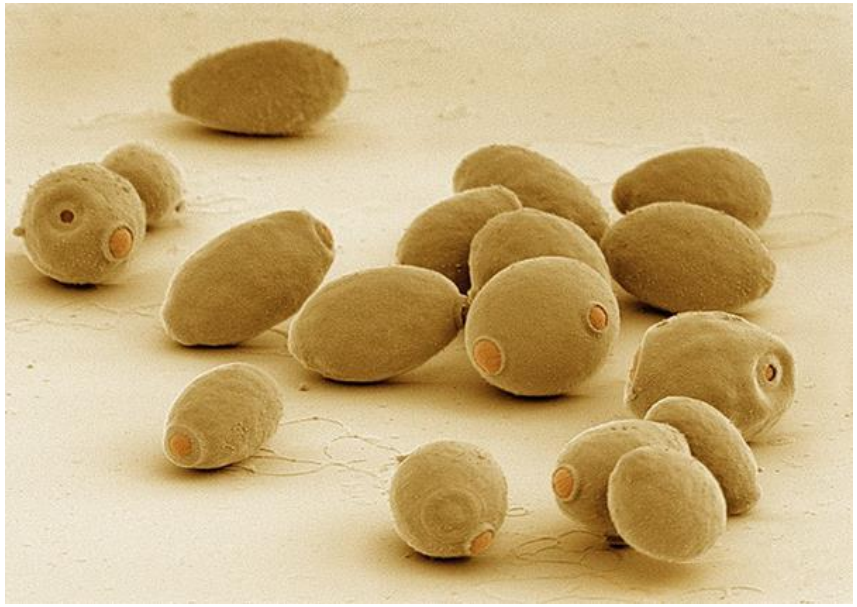


YEAST



HYDRA



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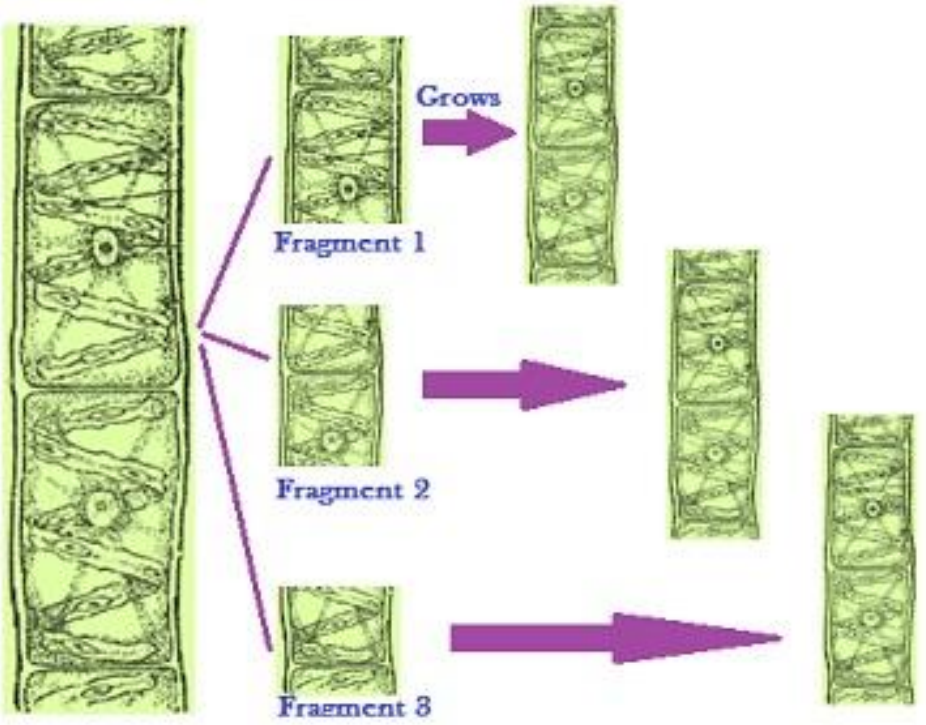
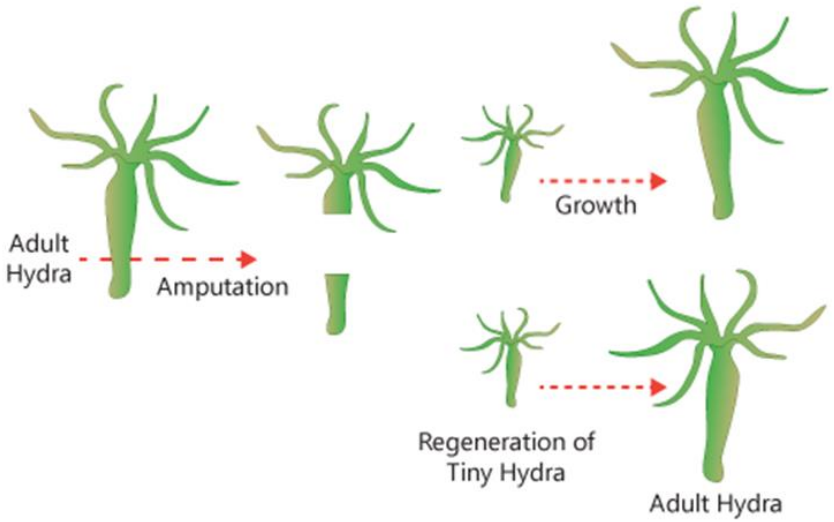
Fragmentation

