

**TOPIC: SEXUAL REPRODUCTION IN
FLOWERING PLANTS**

**Sub-topic: Pollination and
Fertilization**

Done By: Ronald
McDonald
Gabrielle Lindo
Joel Murphy

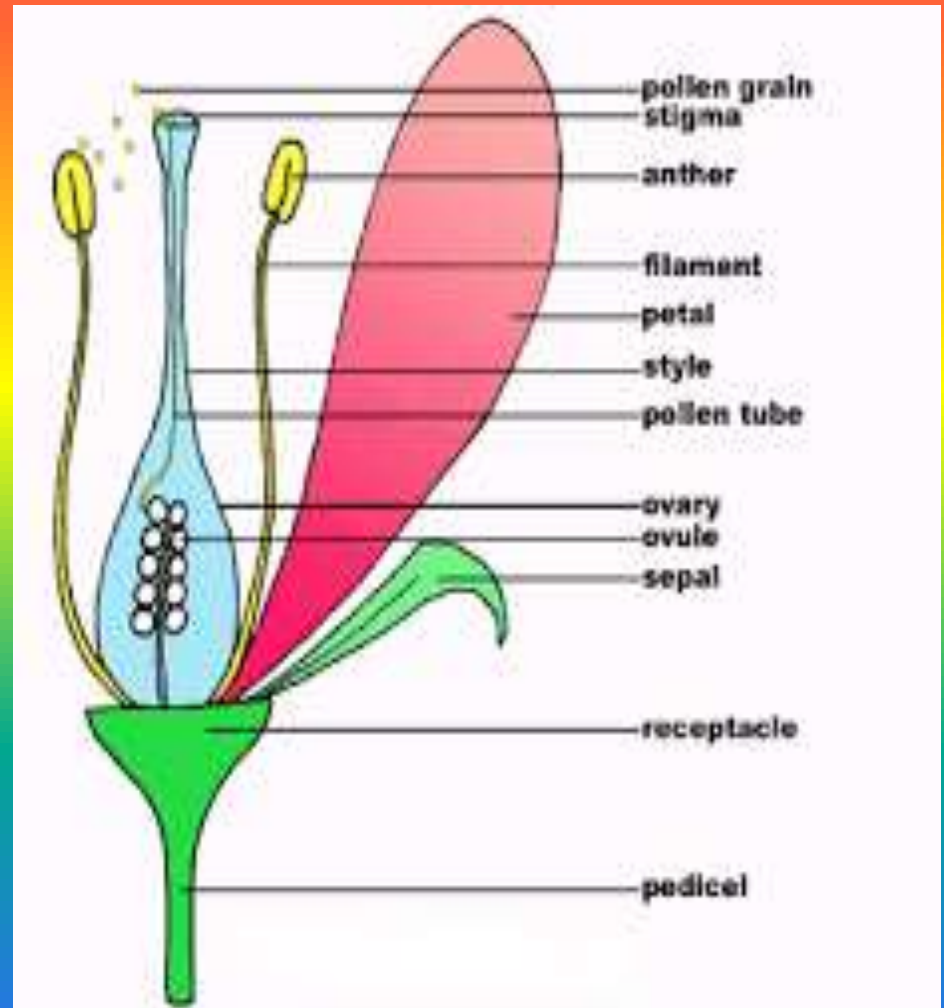
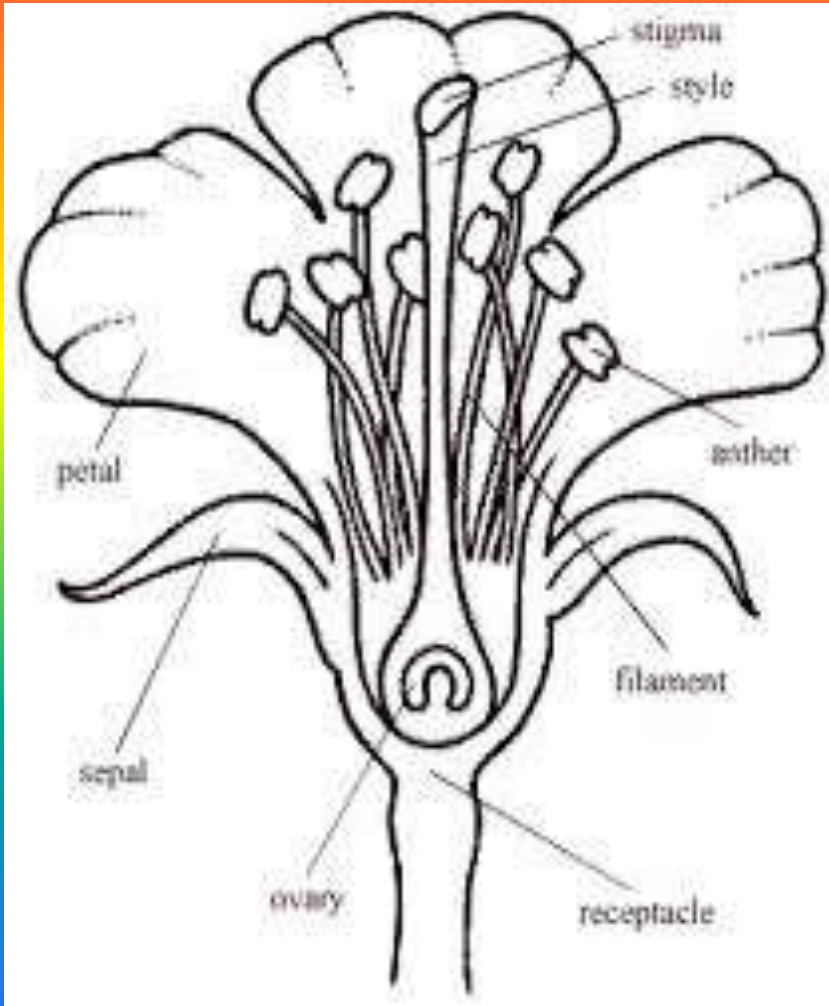
Objectives

