SEXUAL REPRODUCTION IN PLANTS.

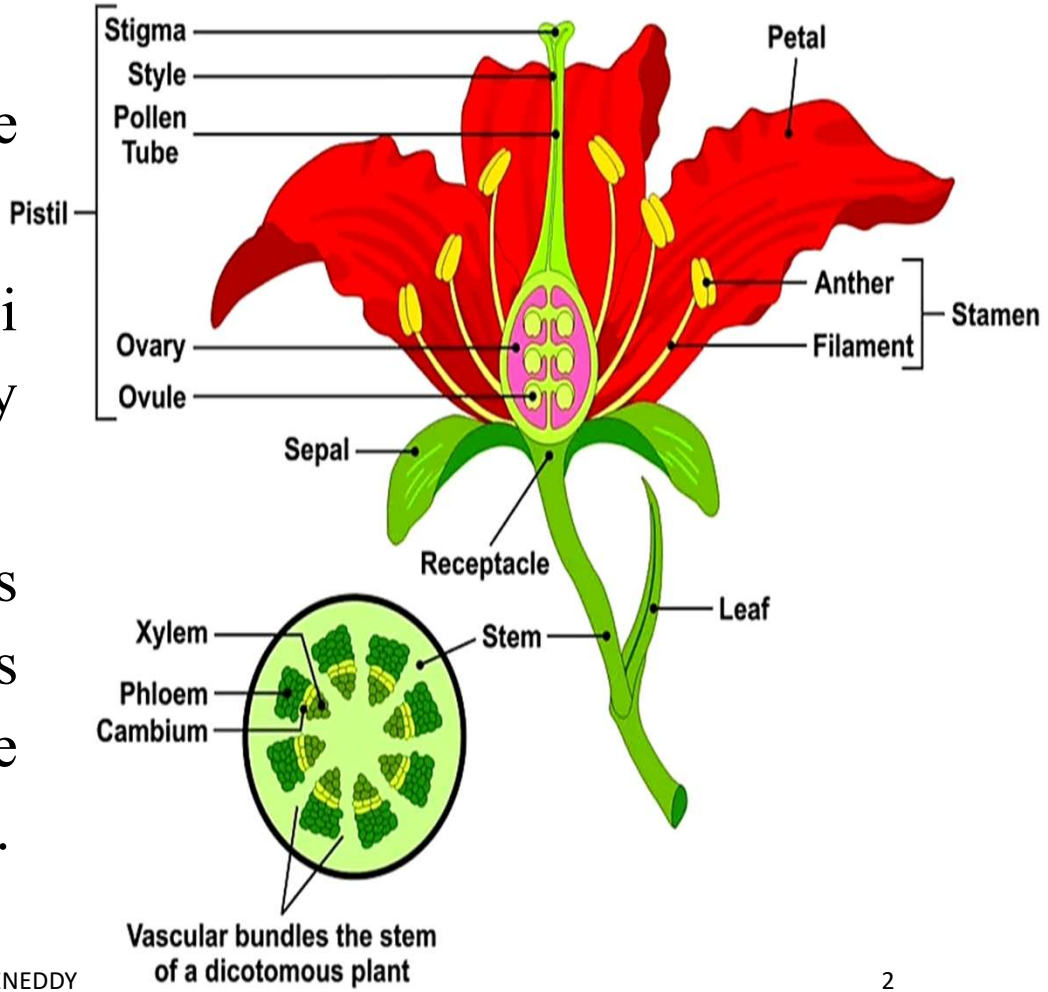
BY ELLY KENEDDY NALITSO
0708838163- 0779031329

SEXUAL REPRODUCTION IN FLOWERING PLANTS

•In flowering plants the flower is the reproductive organ.

•The male gametes are the male nuclei found in the pollen grains produced by the anthers.

•The female gametes are the egg nucleus and polar nuclei found inside the ovules located in the ovary. These two are brought together shortly after pollination.



