# POLLINATION AND FERTILIZATION IN PLANTS:

# Reproduction in plants

- What is the meaning of reproduction process?and what is the importance of it?
- What are the ways of reproduction in plants?
- What is the difference between sexual and Asexual reproduction?
- What is the meaning of"pollination?"
- Whar are the types of pollination in plants?and what are the factors affect these types?
- How can we differentiate between the pollination types?and when do they occure?
- What are the stages which the pollen grain passes Until the zygot produced?
- How are the seed and the fruit produced?

We all know that most of the food we eat comes from seeds, planted in fields or orchards, but have you ever thought about where the seeds themselves come from? Have you ever admired the inside of a beautiful flower? Believe it or not, these two questions are connected! Keep reading to learn about the different ways plant can

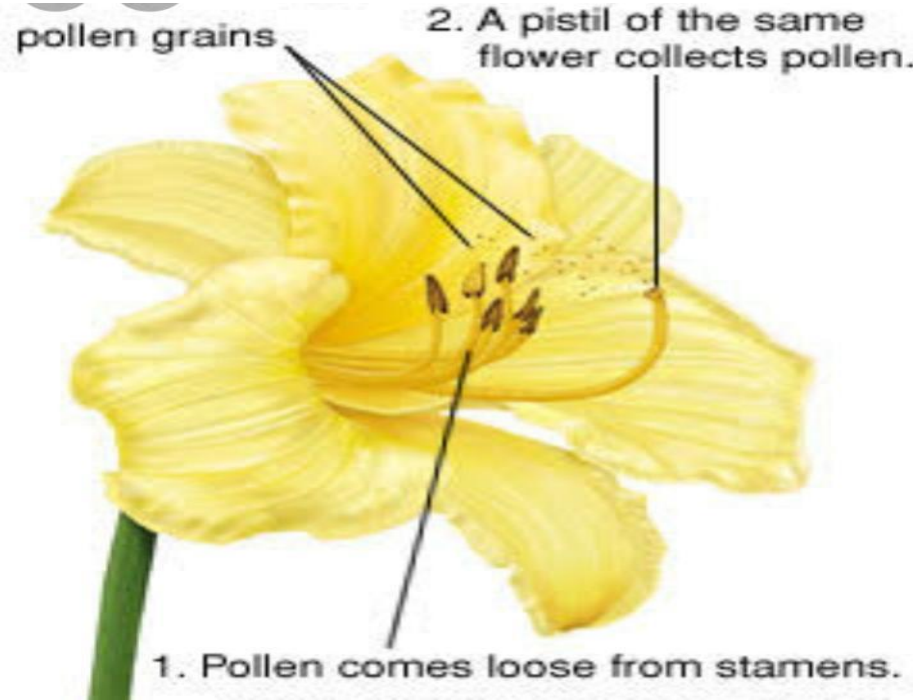
# The meaning of reproduction

- This is the process in which new individuals are produced

Have you ever ask your self about the importance of this process?

Producing new individuals to prevent the living organisms from exitinction

Continiuty of life.



# The ways of reproduction in plants

- Have we ever ask our selves about how do Non flowering plants reproduce?

Through another parts such as stem or roots .....like what?

What we call this type of reproduction?