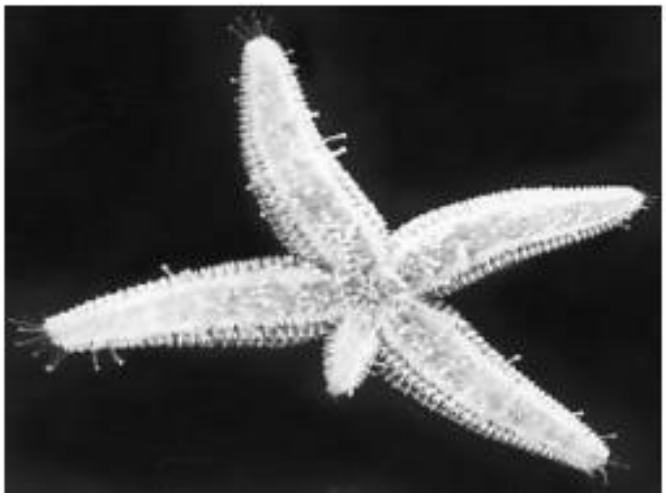
- It is a form of asexual reproduction in which an entirely new organism is formed from a fragment of the parent.
- It occurs in multicellular organisms, whose body organization is fairly simple such as annelids, starfish, fungi, lichens, and some algae such as *spirogyra*.
- The filaments of *spirogyra*, upon maturation, break into small pieces or fragments, which grow into new individual.

