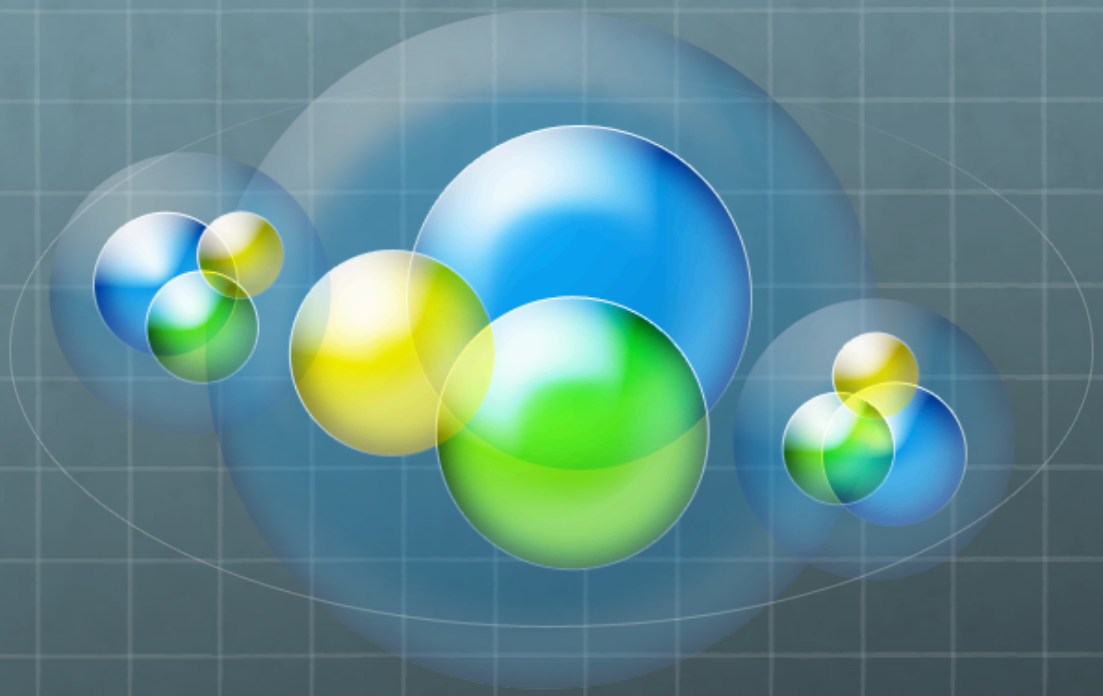


Asexual Reproduction

Mitosis

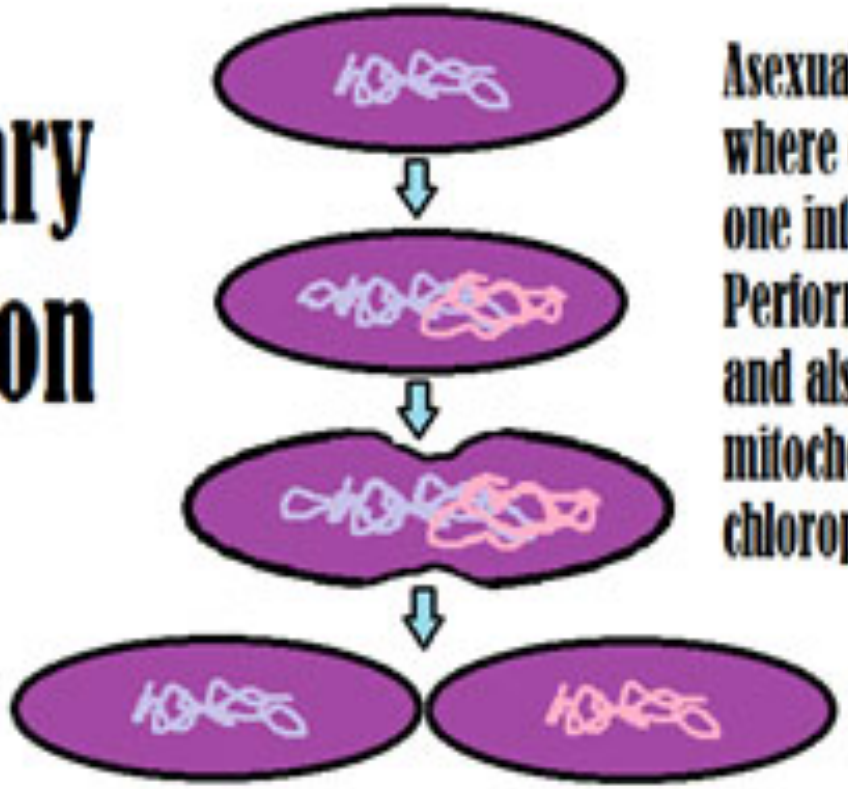
Asexual Reproduction

- A type of reproduction by which an offspring forms from a single organism and inherits its DNA from only one parent.
- Organisms produces off spring without fertilization.
- Offspring are genetically identical to the parent cell and are called daughter cells.
- Diploid – somatic cells are double in the number of chromosomes. Example: Humans have 46 chromosomes or 21 PAIRS.

Types of Asexual Reproduction

