Plant Propagation

Introduction

- What is plant propagation?
  - The reproduction or increasing in number of plants.
- Can be done in one of two ways....
  - Sexual.
  - Asexual.

Sexual Propagation

- The propagation or reproducing of plants from seeds.

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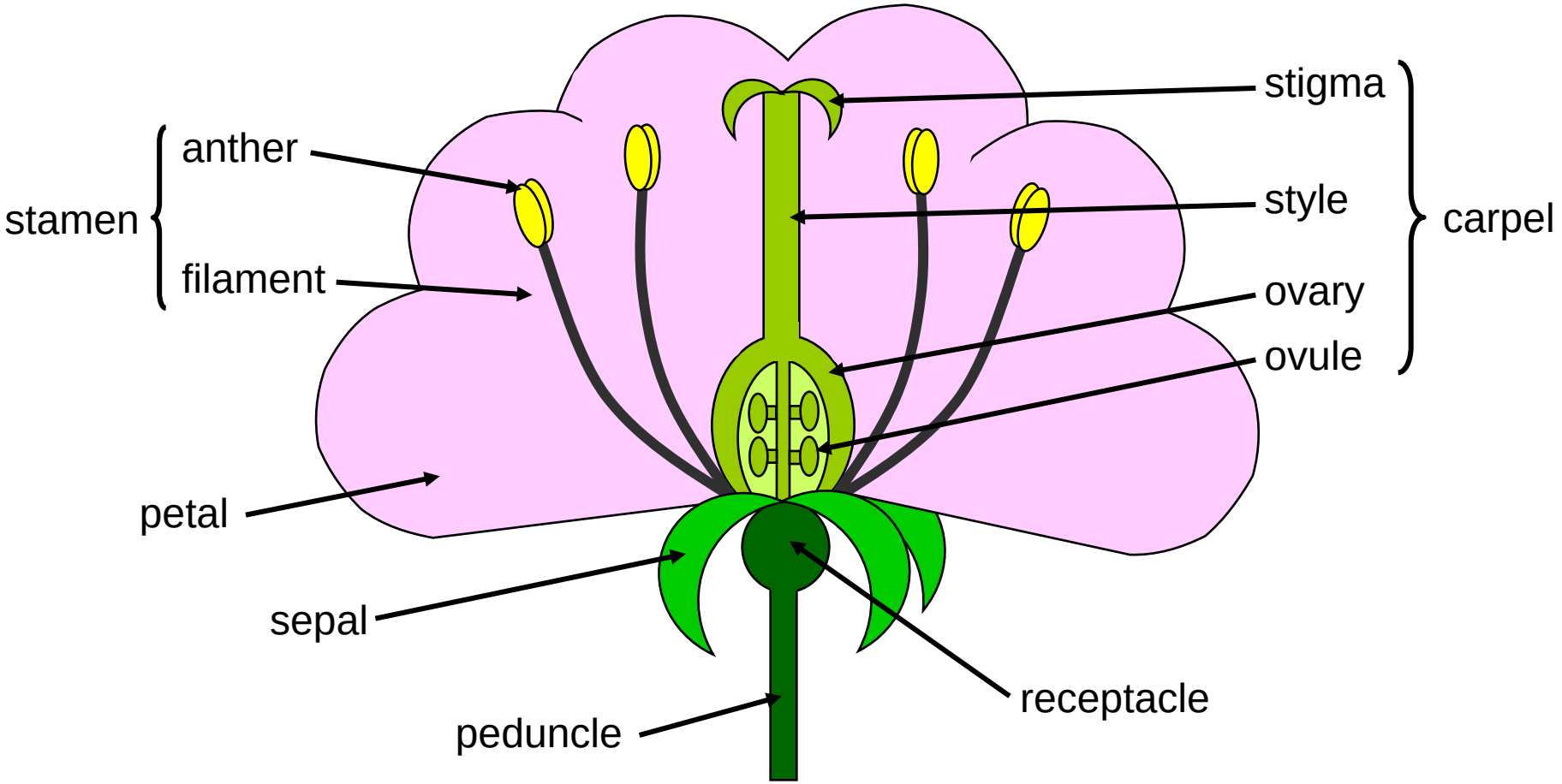
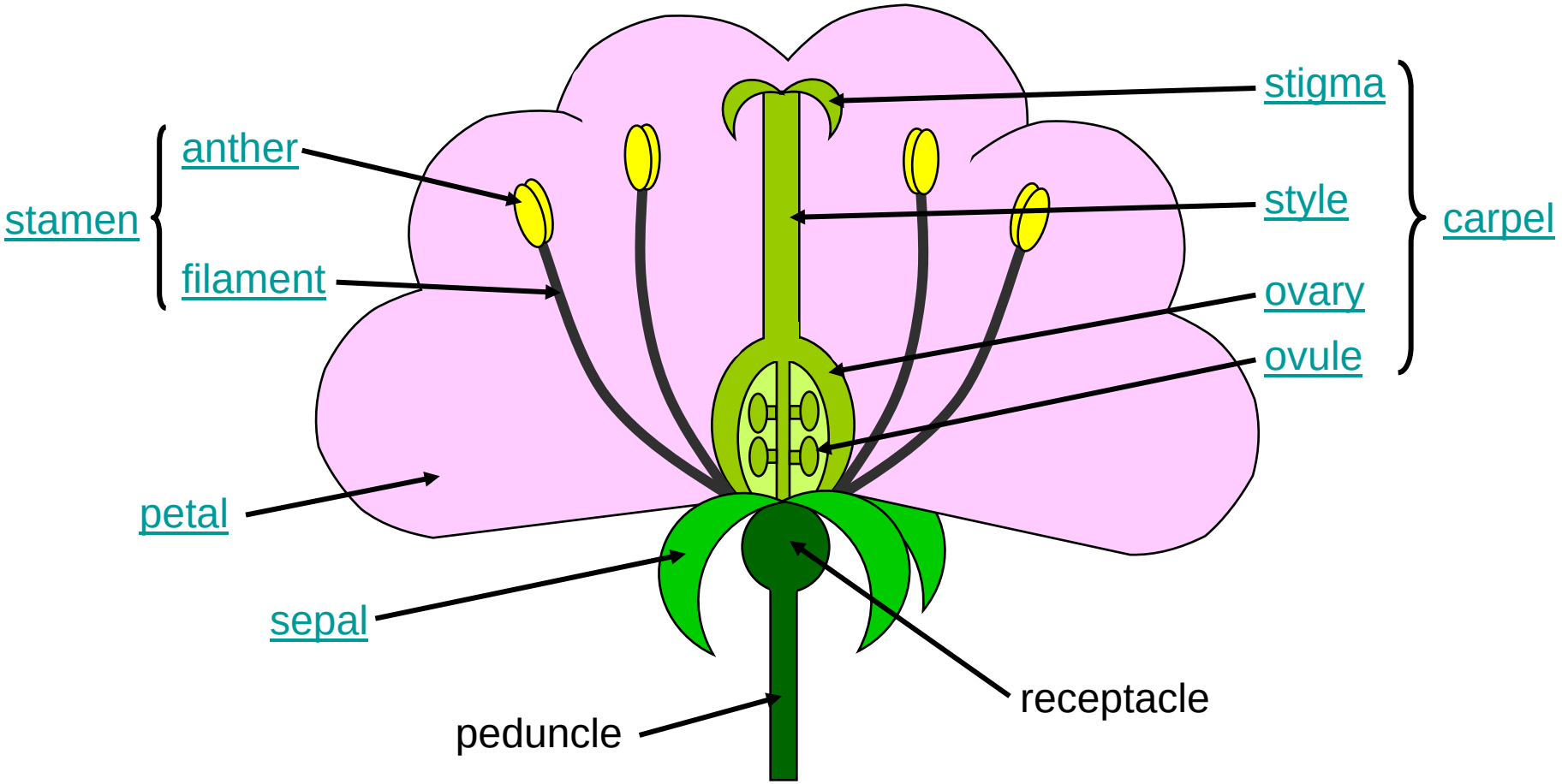
Test