POLLINATION

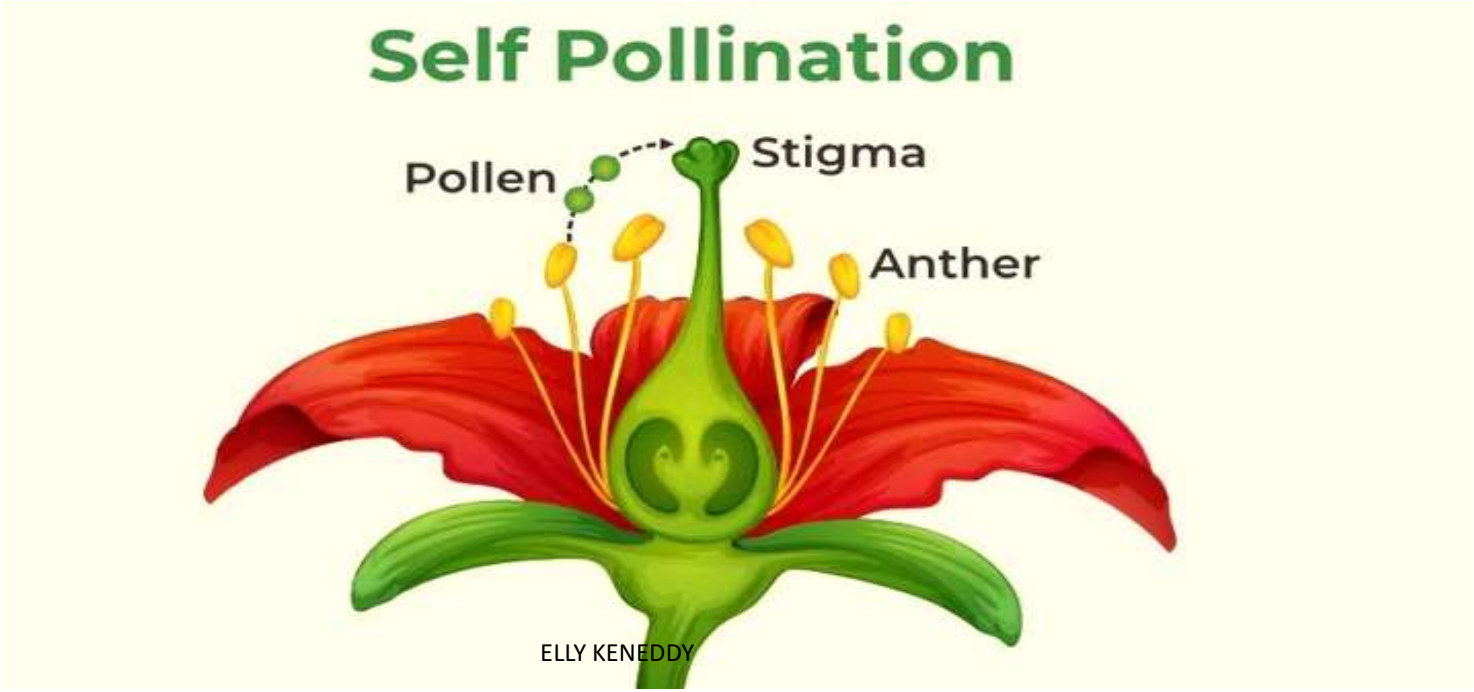
- Pollination is the transfer of pollen grains from the anther of a flower to the stigma of the same flower or different flowers of the same species.

Pollination is of **two** types;

- ✓Self-pollination
- ✓Cross pollination

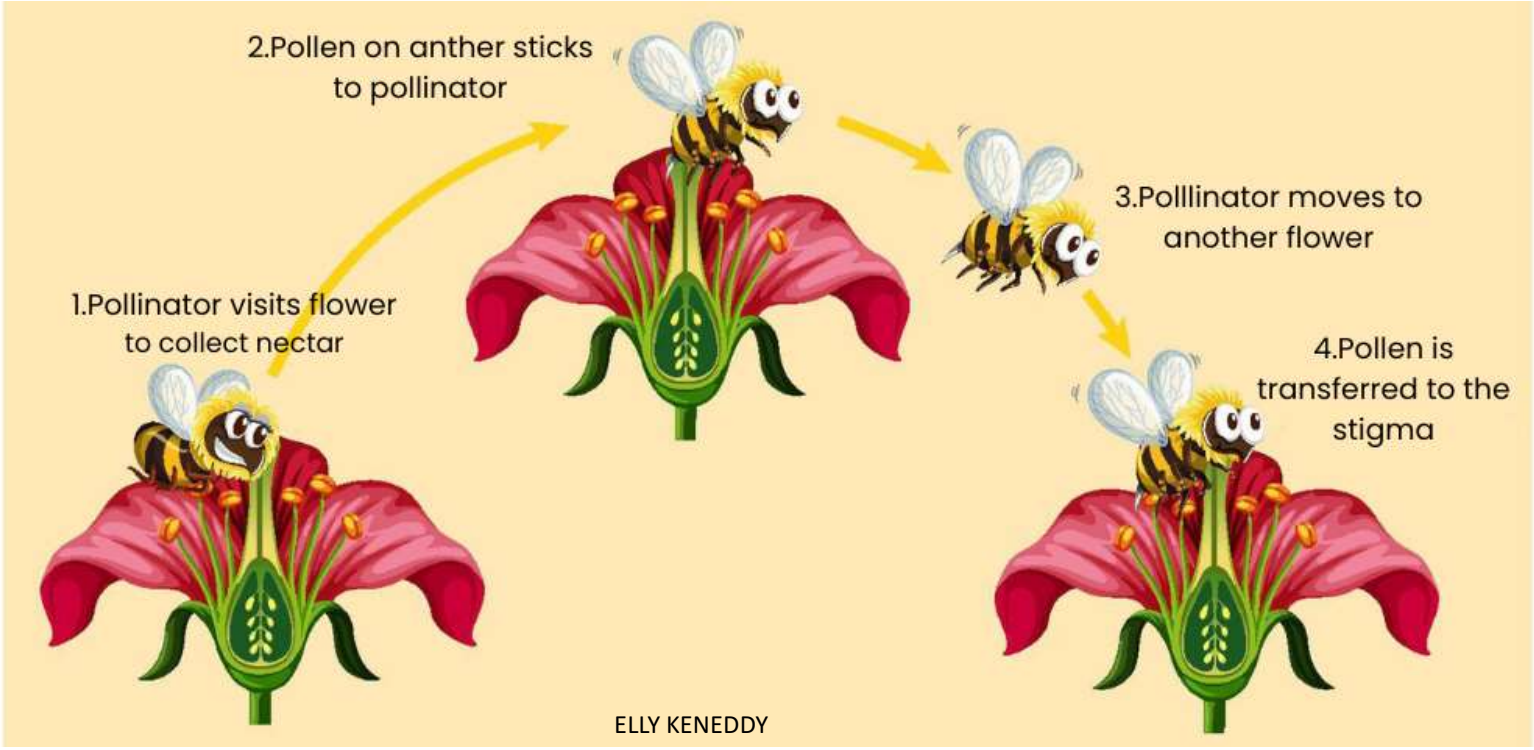
SELF-POLLINATION;

