Plant Reproduction

I. MODES OF REPRODUCTION:

A. Asexual Reproduction – the production of offspring involving only one parent

1. Advantages:

a. allows organisms to reproduce & disperse rapidly

b. is more efficient because it requires fewer resources & less energy

c. no mate is needed (good for small populations)

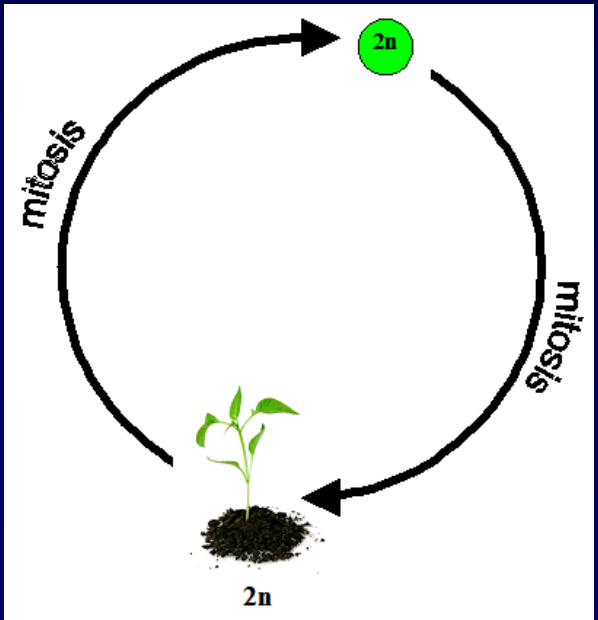
d. all offspring are exact copies of parents and can thrive in the parent's environment

2. **Disadvantages:**

   a. lack of genetic diversity can lead to extinction

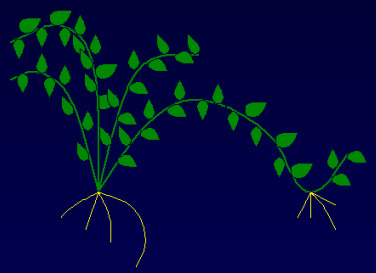
3. **Types of Asexual Reproduction:**

   a. **Cloning** = identical offspring arise via mitosis from a single parent

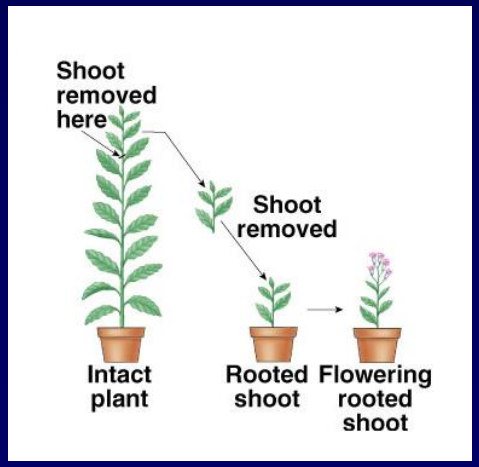


b. Vegetative Propagation = new plants are created from adult meristematic tissues

i. ***Natural*** = meristematic tissue from plants form a new plant (roots & stems)



