**Plant reproduction lect 2**

**Plant reproduction is the production of new individuals or** [**offspring**](https://en.wikipedia.org/wiki/Offspring) **in** [**plants**](https://en.wikipedia.org/wiki/Plant)**, which can be accomplished by sexual or** [**asexual**](https://en.wikipedia.org/wiki/Asexual_reproduction) **reproduction.**

* Sexual reproduction

**Unlike animals, plants are immobile, and cannot seek out sexual partners for reproduction. In the evolution of early plants, abiotic means, including water and wind, transported** [**sperm**](https://en.wikipedia.org/wiki/Sperm) **for reproduction .**

[**Sexual reproduction**](https://en.wikipedia.org/wiki/Sexual_reproduction) **: produces offspring by the fusion of** [**gametes**](https://en.wikipedia.org/wiki/Gamete)**, resulting in offspring genetically different from the parent or parents.**

**Sexual reproduction involves two fundamental processes:**

**\*Meiosis (from** [**Greek**](https://en.wikipedia.org/wiki/Greek_language) **μειώσεις, *meiosis*, which means lessening) is a specialized type of** [**cell division**](https://en.wikipedia.org/wiki/Cell_division) **that reduces the** [**chromosome**](https://en.wikipedia.org/wiki/Chromosome) **number by half, creating four** [**haploid cells**](https://en.wikipedia.org/wiki/Haploid_cells)**, each genetically distinct from the parent cell that gave rise to them.** **which rearranges the** [**genes**](https://en.wikipedia.org/wiki/Gene) **and reduces** **the number of** [**chromosomes**](https://en.wikipedia.org/wiki/Chromosome).

 **This process occurs in all** [**sexually reproducing**](https://en.wikipedia.org/wiki/Sexual_reproduction) **single-celled and** [**multicellular**](https://en.wikipedia.org/wiki/Multicellular_organism)[**eukaryotes**](https://en.wikipedia.org/wiki/Eukaryote)**, including** [**animals**](https://en.wikipedia.org/wiki/Animal)**,** [**plants**](https://en.wikipedia.org/wiki/Plant)**, and** [**fungi**](https://en.wikipedia.org/wiki/Fungi)**.**

**\*** [**Fertilization**](https://en.wikipedia.org/wiki/Fertilisation) **is the fusion of** [**gametes**](https://en.wikipedia.org/wiki/Gametes) **to initiate the development of a** **new individual** [**organism**](https://en.wikipedia.org/wiki/Organism) **which restores the chromosome to a complete** [**diploid**](https://en.wikipedia.org/wiki/Diploid) .**The cycle of fertilization and development of** **new individuals is called** [**sexual reproduction**](https://en.wikipedia.org/wiki/Sexual_reproduction). **During double fertilization in angiosperms the haploid male gamete combines with two haploid polar nuclei to form a triploid primary endosperm nucleus by the process of vegetative fertilization.**

**\*** [**Asexual reproduction**](https://en.wikipedia.org/wiki/Asexual_reproduction)

**Asexual reproduction produces new individuals without the fusion of gametes, genetically identical to the parent plants and each other, except when** [**mutations**](https://en.wikipedia.org/wiki/Mutations) **occur. In** [**seed plants**](https://en.wikipedia.org/wiki/Seed_plant)**, the offspring can be packaged in a protective** [**seed**](https://en.wikipedia.org/wiki/Seed)**, which is used as an agent of dispersal.**