Flowers are the reproductive organs of plants

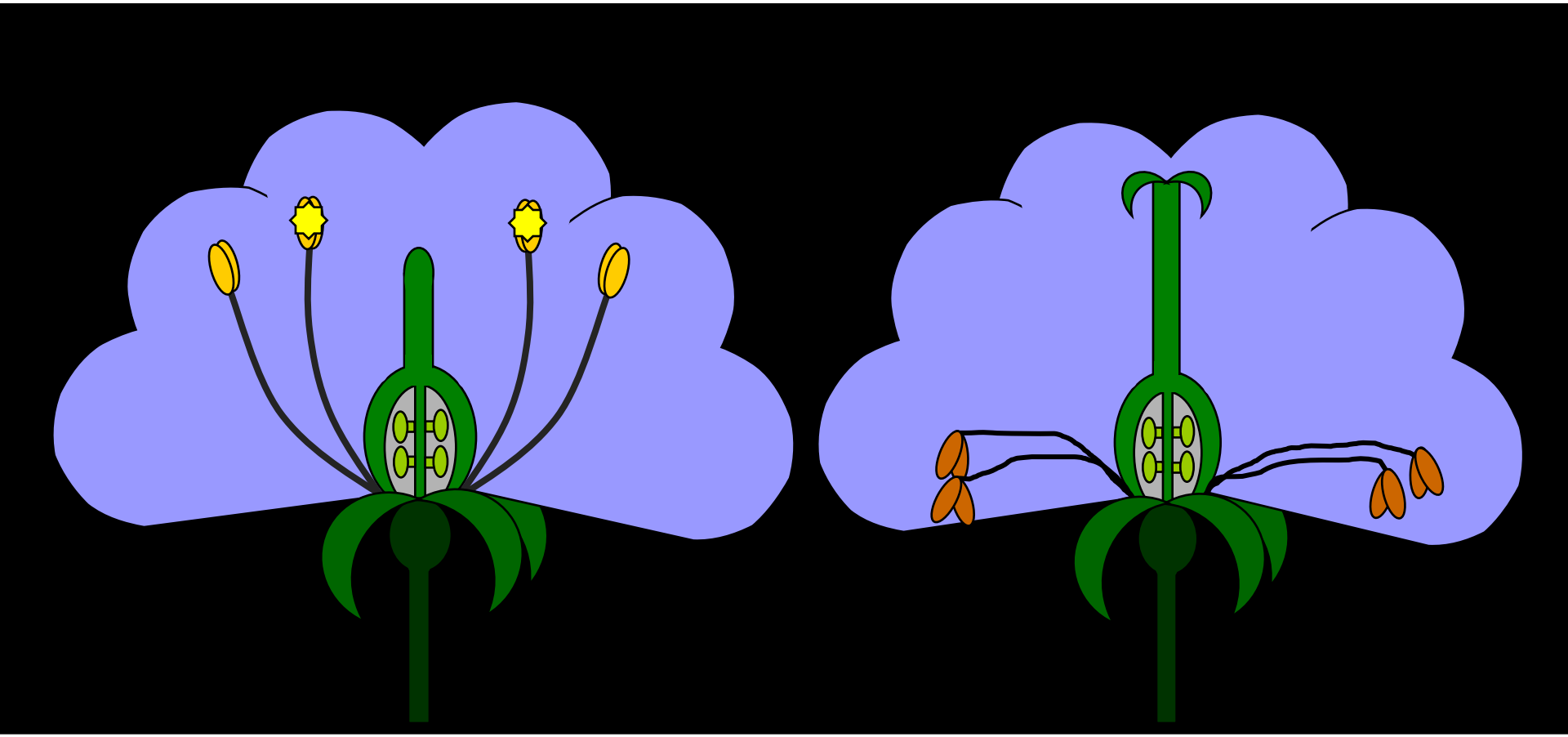
Use the diagram below to complete the labels on the flower structure worksheet