- Define the following terms: pollination, fertilization, double fertilization.
- Types of pollination.
- Agents of pollination.
- Function and parts of a flowering plant.
- Explain the sequence of events from pollination to fertilization using annotated diagrams.
- Explain the significance of double fertilization in the embryo sac.

Pollination

- Pollination is the transfer of pollen from the anthers of a flower to the stigma of the same flower or of another flower. Plants can be pollinated whether by itself (self-pollination) and or with another plant (cross-pollination).

DIAGRAMS SHOWING THE STRUCTURE OF FLOWERING PLANT



FUNCTIONS OF A FLOWERING PLANT

Functions of parts of a flower

	Part	Function
1	Petal	Often large and coloured, to attract insects
2	Sepal	Protects the flower while in bud
3	Petiole (stalk)	Supports the flower to make it easily seen by insects, and to be able to withstand wind
4	Nectary	Produces nectar, to attract insects
5	Stamen	The male reproductive part of the flower, made up of anther and filament
6	Anther	Contains pollen sacs, in which pollen grains are formed. Pollen contains male sex cells.
7	Filamen	Support the anther
8	Carpel	The female reproductive part of the flower, made up of stigma, style and ovary
9	Stigma	A sticky surface to the ovary, through which pollen tubes grow
10	Style	Links the stigma to the ovary, through which pollen tubes grow
11	Ovary	Contains ovules, which develop into seeds when fertilised.

Difference between self-pollination and cross-pollination

- Self-pollination is the transfer of pollen grains from the anther of a flower to the stigma of either the same or genetically similar flower while cross-pollination is the transfer of pollen from the anther of a flower on one plant to a stigma of a flower on another plant of the same species.

Agent of pollination

- Pollen grains from another anther is transferred onto the stigma of the recipient flower by any of these pollinated agents: wind, animal, insect, mechanical explosive and water.

Process of pollination in terms of insect pollination

- Pollinators gather nectar for food. As pollinators move from one flower to another to gather more nectar, the pollen grains on the pollinator's body gets transferred to the stigma of the recipient flower. For example: Bees.