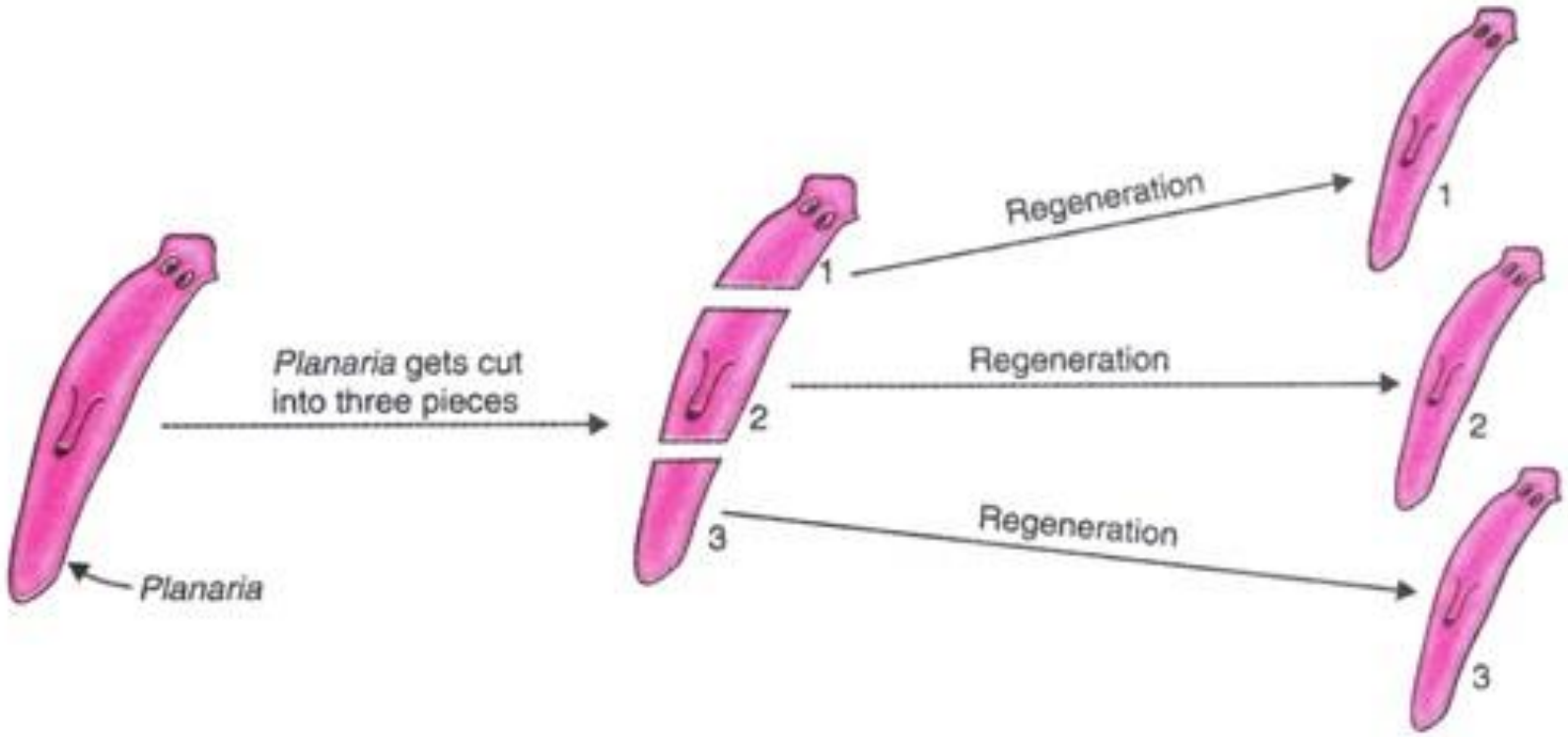


Regeneration

- In regeneration, if a piece of a parent is detached, it can grow and develop into a completely new individual.
  Echinoderms exhibit this type of reproduction
- Hydra, planaria, and earthworms also exhibit regeneration.







(*a*) One *Planaria* worm

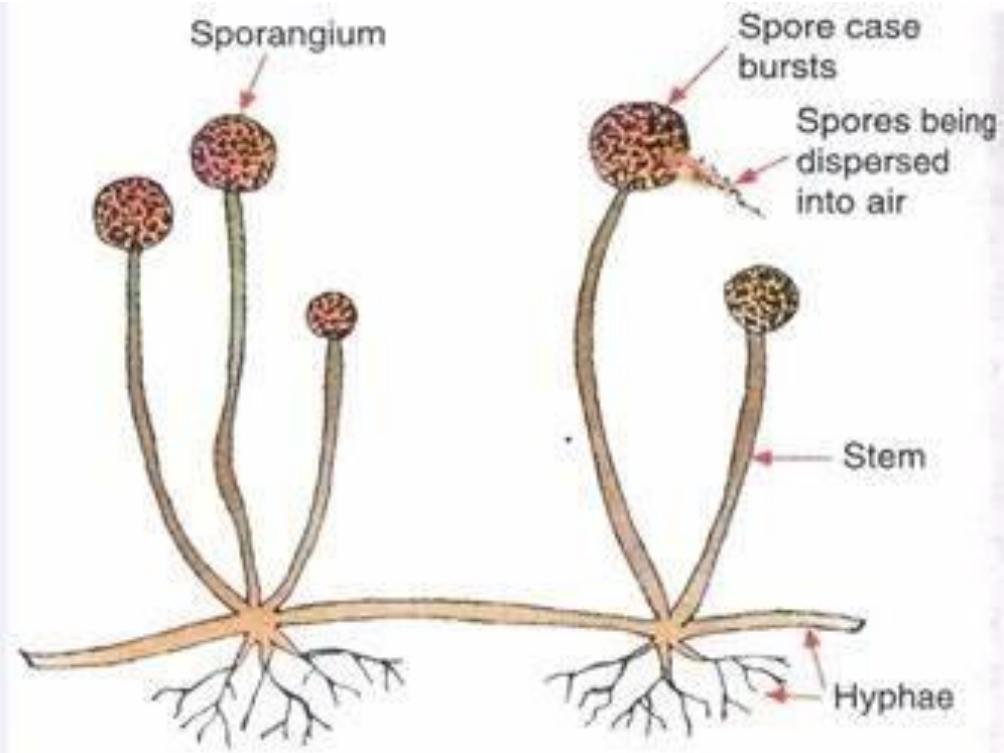
(*b*) *Planaria* worm cut into three pieces

(*c*) Three *Planaria* worms produced

Fragmentation	Regeneration
1. Fragmentation occurs in multi-cellular organisms with simple body organisation.	1. Regeneration occurs in fully differentiated multi-cellular organisms with complex body organization.
2. In fragmentation, an organism breaks into pieces and each piece develops into new individual.	2. In regeneration organisms if breaks into pieces, each piece may or may not develop into new individual.
3. No specialised cells are involved in fragmentation.	3. In regeneration, specialised cells proliferate and form a mass of cells. The cells from the mass differentiate to form different cells types and tissues.

