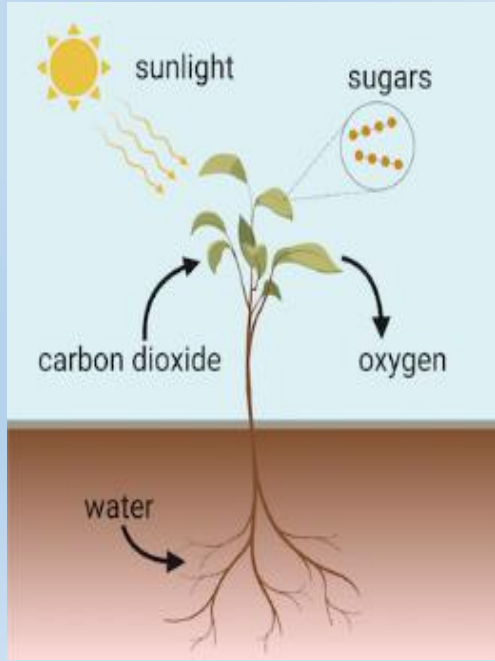
Biology Grade 7

CHAPTER 2: NUTRITIVE NEEDS OF CHLOROPHYLLIC PLANTS

Activity 1: Nutritive Needs of Chlorophyllic Plants



INSTRUCTOR: SUHAIB AUDI

Activity 1: Nutritive Needs of Chlorophyllic Plants

❖ Introduction:

- Chlorophyllic plants are green plants whose leaves contain chlorophyll such as mint, lettuce, apple tree, orange tree, pine tree…
- Chlorophyll is the green pigment in the leaves of a Chlorophyllic plants that:

➢ Gives the plant its green color.

➢ Helps the plant to absorb (trap) light energy to make its food.

- **Nutritive Needs of Chlorophyllic Plants:**

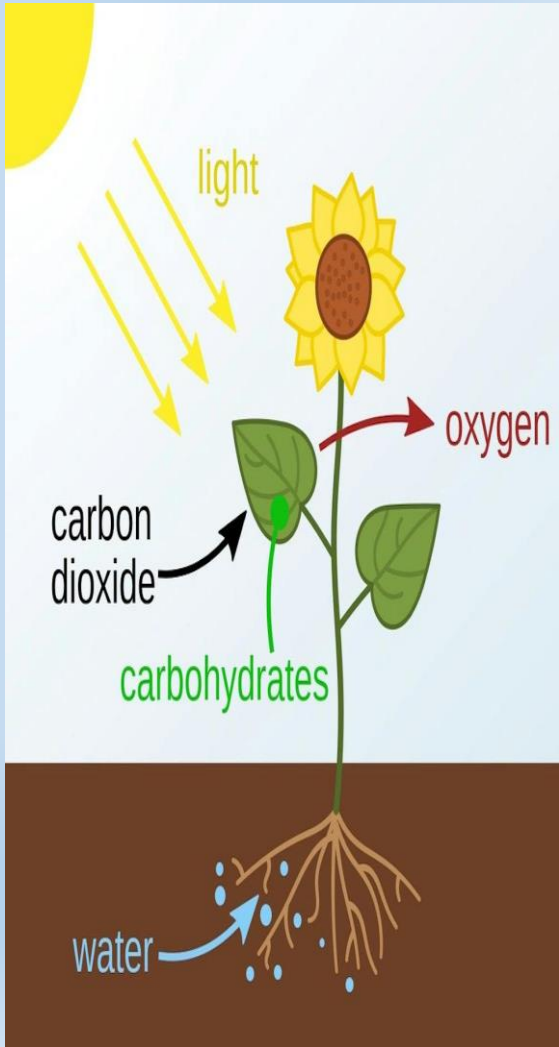
In order to develop, Chlorophyllic plants need:

