

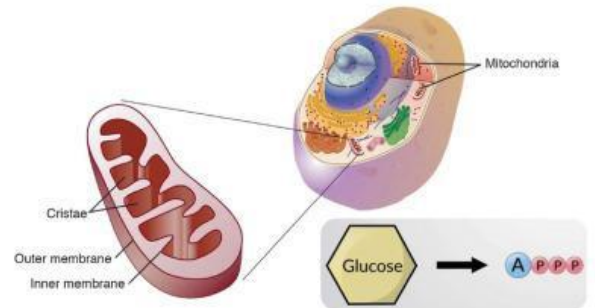
Aerobic Respiration

happens
in the mitochondria in plant
and animal cells.

use glucose
and oxygen to make an
energy molecule called ATP.

Water and CO_2 are waste
products of cellular respiration.

Don't Copy. Only FYI:
ATP = adenosine triphosphate



EMG Education

21%

0.04%

78%

16%

4%

78%

<i>Gas</i>	<i>Amount in inhaled air</i>	<i>Amount in exhaled air</i>
oxygen		
carbon dioxide		
nitrogen		
water vapour	Variable	

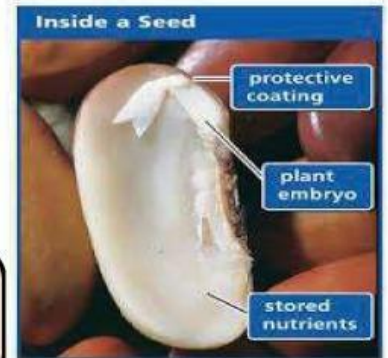
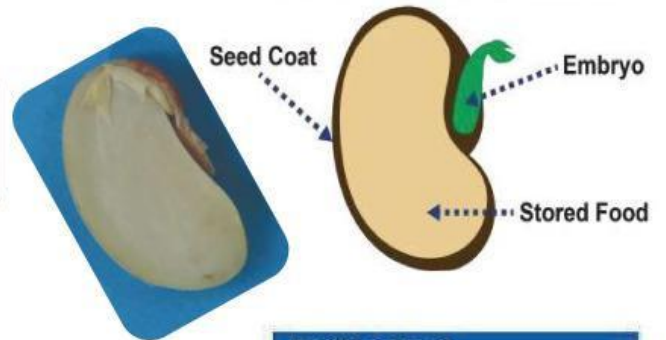
Germination

is when a seed starts to grow.

Parts of a seed:

1. **Seed coat:** The protective outer coating.
2. **Embryo:** The start of a baby plant.
3. **Stored food:** Used for **respiration** until the plant has leaves and can photosynthesize.

Parts of a Seed



Germination Factors

1. Water

Water activates enzymes that use oxygen and stored food (sugar/starch) to make energy.

2. Oxygen

After water wakes up the seeds, they need oxygen to start making energy in **cellular respiration**.

3. Temperature

The optimal temperature for germination varies between plants. But, all seeds must have some soil warmth.



EMG Education

Functions of Parts of a Leaf

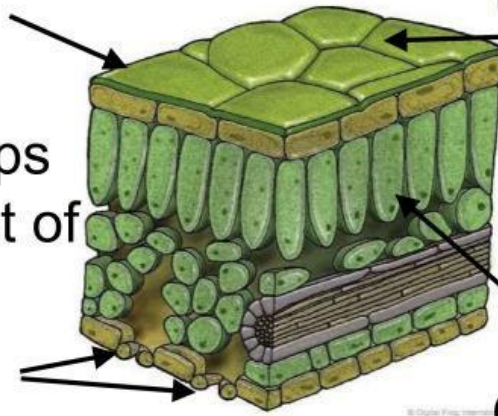
Waxy layer

Stomata

Large surface area

Chloroplasts

A waterproof layer that stops water loss out of the leaf.



Maximise light exposure.

Pores that open and close to allow CO₂ in, and water and O₂ out.

Cells are long and have lots of chloroplasts to maximise photosynthesis.

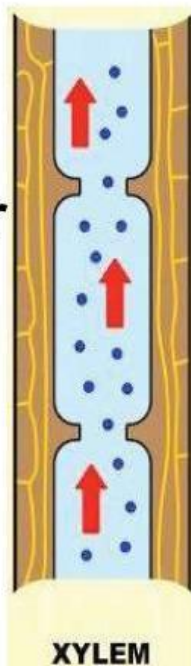
Xylem and Phloem

One-way flow

Transports water and minerals

No end walls between cells

Outer cells are **not** living



Two-way flow

Transports glucose

End walls (sieve plates)

