**CONCEPT:** DEVELOPMENT OF PLANT GAMETES

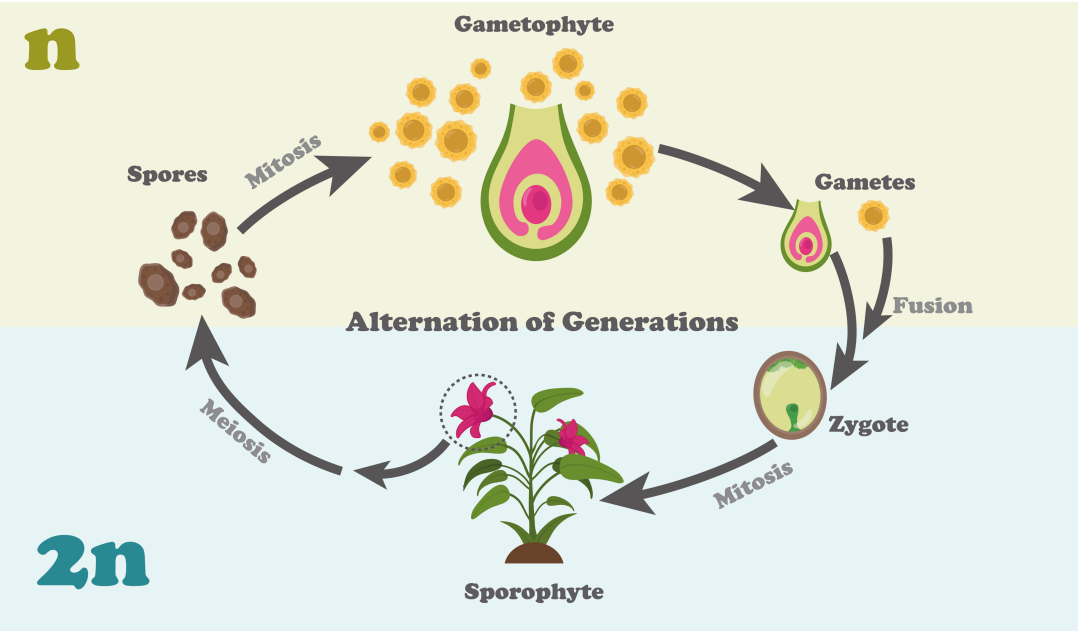
- When it comes to plants, there is a lot of different _____
  - □ **Unisexual** or **dioecious** or **gonochoric** means that the organisms contains male OR female organs
  - □ **Bisexual** or **monoecious** or **hermaphroditic** means that the organism contains male AND female organs
  - □ **Intersex** refers to organisms with an intermediate sexual condition. These organisms are usually sterile
  - □ There are two types of sexual differentiation
    - **Primary sexual differentiation** refers to the types of gametes produced in the sexual organs
    - **Secondary sexual differentiation** refers to the overall sexual appearance of the organism

**EXAMPLE:**

Formation of Plant Gametes

- Plants, like animals have two life stages: the haploid (**gametophyte)** and diploid (**sporophyte)** stages
  - □ Both the gametophyte and the sporophyte are used to create _____
    - Haploid **spores** are created via meiosis of the sporophyte
    - The spores undergo mitosis to create gametes
  - □ The structures of the sporophyte and gametophyte a different
    - The flower is the sporophyte, and the gametophyte is only a few haploid cells within the flower

**EXAMPLE:**



□ The plant can contain both male and female _____

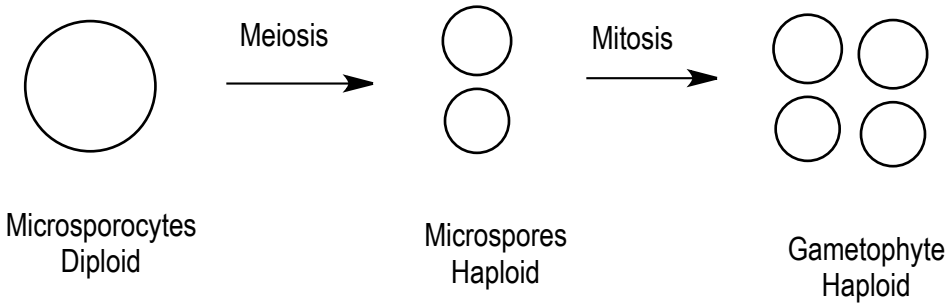
- The male *stamen* contains **microsporocytes** (diploid) – undergo meiosis to form haploid **microspores**

- Microspores undergo mitosis to produce haploid pollen (gametophyte), with 2 nuclei

- The female *stigma* contains **megasporocytes** (diploid) – undergo meiosis to form haploid **megaspores**

- Only one survives – it divides via mitosis to create eight haploid nuclei (gametophyte)

**EXAMPLE:**




□ Fertilization occurs when the pollen lands on the stigma

- Fertilization between the pollen and female gametophyte (embryo sac) creates a diploid zygote

Chlamydomonas Reproduction

● *Chlamydomonas* is an algae that has an interesting life cycle

□ For most of its life, it is a haploid organism which _____ reproduces via mitosis

□ Certain conditions result in fusion of two haploid organisms creating a diploid organism

- Meiosis occurs when the condition is removed producing **zoospores**, which are haploid daughter cells

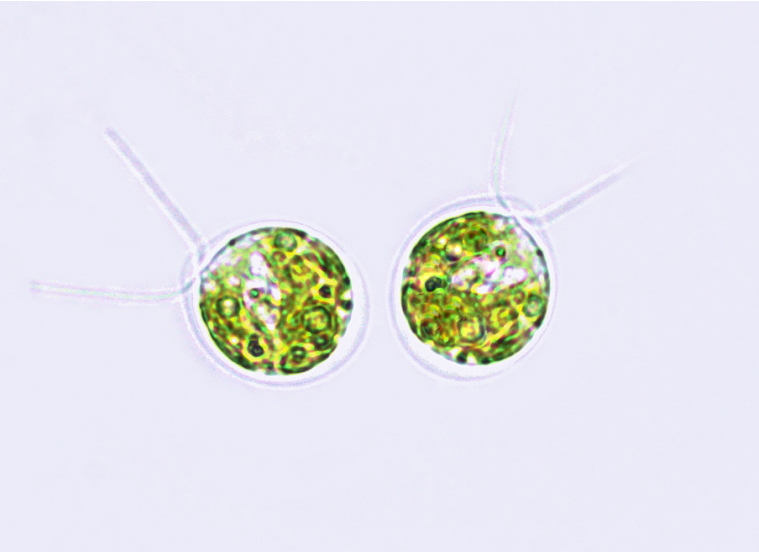
□ Not all *chlamydomonas* organisms are able to _____

- There are two **mating types:** $mt^+$ and $mt^-$

- $Mt^+$ mates only with $mt^-$ cells

- The two types are **isogametes**, meaning that they are morphologically indistinguishable

**EXAMPLE:**



**PRACTICE:**

1. Which of the following terms can be used to describe an organism that contained either male or female sex organs, but not both.
    a. Bisexual
    b. Unisexual
    c. Intersex
    d. Sexually differentiated

2. Which of the following is the diploid life cycle stage in plants?
    a. Gametophyte
    b. Spores
    c. Sporophyte
    d. Gametes

3. In the alternations of generations life cycle, which cellular division process is used to create gametes?
    a. Meiosis
    b. Mitosis

4. Microsporocytes undergo which cellular process to form microspores?
    a. Meiosis
    b. Mitosis

5. True or False: Megaspores are created in the male stamen.
    a. True
    b. False