DIAGRAM SHOWING CROSS-POLLINATION

Cross-pollination

pollen grains

1. Pollen from stamens sticks to a bee as it visits a flower to collect food.



3. Pollen on the bee sticks to a pistil of a flower on the other plant.



2. The bee travels to another plant of the same type.



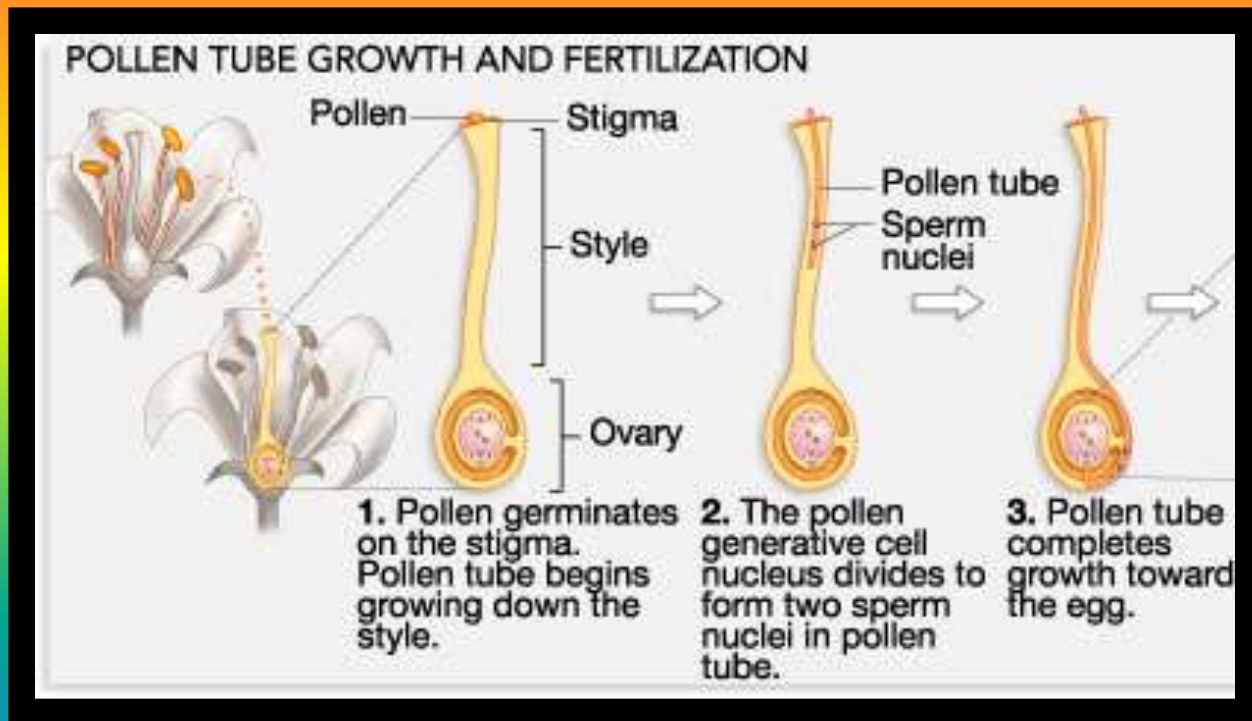
Fertilization

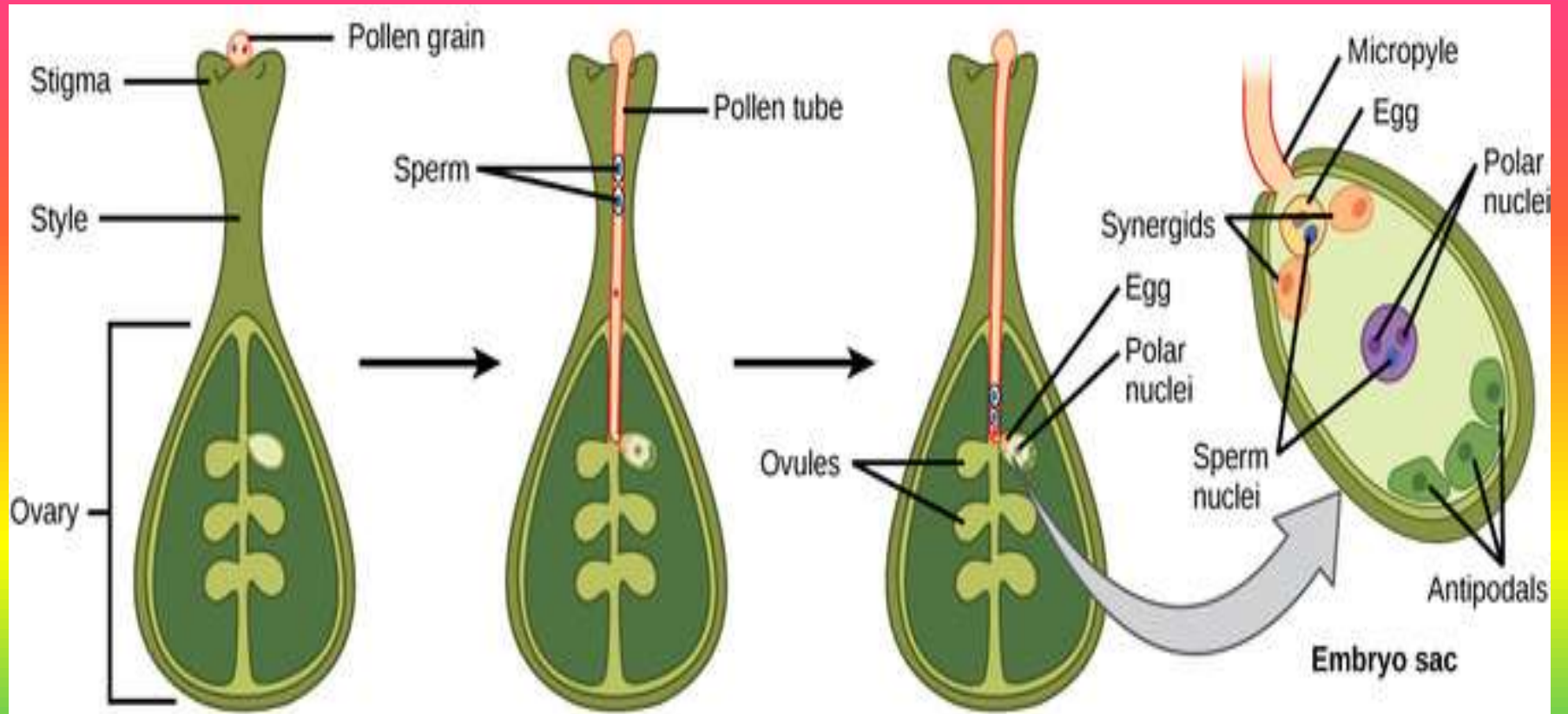
- Fertilization is the process of fusion of the female gamete, the ovule and the male gamete produced in the pollen tube by the pollen grain.

Fertilization process

- Pollen tubes from the pollen grains will start to grow into the style. This will create a pathway for the pollen grain to travel down to the ovary.
- Once the pollen grain reaches the ovary, the male sex cell inside the pollen grain fuses with the female sex cell inside the ovule.