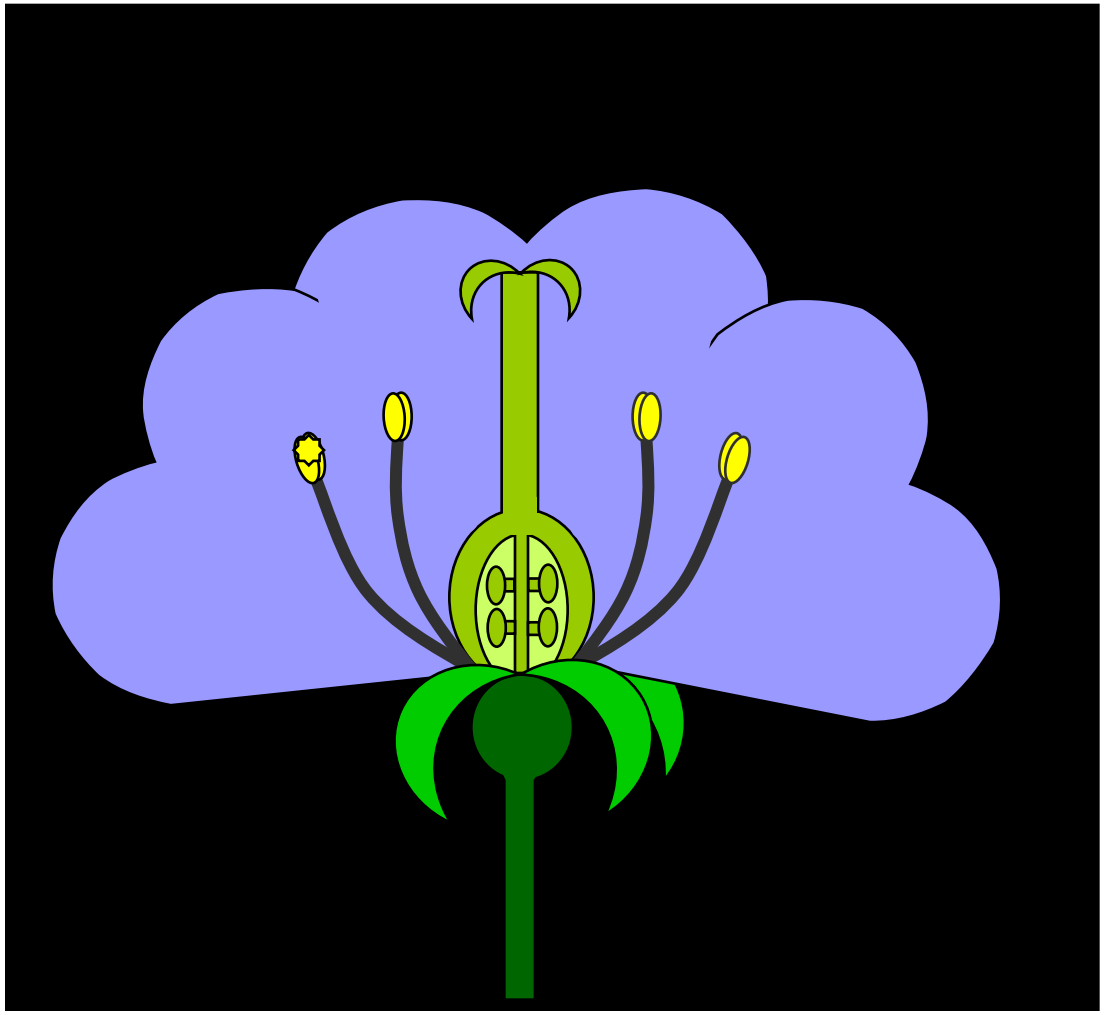
Pollination

Pollination is the transfer of pollen from the anther to the stigma



- This is an example of **cross-pollination** as the pollen travels from one flower to a different flower. This is desirable in plants as it promotes variation.

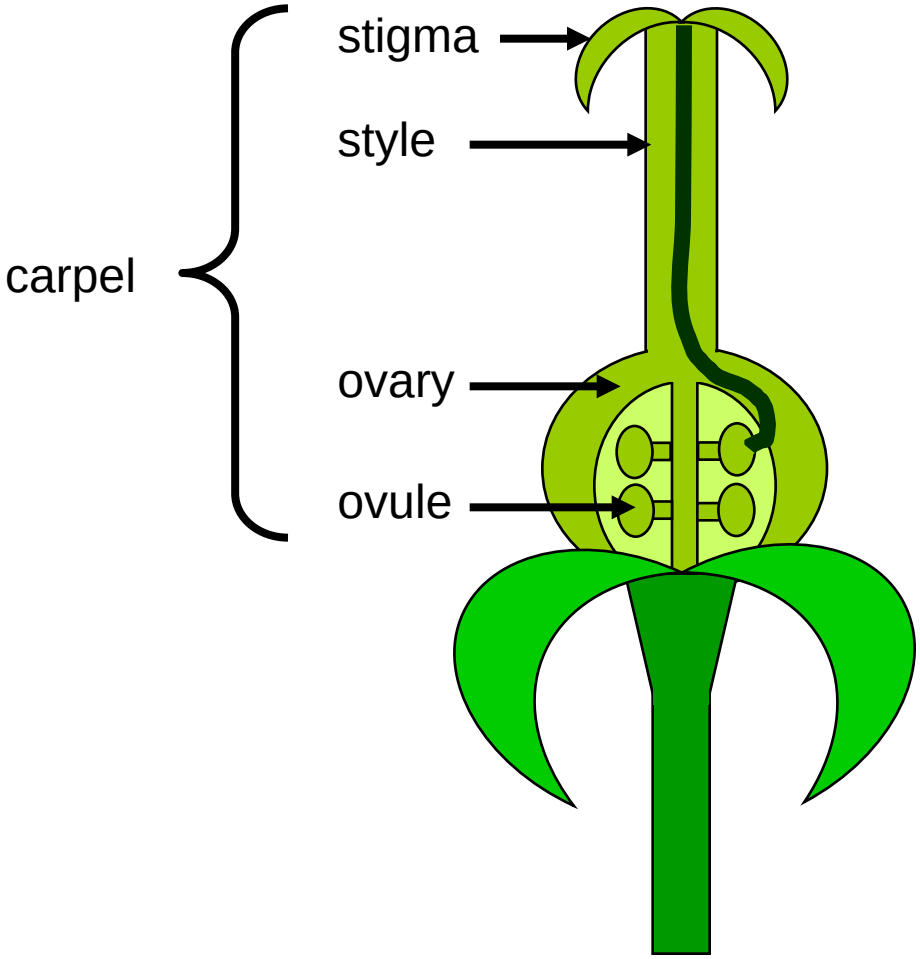
Self-pollination occurs when pollen falls from the anther onto the stigma of the same flower



- Self-pollination is not desirable as it reduces variation

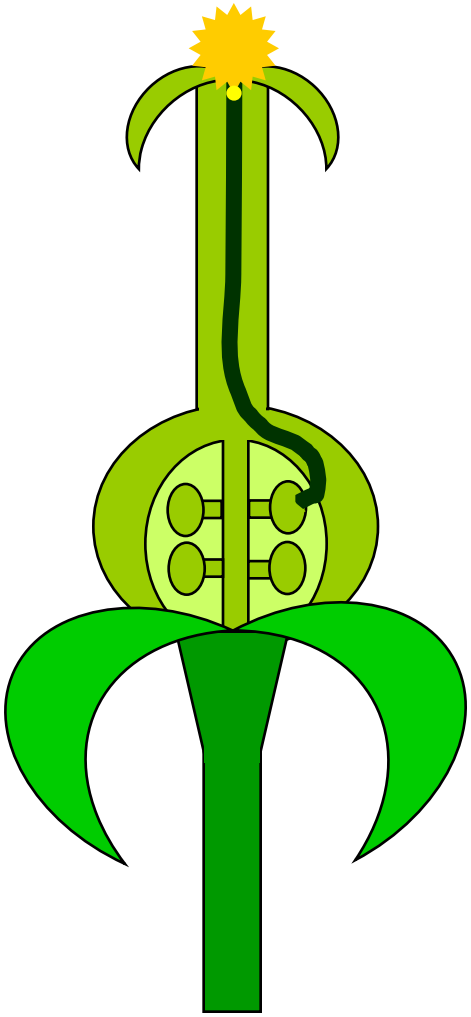
Fertilisation and Fruit Development

Once pollination occurs a tube grows from the pollen grain down through the style to the ovule



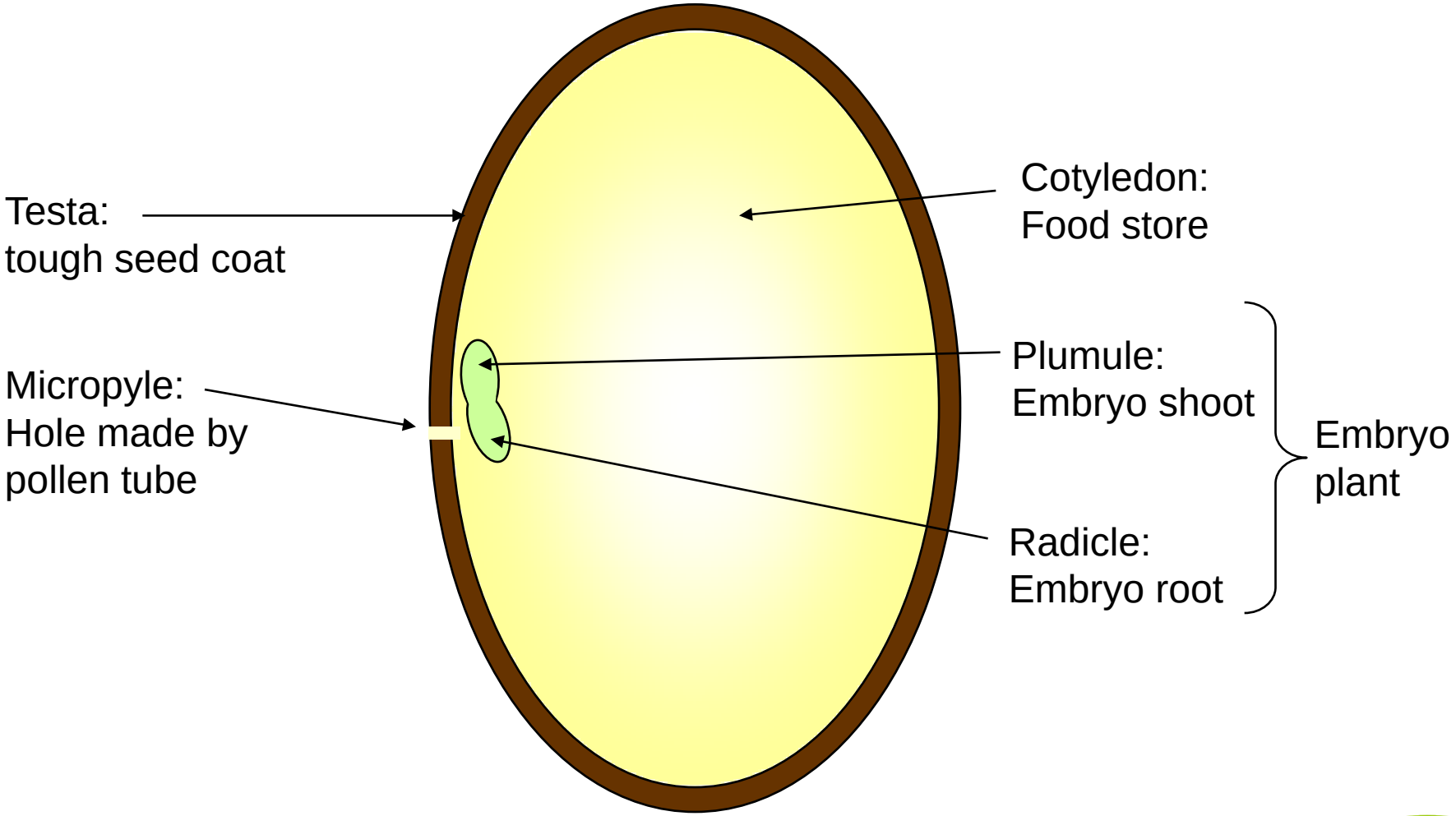
Note: Petals not shown in order to simplify diagram

Fertilisation occurs when the male gamete fuses with the ovule (the female gamete)

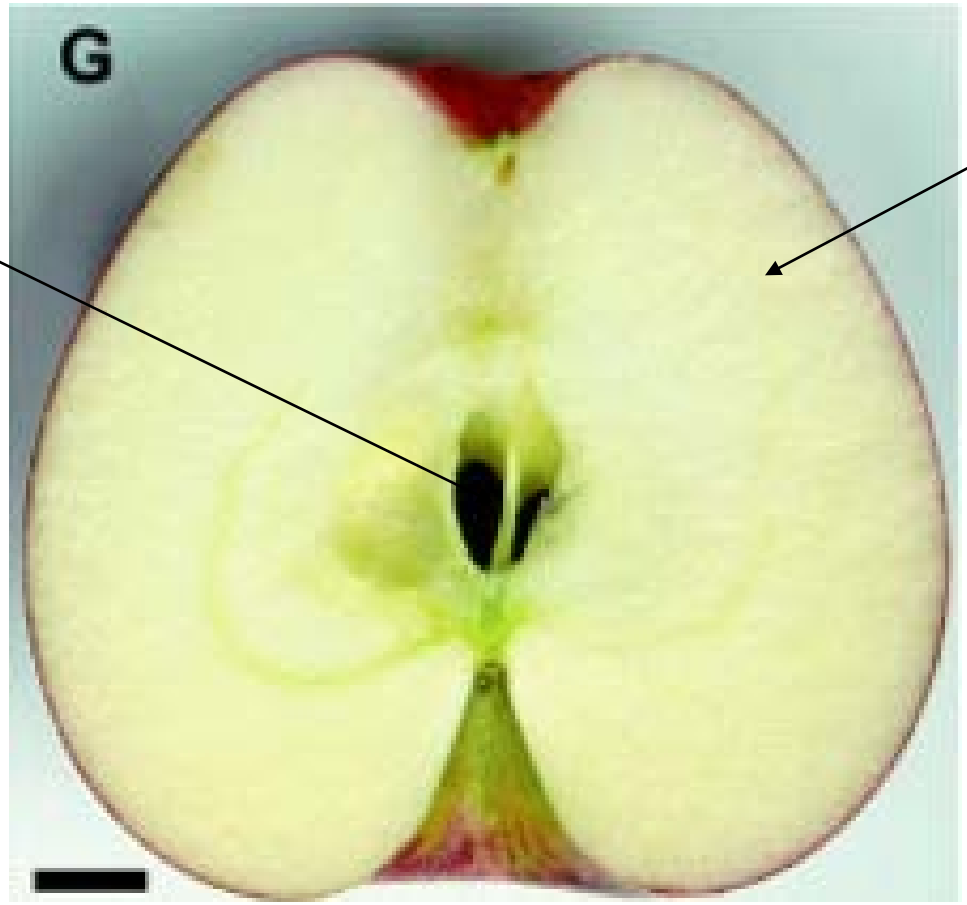


Seed Dispersal

After fertilisation the petals, stamen and sepals fall off. The ovule turns into a seed, the fertilised egg inside develops into an embryo plant.



