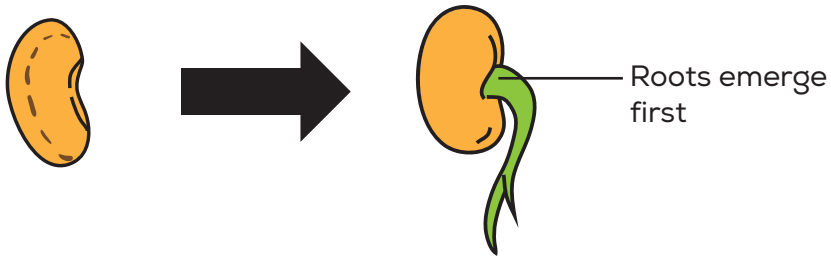
COMPLETE CONCEPT INTEGRATION™ SCIENCE

PLANT CYCLE IN A NUTSHELL

1 SEED → SEEDLING



GERMINATION

→ The process where the seed develops into a seedling.
→ Requirements for germination: water, oxygen, and warmth

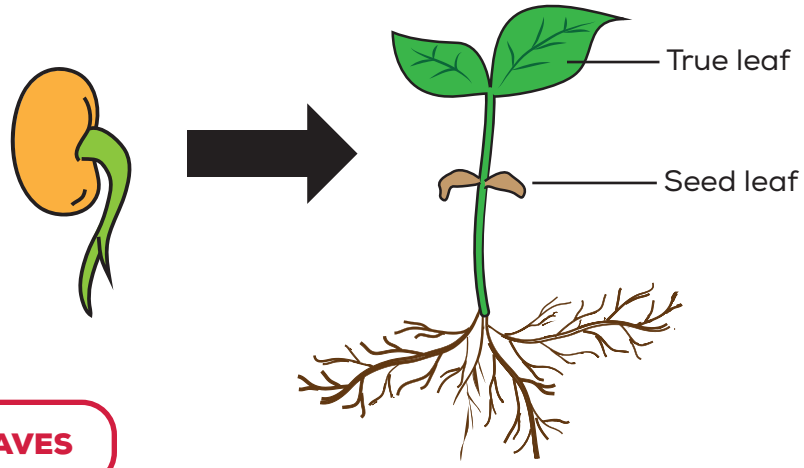
SEED COAT

→ Protects the seed leaves.
*Does NOT provide food for the seedling.

SEED LEAVES

→ Store food for the seedling to use in the process of respiration to release energy **until the true leaves are formed.**

2 SEEDLING → YOUNG PLANT



TRUE LEAVES

→ Contain chloroplasts, which contain chlorophyll to trap sunlight in the process of **photosynthesis** to **make food** (sugar).

FOOD (SUGAR)

→ The food is used together with oxygen by the plant cells in the process of **respiration** to **release energy** for growth.

SEED LEAVES

→ The mass of the seed leaves decrease as the stored food is used by the seedling. The seed leaves eventually wither and drop off.

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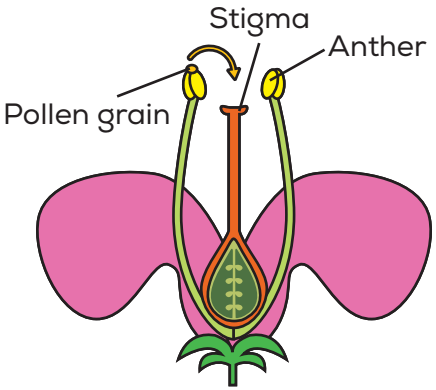
3 YOUNG PLANT → ADULT PLANT

When the young plant develops into an adult plant, the adult plant starts to develop flowers.

TWO PROCESSES TAKE PLACE:

1. POLLINATION

→ The process where pollen grains from the anther are transferred to the stigma.

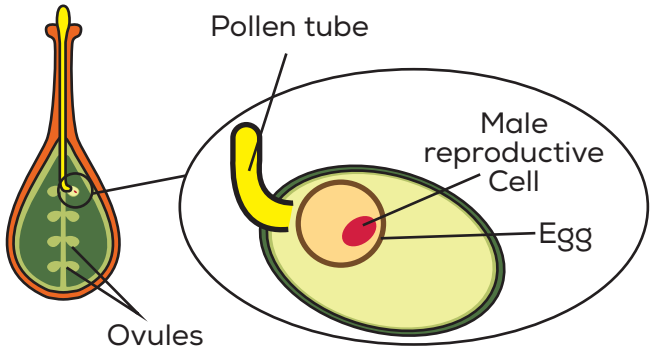


The characteristics of the flower depends on how it is pollinated.