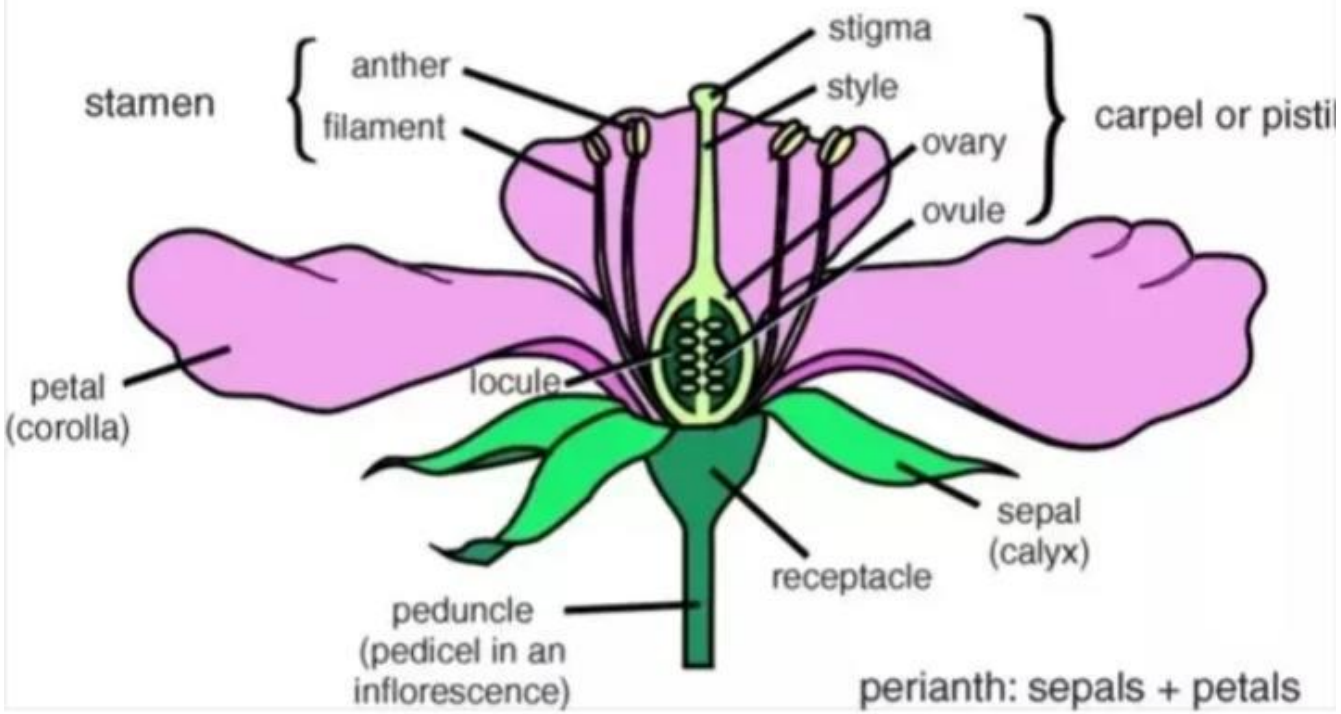
Then the flowering plants how can it reproduce?

through their sexual parts?

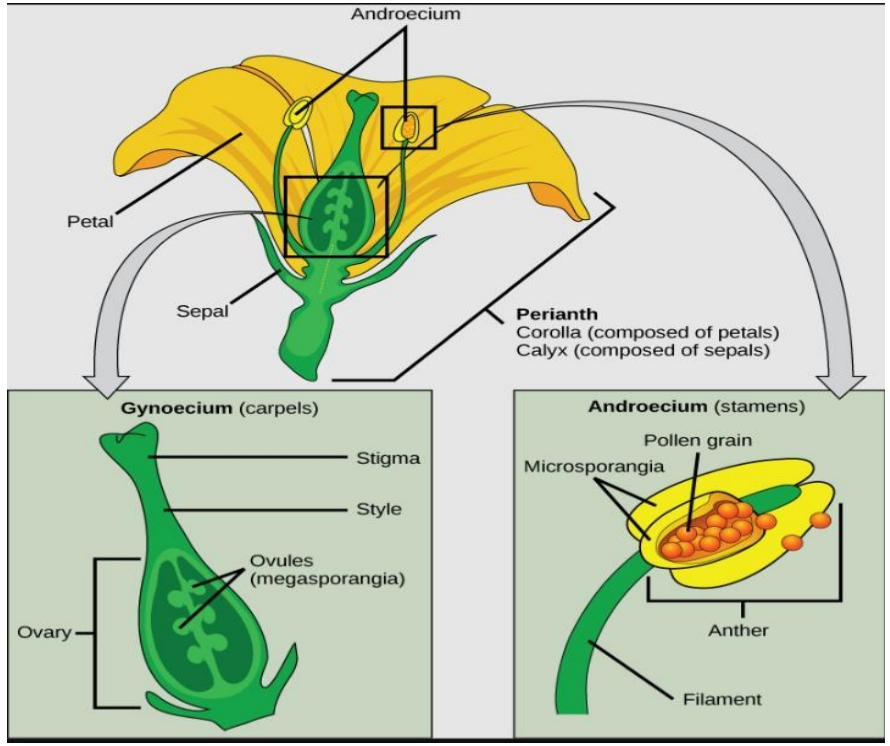
So, what we call this type of reproduction?

