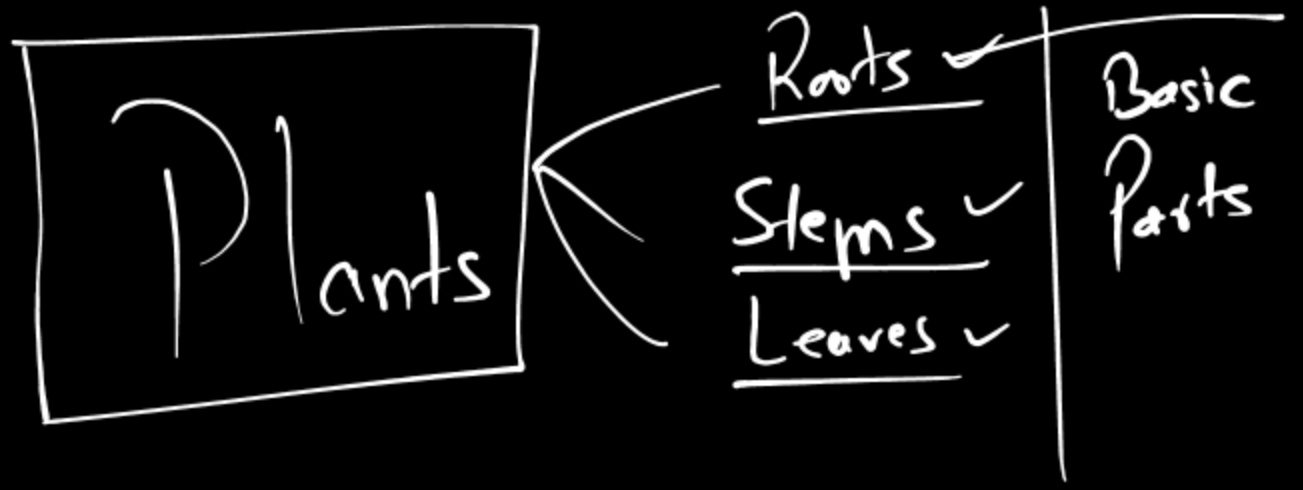
Pollination and Plant Reproduction

Grade 5



Root → absorb water and minerals from soil.
→ Binds the plant with soil.

Stem → Acts as backbone of plant
→ Transport water and minerals to the upper parts of the plant.

Leaves | Leaf → It makes **food** using sunlight, water, carbondioxide and

Chlorophyll } Photosynthesis

Chlorophyll → green colour pigments

Photo → Light

synthesis → to make something → to produce

Only by green leaves

- Even green young stems can perform photosynthesis

Food → Glucose

→ goes to different parts of the plant.

↳ Extra glucose gets deposited in fruits, stems, roots, etc.

Potato is a stem.

sweet potato is a root.

Photosynthesis

Sunlight + Carbondioxide (CO_2) + H_2O (water) + Chlorophyll

↓

Glucose (food) + Oxygen gas → important for the survival of all living things including humans.

⇒ Exchange of gases.