- Is the transfer of pollen grain from anther of a flower to the stigma of the same flower.

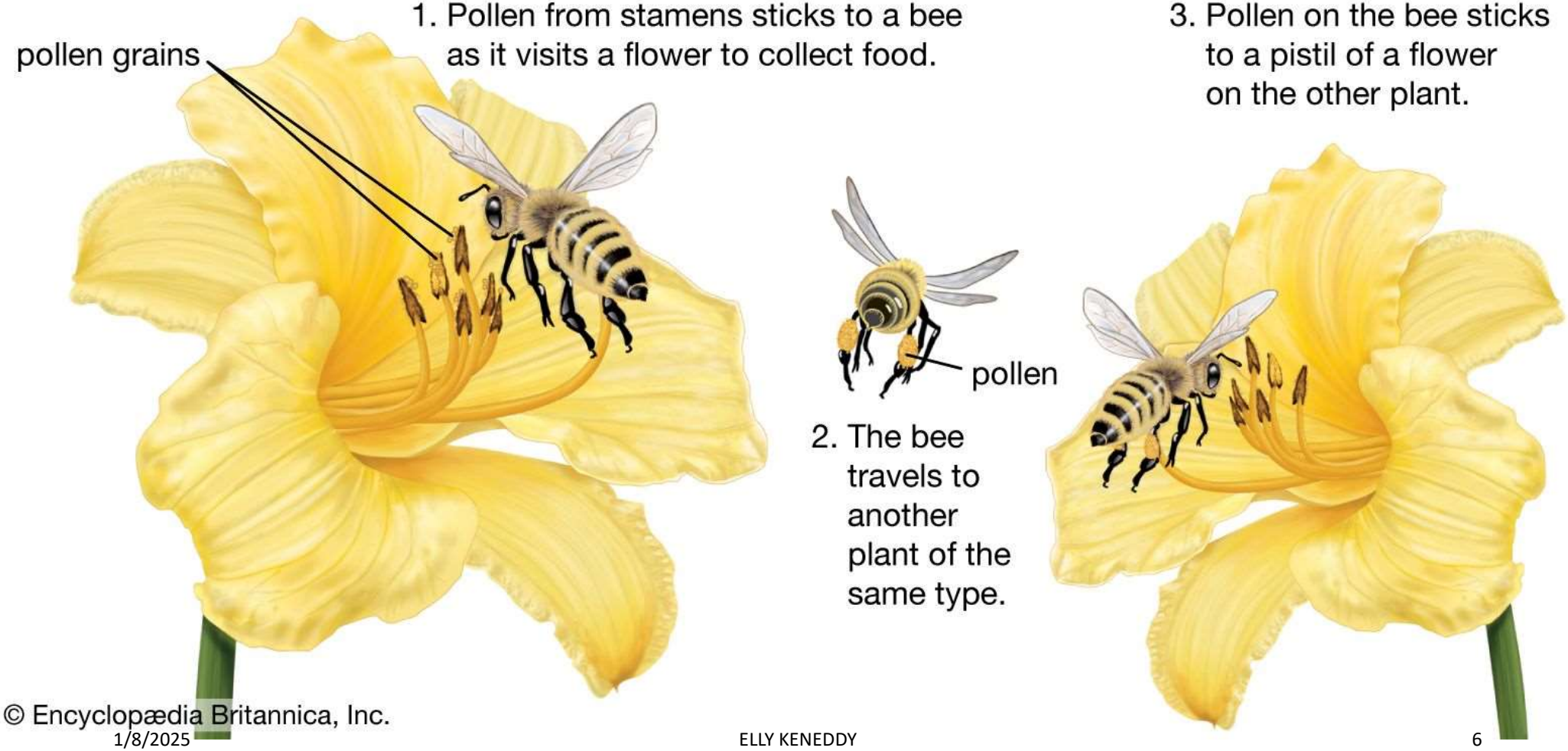


CROSS POLLINATION

- Is the transfer of pollen grain from anther of a flower to the stigma of another flower of the same species. Flower may or may not be from the same plant.



