

1.Reproduction in Organisms:

Each and every organism can live only for a certain period of time. The period from birth to the natural death of an organism represents its life span.

Reproduction is an important biological process by which an organism gives rise to another organism similar to itself.

- Reproduction enables the continuity of the species generation after generation. It results in formation of genetic variation. This genetic variation is inherited during reproduction.
- Reproduction involving a single parent is called **asexual reproduction**.
- Reproduction involving two parents of opposite sexes with the fusion of male and female gametes is called **sexual reproduction**.

ASEXUAL REPRODUCTION

- In asexual reproduction, only a single parent is involved in producing offspring. As a result, the off-spring produced are identical to each another as well as to the parent.
- Asexual reproduction is common among single celled organisms, and in plants and animals with relatively simple organizations. It is also seen in multi cellular organisms.

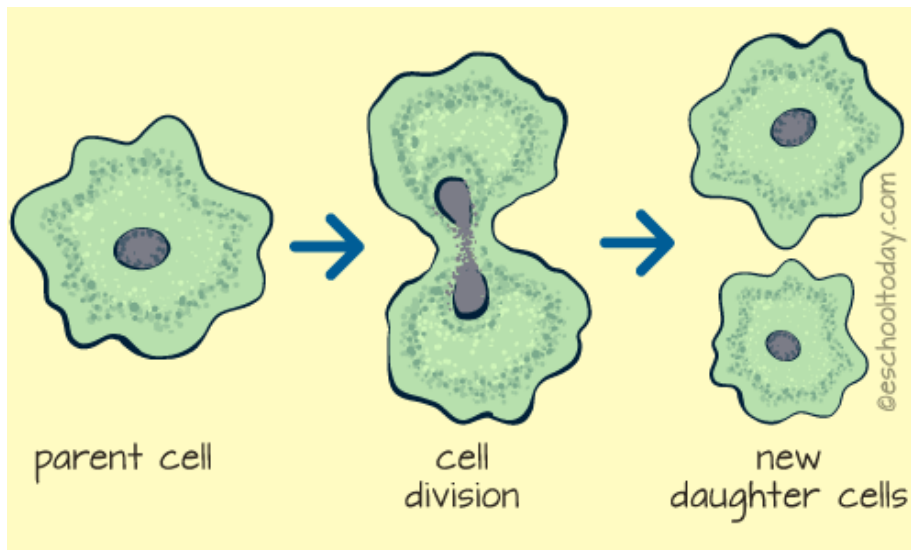
ASEXUAL REPRODUCTION IN ANIMALS

The most common modes of asexual reproduction seen in animals are as follows

1. Fission

- This method is observed in the members of Protista and Monera. In fission, the division of the nucleus occurs first which is then followed by the division of the cytoplasm. Subsequently, the mother cell splits into two equal sized daughter cells.
- When the cytoplasmic division occurs in any direction (e.g. amoeba) the fission is called **simple binary fission**.

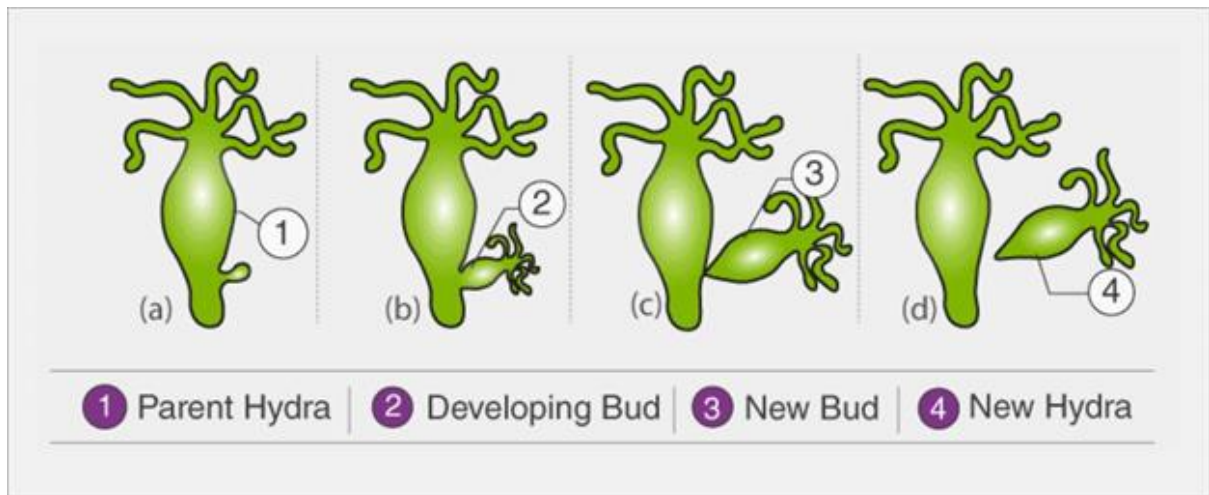
- When cytoplasm divides along the transverse axis of the individual the fission is termed transverse binary fission. E.g. *Paramecium* and *Planaria*.
- When the cytoplasm divides the longitudinal axis of the individual it is designated as longitudinal binary fission. E.g. *Euglena* and *Vorticells*.
- Binary fission involves mitosis only and consequently the resultant offspring are genetically identical to the parent and to each other.



