# ASEXUAL REPRODUCTION

1. **Reproduction** is defined as the production of individuals of the same species, that is the next generation of the species. Reproduction is thus essential for continuation of the species. It ensures that the genetic material of one generation is transmitted to the next.

2. **Importance of Variation**- reproduction involves making copies of the blueprints of body design. The chromosomes in the nucleus of a cell contain information for inheritance of features from parents to next generation in the form of DNA (Deoxyribose Nucleic Acid) molecules. Cells use chemical reactions to build copies of their DNA. The process of copying DNA will have some variations each time. **The DNA copies generated will be similar but may not be identical to the original**. This gives rise to variations. Over time these variations accumulate and give rise to new species or help in adapting to the environment and if not the organisms perish.

3. **Types of Reproduction -** There are two main methods of reproduction in living-

   (i) **Asexual/Vegetative reproduction** - The production of new organism from a single parent without the involvement of sex cells (or gametes) is called asexual reproduction.

   (ii) **Sexual reproduction** - The process of production of new organism from two parents by making use of sex cells.

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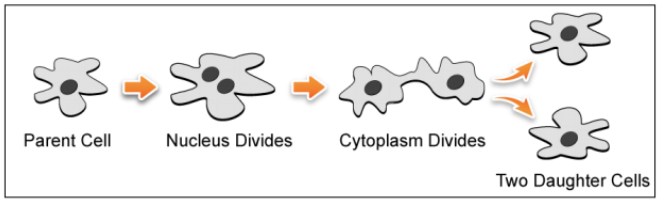
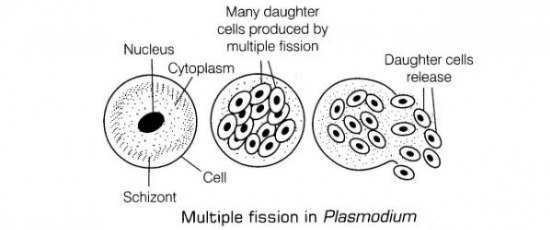
4. **Methods of Asexual Reproduction** [ 6 methods]-

   (i) **Fission** – In the process of fission a unicellular organism split to form two or more new organisms. It is of two types.

   **(a) Binary fission:** In Binary Fission, the parent organism splits to form two new organisms. for example- Amoeba, Paramecium Leishmania (which cause kala-azar), Bacteria etc are reproduce by binary fission.

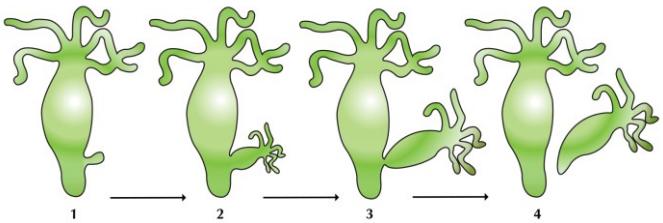



   **(b) Multiple Fission -** In multiple fission the parent organism splits to form many new organisms at same time. For example: Plasmodium. Some organisms during unfavourable condition a cyst or protective wall is formed around the cell of plasmodium. Inside the **cyst** the nucleus of cell splits several time to form many daughter nuclei and then cytoplasm collect around each daughter nuclei and thin membrane are form so many new daughter cells are form with in a cyst. When a favourable conditions comes, the cyst breaks open and daughter cells are released each farming a new organism.

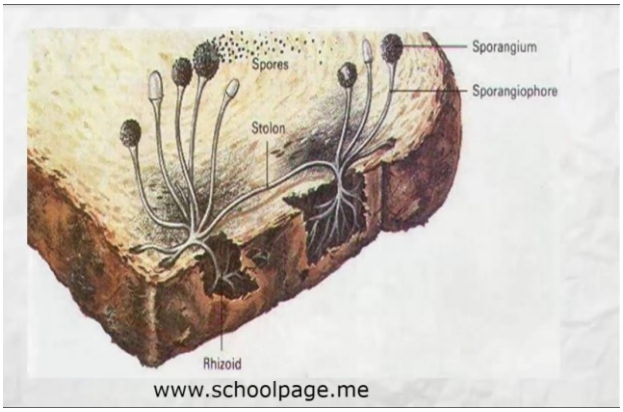


Multiple fission in *Plasmodium*

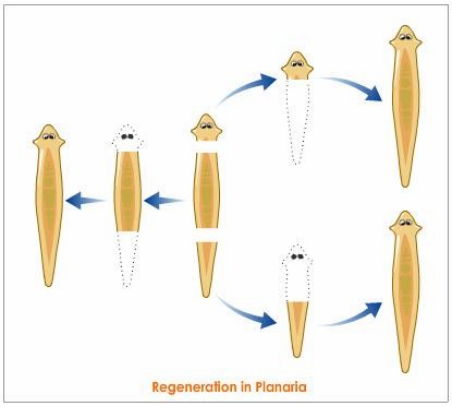
   (ii) **Budding** - In budding a small part of a body of parent organism grows out as a bud which then detaches and become a new organism. For Example: Hydra, yeast reproduce by budding. In Hydra a small out growth (bud) is formed on the sites of its body by the repeated mitotic division of its cell. This bud then grows gradually by developing mouth and tentacles and then tiny new hydra detaches itself from parent organism and lives as a separate organism.