Cross-pollination



FEATURES THAT PROMOTE CROSS POLLINATION.

- Brightly colored petals.
- They have a nice scent to attract insects.
- Produce nectar which is food source for the insects.
- Stamen produce sticky pollen grains which adhere firmly to the bodies of visiting insects.
- The stigma are flat, lobbed and have sticky surface to which pollen grain can easily adhere.
- Presence of landing plat form and pollen guide which ensures that insects visit the flower.
- Stamen hanging outside the corolla to ensure that pollen grains are blown

CHARACTERISTICS OF WIND POLLINATED FLOWERS

- Usually not brightly colored Ø Not scented and lack nectar.
- Stamen of wind pollinated flowers produce large quantity of light powdery pollen grains.
- Usually small and inconspicuous but are borne in large inflorescences.
- The stigma are large often feathery and hang outside the flower by long styles. This provides a large surface area on which pollen grains floating in the air may be trapped.

ARRANGEMENTS THAT PROMOTE SELF-FERTILIZATION (ARRANGEMENTS PREVENTING CROSS POLLINATION)

- Maturation of both male and female parts of the flower at the same time.
- Flowers borne underground.
- Flowers being bi-sexual.
- Flowers remaining closed.

ARRANGEMENTS THAT PROMOTE CROSS POLLINATION (ARRANGEMENTS PREVENTING SELF POLLINATION)

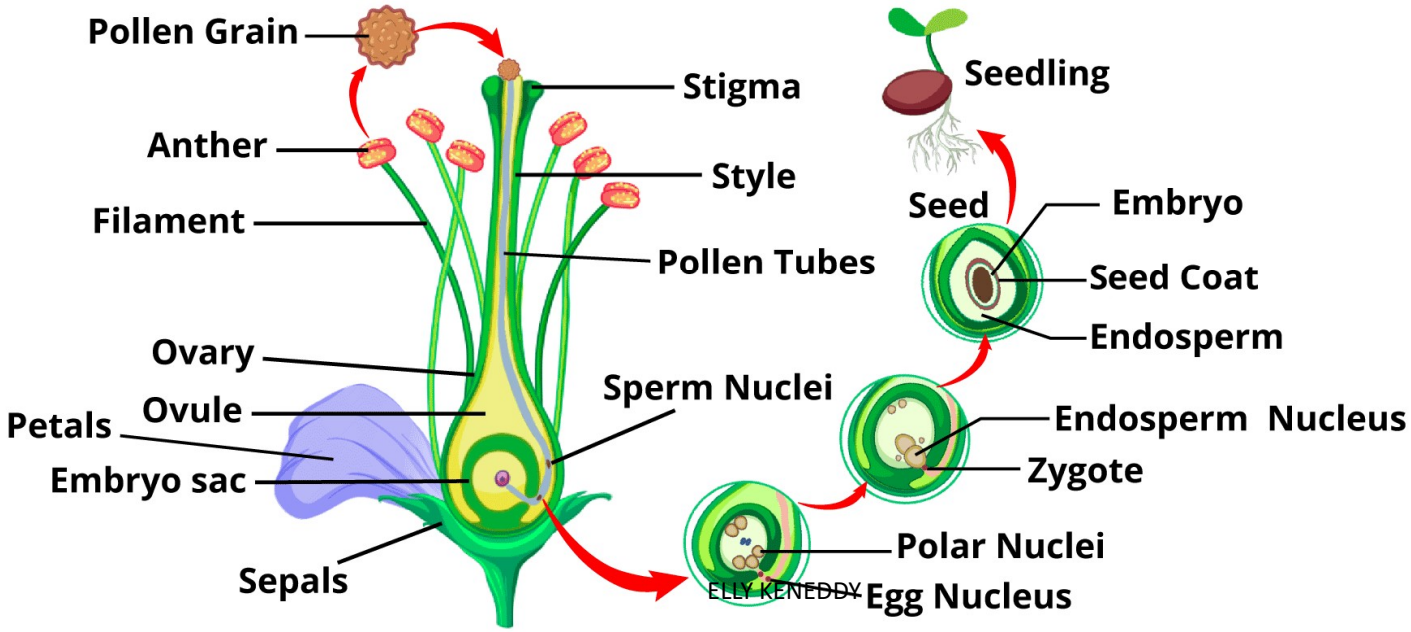
- Possession of unisexual flowers such that both sexes appear on different plants (dioecious). E.g. in pawpaw
- Self-sterility in monoecious plants like maize.
- **Dichogamy,** a condition in which the stamens and pistils do not ripen at the same time. This results in failure of cross fertilization. If the stamens ripen before the pistil the condition is referred to as **protandry** while if the pistil ripens before the stamens it is called **protogyny.**
- Stigmas being than anthers.

NOTE.

