

Reproduction in Plants and animals

Definition of reproduction: Reproduction is the biological process by which new offspring/ individual organisms are produced from their parents. Reproduction is a characteristic of all living organisms; each individual organism exists as the result of reproduction. Reproduction is necessary for the continuity of a particular species. There are two types of reproduction: sexual and asexual reproduction and these occur in both animals and plants.

Definition of asexual reproduction: This is the production of offspring from one parental organism without the fusion of the nuclei of the male and female gametes.

Definition of sexual reproduction: This is the production of offspring from the fusion of the nuclei of the male and female gametes to form a zygote.

Asexual reproduction.

There are five types of asexual reproduction:

- i) Fission
- ii) Sporulation (spore formation)
- iii) Budding
- iv) Fragmentation
- v) Vegetative propagation

Fission

This is a type of asexual reproduction in which the parental organism after reaching maturity divides into two or more equal sized and identical daughter cells. Identical offspring are referred to as a clone. The types of fission are binary fission and multiple fission.

Binary fission

In this process the organism divides into 2 equal identical daughter cells only. This method of reproduction is common in amoeba, paramecium and bacteria. In amoeba and paramecium the cell division involves mitosis.

Assignment: Revise about the successive stages of reproduction in amoeba

Multiple fission

This normally takes place in parasitic microbes e.g. one malarial parasite i.e Plasmodium in a liver cell undergoes multiple fission to produce 1000 organisms. **Revise the life cycle of the malaria parasite from the Functional approach by Roberts**

Sporulation/spore formation

A spore is a small reproductive unit which is microscopic and unicellular

Sporulation occurs in fungi, bacteria, algae and green plants

Sporulation in *Rhizopus* (common mould)

A few days after *Rhizopus* appears on a piece of bread, little black dots are seen. These are the sporangia which are borne at the end of the sporangiophores. Each haploid sporangium contains many haploid small spores produced by mitosis, and when the sporangium is ripe it becomes black and then bursts and the spores are set free. The spores are very light and easily blown by the wind. If they fall on a suitable substrate they germinate and grow into a mycelium.

Assignment: Draw the diagram of asexual reproduction of *Rhizopus* from Biological Science. Page 21

Budding

This is the type of reproduction in which an organism develops an outgrowth which can detach itself and develop into a new organism. Yeast cells and hydra reproduce by this method.

Budding in yeast

In suitable conditions i.e. enough food, water, oxygen and optimum temperature, yeast reproduces by budding. Each cell forms a projection or bud and its nucleus divides into two by mitosis. One part of the nucleus moves into the bud which enlargens filling with cytoplasm and then can detach off the parent or remain attached to it to form a colony.

- **Draw the diagram of yeast multiplying by budding from Advanced biology by Michael Kent .page 375**

Fragmentation

This is the type of reproduction in which an organism breaks up into two or more parts and each part forms an independent individual by successive cell division e.g in spirogyra.This occurs when the conditions are suitable.

Vegetative reproduction/propagation

This is the type of asexual reproduction in which new individuals grow from vegetative parts of a parent plant. These parts are leaves, stems and roots.

The following are examples of plants which carry out vegetative reproduction.

Name of plant	Part of the plant	Identity
Cassava	Stem	Stem cutting
Sugarcane	Stem	Stem cutting
Banana	Stem	Sucker
Irish potato	Stem	Stem tuber
Sweet potato	Stem and root	Stem cutting and root tuber
Bryophyllum	leaf	leaf
Yam	Stem	Stem tuber
Cocoyam	Stem	Corm
Onion	Stem	Bulb
Pineapple	Stem	Sucker
Ginger, Spear grass, Coach grass, Paspalam	Stem	Rhizome
Strawberry	Stem	Runner

In some cases, the organ for vegetative reproduction also acts as a food storage organ so that a plant can survive unfavourable conditions. These organs are known as perennating organs. For example ;Suckers, Stem tubers, Corms, Rhizomes.

- **Read and make notes about vegetative propagation from Biological Science.**
- **Differentiate between a rhizome and a corm.**
- **Research and write notes about Artificial propagation by use of stem cuttings,budding,layering,grafting and marcoting.**
- **Describe the advantages and disadvantages of vegetative reproduction.**
- **Make brief notes about propagation of tea,coffee,citrus fruits,sugarcane and cassava.**