Reproduction in plants

Have u ever wonderd how the reproduction process happens in plant? It can be done in 2 different ways:

Sexual reproduction asexual reproduction

 Asexual reproduction is **a mode**

**of reproduction in which a new**

**offspring is produced by a**

**single parent**. The new

individuals produced are

genetically and physically identical

to each other, i.e., they are the

clones of their parents

the production of new

living organisms by combining

genetic information from two

individuals of different types ([sexes](https://www.google.com/search?rlz=1C1GCEU_enJO946JO946&q=sexes&si=AEcPFx6b5qnVunj5T-U8YS-AVZeQtCgqgJ8-Ei-J4ank8w1J0n4qvIa3VtazA5bYrZO3VmnLLrcS9lE1cQCj-TrWhqXYI-Z2kg%3D%3D&expnd=1)).

In most higher organisms, one sex (male) produces a

small [motile](https://www.google.com/search?rlz=1C1GCEU_enJO946JO946&q=motile&si=AEcPFx5wn31H4NEqJJOA5dASiILLGYE9j2g7n3XLWhAhKZP92DqcM18LL7jTy0SeJJp12gb34fYx-gOlpaaccp0s_vqXY-PjoA%3D%3D&expnd=1) [gamete](https://www.google.com/search?rlz=1C1GCEU_enJO946JO946&q=gamete&si=AEcPFx5wn31H4NEqJJOA5dASiILLnY0tYPagCqnDpMixY3RrQUHyeHMGJct6Do8Y7VEzZVlghbOxgSK5Q7DFBXtUDvMgasRdzg%3D%3D&expnd=1) which travels to

fuse with a larger stationary gamete

produced by the other (female).

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|  | Examples | | |
| Asexual reproduction | Strawberry plants reproduce using stolons. | Potato plants reproduce using tubers | Garlic, onions and tulip plants all reproduce using true bulbs. |

What are some real examples of sexual and asexual reproduction?

Diagram

Description automatically generated

What are the the parts of an insect pollinated plant? and what is their functions?

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| --- | --- |
| Name of parts | functions |
| Sepals | The sepal is a defensive organ that **encloses and protects the developing reproductive structures**. |
| Petals | The petals **attract pollinators**, and the sepal and bract often support the flower. |
| Stamens | **transmits water and nutrients to the anther and positions it to aid pollen dispersal**. |
| Filaments | to **carry nutrients to the anther for the development of the anther and pollen grains.** |
| Anthers | The anther is the male reproductive organ in seed plants. Its main function is to **produce and disperse pollen.** |
| carpels | to **ensure its protection, an efficient fertilization, and the development of diversified types of fruits** |
| style | it not only **generates the pollen tube but also prevents incompatible pollen from entering the ovary**. |
| Stigma | Its main function is to **attract the pollen grains from the air with its sticky tip for reproduction to take place**. |
| Ovary | They **produce eggs for fertilization and they make the hormones estrogen and progesterone** |
| Ovules | **production via meiosis of the female gametophyte with the egg cell** |

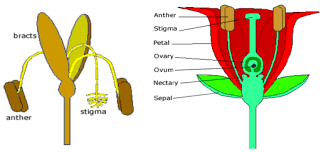
What are the structural adaptations of insect pollinated and wind pollinated flowers?

