90928 (1.4) Flowering Plants

Organs of a plant

- roots: (anchor plant in soil) absorb H_2O, store starch over winter.
- stem: (support leaves to reach sunlight, transport H_2O, nutrients, sugars). → lose H_2O via transpiration.
- leaves: (photosynthesis)
- flowers: (wind + insect pollination)
- fruit: (formed from ovary, used for seed dispersal).
- seed: (dormant package containing embryo plant and food)

Angiosperm = enclosed seed → produce fruit

- flowers — to improve pollination

unique to angiosperms.
- fruit = swollen ovary. → enclosed seeds.

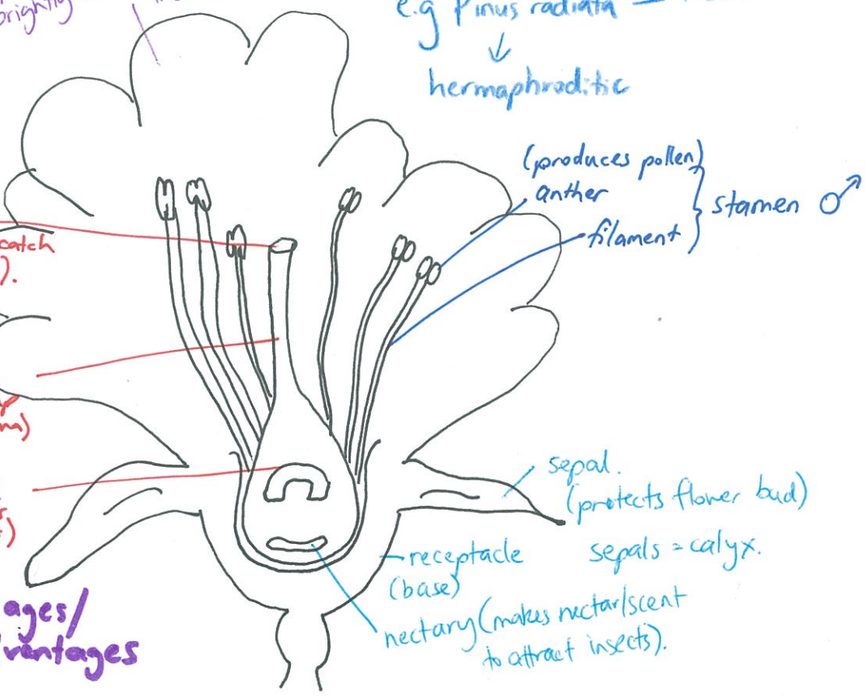
Fruit:
- Dihiscent (seeds in pod)
- Indihiscent (no seed pod).

AWWE: methods of fruit/seed dispersal.

Gymnosperm = naked seed

(Conifers) → no fruit

e.g Pinus radiata → hermaphroditic



Asexual Reproductive Organs

≠ Sexual Reproduction

define: / advantages/disadvantages

- ★ a.k.a. vegetative propagation
- ★ plants reproducing by itself
- ★ no energy wasted on gamete production
- ★ genetically identical offspring
- ★ quick: can populate favourable area (if environment stable/suitable).

- Corm e.g gladioli (vertical swollen stem below ground)
- Bulb e.g daffodil (swollen underground leaves)
- Runners e.g strawberries (lateral shoot, along surface of ground)
- Stem tuber e.g Kumara (swollen underground roots/stems)
- Rhizomes e.g ginger (horizontal stems below ground)

Humans

- CUTTINGS
- GRAFTING

Tropism

auxin causes cells to elongate. +ve phototropism.

- phototropism
- gravitropism
- +ve or -ve.

In complete darkness, auxin causes all stem cells to elongate = Etiolation. plant becomes tall.

Photoperiodism

Vernalisation

- LDP's
- SDP's
- temperature
- Florigen

Self/Cross Pollination

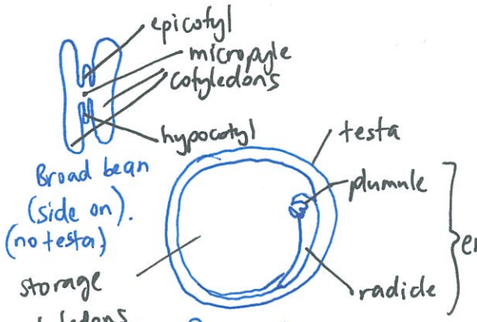
- mechanisms to ensure cross P.
- definition?

Insect: larger, colourful petals, petals close to reproductive organs. anthers arranged so insect must brush past while collecting nectar. Stigma = sticky pad to collect pollen. Scent and nectar used to attract. Mostly bisexual (hermaphroditic). Pollen rough + sticky.

Wind: Petals not obvious, may be small or absent, reproductive organs exposed, anthers 'dangle' outside flower to catch wind. Stigma feathery/net-like to catch pollen, no scent or nectar, often Bisexual but may be dioecious. Pollen is smooth, light, small, aerodynamic.

advantages/disadvantages

Broad bean seed (side on). (no testa)



Growth

- **Primary:** apical meristems
  - D: division → increase in length.
  - E: elongation
  - D: differentiation
- **Secondary:** cambium, xylem, phloem (differentiation) → increase in width.

summer wood, winter wood. wood: old dead xylem.

Double fertilisation

- define
- not same as pollination.
- 1st for embryo plant
- 2nd for endosperm.
- pollen tube!
- female gamete (ovule). → egg.
- male gamete (pollen grain)

Germination

Giberellin → starts amylase production → endosperm (mainly in monocots).

- definition!
- **Epigeal** (ABOVE): hypocotyl elongates, lifts cotyledons out of soil. e.g lupins
- **Hypogeal** (BELOW): seed remains in soil, cots remain in seed e.g broad bean/peas.

NEEDS:
- Water
- O_2

DOESN'T NEED:
- Soil
- Sunlight

MRS GREN
- Movement
- Respiration
- Sensitivity
- Growth
- Reproduction
- Excretion
- Nutrition

Nutrients

- CO_2
- H_2O
- Nitrogen
- $O_2 + CO_2$
- Phosphorous
- Sulfur

Photosynthesis

$$6CO_2 + 6H_2O \xrightarrow{\text{solar energy, chlorophyll}} 6O_2 + C_6H_{12}O_6$$

Factors affecting rate:
- * CO_2 conc.
- * light intensity
- * no. chloroplasts
- * wavelengths of light

Leaf Structure: