

Background Information

Asexual Reproduction

Reproduction is the process by which an organism produces another of its kind. Reproduction is required of all living things to ensure that a species can continue to be present on this planet. If a species was unable to reproduce successfully it would go extinct.

Asexual Reproduction

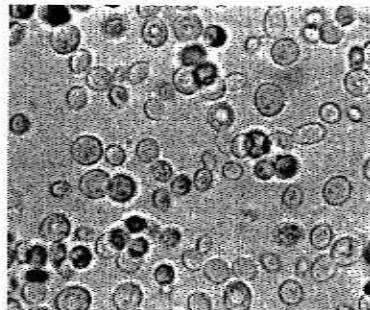
Asexual Reproduction is a type of reproduction that does not require an egg or a sperm. In asexual reproduction a new organism is produced from only one parent organism. Heredity information called DNA is found in the nucleus of the cell. In asexual reproduction the offspring will have heredity material, or DNA that is uniform to the DNA of the parent organism. This means that the parent and the offspring will be genetically alike or identical clones. Not only will the parent and offspring be identical, but all offspring produced by the parent will be identical as well.

Asexual reproduction has its advantages. It is able to reproduce many offspring very quickly. A parent of asexual reproduction does not have to go through the time and energy consuming process of finding a mate as it would have to in sexual reproduction.

Asexual reproduction is common amongst plants and single-celled organisms called prokaryotes. There are a few examples of animals that reproduce asexually but they are usually more simple animal life forms. Generally, the fact that animals have complex bodies makes it difficult for them to break into two or grow a bud, but there are some examples amongst simple animals.

Fission (Binary Fission)

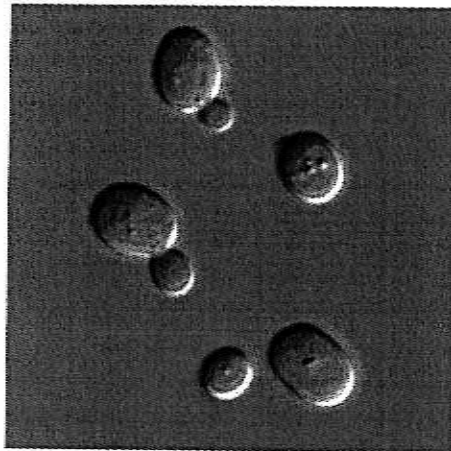
Single-celled organisms, or prokaryotes, use asexual reproduction and can reproduce very rapidly simply by dividing into two equal halves. This is called binary fission. In binary fission, a single DNA molecule replicates then attaches each copy to a different part of the cell membrane. The cell begins to pull apart and the two copies are pulled apart. This results in two parts that have the potential to grow to the size of the original cell.



Bacteria reproducing by dividing through binary fission

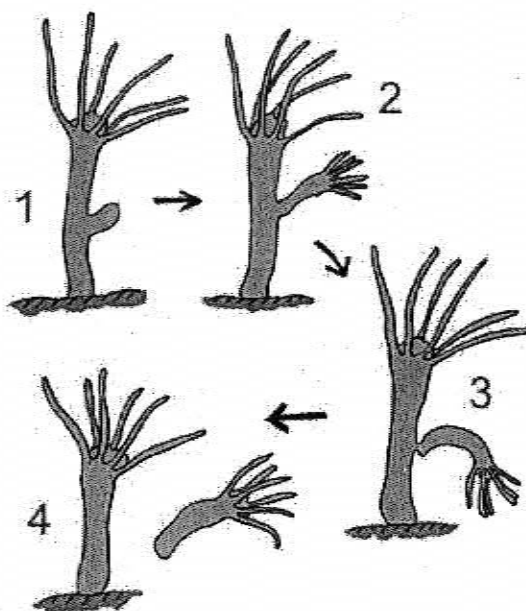
Budding

Budding is a process by which a new duplicated plant or animal begins to form on the side of the parent and enlarges until a new individual is created. Yeast is a fungus that reproduces by budding. A smaller daughter cell grows off of the mother yeast until it is developed enough to be its own organism; it then breaks off from its mother. This daughter is smaller but will continue to grow to the size of the mother and can then grow daughters itself.



Yeast reproducing by budding

Hydra, a very simple animal life-form that lives in freshwater ponds and streams, can reproduce by budding as well. The Hydra shows budding similar to that of yeasts. An adult Hydra will develop a swelling on the side of its body. This will grow into a daughter bud. Eventually this daughter will grow tentacles and start to feed itself by catching small water animals. At this point it breaks off from the mother Hydra and floats freely until it lands on a support. The following diagram depicts Hydra reproducing:



Key

- 1 The hydra develops a "bud".
- 2 The bud develops a mouth and tentacles
- 3 When it is fully formed the daughter hydra detaches from its parent.
- 4 The daughter hydra is now fully independent.

Budding is also very common in plants. If potatoes, for example, are left in warm conditions for too long they begin to sprout from the buds, which are commonly referred to as eyes.

Regeneration

Regeneration is a form of asexual reproduction where a new organism grows from a fragment of the parent. Each fragment develops into a mature, fully grown individual. Regeneration is seen in many organisms such as animals (earthworms), fungi, and plants. Many plants are capable of reproducing via regeneration. There are many plants that you can take a "cutting" of the stem or even leaves and have them regenerate into a new individual organism. Many trees, shrubs, and ferns can produce shoots that, if rooted, become detached and grows into their own new organism.



Planting the top portion of a pineapple can result in a new regenerated pineapple plant.



If placed in water, a cutting from a plant can sprout new roots and become a new organism.

Notes:

Define:	Draw/ Model:
Characteristics:	Examples:

Notes:

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Characteristics:	Examples:

Sample Asexual Reproduction

Chart

Asexual Reproduction

Binary Fission	Budding	Regeneration