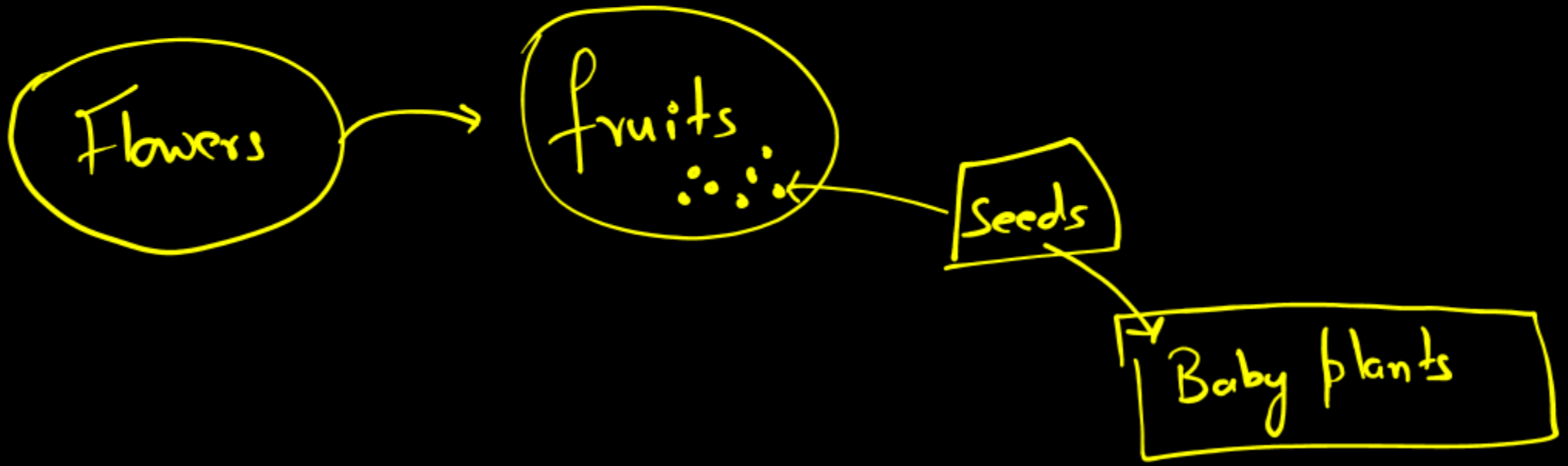
⇒ Get rid of excess water

Reproduction in Plants

"A process by which an organism (plant or animal) produces new individual (baby plant or baby animal)."

"This process is called reproduction"

In flowering plants, process of reproduction is performed by flowers.



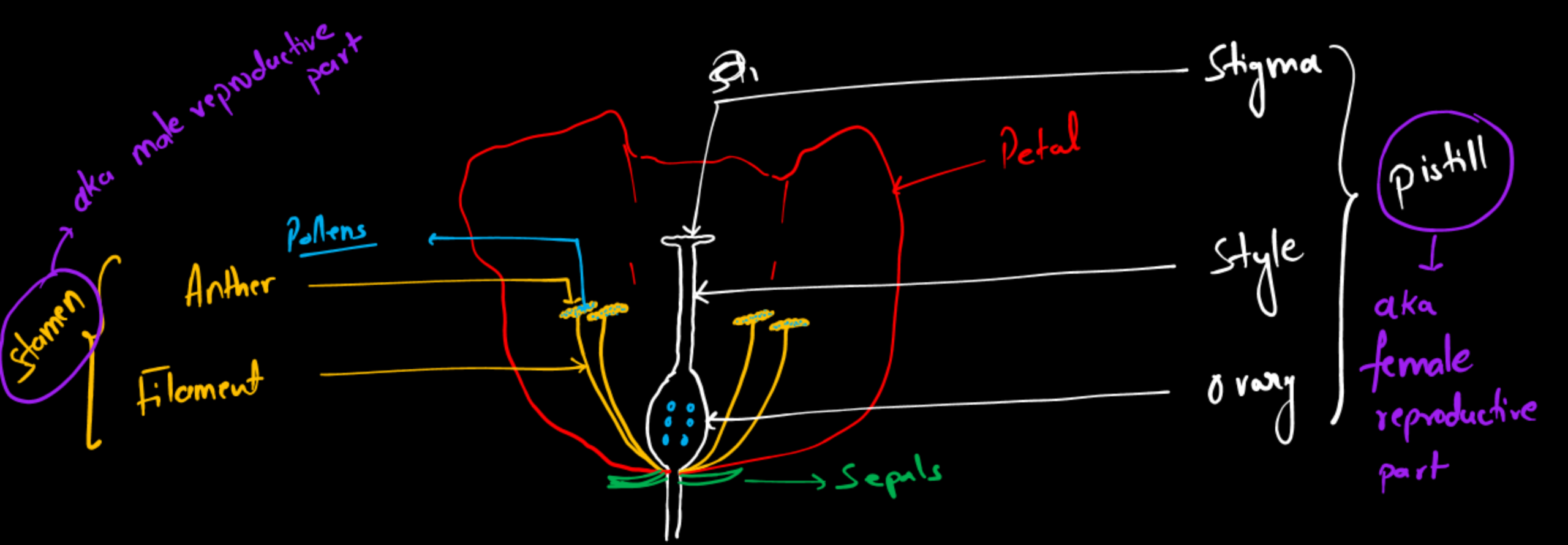
Flowers

→ Unisexual (either male or female reproductive part)
→ Cucumber flower, papaya flower, bitter gourd flower.

