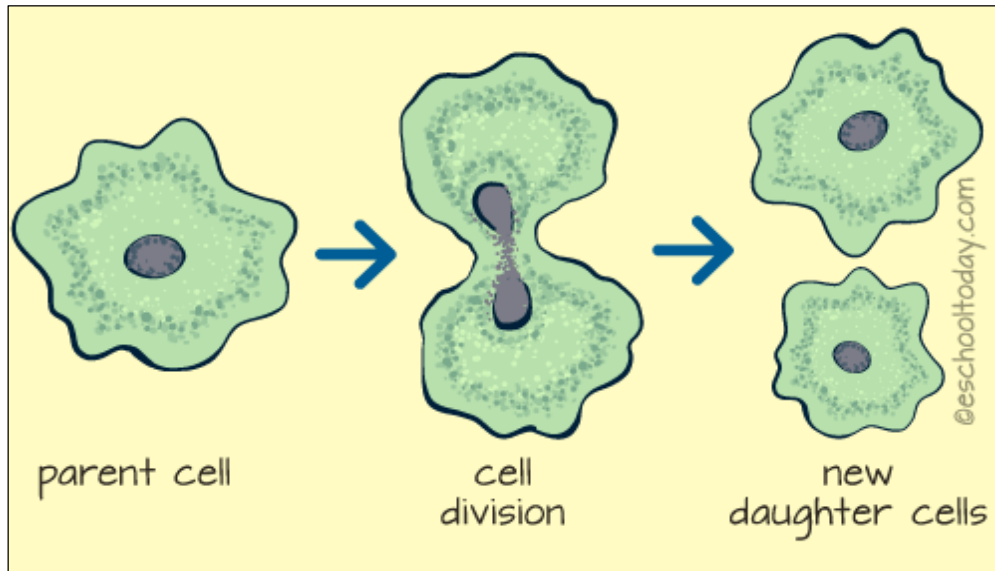


Reproduction in Protozoa:

A sexual reproduction

1. Binary fission:

cell divided into two cells. DNA of the nucleus of a mature cell divided first and then the cell divided into two daughter cells of almost the same. *Amoeba*.



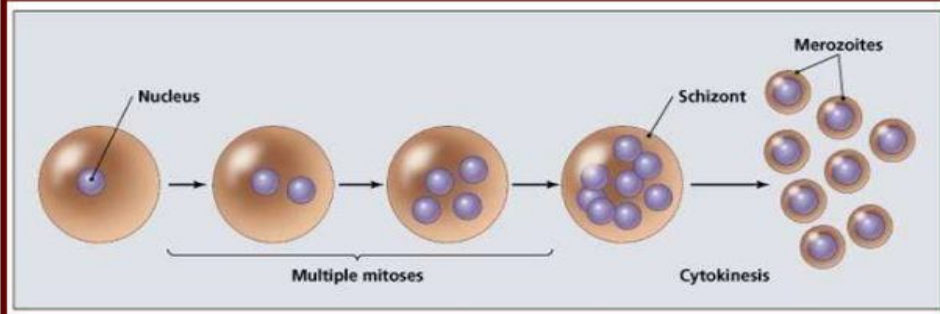
2. Multiple fission (Sporulation):

one of the cells enlarges and forms the sporangium. The nucleus divided many times and then the daughter nuclei are surrounded with protoplasm bits to form daughter cells called spores are covered with a thick wall called the cyst, on maturation the sporangium bursts and releases the spores.

MULTIPLE FISSION

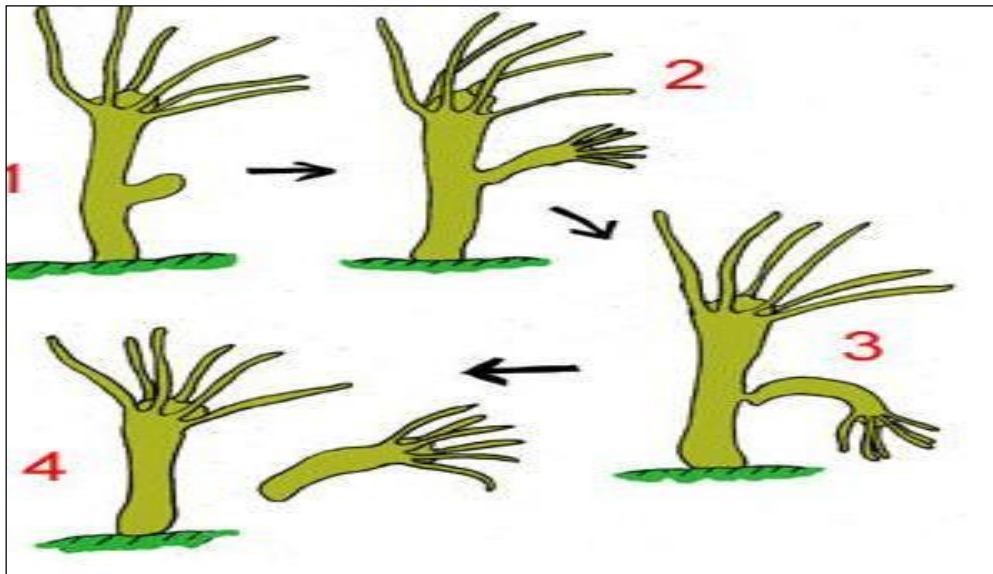
→ **Schizogony** : Formation of numerous daughter nuclei is followed by the formation of cytoplasmic buds, each contains a nucleus.

e.g. Plasmodium



3. Budding:

in which a new individual develops from some generative anatomical point of the parent organism, in some species buds may be produced from almost any point of the body but in many cases budding is restricted to specialized areas.