✓ Water

✓ Mineral salts

✓ CO_2

✓ Sun light energy

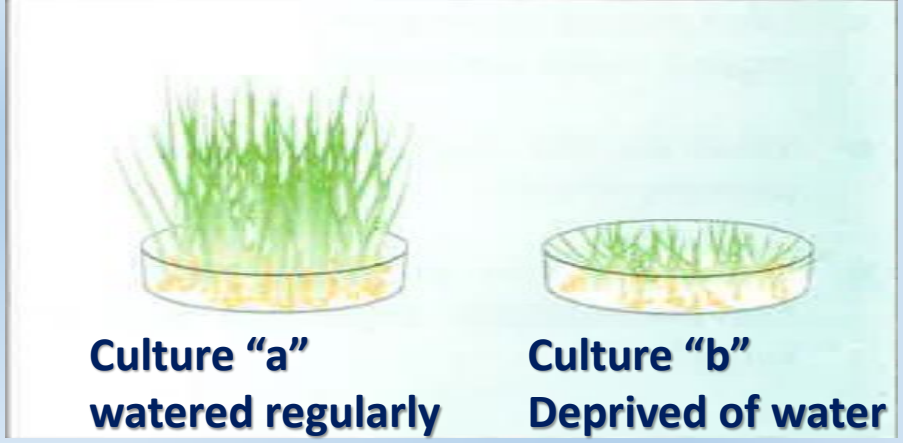


❑ Non-Chlorophyllic plants:

- Non-Chlorophyllic plants are non- green plants whose leaves don’t contain chlorophyll such as **Mashroom**.
- Non-Chlorophyllic plants take their food from green plants.
- They live on the roots of **Chlorophyllic plants**.

❖ Importance of water:

Water is the source of life on our planet. However, do green plants need water! This is an important question which needs an answer. Thus, in order to determine whether water is indispensable for the survival of green plants, the following cultures a & b are prepared.



1.Pick out:

1.1. The posed problem.

do green plants need water?

1.2. The objective.

To determine whether water is indispensable for the survival of green plants

1.3. The sentence that shows the importance of water.

Water is the source of life on our planet.

1.4. The variable factor.

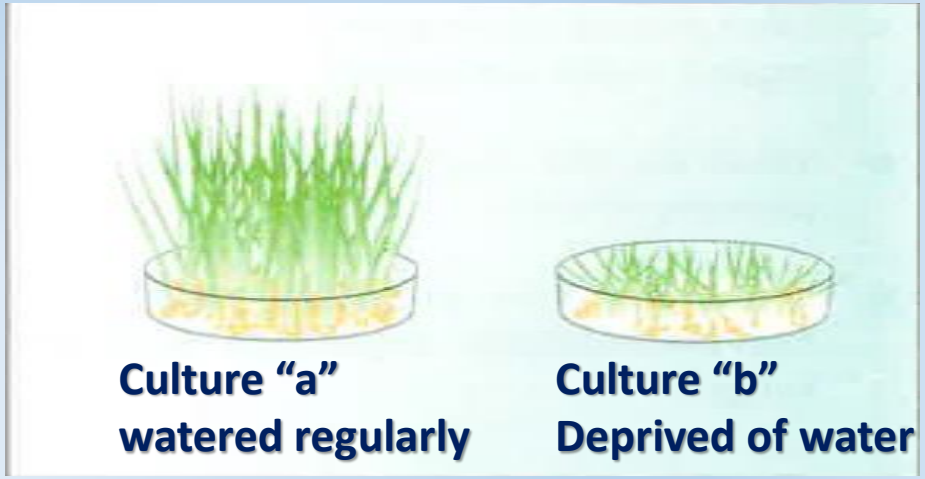
water

2. Compare the growth of the two plants.

Plant “**a**” has an **important growth** when watered regularly **while** plant “**b**” has a **week growth** when it is deprived of water.

3. Derive a suitable conclusion.

water is indispensable for the growth of a chlorophyllic plants.



- Water is essential for the growth and development of the chlorophyllic plants.
- In order to grow a plants need to absorb water from the soil through their roots.