Spore Formation

- Example: Rhizopus
- The tiny blob-on-a-stick structures are involved in reproduction.
- The blobs are sporangia, which contain cells, or spores, that can eventual develop into new *Rhizopu* individuals.
- The spores are covered b thick walls that protect them until they come into contact with another moist surface and can begin to grow.



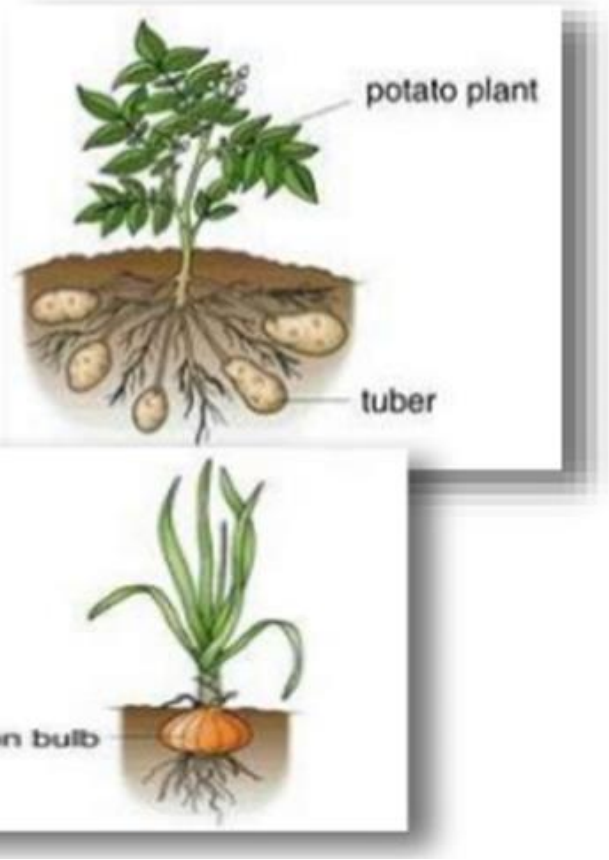
Vegetative Propagation

Vegetative Reproduction

- Plants produced by vegetative propagation take less time to grow and bear flowers and fruits earlier than those produced from seeds

- The roots of some plants can also give rise to new plants. **Sweet potato** and **dahlia** are examples.

- There are two types of vegetative reproduction;
  - **Natural vegetative propagation**
  - **Artificial vegetative propagation**



Types of vegetative propagation

Natural vegetative propagation

1. Through leaf buds. Eg. *Bryophyllum*
2. Through stem. Eg. potato, onion, lemon
3. Through roots. Eg. guava, sweet potato etc.

Artificial vegetative propagation

1. Stem cutting. Eg. rose
2. Micro propagation. Eg. Orchids, Dahlia
3. Layering. Eg. rose, jasmine
4. Grafting. Eg. lemon, orange, mango

Vegetative Propagation- Leaf

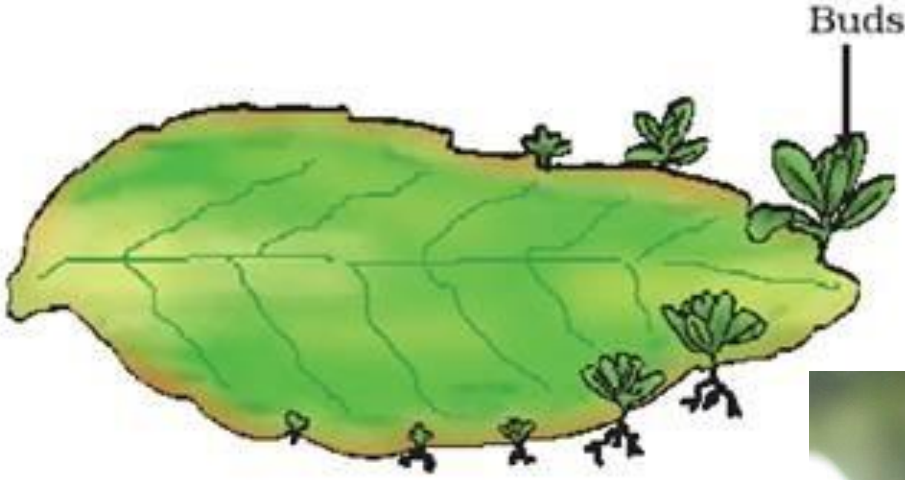
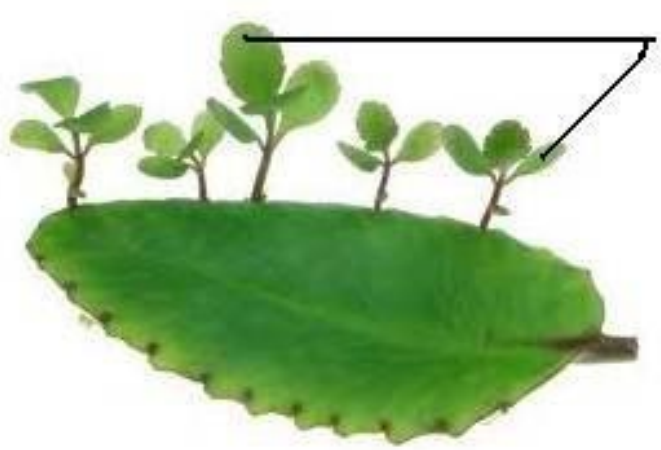
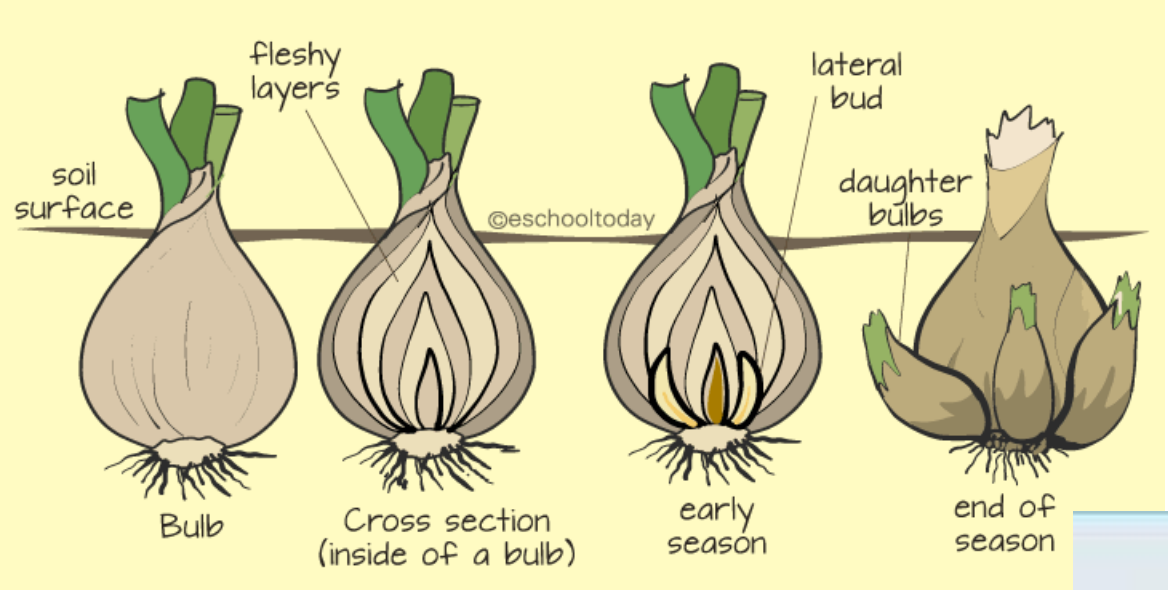
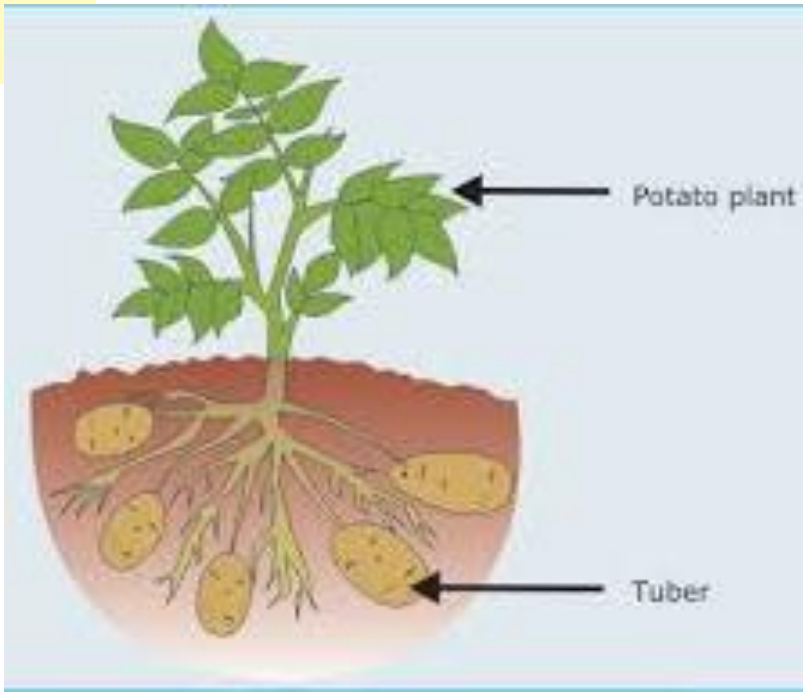