4. Plasmotomy:

Division of a multinucleate cell into multinucleate daughter cells. Cytoplasm divided into two or more masses.

Sexual reproduction:

1. Syngamy:

Is the complete and permanent fusion of the two sex cells gametes to form zygote which gives rise to adult and distinguished into following types:

Hologamy : The form of sexual reproduction in which the gametes are of the same size and structure as the somatic cells

Paedogamy : mutual fertilization of gametes ultimately derived from the same parent cell or gametangium

Isogamy: the fusion of two gametes of similar form, as in certain algae

Anisogamy: Sexual reproduction involving two types of gametes that differ in size

Macrogamy: syngamy between fully developed vegetative cells

Microgamy: syngamy between gametes much smaller than the vegetative cells

2. Conjugation:

Sexual process in which two lower organisms of the same species, such as protozoans exchange nuclear material during a temporary union completely transfer one or organism's contents to the other organism or fuse together to form one organism, the forms may or may not resemble each other in size, shape or mortality, they differ in some physiological or genetic characteristic

- **Plasmogamy:**

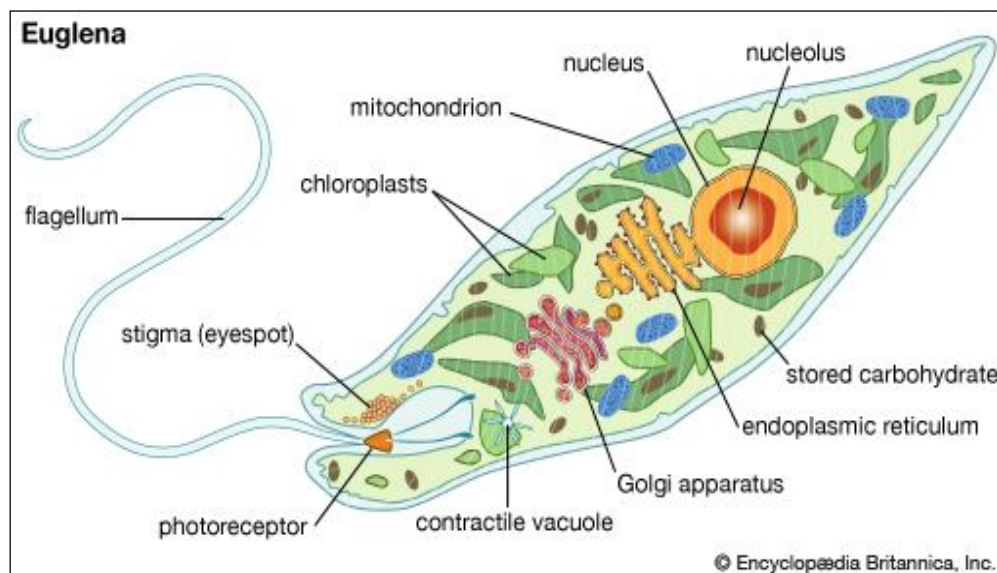
Fusion of two or more cells without fusion of nuclei. The purpose to kill the big size prey like *Paramecium* (that method not kind of reproduction).

Euglena

1. Bi-flagellated, unicell, spindle shape.
2. Most species have photosynthesizing, chloroplast within the body of cell, chloroplasts contain pyrenoid used in the synthesis of paramylon, a form of starch energy storage.

3. Have two flagella rooted in basal bodies located in small reservoir at the front of the cell, one of flagellum is very short while the other is long easily visible with light microscopy.
4. Posses red eye spot (stigma) an organelle composed of carotenoid pigment granules, the red spot itself is not through to be photosynthetic so that paraflagellar body it filters the sun light located at base of flagellum.
5. Like a cell wall instead it has pellicle, made of protein layer supported by structure of microtubules arranged in strips spiriting around the cell, pellicle give exception flexibility and contractility, there is no cellulose.
6. Euglenoids are found in many freshwater habitat and are most abundant in those.
7. Small and conspicuous contractile vacuole is located to one side of the reservoir into which it discharges, its function is osmoregulatory.
8. Binary fission the type of asexual reproduction that start by divide the cell

(*Euglena*) longitudinally beginning at the front end of the cell with the duplication of flagella processes, stigma cleavage from the anterior and (V) shaped moves toward the posterior until the two halves are anterior separated, sexual conjugation are rare.



Amoeba

1. They are so tiny so need microscope to see them.
2. Living in water, including lakes, Ponds, Streams, Rivers. Some can live in the bodies of animals.
3. Move by pseudopodia and they help *Amoeba* to eat.
4. 4- Reproduce by binary fission, it means that one *Amoeba* can split in half and make two identical new *Amoeba*.
5. Cytoplasm divided into two parts (Endoplasm & Ectoplasm) both enclosed within flexible plasma membrane.
6. Cell contains single granular nucleus containing DNA.
7. Contractile vacuole is used to maintain osmotic equilibrium by excreting excess water from the cell.
8. *Amoeba* obtains its food by phagocytosis and particles of organic matter, Or by Pinocytosis taking in dissolved nutrients through vesicles formed within the cell membrane.