- Self-pollination has the disadvantage of failing to introduce variation in the new generation.
- This results into maintenance of poor characters from one generation to the next.
- Cross pollination results into mixing of genetic material which leads to variation.
- This results into introduction of new character from one generation to the next.

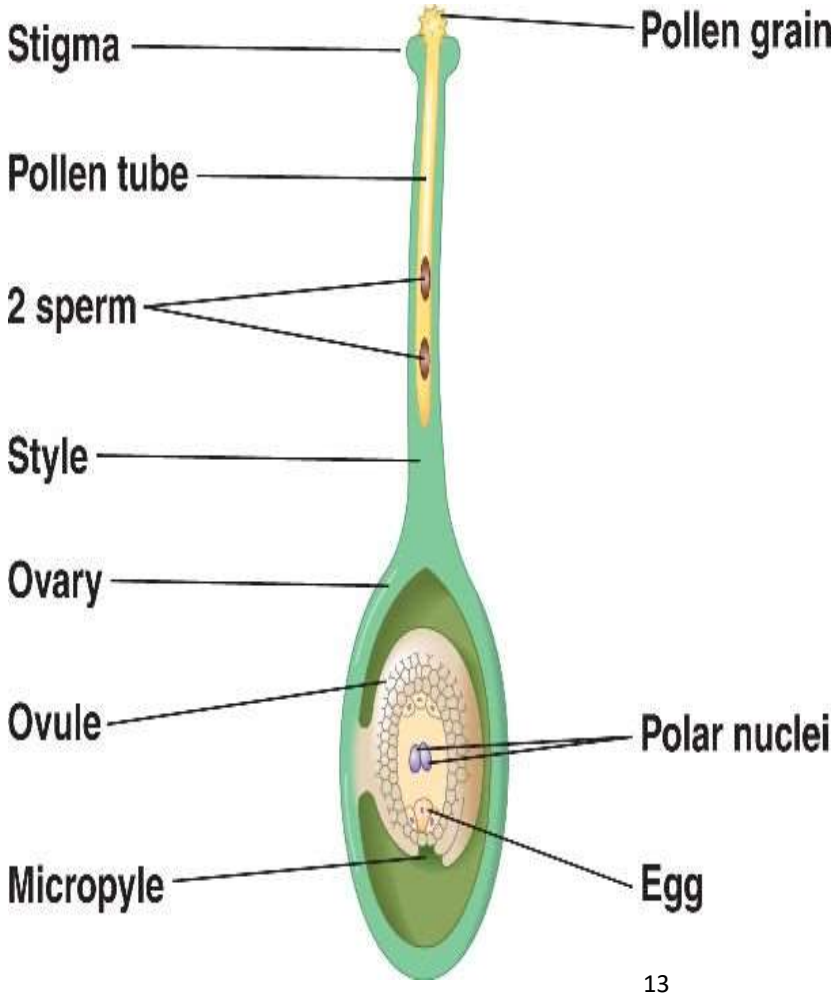
FERTILIZATION IN PLANTS

•This is the fusion of male and female gamete to form a zygote. Fertilization in plants is internal taking place inside the ovary in the structure called embryo sac.



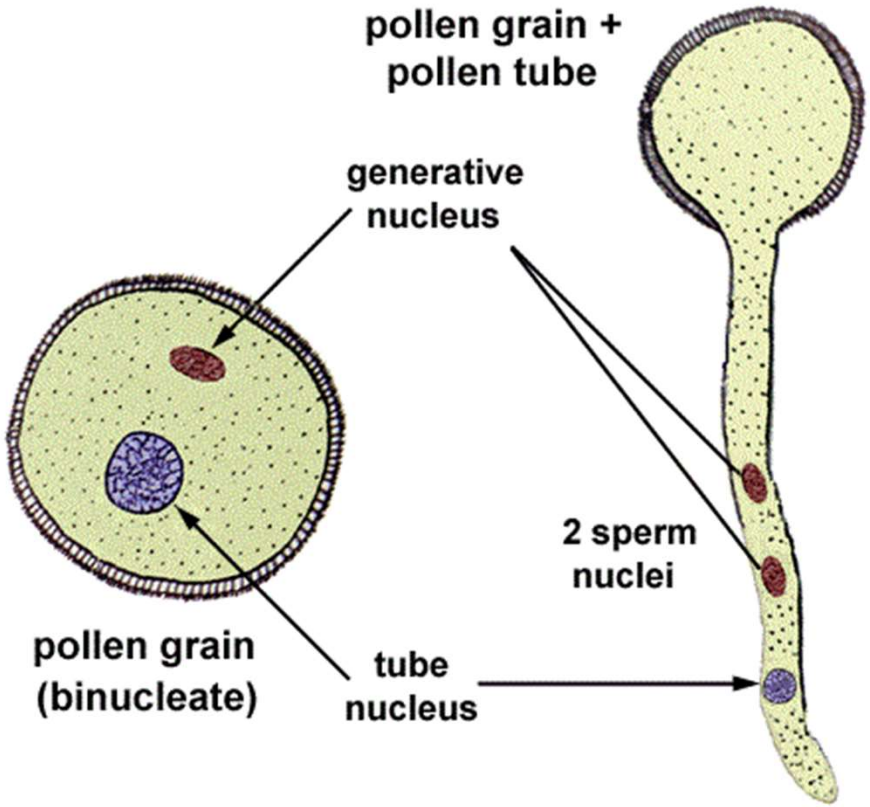
THE PROCESS OF FERTILIZATION IN PLANTS

- Pollen grain lands on the stigma of a flower of the same species.
- On the stigma, pollen grain absorbs water, nutrients and then germinates to form a pollen tube which grows through the style under the control of the tube nucleus at the tip.