Figure 8.5
Leaf of Bryophyllum

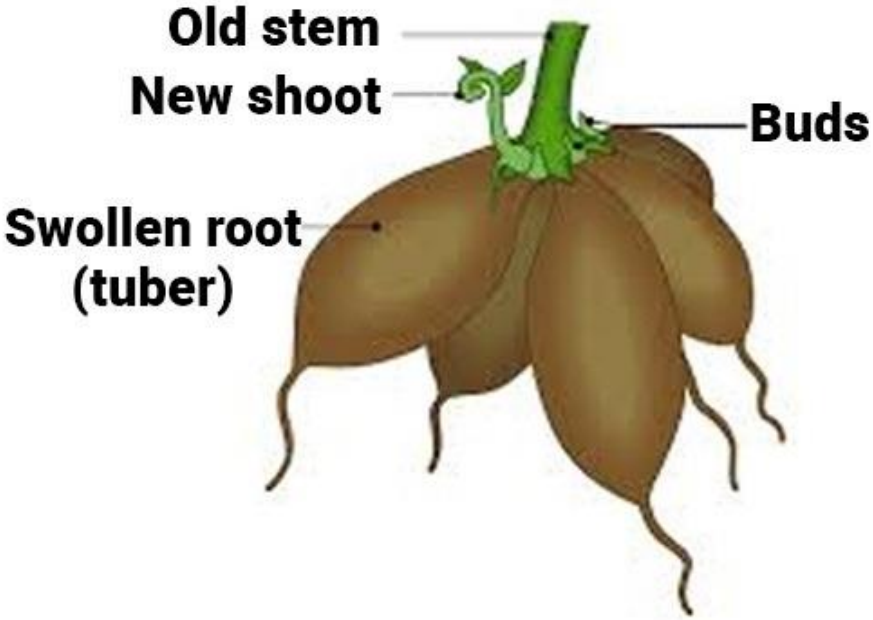


Vegetative Propagation- Stem



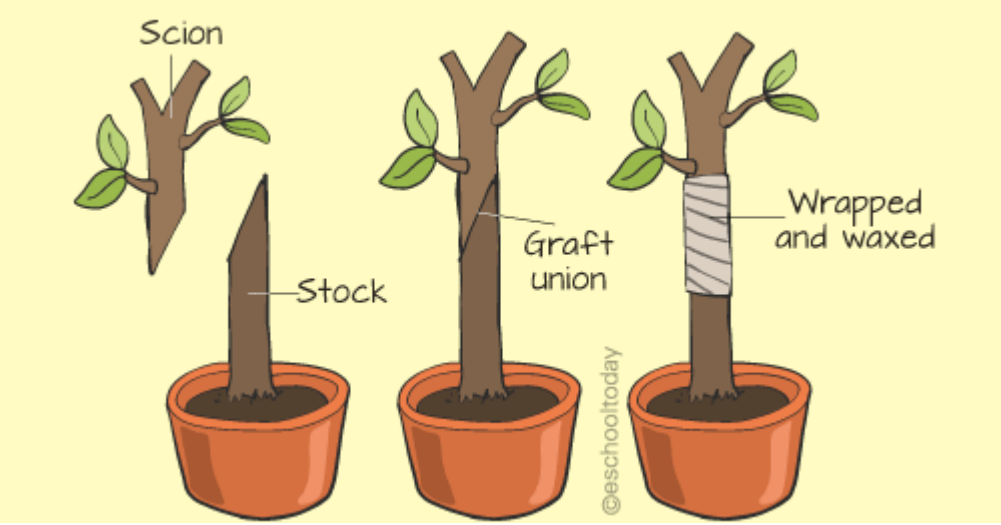


Vegetative Propagation- Roots



Sweet Potato

Vegetative Propagation- Grafting



In **grafting**, the upper part (scion) of one plant grows on the root system (rootstock) of another plant.