- <u>Fission</u> – Cell division of PROKAROTIC (no nucleus) that forms two identical cells.
  - DNA is copied
  - The cell begins to grow longer, pulling the two copies apart.
  - The cell membrane pinches inward in the middle of the cell.
  - Cell splits to form two new identical offspring.
  - Example: Bacteria reproduces by Fission

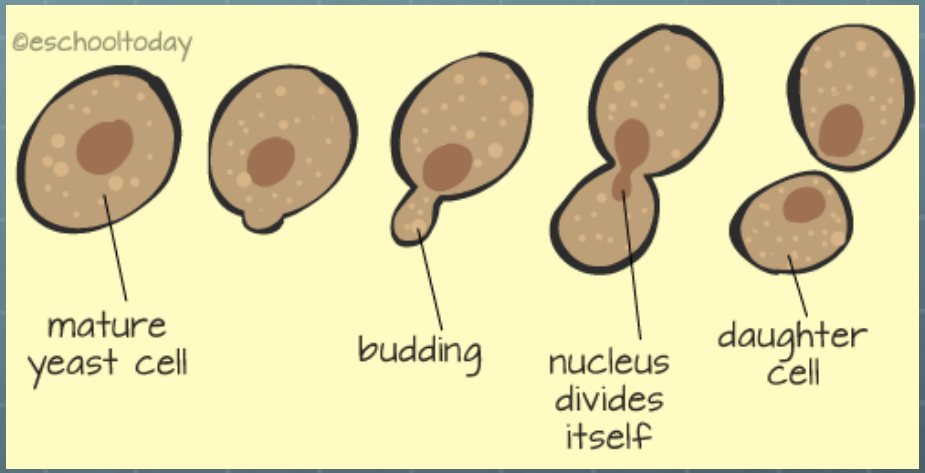
Binary Fission

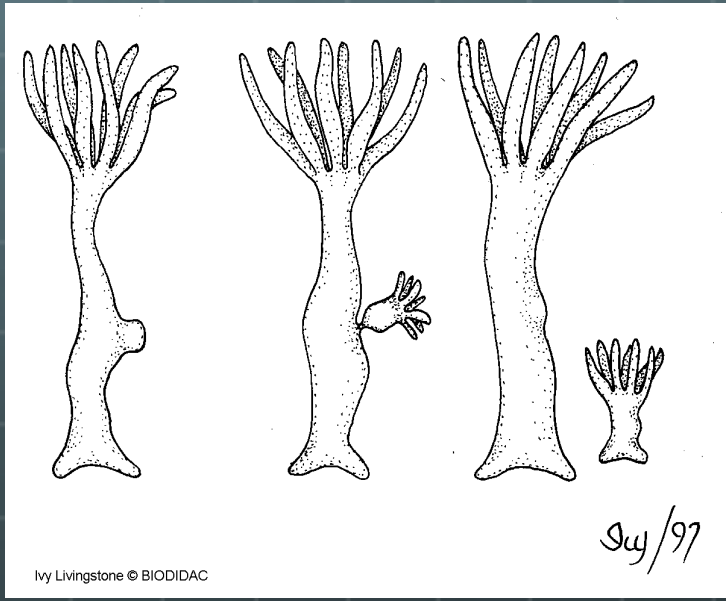


Asexual reproduction where cells split from one into two. Performed by bacteria and also organelles like mitochondria and chloroplasts.