DIAGRAMS SHOWING FERTILIZATION OF A FLOWERING PLANT





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

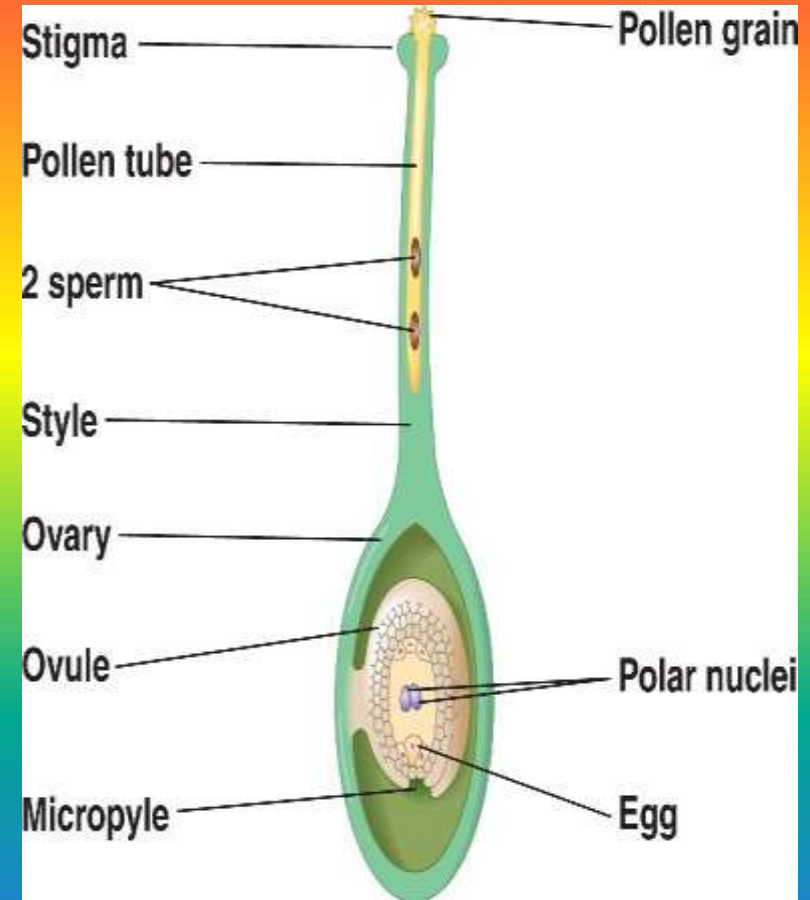
The pollen tube cell grows into the style. The generative cell travels inside the pollen tube. It divides to form two sperm.

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

One of the sperm fertilizes the egg to form the diploid zygote. The other sperm fertilizes two polar nuclei to form the triploid endosperm, which will become a food source for the growing embryo.

Outlined steps and diagram of plant from pollination to fertilization

- Pollen grains land on the sticky stigma.
- A pollen tube grows down the style, followed by male sperm nuclei.
- The sperm nuclei fuse with the female ovules.
- The ovules develop into seed, and the ovary develops into fruit.



DOUBLE FERTILIZATION

Double fertilization is a complex mechanism of fertilization in flowering plants (angiosperms). Double fertilization is the joining of a female gametophyte with two male gametes.