→ Bisexual (both male and female reproductive part)
eg: Hibiscus, rose.

① → Petal → (colourful) → helps attract pollinators (bees | insects)
→ Sepals → (green in colour)
→ Stamens → (anther + filament)
→ Pistil → (stigma + style + ovary)

→ Ovary → Ovule.



Pistill, Stamen } essential part of flower

Petals, Sepals } Non-essential part of flower.

Main function of flower is reproduction.

⇒ Process of reproduction produces fruits containing seeds.

⇒ Reproduction takes place in two steps:

1. Pollination
2. Fertilization.

① Pollination: ⇒ Transfer of pollens from anther to stigma.

∴ Two types of pollination

→ Self pollination :→ Transfer of pollen from anther of one flower to the stigma of same flower or another flower on the same plant.

→ Cross-pollition : Transfer of pollen from anther of one flower to stigma of another flower on ~~the~~ a different plant.

male gamete (inside pollen grain)

anther

pollen grains

very small (microscopic)

Pollen grains → Stick to stigma

stigma.

Sticky surface

pollen tube

ovule

ovary.

(egg) ← female gamete

Agents of pollinations:

- Insects eg: bees, butterfly
- Animals / Birds
- Wind [in sugarcane, grass, corn]
- Water (in water lily)

(2) Fertilization

↳ Germination of pollen grain on the stigma.

↳ Growth of pollen tube downwards into the style.

↳ Male gamete goes down the pollen-tube and it is released in ovary.

↳ Male gamete fuse with female gamete to form Zygote.

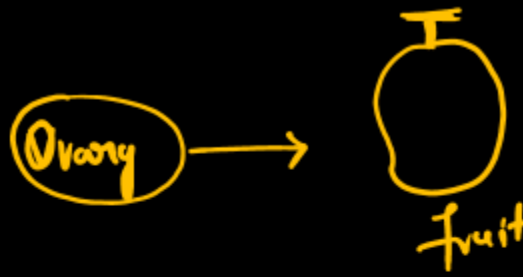
Changes taking place after Fertilization.

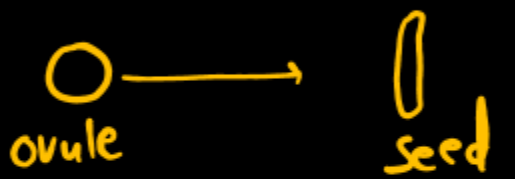
1 → Sepals, petals and stamen fall off.

2 → Ovary swell to become fruit.

3 → Ovule develops to form seeds.

4 → Zygote develops into embryo inside seed.





Zygote → Embryo

↓

present inside seed

Ovary → after fertilization → forms → fruit → have one or more seeds

Fruits → can be → fleshy eg: papaya, mango, apple, banana.

can be → Non-fleshy (dry) → eg: pea, gram

[Ripened fruit contains matured seed → has embryo]

Ovule → Seeds → embryo → can develop into baby plant in future.

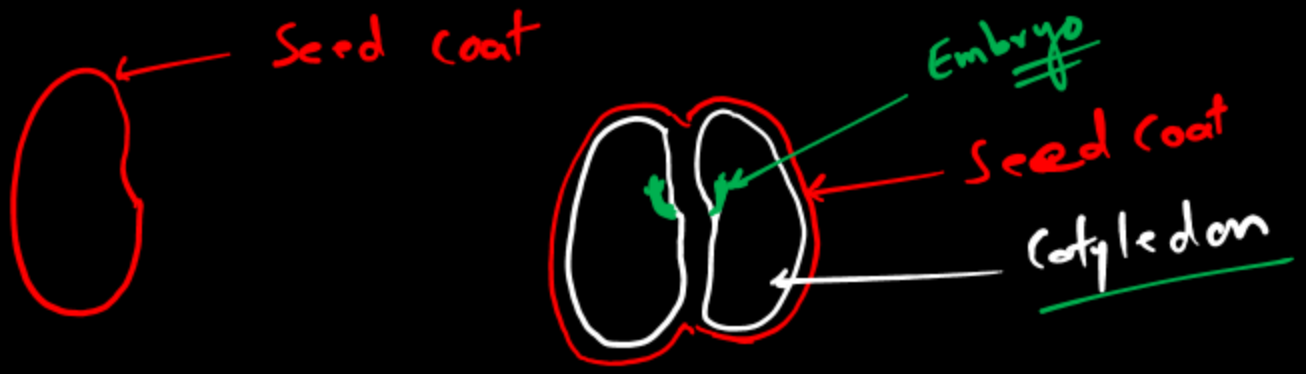
[they contains one or two cotyledons]

Based on the number of cotyledons in a seed, plants are classified into 2 categories

Monocotyledons
(One cotyledon in seeds)
eg: Maize, Rice, wheat

Dicotyledons
(Two cotyledons in seeds)
eg: Pea, Gram, Mango, Apple.