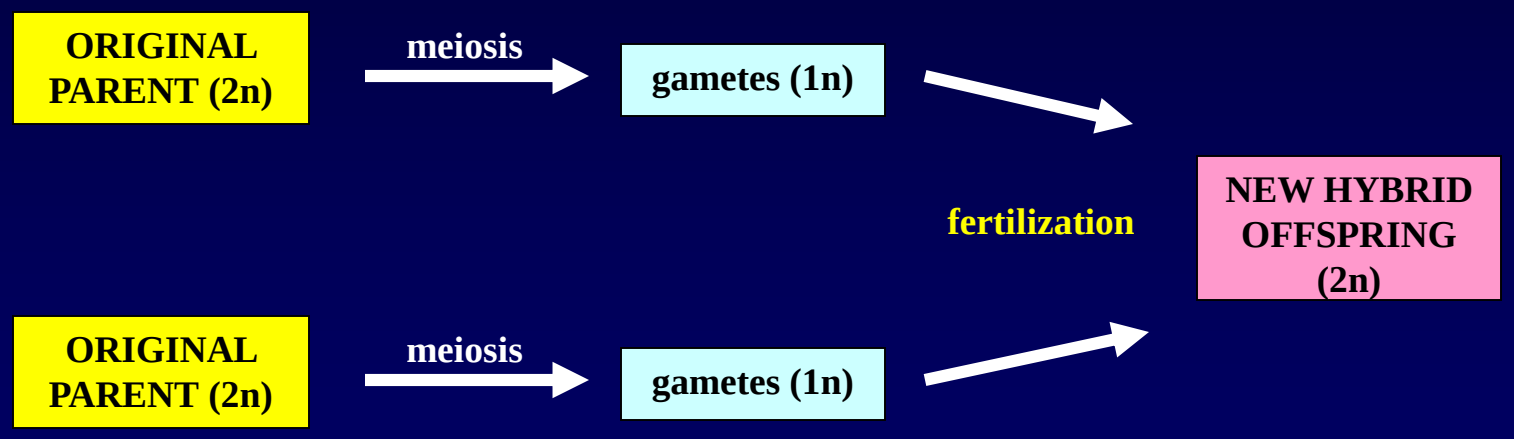
ii. ***Artificial*** = a meristematic portion of a plant is removed & planted; often used in agriculture (cuttings)



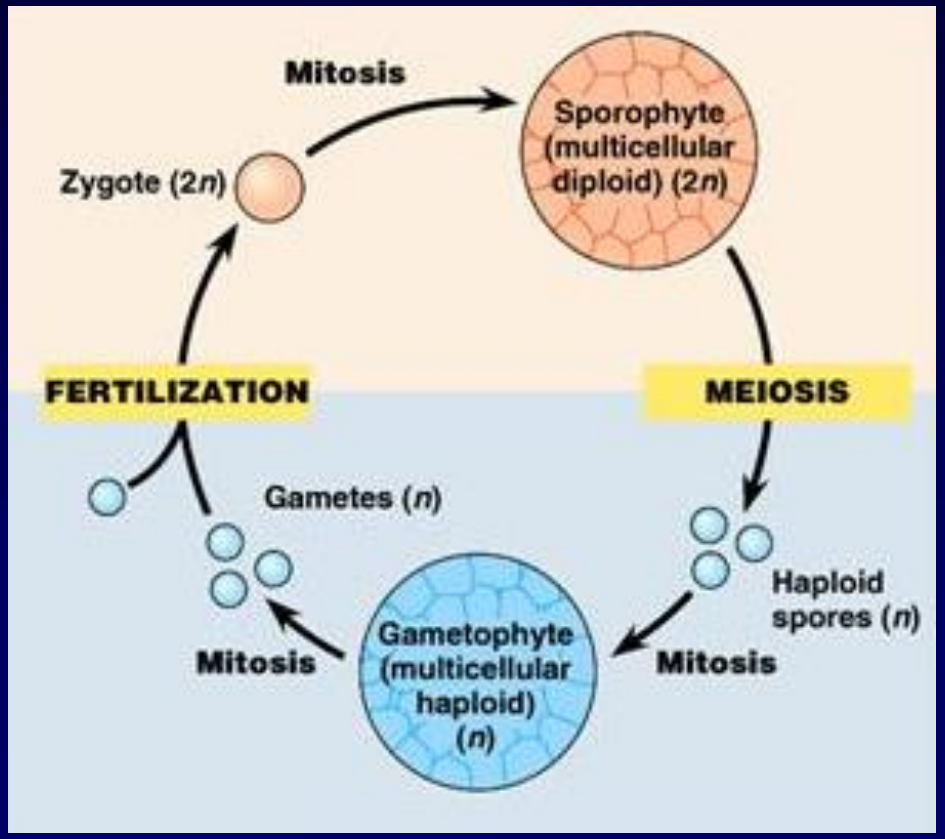
B. SEXUAL REPRODUCTION = gametes (1n) formed via meiosis from different parents fuse together to create a genetic hybrid (2n)

$$1n + 1n = 2n$$

Vascular Plants:



1. **Alternation of Generations** = the specific type of sexual reproduction used in all plants that includes both diploid (2n) and haploid (1n) phases



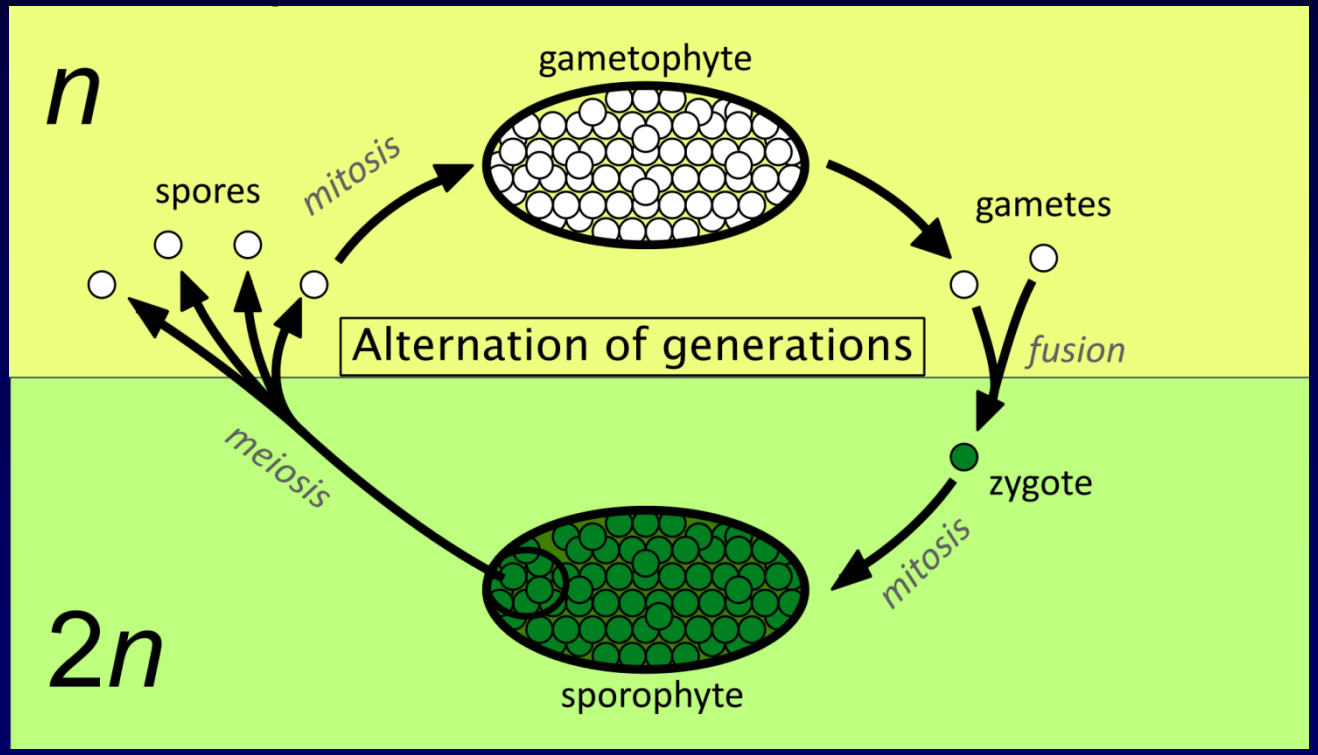
a. **Sporophyte Generation (2N)** – the flower

- is the **diploid** generation
- undergoes meiosis to **form haploid spores**
- the spores develop into the haploid gametophyte