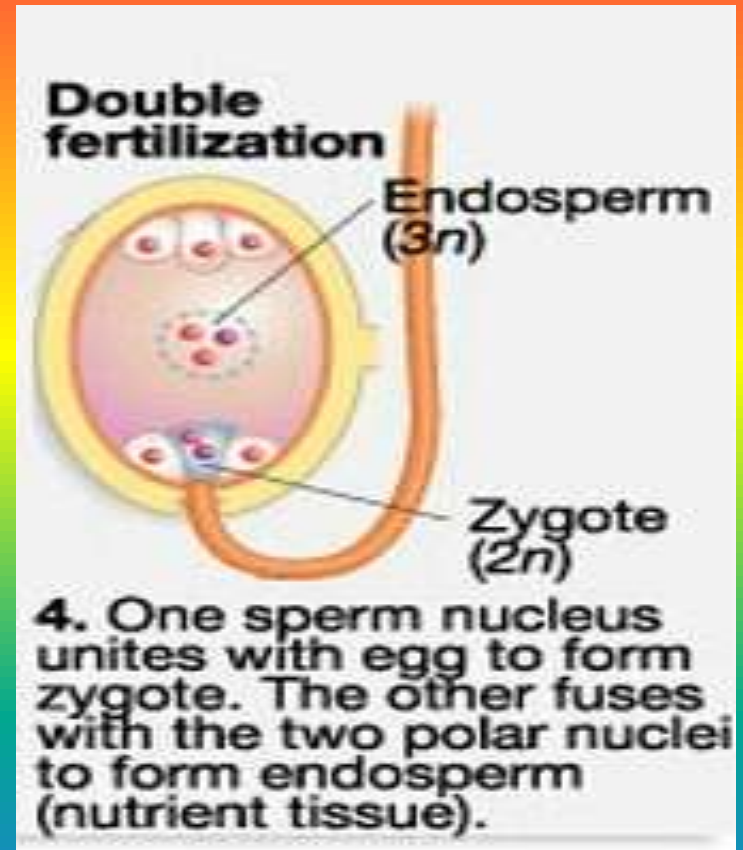
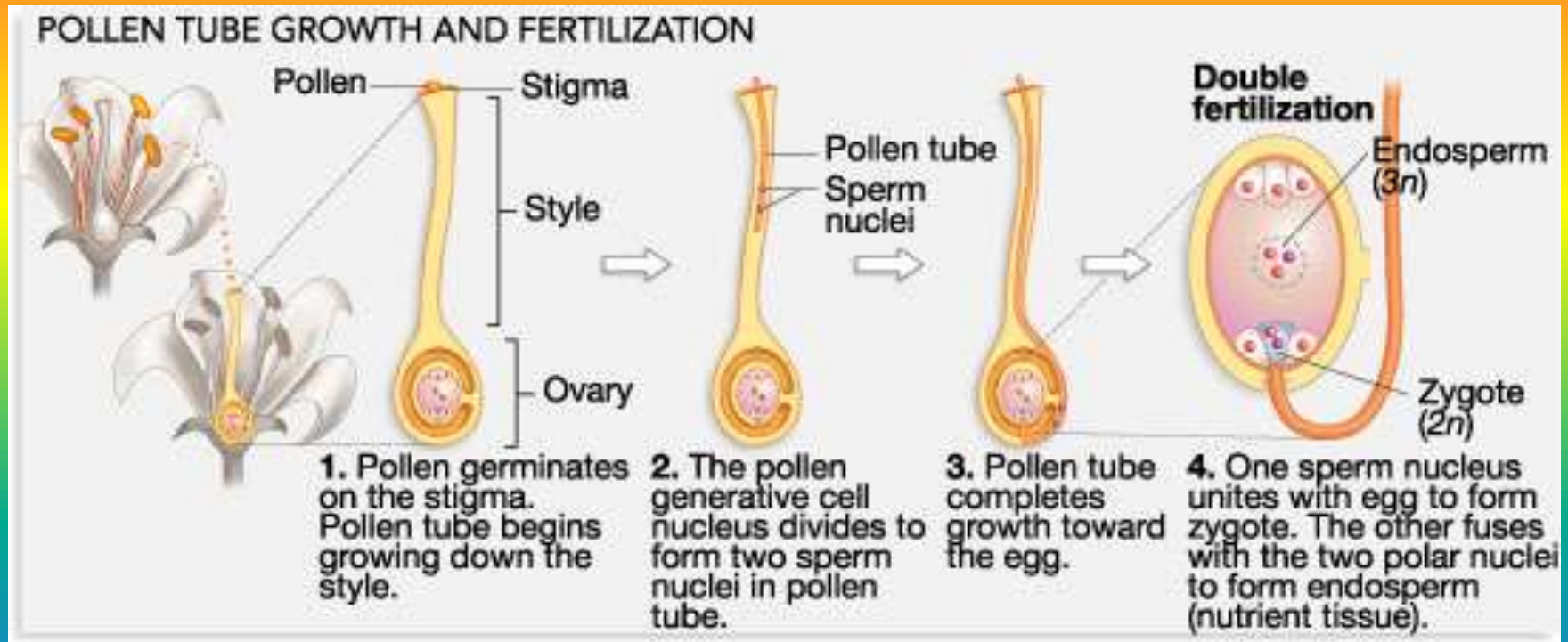
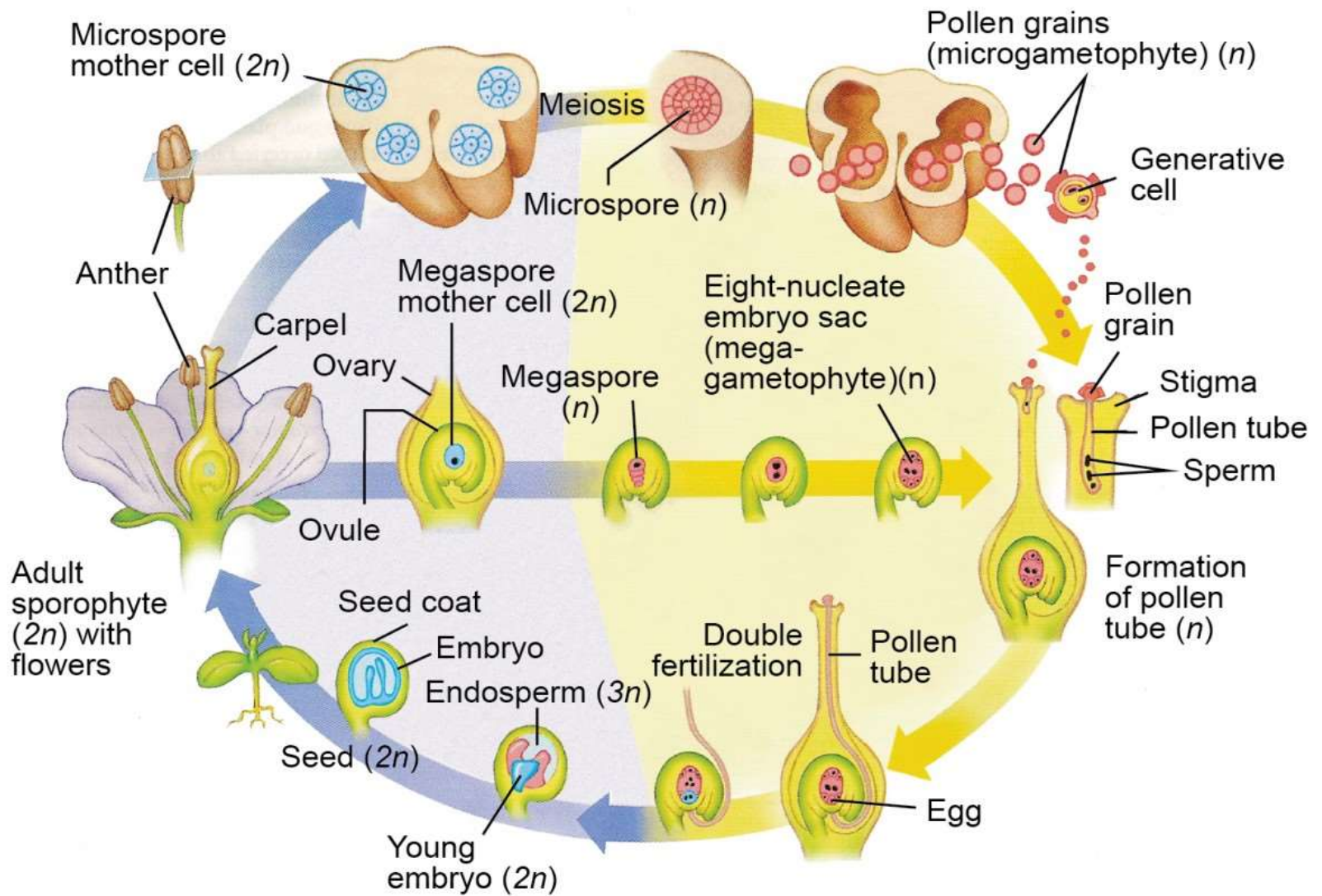


DIAGRAM SHOWING A FLOWERING PLANT FROM POLLINATION TO DOUBLE FERTILIZATION





THE SIGNIFICANCE OF DOUBLE FERTILIZATION IN THE EMBRYO SAC

- The triploid endosperm nucleus divides by mitosis to give a tissue that surrounds the developing embryo. In some cases, the endosperm is used up before the embryo is mature.