Structure of seed



Dicot seed

Seed Germination :

→ When seed forms inside fruit, it has to go for a period of dormancy (Deep sleep / inactivity)

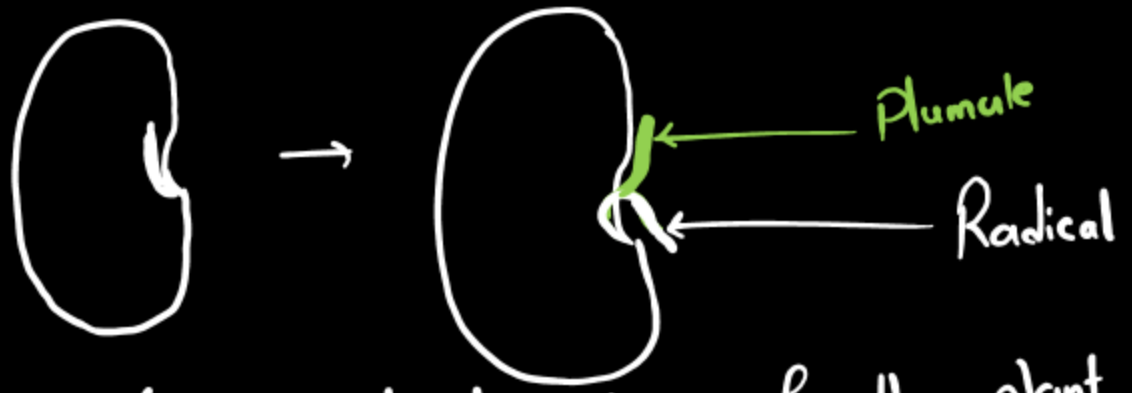
- → during dormant period seeds dry out.
- → Seeds can live in this period from few days to few hundred years.

⇒ When dormant seeds get favourable condition, they come out of their dormancy.

Favourable conditions to break dormancy :- Water (moisture), air, suitable temperature, sunlight, soil.