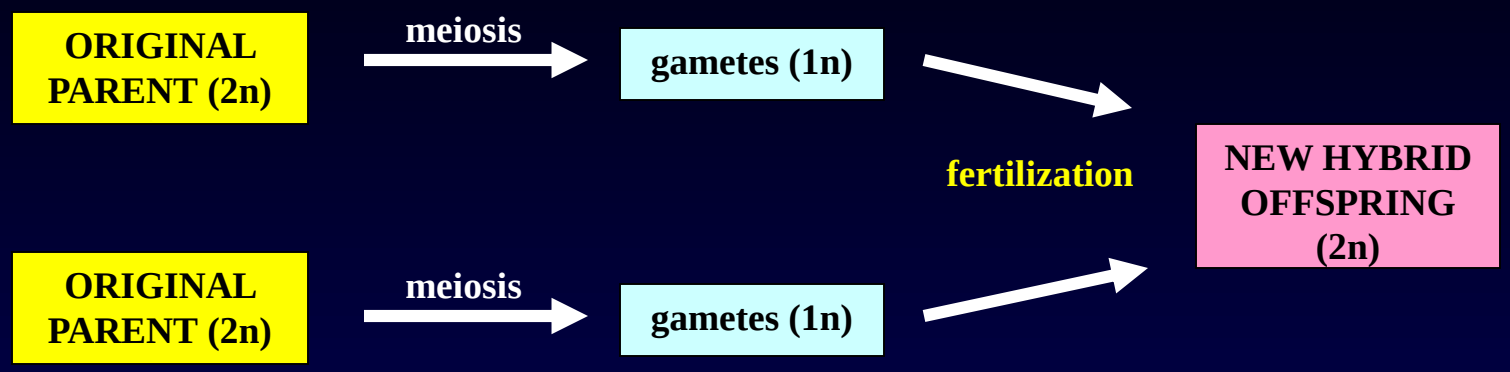
b. **Gametophyte Generation (1N)** – the plant

- is the **haploid** generation
- undergoes mitosis to **form gametes** (egg/sperm)
- haploid gametes fuse to form a diploid zygote
- the zygote undergoes mitosis to develop into the diploid sporophyte

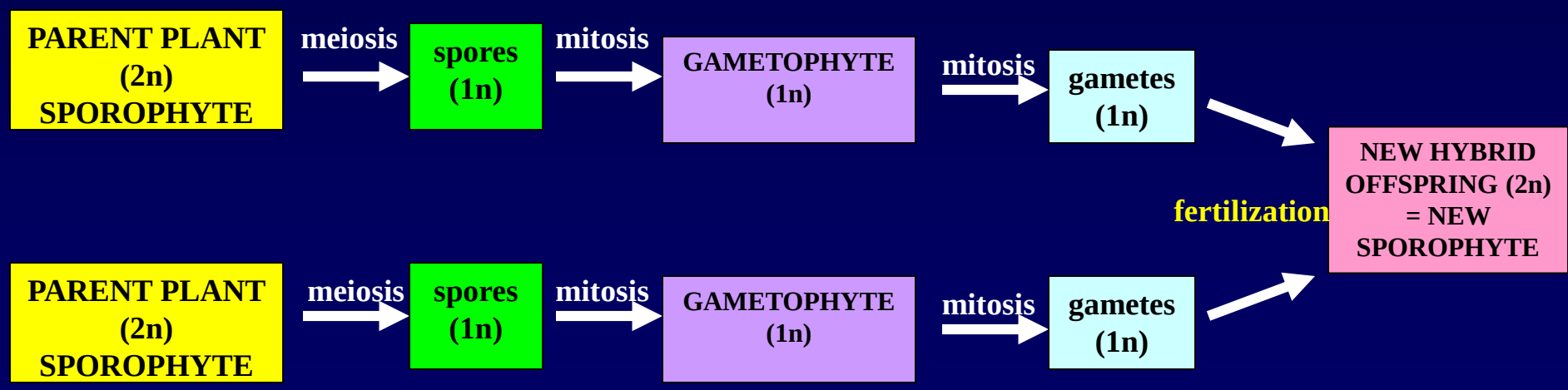
ALTERNATION OF GENERATIONS VIDEO CLIP



Vascular Plants:



Non-Vascular Plants:



2. **Advantages:**

   a. accelerates adaptation by creating new genetic combinations

   b. provides potential to colonize new types of environments

   c. allows adaptation to changing conditions

   d. can speed up the loss of deleterious genes (known as purging)

3. **Disadvantages:**

   a. slow process that requires a lot of time & energy

   b. it takes two to tango (finding a mate/gametes can be difficult)