❖ Importance of the light:

The sun, the gift of God, is the major source of light & warmth to all living organisms on earth. Sunlight is an important factor for the growth of the green plants. In order to verify this hypothesis, we conduct the adjacent cultures c & d.

Culture "d" deprived of light

Culture "d" deprived of light

1. Pick out the tested hypothesis.

Sunlight is an important factor for the growth of the green plants.

2. Indicate the variable Factor.

The variable factors is the presence of Sunlight ; plants in "c" are exposed to sun light while plants in "d" are the deprived of sun light.

3. Analyze the results of the experiment.

Green plant "c" grows long and green after exposing it to light while plant "d" remains short & yellow after depriving it of light.

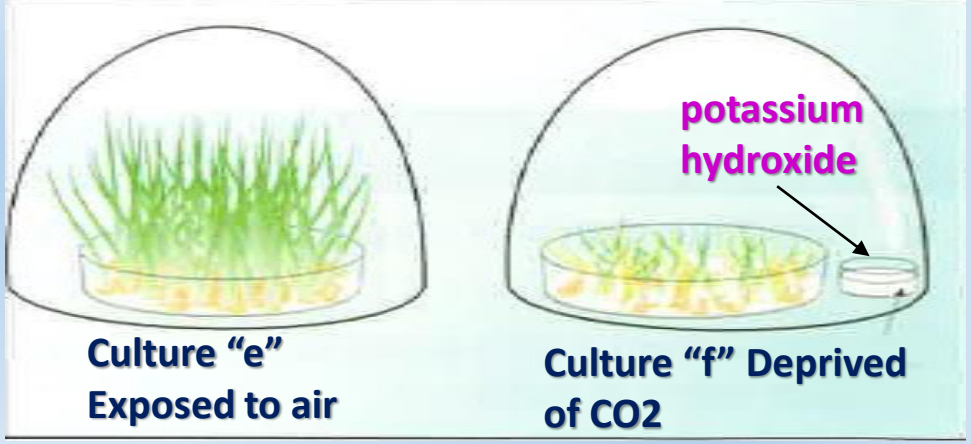
4. Derive a conclusion.

Therefore, light is important for the growth of green plant.

❖ Importance of carbon dioxide

In order to determine if the green plants need CO_2 or not, we prepared cultures e & f.

Note: potassium hydroxide absorbs CO2; it makes the medium free from CO2.



1. Draw out the variable factor

Carbon dioxide

2. Pose a problem about the experiment.

Does the green plant need CO_2 to grow?

3. Formulate a hypothesis about the experiment.

Hypothesis: Green plants need CO_2 to grow.

4. Analyze the experiment then conclude about the needs of green plants.

Plant "e" exposed to air grows normally and it is green while plant "f" deprived of CO_2 dies and becomes yellow.

We conclude that Green plants need CO2 to grow normally.

❖ Importance of mineral salts:

1- Draw out the variable factor.

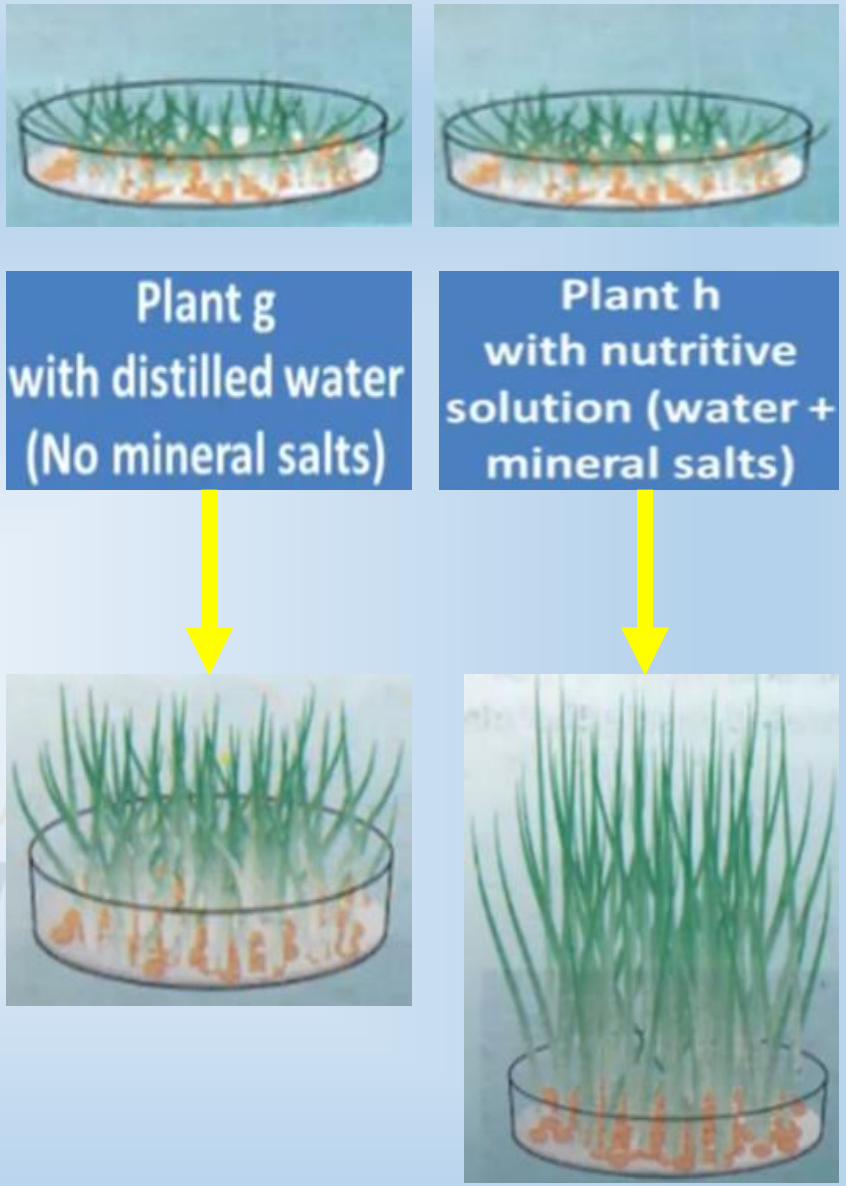
Mineral salts

2- Compare the two plants

plant “g” with distilled water (No mineral salts) **grows less than** plant “h” with nutritive solution (water + mineral salts).

3- What do you conclude about the needs of green plants.

We conclude that green plants need mineral salts to grow normally.



water	1000 g
calcium nitrate	1 g
potassium nitrate	0.25g
magnesium sulfate	0.25g
potassium phosphate	0.25g
ferric chloride	traces

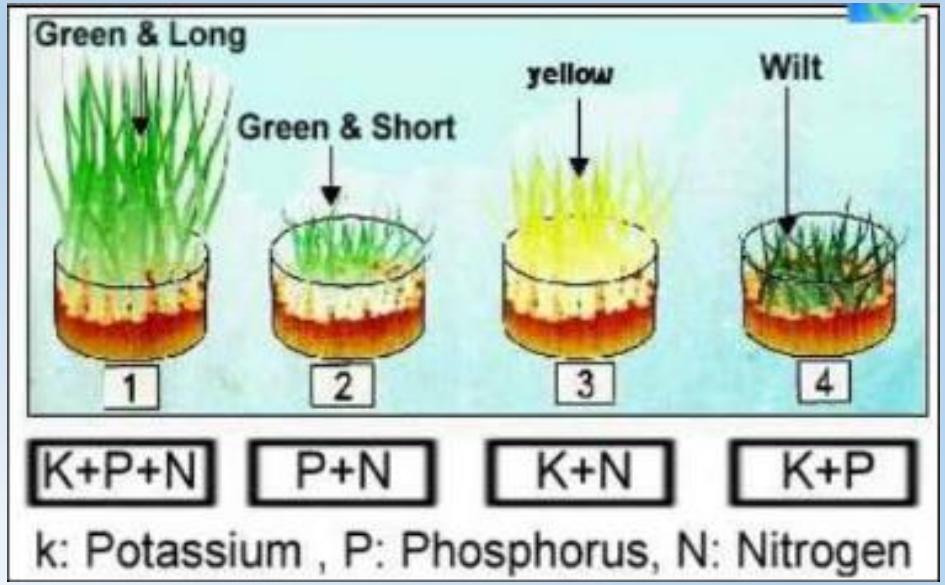
Compositions of nutritive solution

Nutritive solution: a solution rich in mineral salts.

❖ Importance of Mineral Salts:

Ibrahim told his friend Ali in the same class that the green plants need minerals to survive. Ali said: "that's right but I think that each mineral has its own function for the plant".

Ibrahim refused that idea & suggested that all minerals together have one function. In order to solve this problem, Ali conducted the following experiments.



a- Pick out the two hypotheses studied.

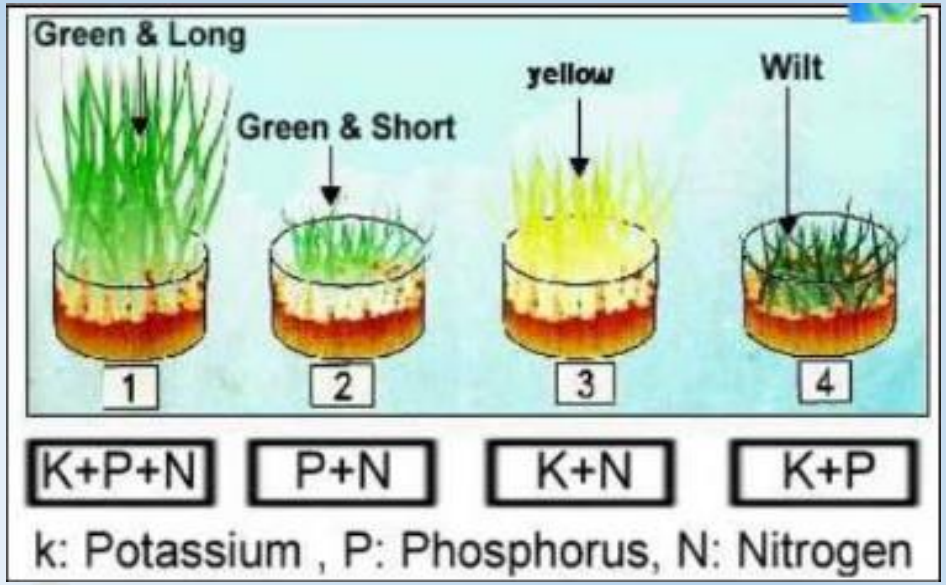
- Ali's hypothesis: Each mineral has its own function for the plant.
- Ibrahim's hypothesis: All minerals together have one function

b- Indicate the objective of these experiments.

To know if each mineral has its own function, or all together have one function.

c- Compare the conditions & the results of the different plants in this document.

Plant 1 with K+ P + N grows long and green, while plant 2 without K remains short but green. whereas plant 3 without P grows long but yellow. on the contrary, plant 4 without N wilts.



d- Conclude the valid hypothesis

Ali's hypothesis is validated.

e- Draw out the role of each mineral.

K: for the long growth.

P: for supplying the plant with green color.

N: for survival and growth of plant.

❑ Note:

- distilled water doesn't contain mineral salt.
- Nutritive solution: a solution rich in mineral salts.

❖ Fertilizer:

- Fertilizer are chemical substances added to the green plants in order to allow it to grow faster and the Producers better crops.
- Fertilizers are mainly made up of mineral salts.
- NPK fertilizers: contain three types of minerals:

✓ Nitrogen (N)

✓ Phosphorus (P)

✓ Potassium (K)