Water leaves the seed, it dehydrates and becomes dormant because metabolic reactions stop.
The ovary develops to become a fruit.



Seeds need to be dispersed away from the parent plant in order to reduce competition for space, light, nutrients and water.

- Seeds can be dispersed by:

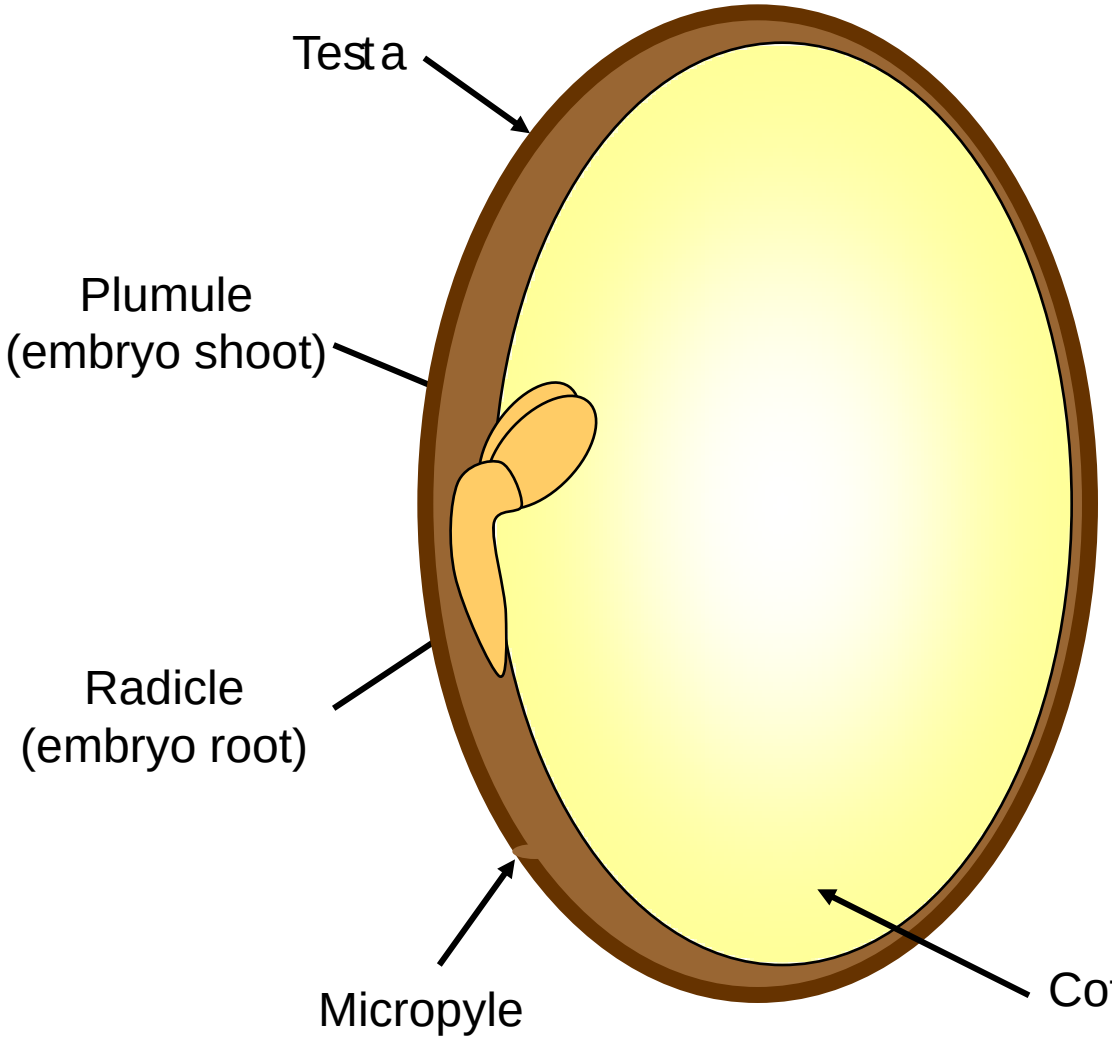
- Wind
- Water
- Mechanical
- Animals





Germination

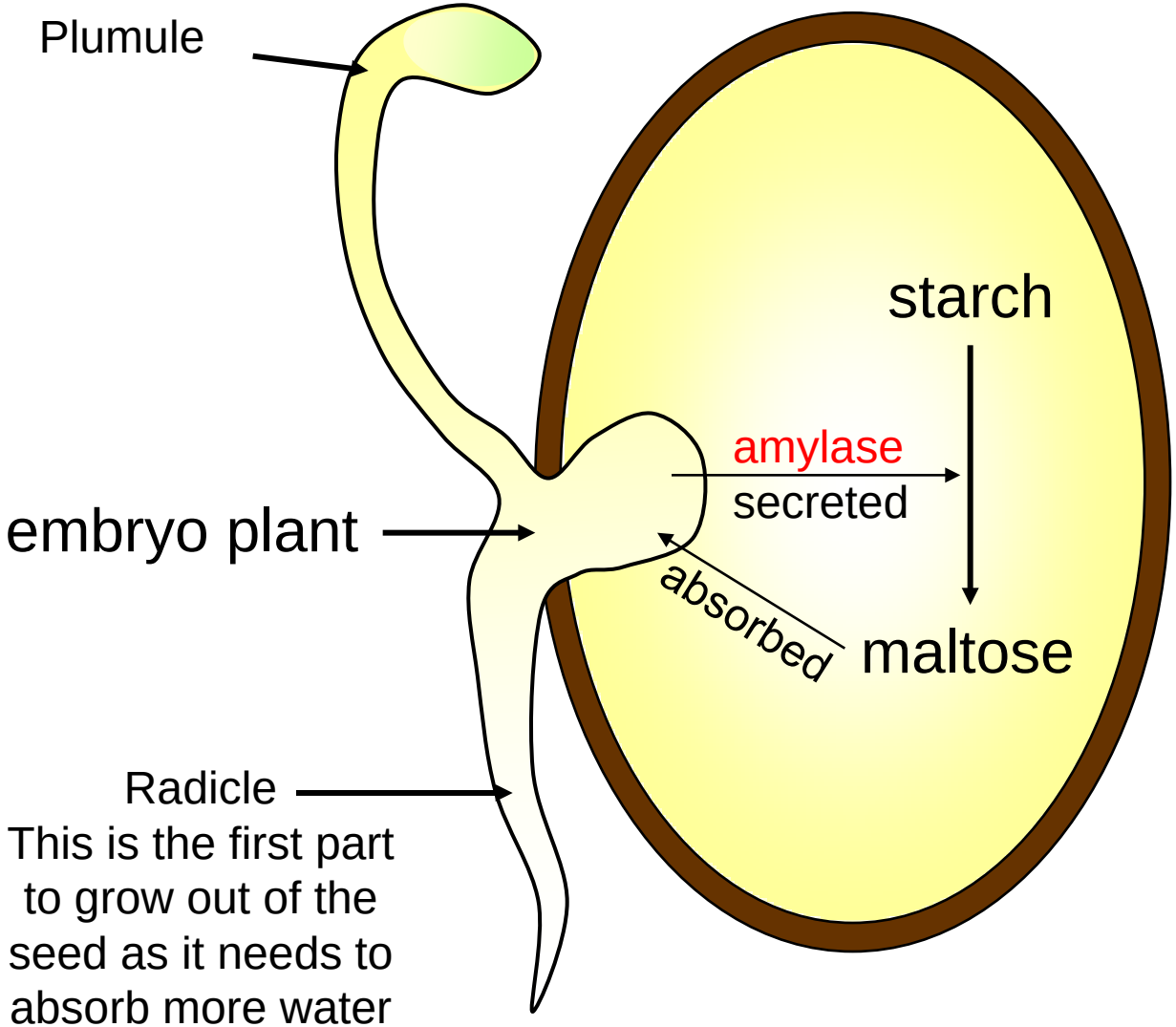
The seed contains the embryo plant and cotyledons (starch stores)