	Wind-pollinated flower	Insect-pollinated flower
Agent of Pollination	Wind	Insects
Petals	Small and dull-coloured	Large and brightly-coloured to attract insects
Scent	Non-scented	Scented
Nectaries	Does not have nectaries	Contains nectaries to produce nectar to attract insects
Anthers	Anthers dangle outside the flower so that pollen grains can be carried away by the wind easily.	Anthers are enclosed inside the flower for pollen grains to stick onto the insect's body easily.
Stigma	Stigma is large, sticky and feathery to trap pollen grains floating in the air easily.	Stigma is sticky for pollen grains to stick to easily.

2. FERTILISATION

→ The process where the male reproductive cell in the pollen grain fuses with the female reproductive cell in the ovule.



* Read more about the characteristics of wind-pollinated and insect-pollinated flowers in our blog post: Pollination VS Seed Dispersal- What's the difference?!

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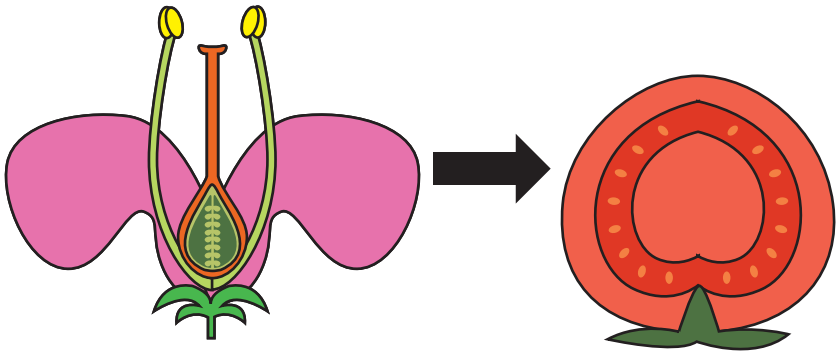
4 FLOWER (Adult plant) → FRUIT



Cross section of a tomato

After fertilisation,

OVARY

→ Develops into a fruit.

OVULE

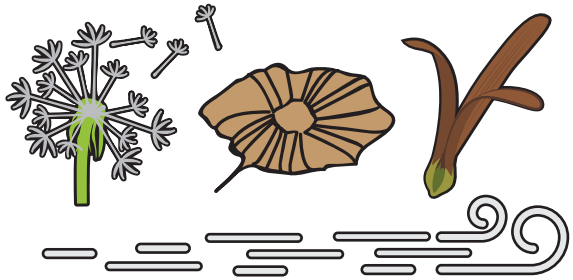
→ Develops into a seed.

* Fruits with many seeds have many ovules in their flowers.

5 FRUIT → SEED

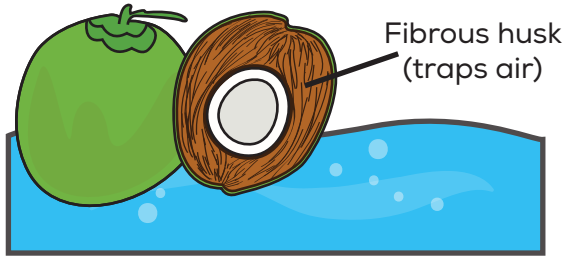
4 METHODS OF SEED DISPERSAL

1. WIND



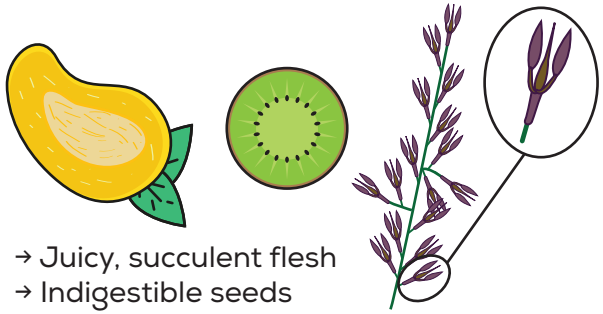
→ Wing-like structure
→ Feather-like structure

2. WATER



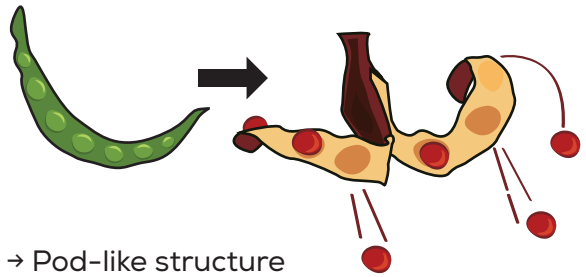
→ Fibrous husk
→ Waterproof covering

3. ANIMALS



→ Juicy, succulent flesh
→ Indigestible seeds
→ Hook-like structure

4. SPLITTING/EXPLOSIVE ACTION



→ Pod-like structure

*Read more about the 4 methods of dispersal in our blog post: Mastering The 4 Seed Dispersal Methods in 4 Minutes.

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