**Asexual reproduction may happen through** **:**

1. [**budding**](https://en.wikipedia.org/wiki/Budding) **is a type of** [**asexual reproduction**](https://en.wikipedia.org/wiki/Asexual_reproduction) **in which a new organism develops from an outgrowth or bud due to cell division at one particular site. The small bulb like projection coming out from the yeast cell is called a bud** .
2. **Fragmentation or clonal fragmentation in multi cellular or colonial organisms is a form of asexual reproduction or cloning in which an organism is split into fragments. Each of these fragments develop into mature, fully grown individuals that are clones of the original organism.**
3. **Fission , in biology, is the division of a single entity into two or more parts and the regeneration of those parts into separate entities resembling the original. The object experiencing fission is usually a** [**cell**](https://en.wikipedia.org/wiki/Cell_%28biology%29)**, but the term may also refer to how** [**organisms**](https://en.wikipedia.org/wiki/Organism)**, bodies,** [**populations**](https://en.wikipedia.org/wiki/Population)**, or** [**species**](https://en.wikipedia.org/wiki/Species) **split into discrete parts. The fission may be *binary fission*, in which a single entity produces two parts, or *multiple fission*, in which a single entity produces multiple parts.**
4. **Sporogenesis : is the production of** [**spores**](https://en.wikipedia.org/wiki/Spore) **in** [**biology**](https://en.wikipedia.org/wiki/Biology)**. The term is also used to refer to the process of** [**reproduction**](https://en.wikipedia.org/wiki/Reproduction) **via spores. Reproductive spores were found to be formed in** [**eukaryotic**](https://en.wikipedia.org/wiki/Eukaryote) **organisms, such as** [**plants**](https://en.wikipedia.org/wiki/Plant)**,** [**algae**](https://en.wikipedia.org/wiki/Algae) **and** [**fungi**](https://en.wikipedia.org/wiki/Fungus)**, during their normal reproductive** [**life cycle**](https://en.wikipedia.org/wiki/Biological_life_cycle)**.**
5. **Vegetative reproduction (also known as vegetative propagation, vegetative multiplication or vegetative cloning) is any form of asexual reproduction occurring in plants in which a new plant grows from a fragment of the parent plant or grows from a specialized reproductive structure (such as a stolon, rhizome, tuber, corm, runner, offset or bulb).**

**\* Plant reproductive morphology**

**is the study of the physical form and structure (the** [**morphology**](https://en.wikipedia.org/wiki/Plant_morphology)**) of those parts of plants directly or indirectly concerned with** [**sexual reproduction**](https://en.wikipedia.org/wiki/Sexual_reproduction).

**Among all living organisms,** [**flowers**](https://en.wikipedia.org/wiki/Flower)**, which are the reproductive structures of** [**angiosperms**](https://en.wikipedia.org/wiki/Flowering_plants)**,** **are the most varied physically and show a correspondingly great diversity in methods of reproduction.**

**Plants that are not flowering plants** ([**green algae**](https://en.wikipedia.org/wiki/Green_alga)**,** [**mosses**](https://en.wikipedia.org/wiki/Moss)**,** [**liverworts**](https://en.wikipedia.org/wiki/Marchantiophyta), [**hornworts**](https://en.wikipedia.org/wiki/Hornworts)**,** [**ferns**](https://en.wikipedia.org/wiki/Fern) **and** [**gymnosperms**](https://en.wikipedia.org/wiki/Gymnosperm) **such as** [**conifers**](https://en.wikipedia.org/wiki/Conifer)**)** **also have complex interplays between morphological adaptation and environmental factors in their sexual reproduction. The breeding system, or how the sperm from one plant fertilizes the ovum of another, depends on the reproductive morphology, and is the single most important determinant of the genetic structure of monoclonal plant populations.**

* **Flowering plants**
* **Basic flower morphology**



 **Flower of *Ranunculus glaberrimus***

**The** [**flower**](https://en.wikipedia.org/wiki/Flower) **is the characteristic structure concerned with sexual reproduction in flowering plants (angiosperms). Flowers vary enormously in their construction (morphology).**

**A "complete" flower, like that of** [***Ranunculus glaberrimus***](https://en.wikipedia.org/wiki/Ranunculus_glaberrimus) **shown in the** **figure, has a** [**calyx**](https://en.wikipedia.org/wiki/Calyx_%28botany%29) **of outer** [**sepals**](https://en.wikipedia.org/wiki/Sepal) **and a** [**corolla**](https://en.wikipedia.org/wiki/Corolla_%28flower%29) **of inner** [**petals**](https://en.wikipedia.org/wiki/Petal). **The sepals and petals together form the** [**perianth**](https://en.wikipedia.org/wiki/Perianth) **Next inwards there are** **numerous** [**stamens**](https://en.wikipedia.org/wiki/Stamen), **which produce** [**pollen**](https://en.wikipedia.org/wiki/Pollen) **grains, each containing a** **microscopic male gametophyte. Stamens may be called the "male" parts of a flower and collectively form the androecium. Finally in the middle there are** [**carpels**](https://en.wikipedia.org/wiki/Gynoecium), **which at maturity contain one or more** [**ovules**](https://en.wikipedia.org/wiki/Ovule)**, and within each ovule is a tiny female gametophyte.**

**Carpels may be called the "female" parts of a flower and collectively form the gynoecium**.