

GIRLS' HIGH SCHOOL & COLLEGE,
PRAYAGRAJ.
WORKSHEET No.3
CLASS 8-A,B,C,D,E
SUBJECT- BIOLOGY

NOTE:-Parents are expected to ensure that the student takes reference from a book or the internet and thereafter answers the questions.

Book Srijan ICSE Biology class 8 by Veer Bala Rastogi

YouTube link:-<https://youtu.be/LeTQWvbOf-U>

CHAPTER::- Transport of food and minerals in plants.

TOPIC:- Root Pressure & Transpiration

Plant roots build up pressure that forces water upward in the xylem vessels. It is called root pressure.

Significance of root pressure-

It provides the initial push to the water molecules in the xylem.
It holds the water column up.

Experiment-To demonstrate root pressure in plants.

Procedure-Take a potted plant such as a balsam plant and remove its leafy parts leaving the stem just a few centimetres above the soil.

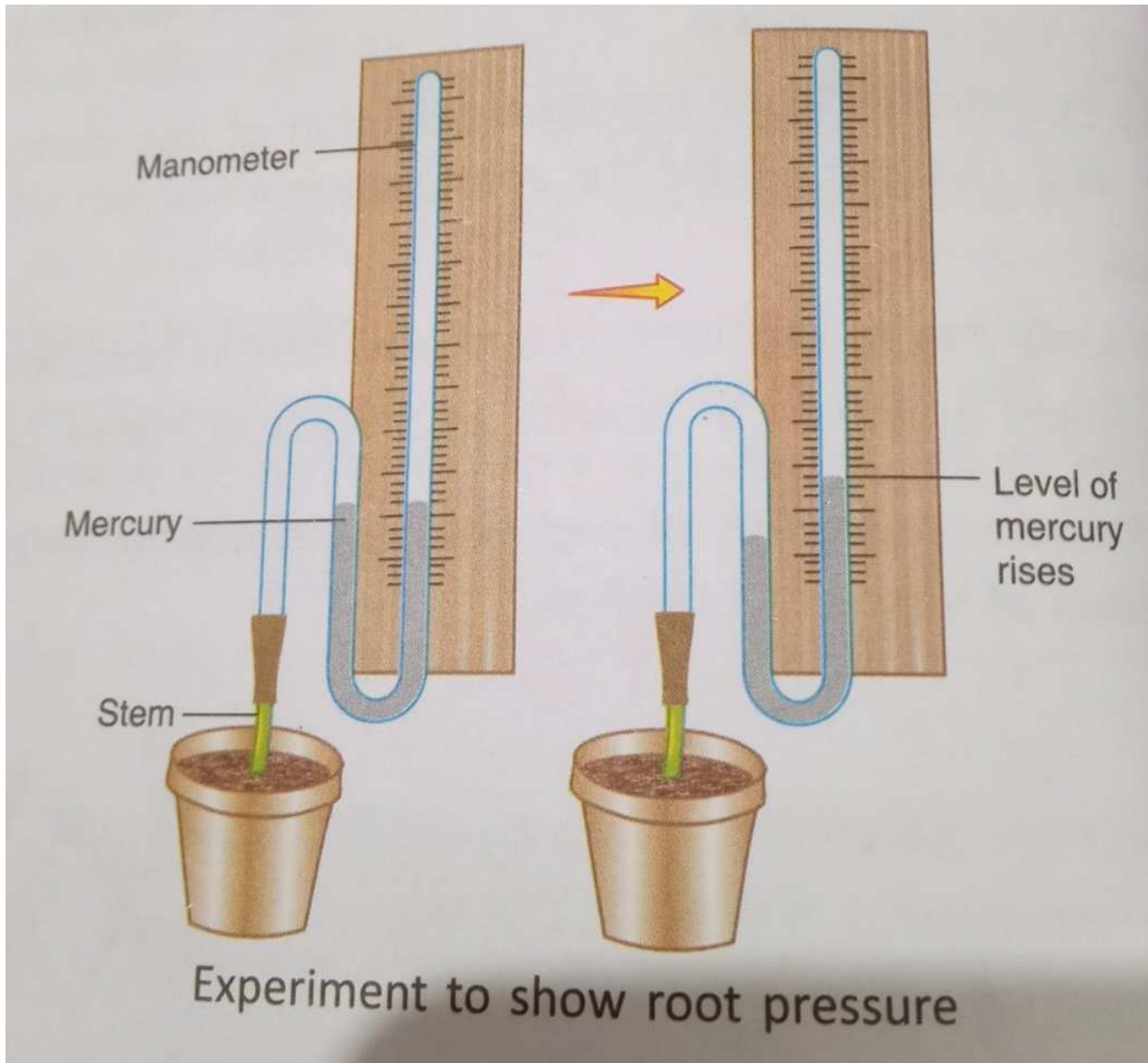
Insert a glass tube immediately over the cut end of the stem and fix it with the help of a rubber tube.

Connect a manometer with the glass tube as shown in the figure.