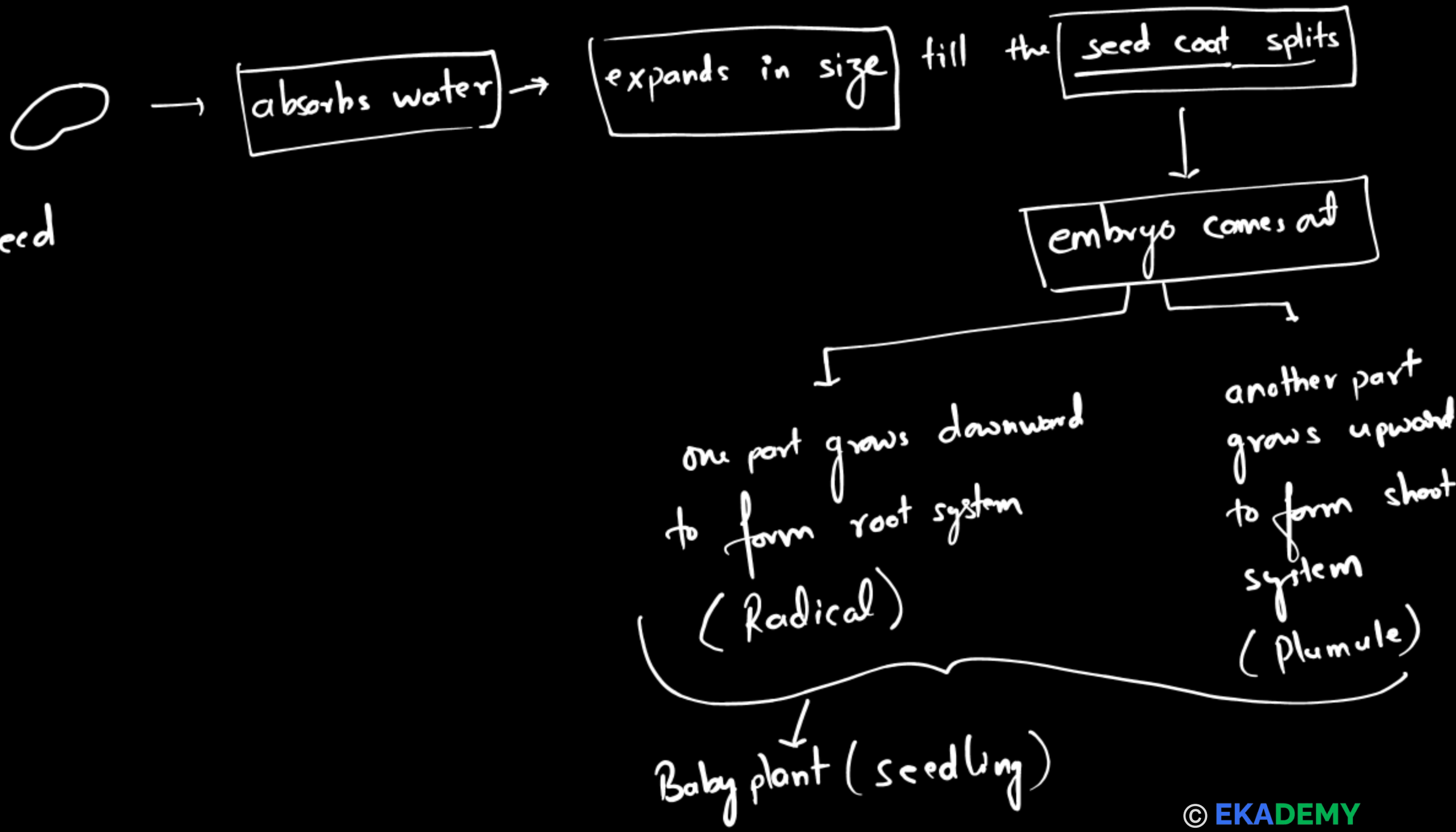
When a seed gets all the favourable condition, they grows into a baby plant (a.k.a seedling).

[This process of a seed turning into seedling is called germination.]



Germinating Seeds

- Plumule → forms shoot system of the plant
- Radical → forms root system of the plant.



Sexual Reproduction in plants

→ flower → male gamete
→ female gamete.