Types of Asexual Reproduction

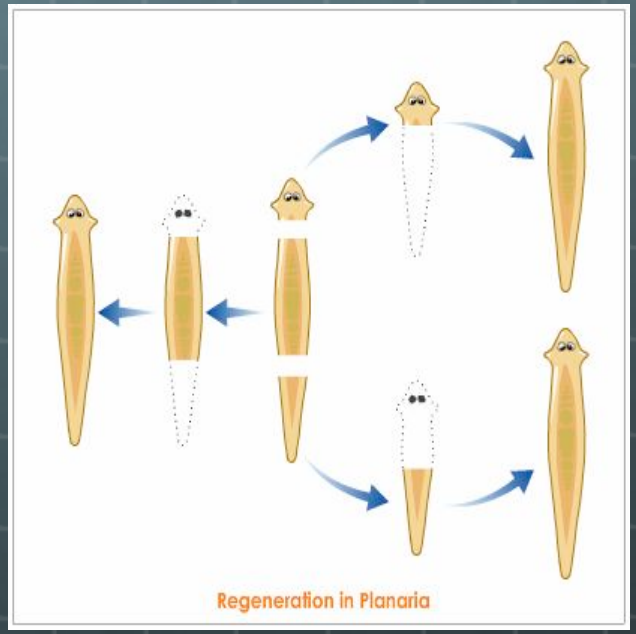
- Budding – a new organism grows by mitosis and cell division on the body of its parent.
  - The bud, or offspring is identical to the parent cell.
  - The bud, when large enough, can break off of the parent.
  - Offspring may remain attaches and form a colony.
  - Examples: Hydra, Cactus, Yeast

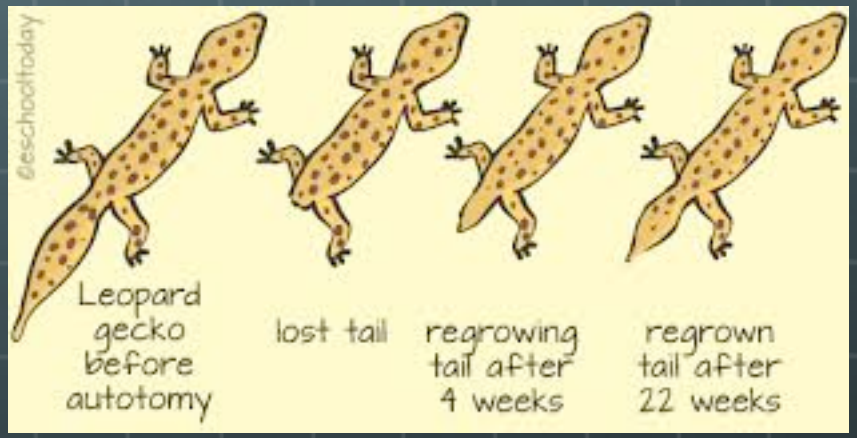

@eschooltoday
mature yeast cell
budding
nucleus divides itself
daughter cell


Ivy/97
Ivy Livingstone © BIODIDAC

Types of Asexual Reproduction

- Regeneration/Fragmentation
  - Regeneration occurs when an offspring grows from a piece of its parent through mitosis.
    - Producing new organisms: Sea Star
      - Sea urchins, sea cucumber, sponges, and planarians
    - Producing new body parts: Gecko
      - Newts, tadpoles, crab, hydra, and zebra fish
  - Fragmentation – the body of the parent breaks into distinct pieces, each of which can produce an offspring through mitosis.
    - Coral, star fish, plant cuttings