- In some cases the nucleus divides several times by amitotic divisions. This leads to the formation of multiple new copies of nuclei. Cytoplasmic division does not occur during this period. The cytoplasm collects around each nucleus. Thus from a single cell many unicellular and uni-nucleated offspring are formed. This method of reproduction is called multiple fission.

2.Budding

- In this method cells of some parts of the body of the animal undergo repeated mitotic cell divisions. This leads to the formation of overgrown regions of cell masses. Such regions of cell masses that result due to mitosis are called bud. A young animal is developed from such a bud. It detaches itself from the parent body and lives as independent animal.
- Such a bud produced on the outside of the body, is called exogenous budding. E.g. **Hydra**

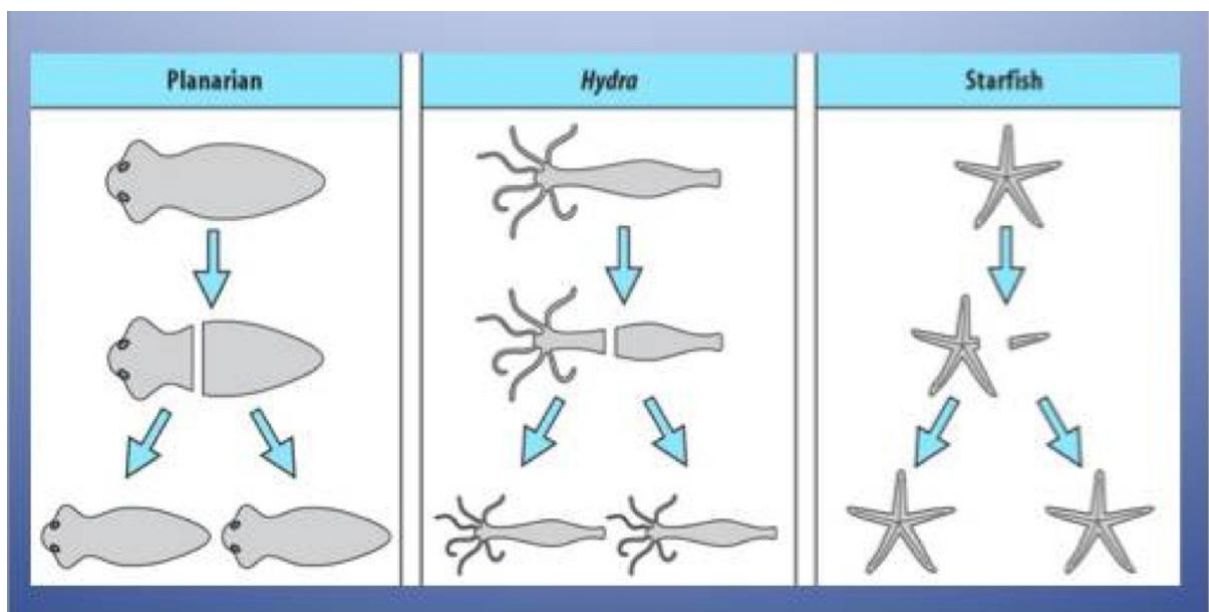


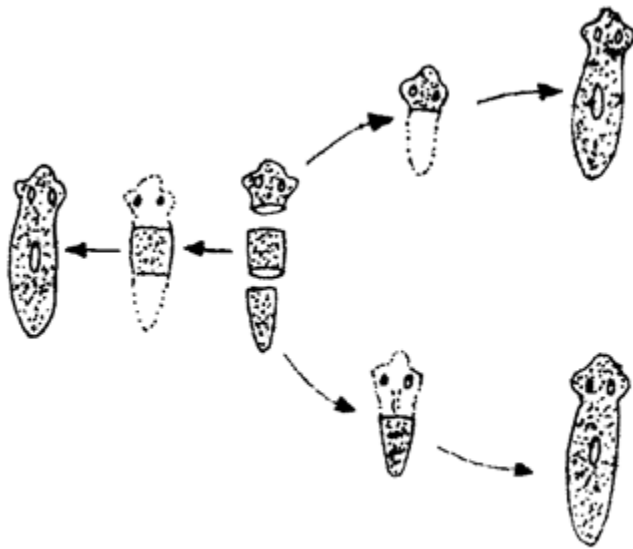
- Enveloped cell mass developed towards the inside of the body are called as internal buds or gemmules. Such gemmules can be seen in fresh water sponge (e.g. *Spongilla*) and marine sponge (e.g. *Sycon*). Each gemmule gives rise to a new animal. This is called endogenous budding.

3.Fragmentation

- In this method of reproduction, the body becomes fragmented into several different parts. Each part develops the remaining body parts and becomes a complete animal. This capacity is known as **regeneration**.

E.g. Planaria, Hydra, Starfish, etc.





Regeneration in Planaria