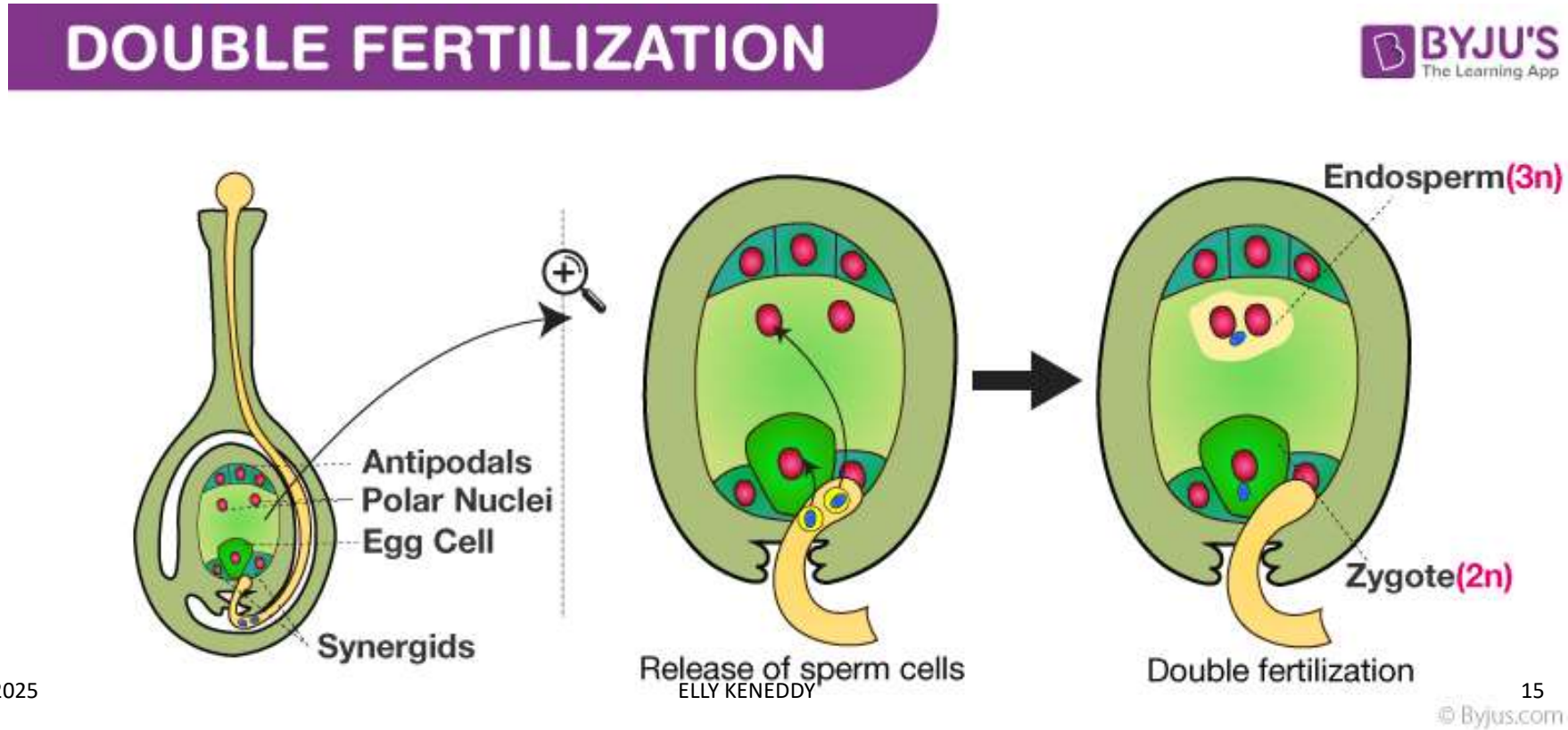


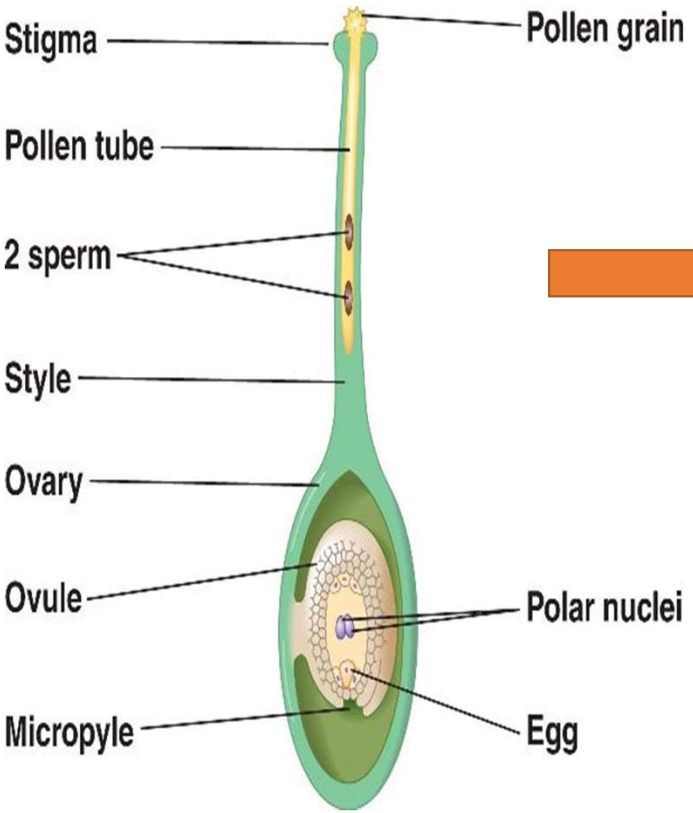
CONT.....

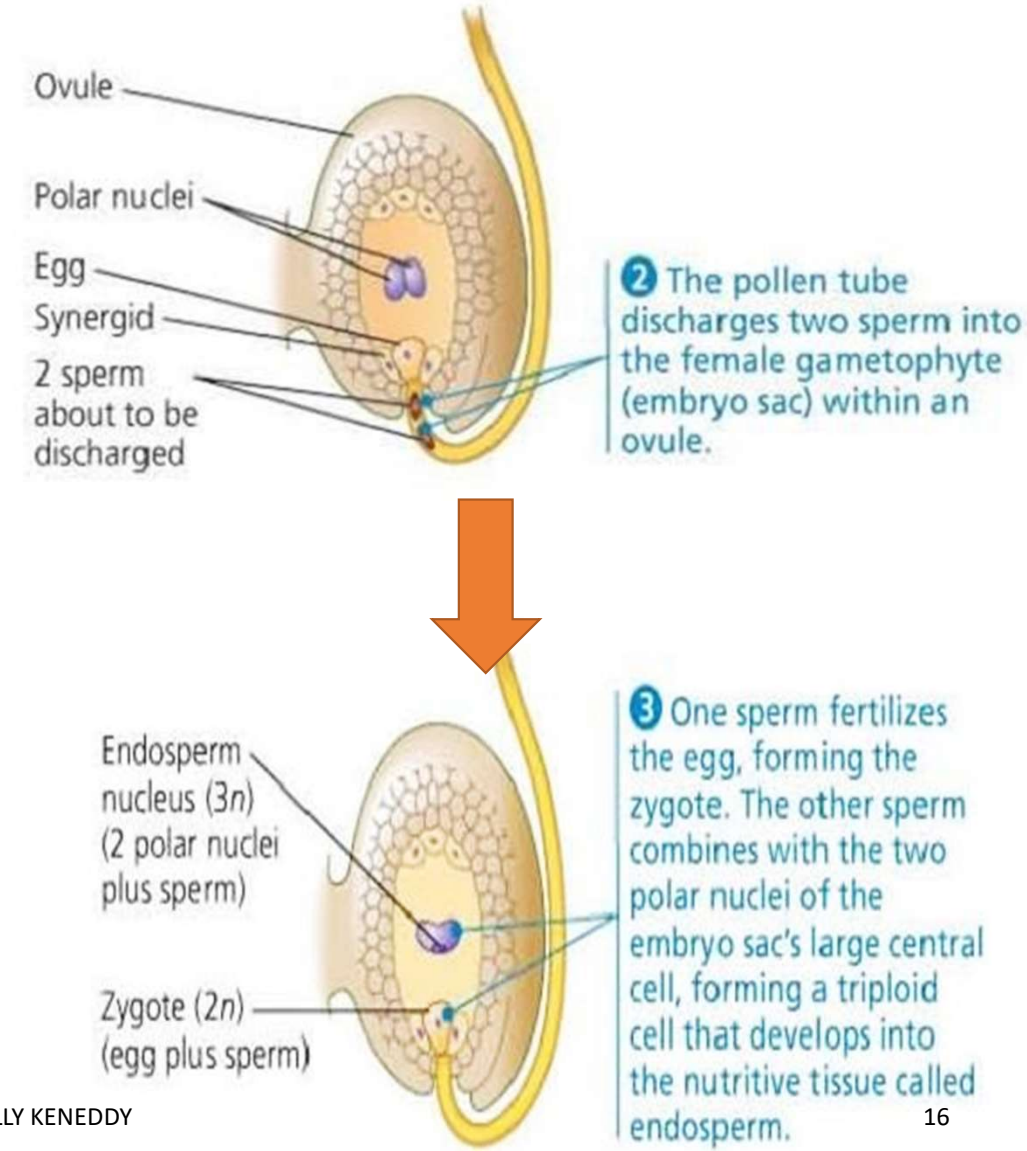
- Pollen grain has two nuclei i.e. generative nucleus and pollen tube nucleus.
- The generative nucleus divides mitotically to form two male nuclei which lie behind the pollen tube nucleus.
- The pollen tube enters the ovary and the tip of the pollen tube breaks. The pollen tube nucleus disappears.



