

Asexual Reproduction

- Some organisms reproduce through the process of mitosis
- Some organisms can even regenerate missing body parts (again through mitosis)
- There are 5 general types of asexual reproduction

Binary Fission

- The one-celled organism simply splits into two daughter cells which are identical to the parent
 - Bacteria, some fungi, algae

Budding

- Similar to binary fission, but occurs in plants and animals that are multicellular
- A small version of the organism forms and grows on the parent
- When large enough, the “daughter” breaks off and continues to grow on its own
 - Yeast, Hydra

Sporulation

- The organism produces spores (reproductive cells) by mitosis
- The spores are released to form new organisms where they land
- The new organisms are identical to their parent
 - Mould, some algae

Regeneration

- A new organism grows from a fragment of the parent
- Each fragment develops into a mature, fully grown individual
 - some annelid worms, sea stars, some fungi

Vegetative Propagation

- Plants produce new individuals without the production of seeds
 - Formation of miniaturized plants called plantlets
 - Produce new plants out of runners
 - Strawberry
 - Forming bulbs
 - Tulip

- Plants that reproduce vegetatively may form a clonal colony, where all the individuals are clones, and the clones may cover a large area
 - Dandelions
 - Roots divide through mitosis

Applications of Asexual Reproduction

- Plants can repair and regenerate themselves through mitosis
 - When you mow the grass it grows back
 - Pruned bushes grow out again
 - A cutting of a plant will grow
- We can use this ability to produce more plants identical to what already exist
 - cloning

Cuttings

- A portion of the plant is cut off and then planted
- The cutting will then regenerate roots and continue to grow

Layering

- A portion of a stem grows roots while still attached to the parent plant and then detaches as an independent plant
- Natural layering typically occurs when a branch touches the ground

- “Artificial” horticultural layering process typically involves wounding the target region to expose the inner stem
- In **ground layering**, the stem is bent down and the target region buried in the soil
- The rooting process may take from several weeks to a year

Grafting

- Used by gardeners to propagate plants, especially fruit trees
- A piece of one plant (it could be as small as a bud) is joined onto the top of another plant
- It continues to grow and eventually produce flowers and fruit

- Sometimes more than one variety of apple, for instance, may be grafted onto one tree