   (iii) **Spore formation** - In spare formation, the parent plant produces 100 of microscopic reproductive units called "spores" within the spore case. When the spore case burst, then the spores spread into air. When these air borne spores land on food or soil, under favourable condition they germinate and produce new plants for example: Most of the fungi such as Rhizopus ( bread mould) ,mucor, bacteria, non-flowering plants, ferns and mosses.




   (iv) **Regeneration** - The process of getting back off full organism from its body part is called regeneration. For example, simple animals like Hydra and Planaria show regeneration. Planaria (Flatworm) is found in freshwater ponds. If the body of Planaria somehow gets cut into number of pieces then each body piece can regenerate into complete Planaria.




   (v) **Fragmentation** - The breaking up of body of simple multicellular organism into two or more fragments or maturing, each of which subsequently grows to form a new complete organism is known as fragmentation. Spirogyra is a green filamentous algae. Spirogyra breaks into two or more fragments on maturing and each fragment then grows into new spirogyra.

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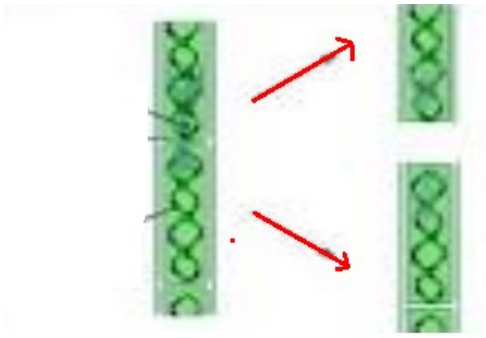


Fragmentation in Spirogyra

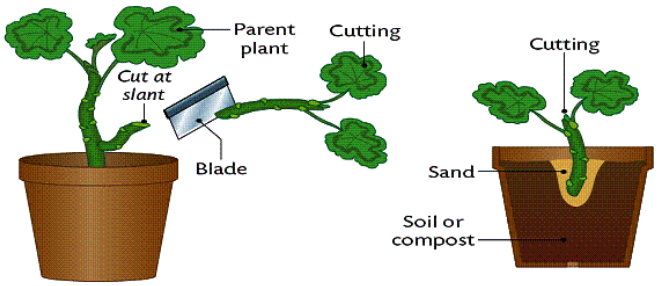
(vi) **Vegetative Propagation** - In vegetative propagation new plants are obtain from the parts of old plants (stem, leaves, or root) without the help of any reproductive organ. This can be done in two ways

(a)**Natural methods of vegetative propagation**: The green grass grows in the field after rain from the dry, old stem of grass plant present in the field by the method of vegetative propagation. Bryophyllum plants can be reproduce by vegetative propagation by using leaves.

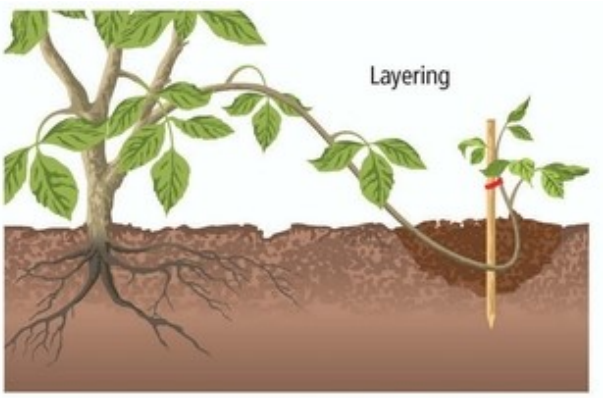
| | | |
|---|---|---|
| a. | Plant | Vegetative propogule |
| b. | Potato | Potato tuber (stem) |
| c. | Begonia | Leaves |
| d. | Money plant | Stem |

(b) **Artificial method of vegetative propagation** - The process of growing many plants from one plant by man-made method is called vegetative propagation.

I. **Cutting**: A small part of plant which is removed by making a cut with sharp knife is called cutting. A cut may be a piece of stem, root or leaves. For example- The plant like rose, sugarcane, cactus is grown by cutting. It is necessary that there are some buds on it.




II. **Layering**: In this method a branch of plant is pulled towards the ground and a part of it is covered with moist soil leaving the tip of branch exposed above the ground. after some time new roots develop and then it cut off from parent plant and grows as new plant. for example- Jasmine, strawberry, hibiscus and guava etc.




III. **Grafting**: It is the method in which the cut stem of two different plant one with root and other without root and joined together in such a way that the two stem joint and grows as a single plant. This new plant has the characteristics of both the plants. The cut stem of plant having root is called stock and the cut stem of another plant is called scion. For example- Apple, peach, apricot, pear etc.