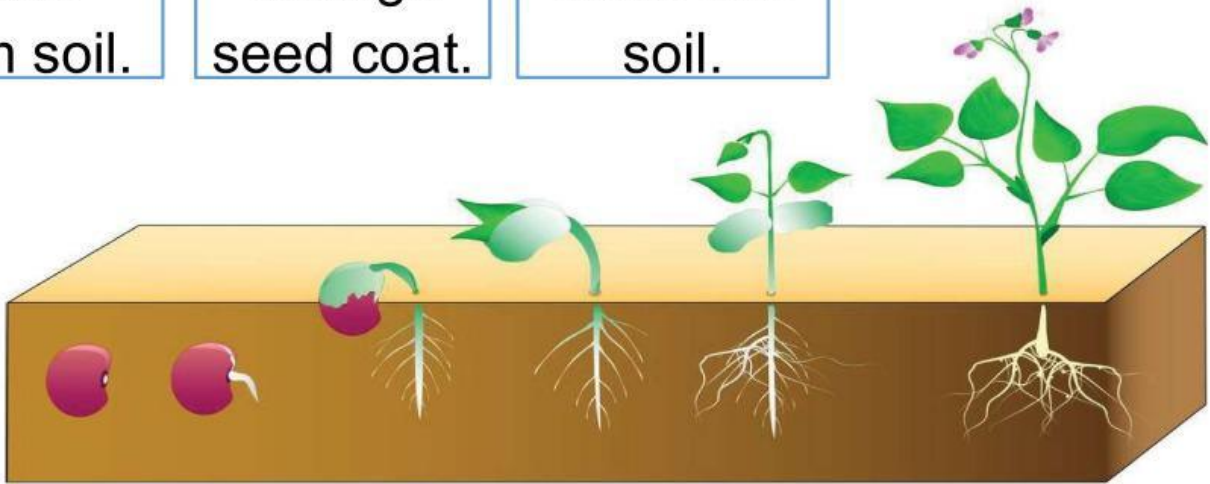
Outer cells are living but need support

 **EMG** Education

Seed
absorbs
water
from soil.

Embryo
breaks
through
seed coat.

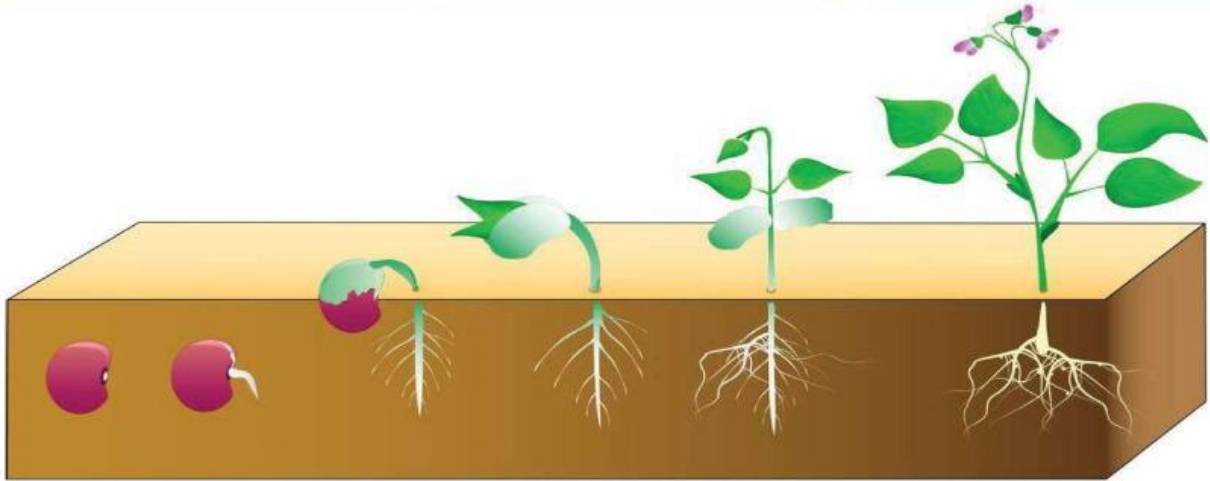
Embryo
sends root
down into
soil.



Shoot grows
up above the
soil.

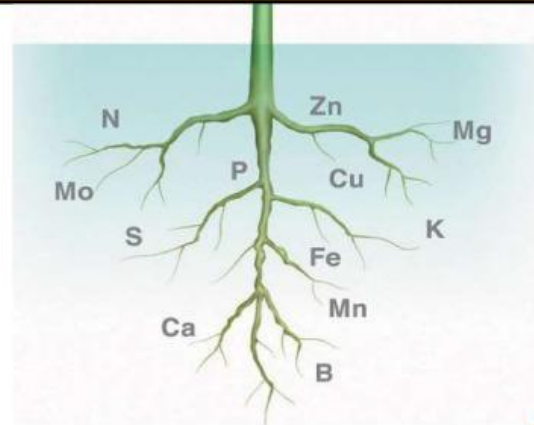
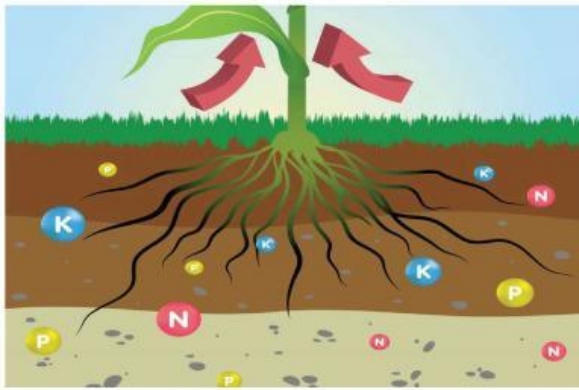
Seedling starts
to grow leaves.

Seedling
grows into
mature plant.



Plant Nutrients

: The minerals that plants need which allow them to complete chemical reactions to live. There are at least 17 essential minerals needed for healthy plants.



4 important minerals for plants

Nitrogen (N)



Potassium (K)



Phosphorous (P)



Magnesium (Mg)



Fertilizers

are substances that contain nutrients to help crops grow well. They can increase the farmer's .

- Using fertilizers helps crops **grow faster, bigger**, and overall it **increases the farmer's crop yield**.

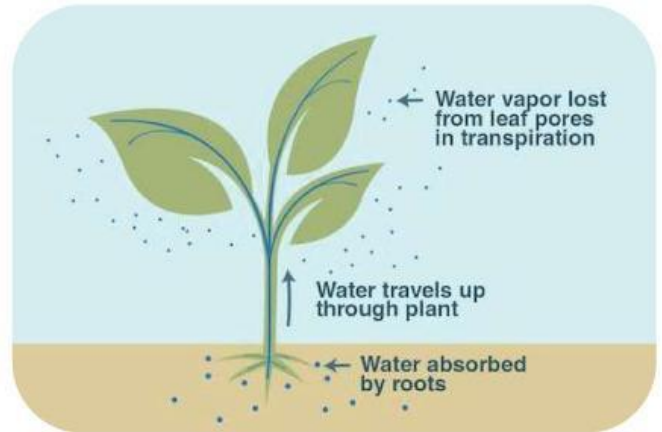
= how
much food
farmers get
from their land



Water and Mineral Transport

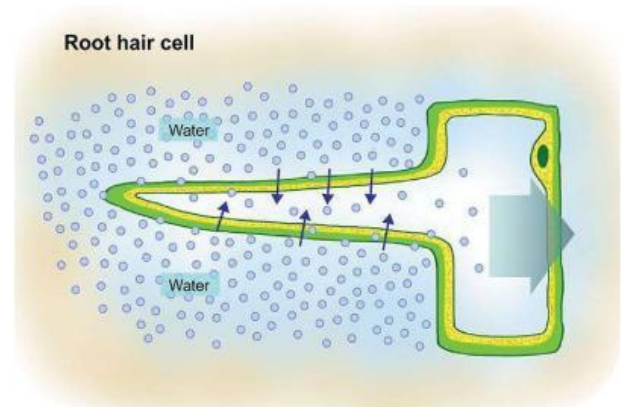
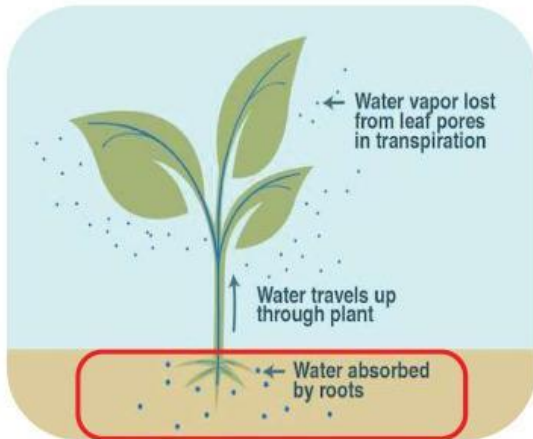
3 Steps

1. Osmosis
2. Capillary Action
 - adhesion
 - cohesion
3. Transpiration



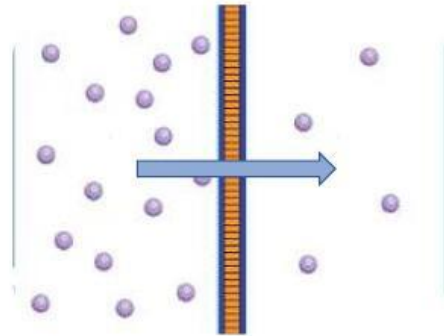
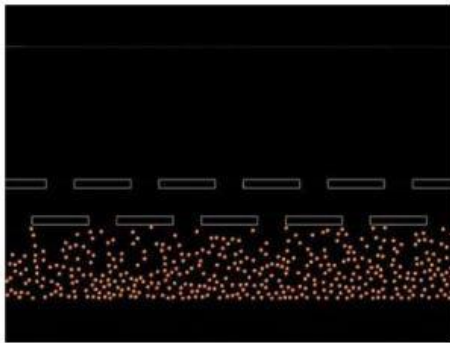
Step 1: Osmosis

Water and nutrients are absorbed into the root hairs and roots from the soil.



Step 1: Osmosis

Water moves into roots by osmosis. is the movement of water from an area of more water to an area of less water.



Step 2: Capillary Action

is when water moves through the narrow spaces of a material because of and .