Apple grafting

Grafting

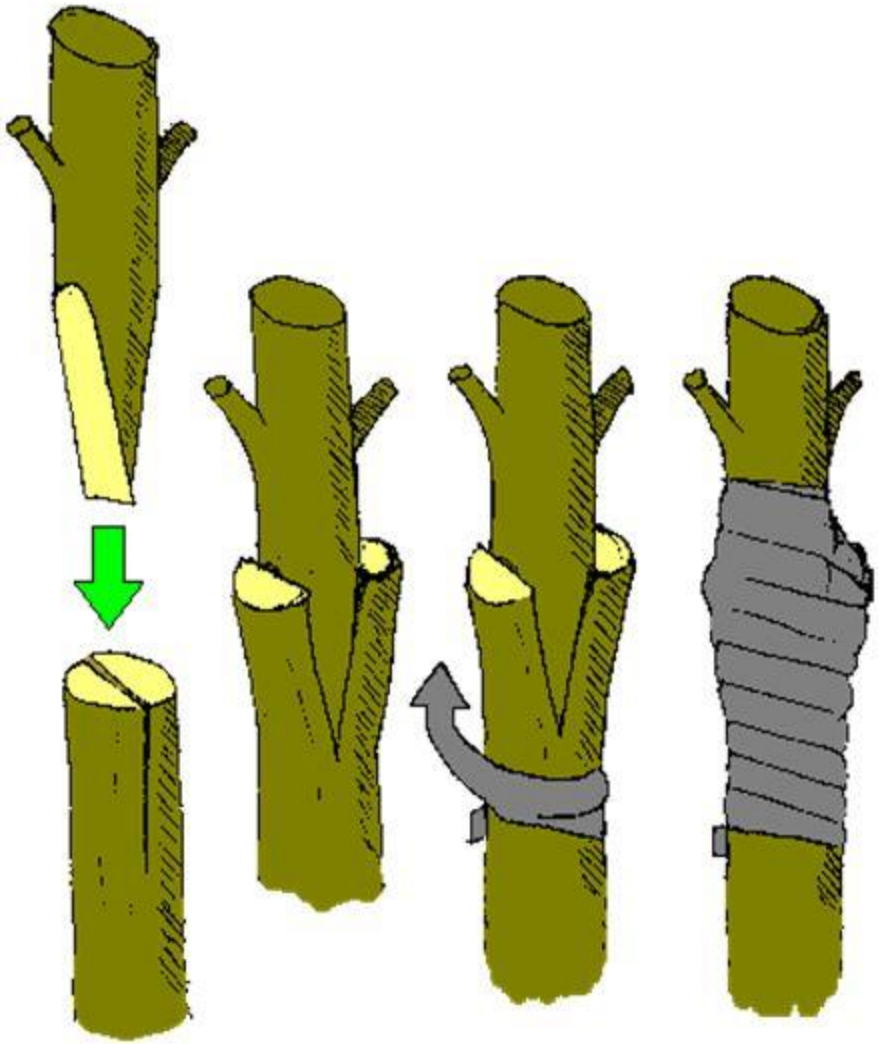
Joining a part (stem or bud) of a living plant to another causing it to grow as a part of the second plant.

It is useful in inducing the special traits or characters of one plant into the other.
Examples:

Rose and fruit yielding plants like Mango, Guava, peaches etc

Types of Grafting;