# Sexual reproduction

Everybody knows that flowering plants usually grow from seeds, but have you ever wondered where the seeds come from?



Seeds are made when pollen (from the male part of a flower) reaches the ovule (from the female part of a flower). It seems simple enough, but there are actually several different ways that plants can reproduce! In

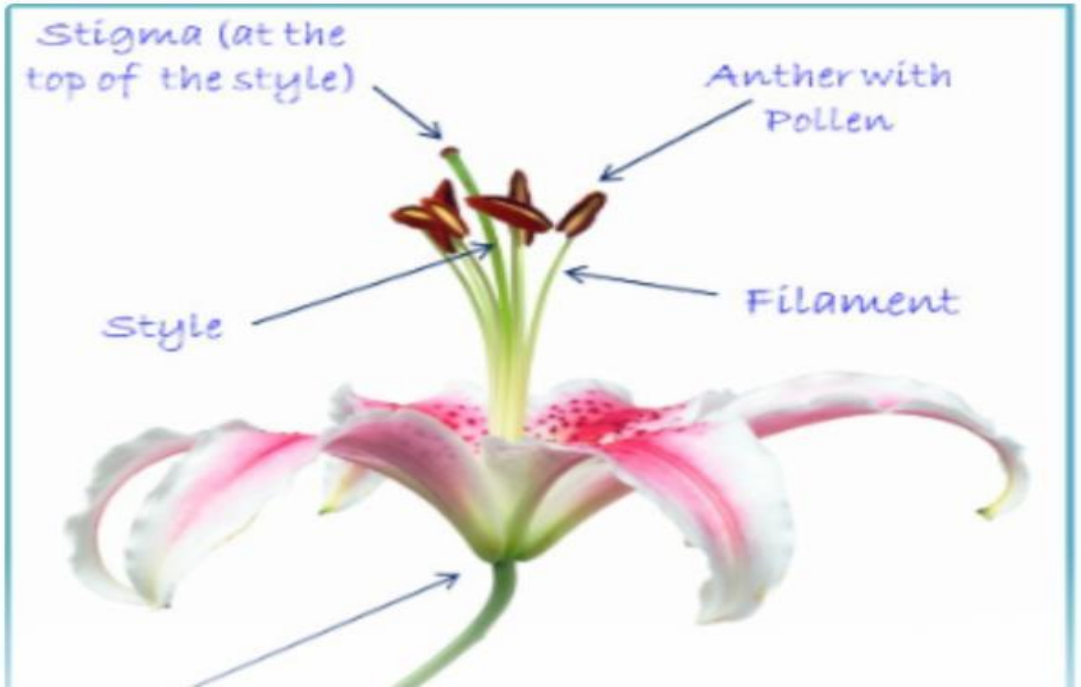



**Any way....the process by which pollen grains move into the stigma called "pollination"**

# There are two ways of pollination in plants depending on the type of the flowers

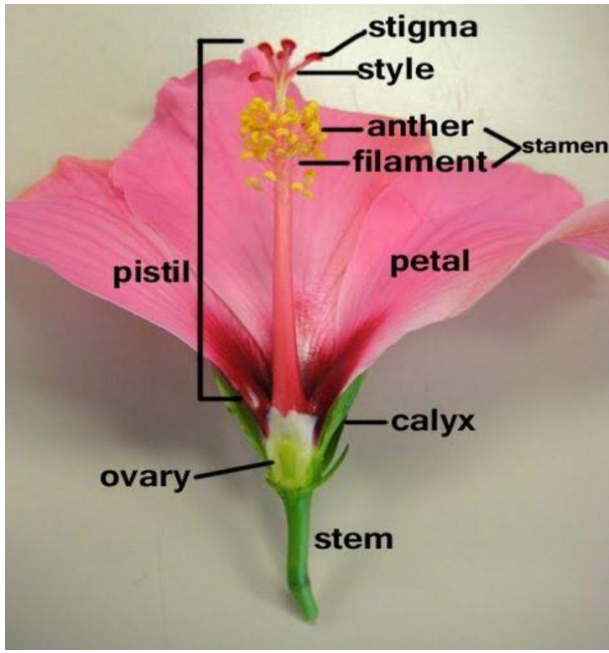
The self pollination

**The hermaphrodite flower**




The cross pollination

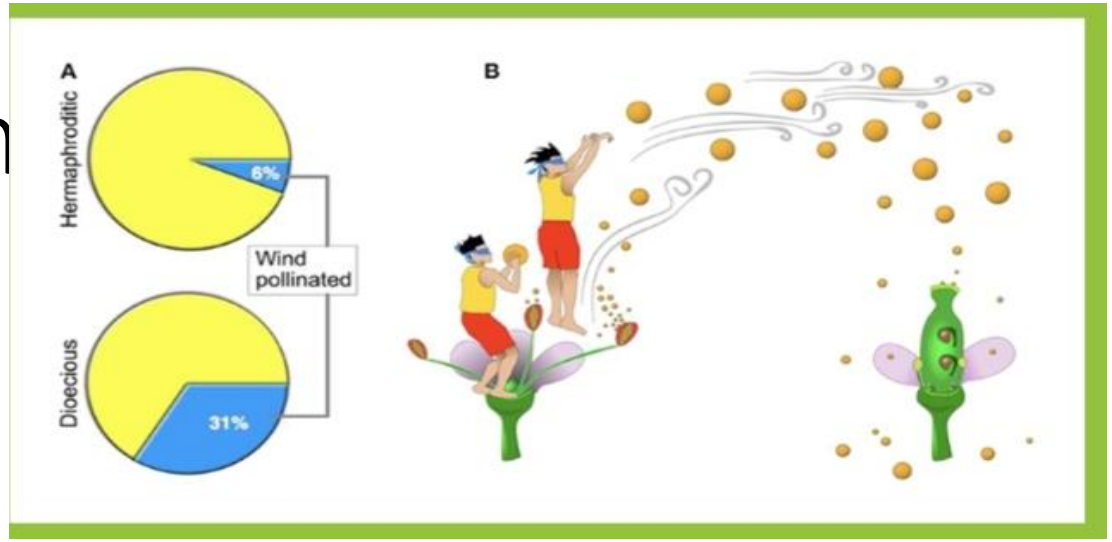
**Thmoni flower**



# The stages of reproduction

## 1- pollination

This process starts with the movement of pollens to the stigma




pollen in order to increase the chances that their pollen reaches the distant female ovules. You can think of this like shooting basketballs into a hoop (Figure 3B). Being a selfer is a lot like shooting basketballs from right under the basketball hoop. Being a dioecious plant is like shooting basketballs at the hoop from half court: you need a lot more basketballs to increase your chances of making it in the hoop.

| Self-Pollination | Cross-Pollination |
| --- | --- |
| 1. Transfer pollen grains from the anther to the stigma of the same flower. | Transfer pollen grains from the anther to the stigma of the different flower. |
| 2. This process can take place either in the same flower or another flower of the same plant. | This process can take place between two flowers on different plants. |
| 3. It occurs in the flowers which are genetically same. | It occurs between flowers which are genetically different. |
| 4. Occurs only in perfect flowers. | Occurs both in perfect or imperfect flowers. |

| | |
|---|---|
| .Produces limited amounts of pollen grains. | Produces large amounts of pollen grains. |
| O.In self-pollination, both the stigma and anther mature at the same time. | In cross-pollination, both the stigma and anther mature at the different time. |
| .Transfers few numbers of pollen. | Transfers large numbers of pollen. |
| .This process is carried out even when the flowers are closed. | For cross-pollination to happens flower should be open. |
| .No need of pollinators to transfer pollen grains. | Require pollinators to transfer pollen grains.Pollen grains are transferred through insects, wind, water, animals, etc. |

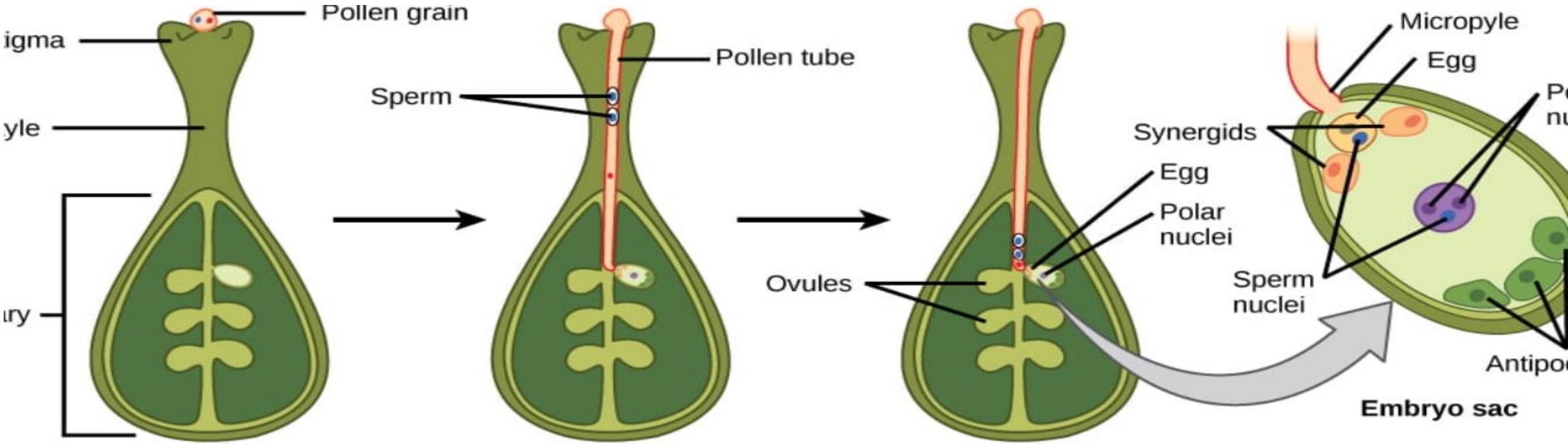
# In cross pollination pollens transes to Stigma through many ways ...such as:

| Pollinated by insects |  |
|---|---|
| Petals | Large and brightly-coloured – to attract insects |
| Scent and nectar | Usually scented and with nectar – to attract insects |
| Number of pollen grains | Moderate - insects transfer pollen grains efficiently |
| Pollen grains | Sticky or spiky - sticks to insects well |
| Anthers | Inside flower, stiff and firmly attached - to brush against insects |
| Stigma | Inside flower, sticky - pollen grains stick to it when an insect brushes past |

| Pollinated by the wind |  |
|---|---|
| Petals | Small, often dull green or brown – no need to attract insects |
| Scent and nectar | No scent or nectar – no need to attract insects |
| Number of pollen grains | Large amounts – most pollen grains are not transferred to another flower |
| Pollen grains | Smooth and light – easily carried by the wind without clumping together |
| Anthers | Outside flower, loose on long filaments – to release pollen grains easily |
| Stigma | Outside flower, feathery – form a network to catch drifting pollen grains |

# Fertilisation

- When a pollen tube reaches the ovule, the female egg cell and male cell combine.
- This process is called **fertilisation**.