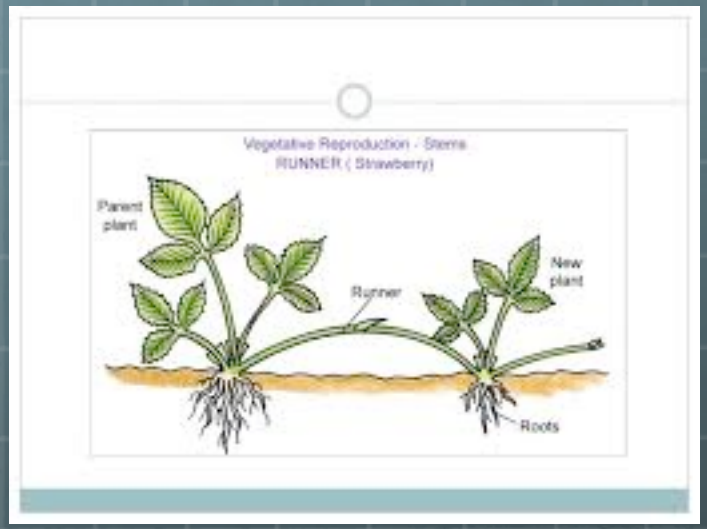

Regeneration in Planaria

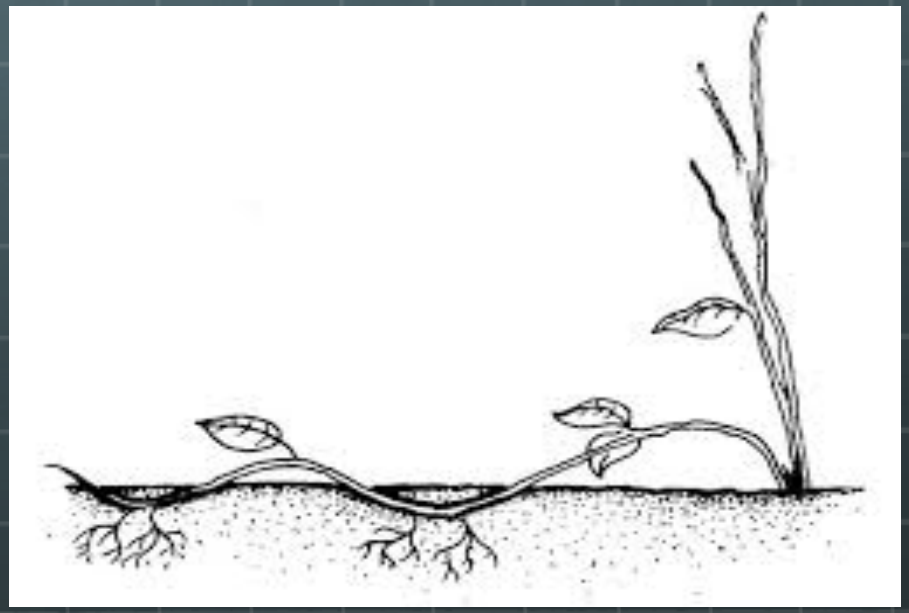

©eschooltoday
Leopard gecko before autotomy
lost tail
regrowing tail after 4 weeks
regrown tail after 22 weeks

Types of Asexual Reproduction

- Vegetative Propagation – uniform offspring grows from a parent plant through mitosis.
  - Parent sends out runners.
  - Where the runner touches the ground, roots can grow.
  - A new plant is produced even if the runner is broken apart.
  - Each new plant is uniform and identical to the parent.
  - Examples: strawberries, potatoes, ivy


Runner of mint
© J. P. Braselton


Vegetative Reproduction - Stems
RUNNER (Strawberry)
Parent plant
Runner
New plant
Roots



Asexual Reproduction

- **Advantages:**
  - **Does not require special cells.**
  - **Able to reproduce without a mate.**
  - **Faster: No wasted time or energy.**
  - **Enables organism to rapidly reproduce a large number of identical off spring.**
- **Disadvantages:**
  - Very <u>little</u> genetic variations.
  - <u>Limited</u> ability to adapt.
  - High risk of <u>extinction</u> if environment changes.
  - Dangerous <u>mutations</u> in DNA .