Water enters the seed through the micropyle and activates enzymes.

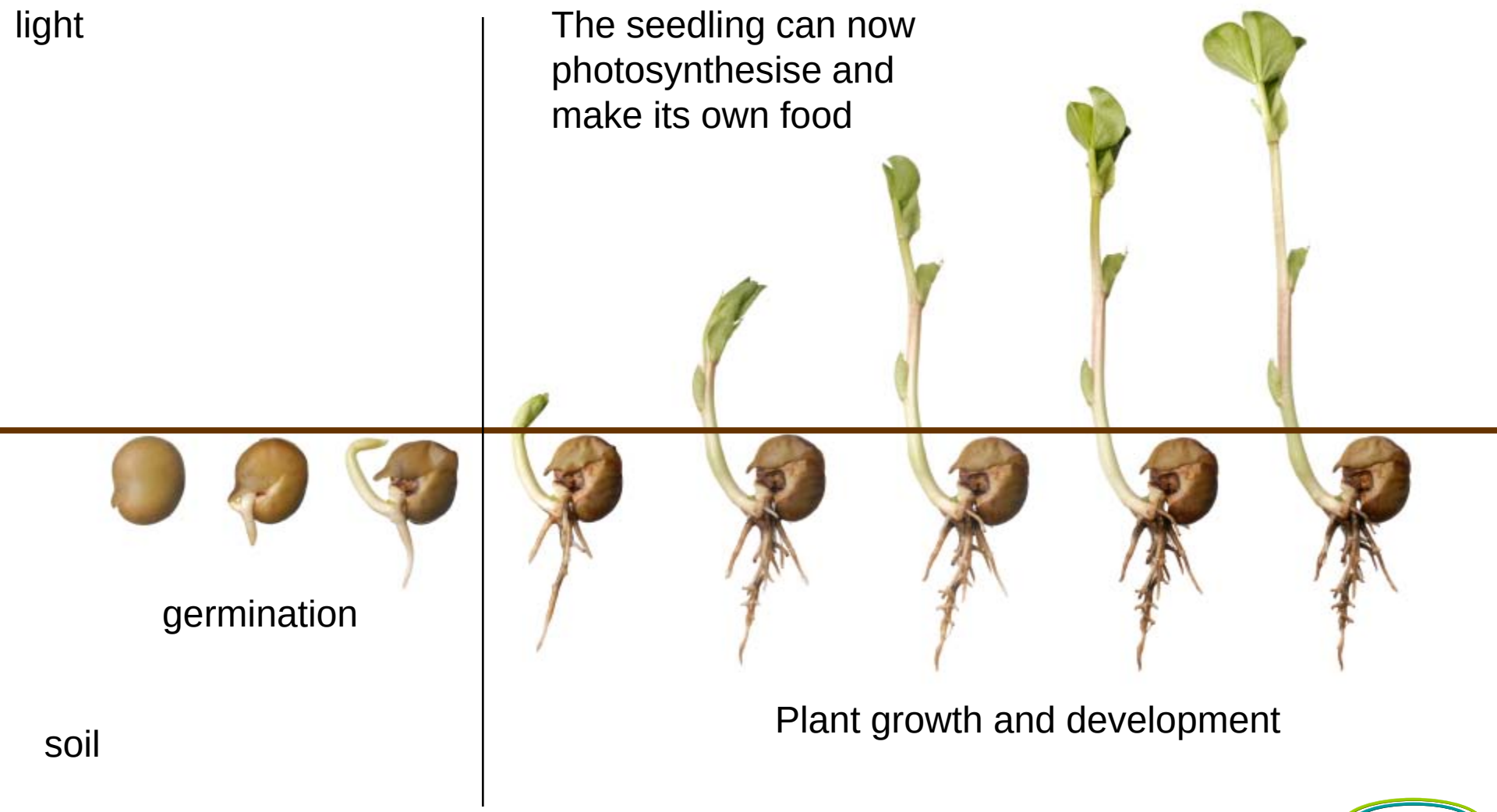
The water also softens the testa to allow it to split.

Enzymes are used in seed germination



The enzymes break starch down into maltose and then glucose. The glucose is used in respiration to provide energy for growth

Whilst germinating the plant uses food stores in the cotyledon to provide energy for growth



Transplanting Seedlings

- Seedlings are the small plants.
- Transplant when first true leaves appear
- Held by the true leaves rather than the stems to prevent stem bruising which will kill the plant.

Hardening Off

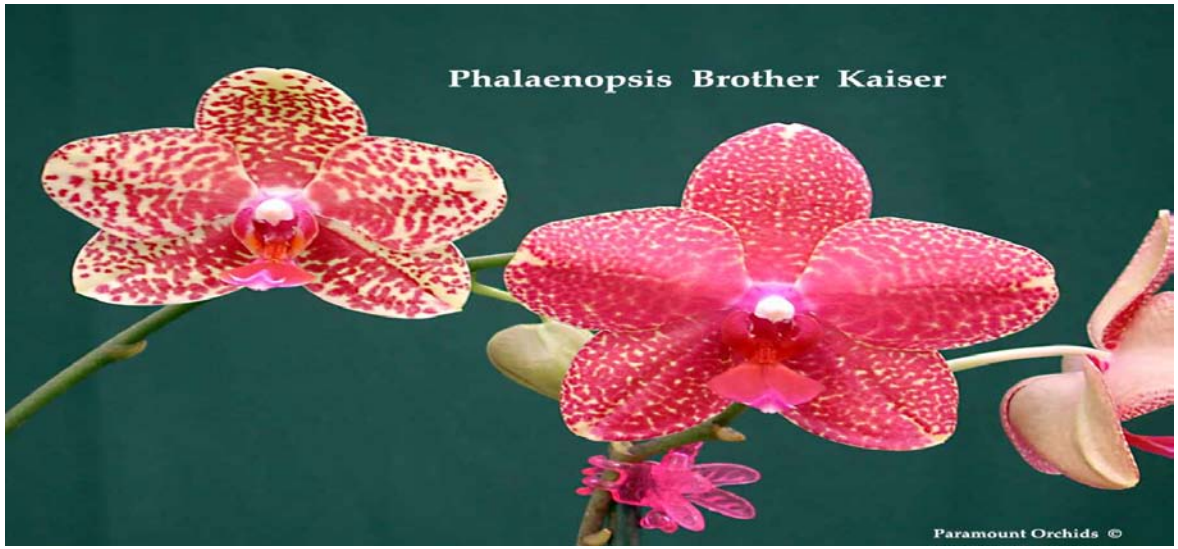
- The reducing of humidity and water to make the environment more like the outside.

- Pelletized seeds

- Seed tapes

Disadvantages of Sexual Propagation

- Some plants, especially hybrids, do not reproduce true to parents.
- Some plants are difficult to propagate from seeds.



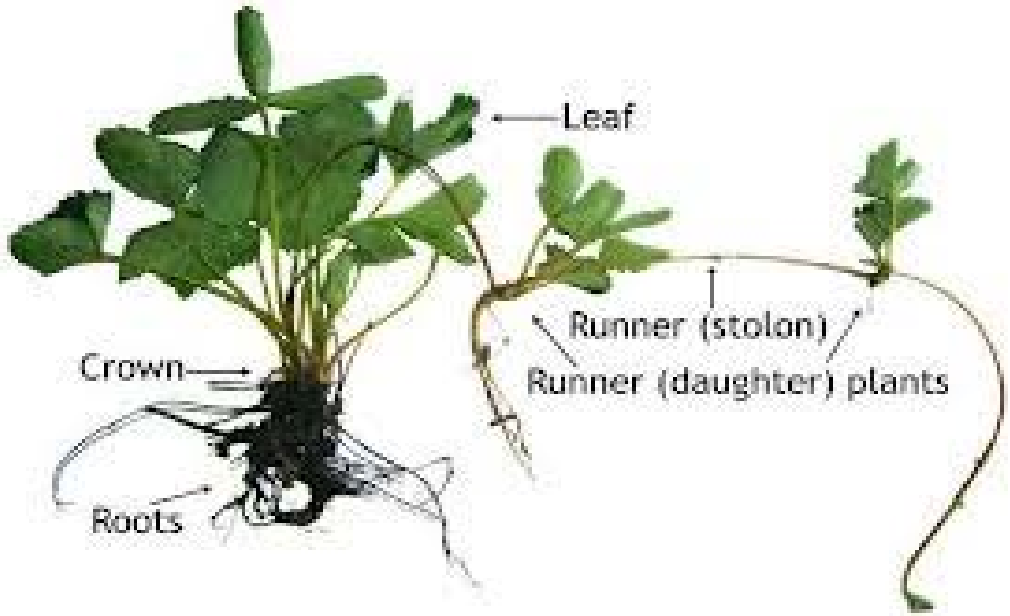
Asexual Propagation

Asexual Propagation

- The use of growing parts other than seeds to reproduce plants.
- The types are....
  - Cuttings
  - Layering
  - Division/Separation
  - Budding
  - Grafting
  - Tissue Culture

- Apomixis

- Runner

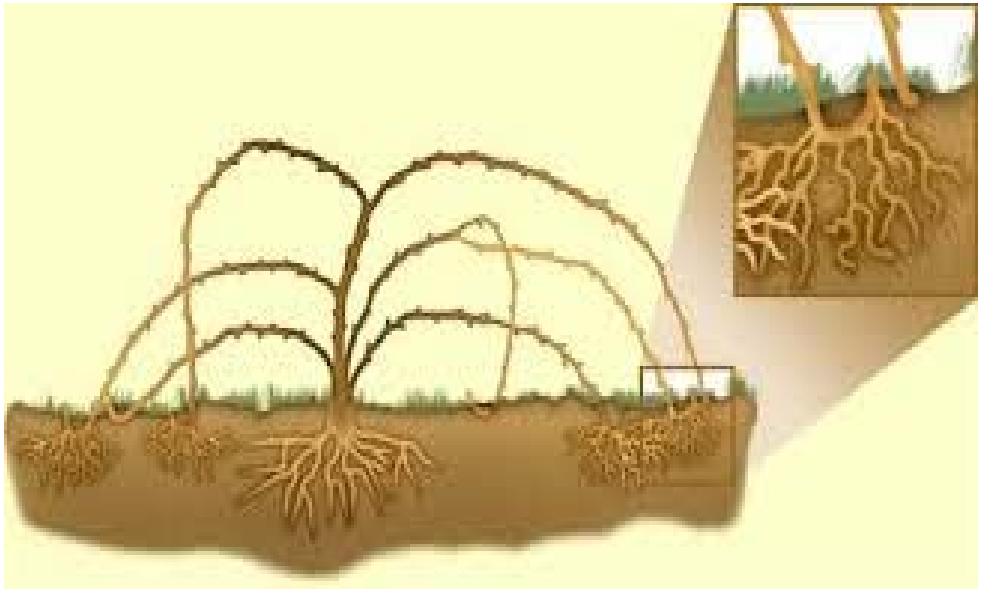


- Sucker

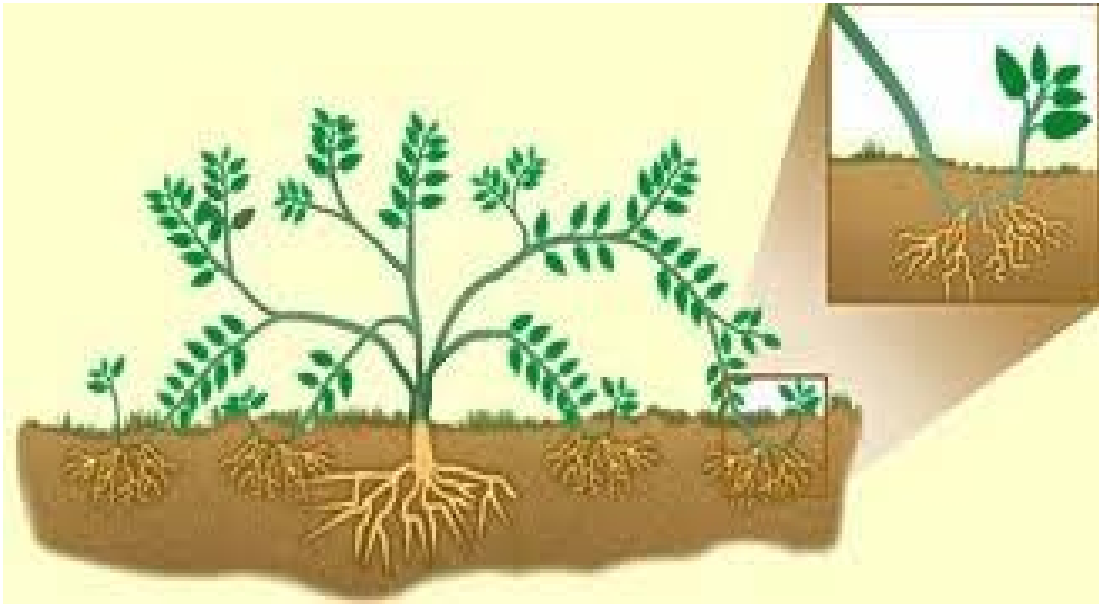
Layering

- The rooting of plant parts while they are still attached to the “parent” plant.
- The types are....
  - Air Layering.
  - Trench Layering.
  - Mound Layering.

Tip Layering

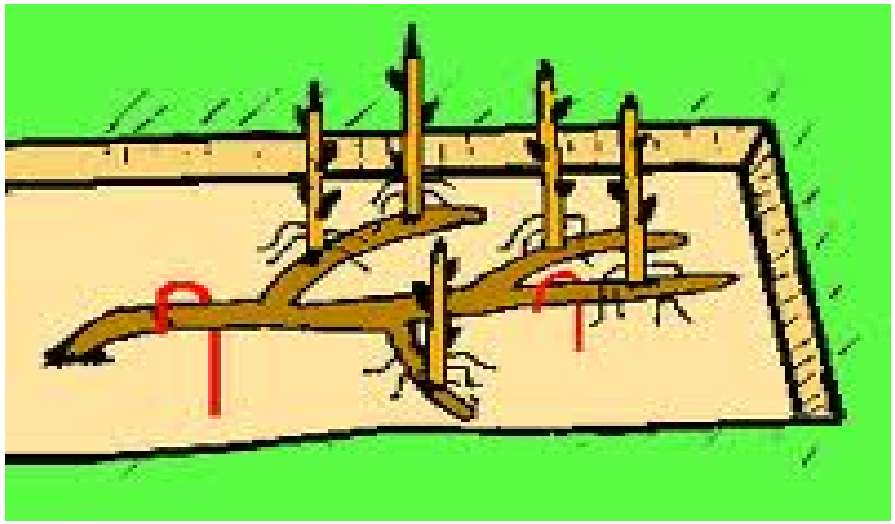


Simple Layering



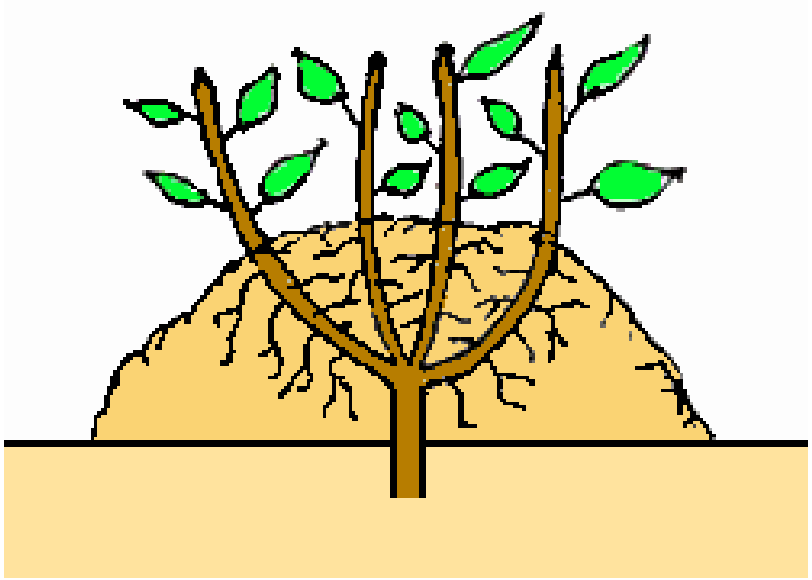
Trench Layering

- Mother plant is bent to the ground and buried.
- Plants form at each node on covered stem.



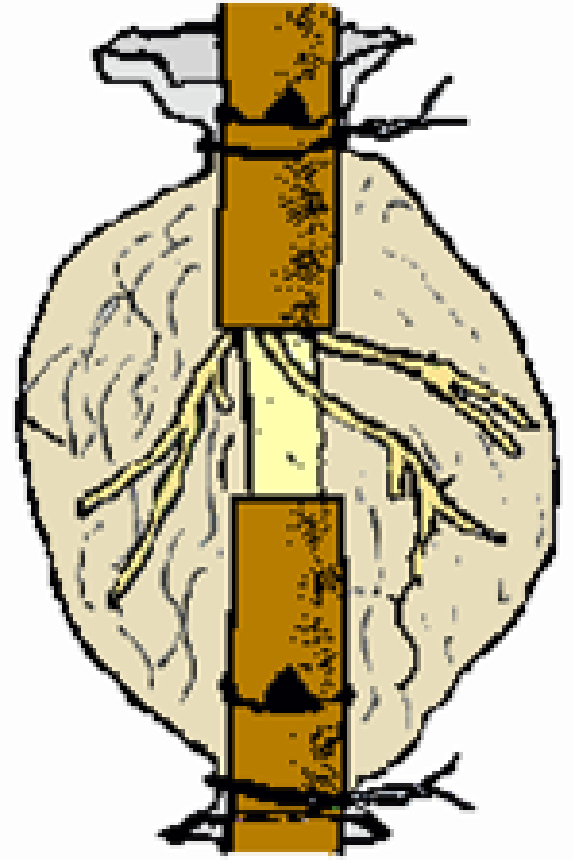
Mound Layering

- Rooted plant is cut off at the soil level.
- As the season progresses, soil is added to cover the growing shoots.
- After 1 year, the shoots are rooted and removed from the parent plant.



Air Layering

- Also called Chinese propagation.
- Area of plant is girdled and surrounded by a moist growing medium that is sealed in polyethylene film.



Compound Layering