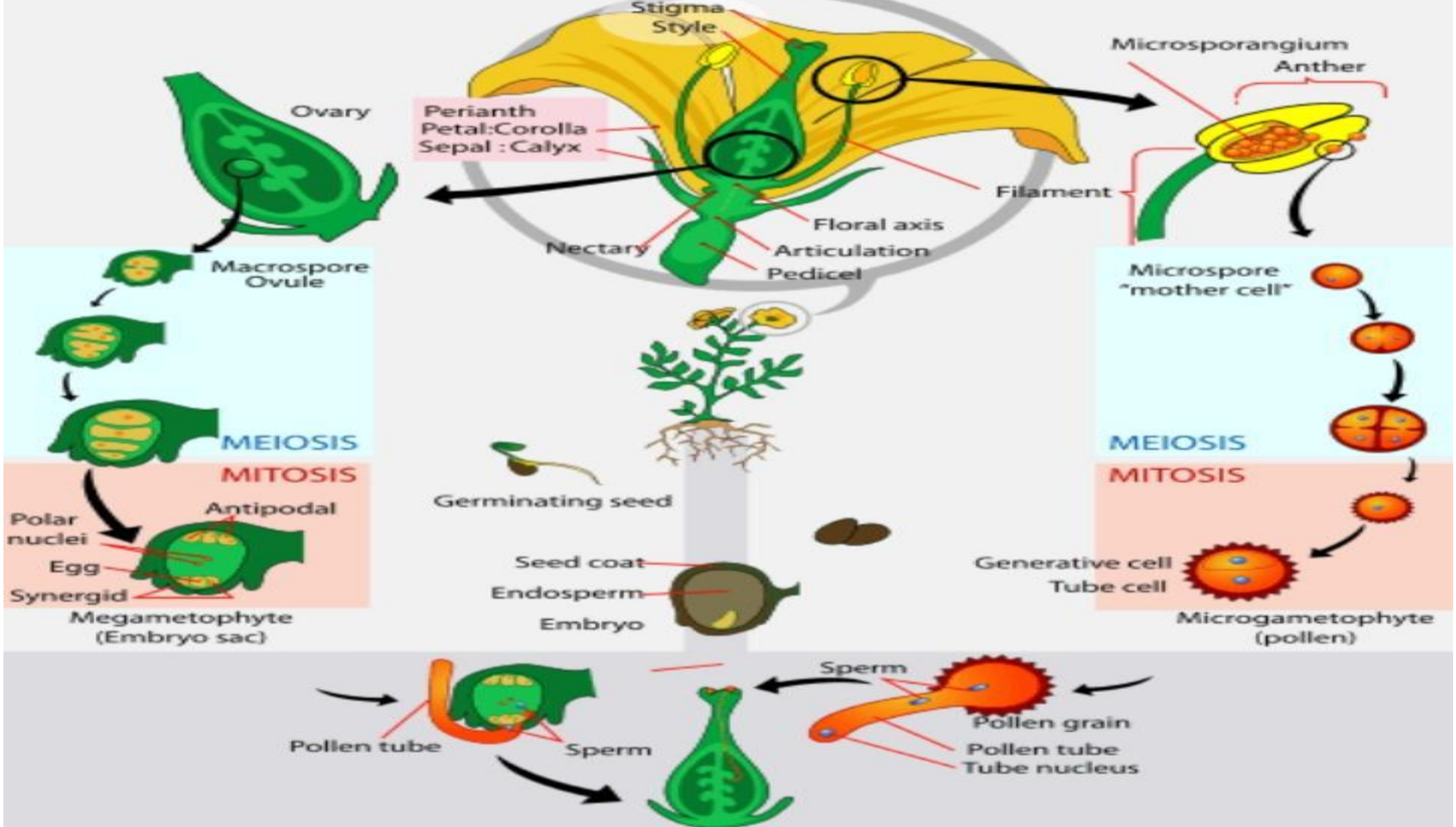



The pollen grain adheres to the stigma, which contains two cells: a generative cell and a tube cell.

The pollen tube cell grows into the style. The generative cell travels inside the pollen tube. It divides to form two sperm.

The pollen tube penetrates an opening in the ovule called a micropyle.

One of the sperm fertiliz the egg to form the diplo zygote. The other sperm fertilizes two polar nucle form the triploid endospe which will become a foo


Stigma
Style
Ovary
Perianth
Petal:Corolla
Sepal : Calyx
Microsporangium
Anther
Filament
Floral axis
Articulation
Pedicel
Nectary
Macrospore
Ovule
Microspore
"mother cell"
MEIOSIS
MITOSIS
Antipodal
Polar
nuclei
Egg
Synergid
Megametophyte
(Embryo sac)
Germinating seed
Seed coat
Endosperm
Embryo
Generative cell
Tube cell
Microgametophyte
(pollen)
Sperm
Pollen grain
Pollen tube
Tube nucleus
Pollen tube
Sperm