**Insect pollinated plants :**

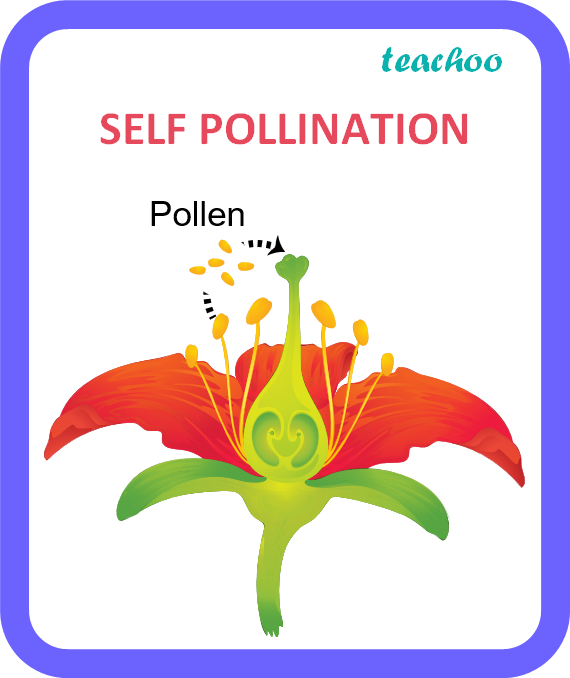
In insect-pollinated flowers, **the produced pollen grains are larger in size, sticky and spiny**, which helps the insect to carry the pollen grains. Stigma is feathery or sticky and found hanging out of petals. Stigma is small and is situated deep inside the petals. The stamens are long and visible out of the petals.

**Wind pollinated flowers :**

Anemophilous, or wind pollinated flowers, are **usually small and inconspicuous, and do not possess a scent or produce nectar**. The anthers may produce a large number of pollen grains, while the stamens are generally long and protrude out of flower.

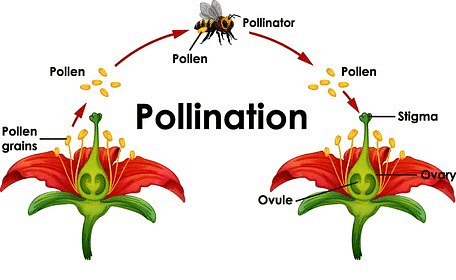


**Self-pollination**: **is** **the transfer of pollen from the anther of a flower to the stigma of the same flower or sometimes to that of a genetically identical flower (as of the same plant or clone)**



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**Cross pollination:** is the process of applying pollen from one flower to the pistils of another flower. Pollination occurs in nature with the help of insects and wind. This process can also be done by hand to produce offspring with desired traits, such as colour or pest resistance.



Advantages of self-pollination :

* Self-pollination helps to maintain parental characters or purity of the species.
* The plant does not need to depend on the pollinating agents.
* No need of producing a large number of pollen grains.
* Flowers do not need to develop devices for attracting insect pollinators.
* It ensures seed production.

Disadvantages of self-pollination:

* The seeds are in smaller quantities.
* New plant varieties cannot be created. Because the endosperm is so little, the seeds produced are feeble.
* The immunity of the offspring decreases if new characteristics are not introduced.



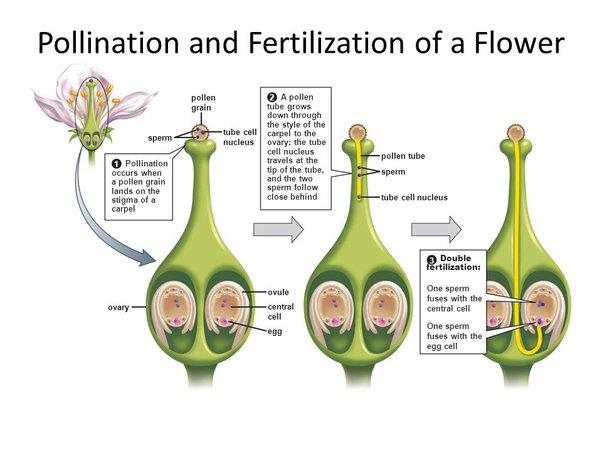
https://www.google.com/search?q=pollination&tbm=isch&ved=2ahUKEwiSoNzpksL9AhV\_TKQEHZTcAcMQ2-cCegQIABAA&oq=pollination&gs\_lcp=CgNpbWcQAzIECAAQQzIECAAQQzIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEOggIABCABBCxA1D1BVizNWC0N2gAcAB4A4ABoQGIAbQekgEEMC4zMpgBAKABAaoBC2d3cy13aXotaW1nsAEAwAEB&sclient=img&ei=RSgDZNJp\_5iR1Q-UuYeYDA&bih=632&biw=1422&rlz=1C1GCEU\_enJO946JO946#imgrc=-okDpnyri6IPJM

Advantages of cross pollination:

* New varieties are created as a result of cross-pollination.
* Seeds are produced in more significant quantities and are more viable.
* Healthier offsprings are produced.