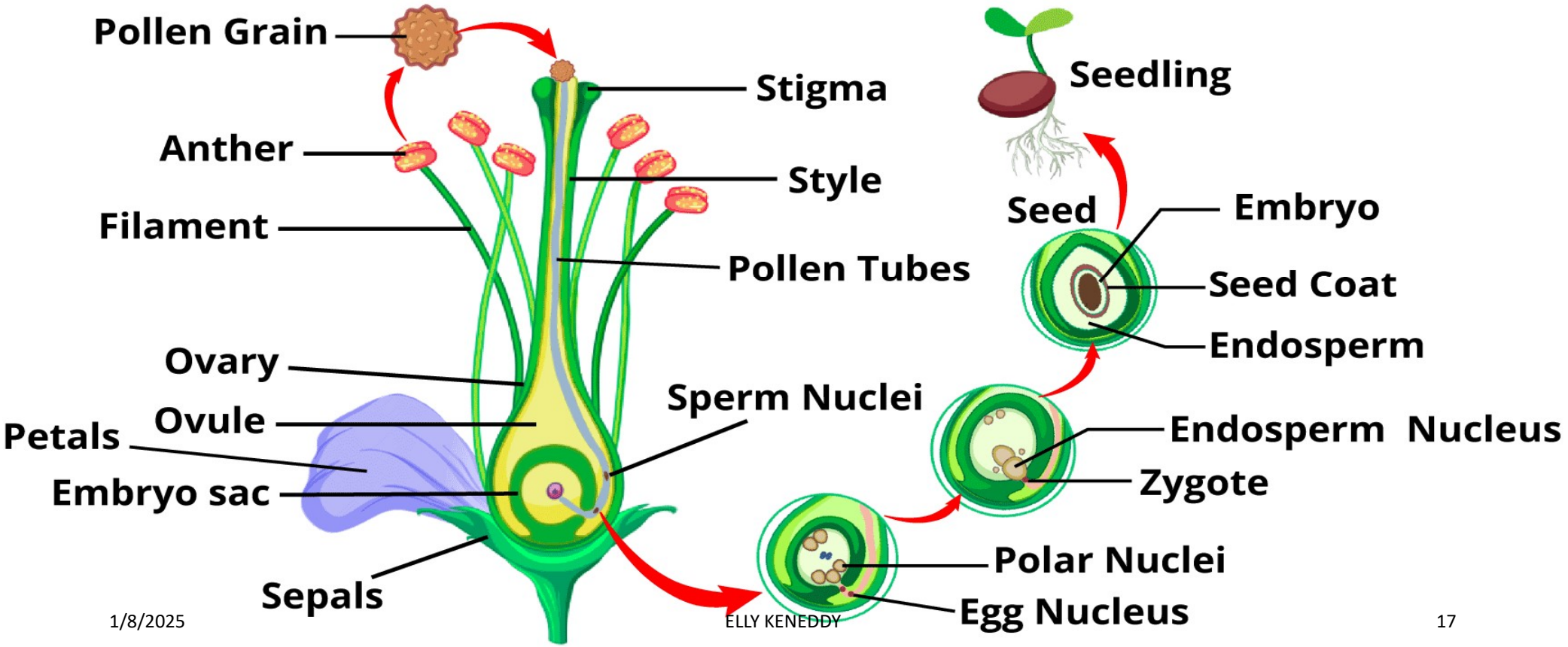
- One of the male nucleus fuse with the egg nucleus to form a zygote which divides mitotically to form embryo.
- The other male nucleus fuses with two polar nuclei to form a triploid endosperm which develops into endosperm. This is called double fertilization.




Stigma
Pollen grain
Pollen tube
2 sperm
Style
Ovary
Ovule
Polar nuclei
Micropyle
Egg


Ovule
Polar nuclei
Egg
Synergid
2 sperm about to be discharged
2 The pollen tube discharges two sperm into the female gametophyte (embryo sac) within an ovule.
Endosperm nucleus (3n) (2 polar nuclei plus sperm)
Zygote (2n) (egg plus sperm)
3 One sperm fertilizes the egg, forming the zygote. The other sperm combines with the two polar nuclei of the embryo sac's large central cell, forming a triploid cell that develops into the nutritive tissue called endosperm.

SUMMARY OF THE PROCESS




ALWAYS AIM FOR EXCELLENCE
BY ELLY KENEDDY NALITSO
0708838163- 0779031329