→ Pollination

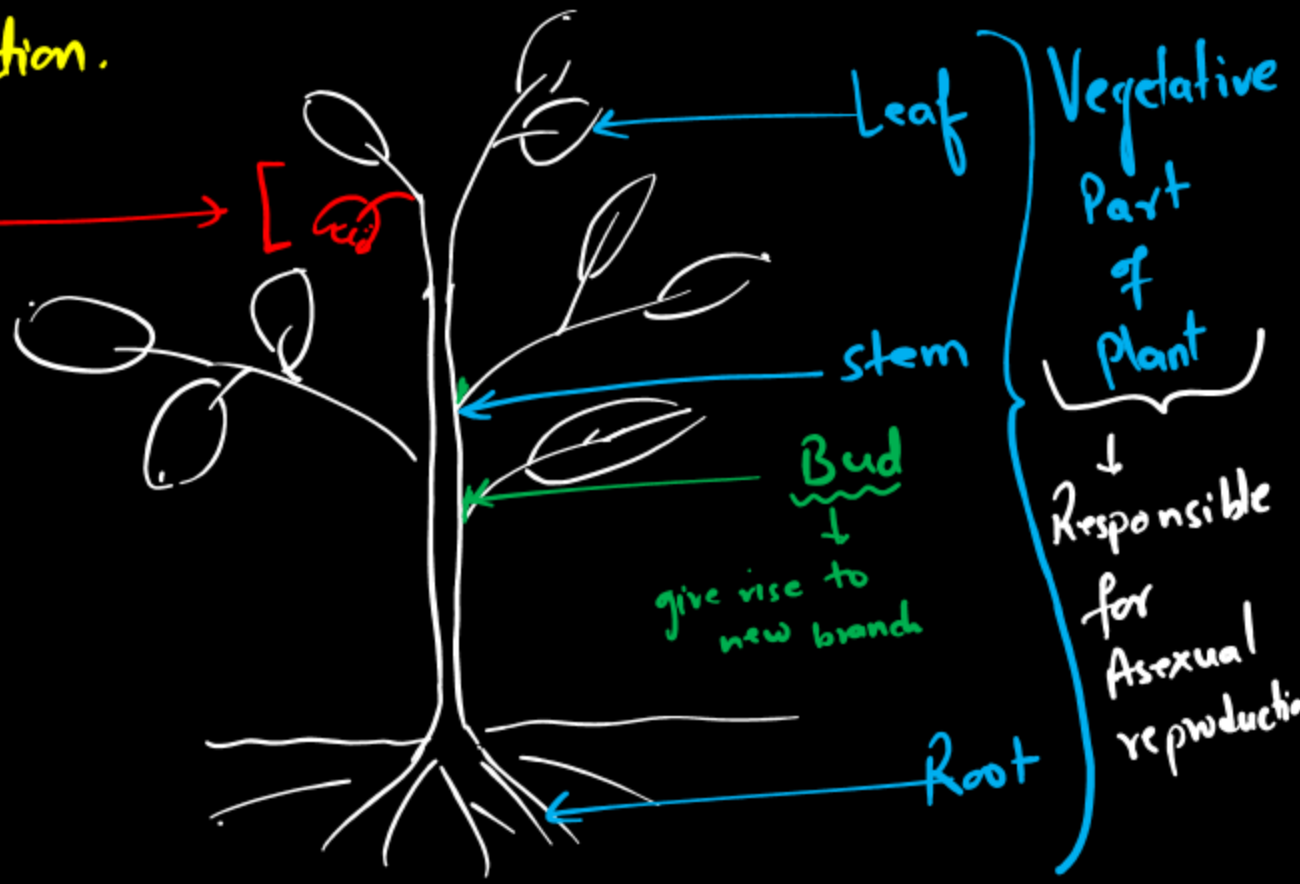
→ Seed

⇒ Many plants also undgo Asexual Reproduction (without flower/seed)

⇒ Asexual Reproduction in plants

A type of reproduction in which flower/seed is not involved is called asexual reproduction.

Reproductive Part of plant { Flower → Responsible for sexual reproduction



⇒ In asexual reproduction, plants reproduces using vegetative parts (stems, roots, leaves and buds).

⇒ Asexual reproduction is aka Vegetative propagation.

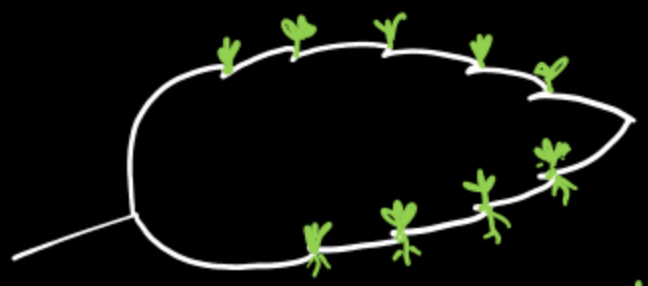
Examples:

① Plants using stem for asexual rep.
→ money plant, banana, potato, ginger, onion.

② Plants using roots: (arrot, radish, sweet potato, Dahlia

(3) Plants using leaf :

[Bryophyllum , Begonia]



[Mature Leaf of Bryophyllum]

Succulants → lot of stored water in leaf.

Dispersal by air

Seeds are :

- light and small
- → fine hair or wings that help in flying.

→

Eg:
- Seeds of milkweed plant have fine hair.
- Indian elm (winged seed)
- Dandelion seeds (very small and has fine hair)

Dispersal by water

→ eg: coconut, lotus, water lily.

↓

- Seeds are light & spongy
- Seeds can float on water.

Dispersal by explosion ⇒

⇒ Pods/fruits of ladie's finger and beans.

Dispersal by animals

→ Seeds have hooks and spines. (burdock plant)

attaches with the fur of animals.

→ Seeds of nut trees

Disp

- All the petals of a flower form the corolla.

[Corolla is made up of petals]

- all the sepals of a flower forms calyx.

[Calyx is made up of sepals]

End of the chapter