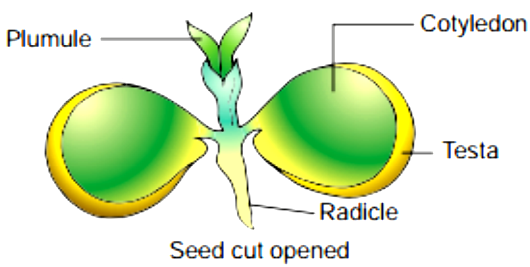
Disadvantages of cross pollination:

* Pollen grains are being wasted in more significant quantities.
* Because of the distance barrier, pollination may fail.
* Cross-pollination has the potential to introduce undesirable traits.
* It is uneconomical for plants to create huge, scented, nectar-filled flowers to attract insects.



https://www.google.com/search?q=fertilization+in+plants&tbm=isch&ved=2ahUKEwiC743mksL9AhU9WKQEHYa9AVQQ2-cCegQIABAA&oq=fertilization+in+plants&gs\_lcp=CgNpbWcQAzIECAAQQzIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgUIABCABFDoBFiPHmC3IGgAcAB4AIABeYgBngmSAQQxLjEwmAEAoAEBqgELZ3dzLXdpei1pbWfAAQE&sclient=img&ei=PSgDZMLcGr2wkdUPhvuGoAU&bih=632&biw=1422&rlz=1C1GCEU\_enJO946JO946#imgrc=hkTE7Jb-avu\_rM

**Parts of the seeds:**



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|  | Functions |
| plumule | **Since the plumule forms the shoot of the plant, it is responsible for performing photosynthesis.** |
| Testa | **The testa of higher plant seeds protects the embryo against adverse environmental conditions.** |
| Radicle | **Radicle is capable of absorbing water from the soil** |
| Cotyledons | **The function of Cotyledons is to store food for the growing embryo.** |

Germination : the development of a plant from a seed or [spore](https://www.google.com/search?rlz=1C1GCEU_enJO946JO946&q=spore&si=AEcPFx6b5qnVunj5T-U8YS-AVZeQQE7lAtsZiNV2jeClZ5K2ichUzbweolstMdIp_qItq4yPgA1GU6xUUyX3sBZAarU17irsTA%3D%3D&expnd=1) after a period of [dormancy](https://www.google.com/search?rlz=1C1GCEU_enJO946JO946&q=dormancy&si=AEcPFx6giEFwMtc5-VlsuZjQBEMyaBBD5Ei98dYx--242be-cIP3uRGG4eSbuIB8BwIgkKSQYezegUa-p0mIoA3SMAeUmJYQYg%3D%3D&expnd=1).

Factors that affect germination:

1. Water
2. Oxygen
3. Temperature

Oxygen: Seeds need oxygen so that they can produce energy for germination and growth. The embryo gets energy by breaking down its food stores. Like all organisms, this is done through a process known as aerobic respiration. A series of reactions where energy is released from glucose, using oxygen.

Water: Water plays an important role in seed germination. It helps by providing necessary hydration for the vital activities of protoplasm, provides dissolved oxygen for the growing embryo, softens the seed coats and increases the seed permeability.

Temperature: Temperature affects germination in three primary ways: moisture, hormone production, and enzyme activity. For seeds to germinate, they need to imbibe water. For this to occur, sufficient moisture must be present. A warmer climate may increase evaporation and decrease moisture, which would negatively affect germination.

https://underc.nd.edu/assets/156376/fullsize/dove2010.pdf