

# Difference Between Fragmentation and Budding

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## Key Difference - Fragmentation vs Budding

Reproduction is the mechanism which produces new organisms (offspring). There are two basic modes of reproduction: [sexual reproduction](#) and [asexual reproduction](#). Sexual reproduction occurs between two parents while asexual reproduction is carried out by a single parent. Sexual reproduction results in offspring which are genetically diverse and unique. Asexual reproduction results in offspring which are genetically identical to each other and to their parents. Different types of asexual reproduction methods are seen in organisms. Fragmentation and budding are two methods commonly used by organisms. **Fragmentation occurs when the parent organism breaks into fragments or pieces and each fragment develops into a new individual. Budding occurs when the parent organism develops a bubble like bud which can ultimately become a new individual after maturity.** This is the key difference between fragmentation and budding.

## What is Fragmentation?

Fragmentation is a type of asexual reproduction which occurs in [multicellular](#) organisms. The body of the parental organism breaks into pieces or fragments and each part later becomes a new individual. These individuals are genetically identical to each other and to parent. Fragmentation is commonly seen in flatworms, marine worms, algae, jellyfish, starfish, fungi and other [echinodermata](#).

Fragmentation is the simplest method of reproduction in [fungi](#). Small fragments of the fungal thallus can be separated from the mother thallus and grow into new fungal thalli. Fragmentation produces [clones](#) of the original organism. Hence, it is a common type of vegetative propagation method in plants.

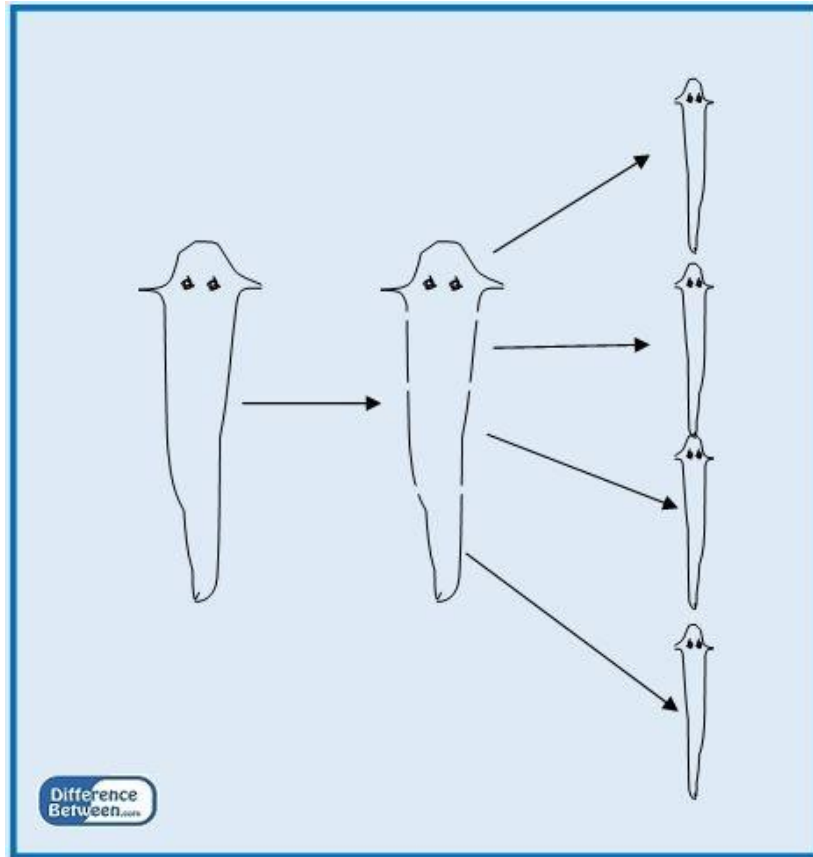


Figure 01: Flatworm Fragmentation

## What is Budding?

Budding is a type of asexual reproduction shown by certain organisms. In this process, the parent organism forms a bud-like outgrowth. Bud formation is a result of [cell division](#). Then this bud enlarges and receives a nucleus from the parent. While attached to the parent, this bud becomes matured. Later it detaches from the parent cell and becomes a new individual which is genetically identical to its parent. In some organisms, these buds can remain attached to the parent cell for a long time until a chain of buds develops. This resulting chain of buds is known as **pseudomycellium**.

Budding is a common asexual mode of reproduction in unicellular fungi such as yeasts. Budding is a somewhat similar mechanism to [binary fission](#) in bacteria. However, unlike binary fission, budding involves unequal division of the [cytoplasm](#).

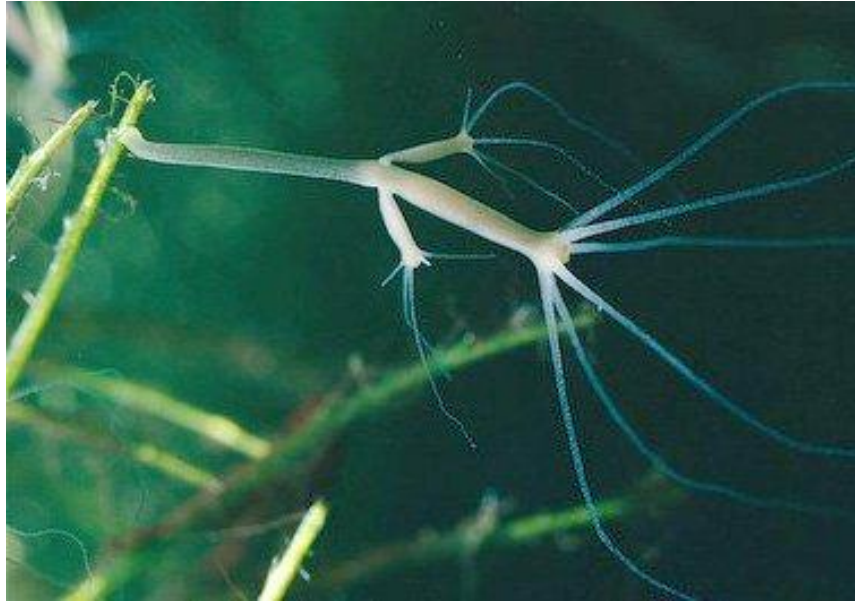


Figure 02: Budding shown by Hydra

## What is the difference between Fragmentation and Budding?

Fragmentation vs Budding	
Fragmentation is a type of asexual reproduction in which the body of the parent breaks into fragments that have the potential to produce a new individual.	Budding is a type of asexual reproduction in which a new organism originates from the small bud-like structures developed from the parent.
Type of Organisms	
Fragmentation is common in multicellular organisms.	Budding is common in unicellular organisms.,
Maturity of the New Organism	
Fragments become matured after separating from the parent.	Buds become mature while attached to the parent and then detach from the parent organism.
Organisms	
Fragmentation is shown by starfish (Echinodermata), spirogyra, fungi, jellyfish. lichens, liverworts, flatworms etc.	Budding is shown by yeast, amoebae, hydra, Sea anemones, small multicellular animals etc.

## Summary - Fragmentation vs Budding

Asexual reproduction is a type of reproduction shown by organisms. Fragmentation and budding are two modes of asexual reproduction which result in genetically identical offspring to parents. A new individual arises from an outgrowth or from a bud developed from the parent during budding. During the fragmentation, the body of the parent breaks into distinct pieces or fragments and each fragment develops into a new individual or offspring. This is the difference between fragmentation and budding. Both processes finally result in genetically identical offspring or clones of the parent organism.

### References:

1. "Types of Sexual and Asexual Reproduction - Boundless Open Textbook." Boundless. 08 Aug. 2016. Web. [Available here](#). 14 June 2017.
2. "Fragmentation (reproduction)." Wikipedia. Wikimedia Foundation, 11 May 2017. Web. [Available here](#). 14 June 2017.

### Image Courtesy:

1. "Hydra oligactis" By Lifetrance at en.wikipedia ([CC BY-SA 3.0](#)) via [Commons Wikimedia](#)

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