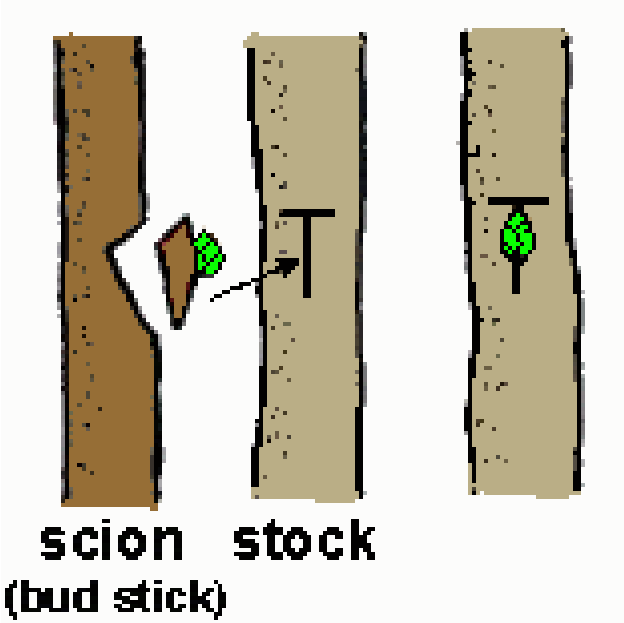
- Scion Grafting
- Bud Grafting



CLEFT (OR TOP WEDGE) GRAFT

Vegetative Propagation- Rose Grafting

T Budding

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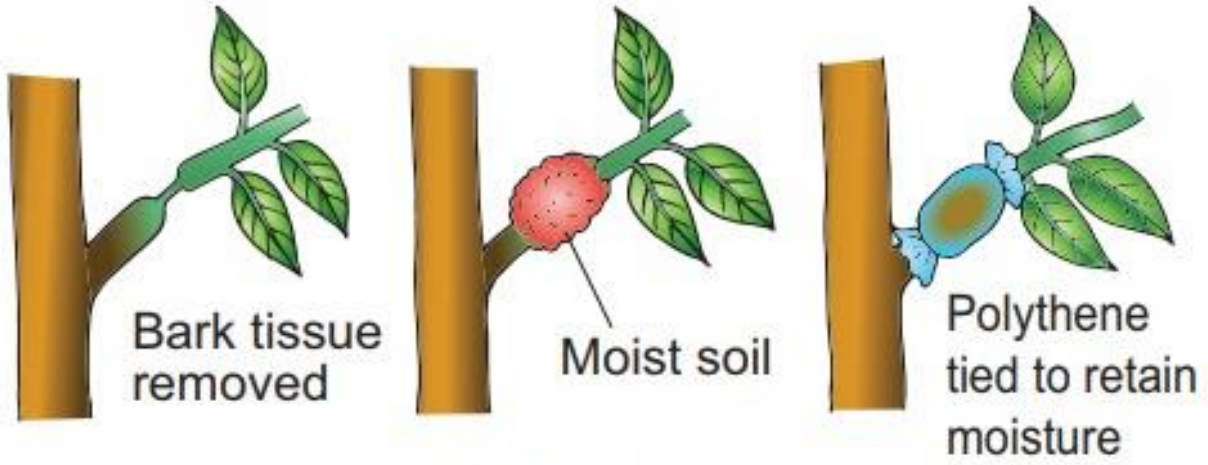
Vegetative Propagation- Layering

(i) Mound layering



(ii) Air layering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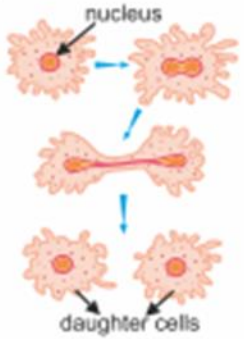
Vegetative Propagation- Cutting

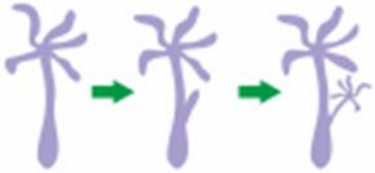
Rose Cutting

Summary

Binary fission: A single parent cell divides into two daughter cells .
e.g. Amoeba, paramecium, bacteria.



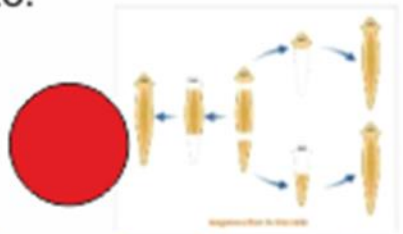
Budding: Parent cell produces bud, it gets detached and develops into new individual e.g. Yeast, Hydra



Spore Formation: Reproduces by forming spores. Under favourable conditions spores develop into new individuals. E.g. Fern, fungi, bacteria.

Fragmentation: Organism with filamentous body, break into two or more fragments. Each fragment grows into a new individual.
e.g. Spirogyra

Regeneration: Organism's body breaks up into one or several parts. Each part develops into a new individual Ex-planaria, hydra etc.



Vegetative Reproduction: Organism produces new individuals by a vegetative part of the plant.
Ex- potato, onion, ginger, mint etc.