Observe the level of mercury in the manometer.

Observation- The mercury level starts rising just after connecting the manometer with the glass tube inserted over the stem.

Conclusion-The upward movement of water in the stem is due to root pressure.



TRANSPIRATION

The loss of water in the form of water vapour from aerial parts of the plant is known as transpiration.

It occurs through stomata in green herbaceous stems and leaves and through lenticels in woody stems.

Factors affecting transpiration-

The rate of transpiration is affected by following factors-

1. Temperature of air increases transpiration.
2. Humidity decreases transpiration.
3. Wind speed increases the rate of transpiration.
4. Light causes stomata to open and increases transpiration.

Importance of transpiration-

1. Transpiration helps in the upward movement of water and minerals from roots to leaves.
2. Transpiration produces a cooling effect, which protects plants from heat of the sunlight.
3. Rate of absorption of water increases when there is more transpiration.
4. Transpiration builds a suction force called transpirational pull.

Transpirational pull is an upward pull of water column in plants caused due to loss of water by transpiration.

Experiment-To demonstrate transpiration in plants.

Procedure-Take a well watered potted plant.

Cover the pot with a polythene. Place a bell jar over the pot and seal it with vaseline on a glass plate. Leave the set-up in sunlight for an hour.

Observations:- Tiny water droplets are seen on the inner surface of the bell jar.

Conclusion:-These water drops have evaporated from the leaves.



Importance of minerals

Inorganic elements which plants obtain from the soil are in the form of minerals. The elements absolutely necessary for the normal growth and development of plants are called essential elements. They are needed as structural components and the rest are called non-essential elements.

Macronutrients-They are the essential elements needed in large quantities. eg. carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, calcium, potassium and magnesium.

Micronutrients-They are the essential elements needed in small quantities. eg. Iron, manganese, copper, boron, zinc, molybdenum, chlorine and nickel. They are also called trace elements.

Role of macronutrients & micronutrients-

Essential elements take part in:-

- Permeability of cell membrane.
- Maintenance of osmotic concentration of cell sap.
- Components of protoplasm, nucleic acid, cell wall etc.
- Protein synthesis, photosynthesis and respiration.
- Opening and closing of stomata.
- Growth and reproduction.

Deficiency of essential elements produces deficiency symptoms or disorders. Some minerals and their deficiency diseases are summarised below:-

Macronutrients & their role in plants & their deficiency symptoms.

Nitrogen____ is a constituent of proteins & nucleic acid.	Poor growth, small leaves, delayed flowering, chlorosis.
Sulphur_____ is a constituent of some proteins, enzymes, vitamins, chlorophyll.	Chlorosis, curling and yellowing of leaves.
Phosphorus____ is a constituent of nucleic acid and nucleoproteins.	Stunted growth, premature leaf fall.

Micronutrients & their role in plants & their deficiency symptoms.

Zinc____ acitvates certain enzymes and is a constituent of some plant hormones.	Stunted plant growth, deshaped leaves, yellowing of leaves.
Manganese_____ Plays a role in chlorophyll synthesis and in nitrogen metabolism.	Yellowing of leaves, spots on leaves.
Boron_____ Helps in translocation of enzymes, Flowering and fruiting.	Death of stem and root apices, thick and curled leaves.

ANSWER THE FOLLOWING QUESTIONS:-

Q1 Fill in the blanks:-

- Water is evaporated through the _____ parts of the plant.
- In woody stems, transpiration occurs through _____.
- Humidity _____ transpiration.
- _____ elements are needed as structural components.
- _____ pressure forces ascent of sap.

Q2. State TRUE or FALSE:-

- (a). Calcium is a macronutrient.
- (b) Copper takes part in the formation of protein and nucleic acid.
- (c) Plants lose water by the process called translocation.
- (d) Pressure developed in the root due to continuous inflow of water is called osmotic pressure.
- (e) Plants obtain minerals from the soil.

Q3 Name the following:-

- (a) A macronutrient whose deficiency causes chlorosis.
- (b) A micronutrient which has an important role in flowering and fruiting.
- (c) Inorganic elements which plants obtain from the soil.
- (d) Suction force which pulls water up to the top of a tree.
- (e) Loss of water from leaf surface by evaporation.

Q4 Match the items in Column A with the most appropriate ones in Column B.

Column A.	Column B
● Macronutrient.	Yellowing of leaves
● Transpiration.	Ascent of sap
● Micronutrient.	Carbon
● Manganese.	Iron
● Root pressure.	Stomata

Q5, Answer in short:-

A. Define the following:-

- (a) Root pressure.
- (b) Transpirational pull.

B. Differentiate between:-

- (a) Macronutrient and Micronutrient.
- (b) Transpiration and Root Pressure.

C. Give the functions of the following in plants.

- (a) Phosphorus
- (b) Nitrogen
- (c) Zinc

D. Give reasons for the following:-

- (a) Intensity of light increases transpiration rate.
- (b) We feel cool on standing under a tree in midday summer.

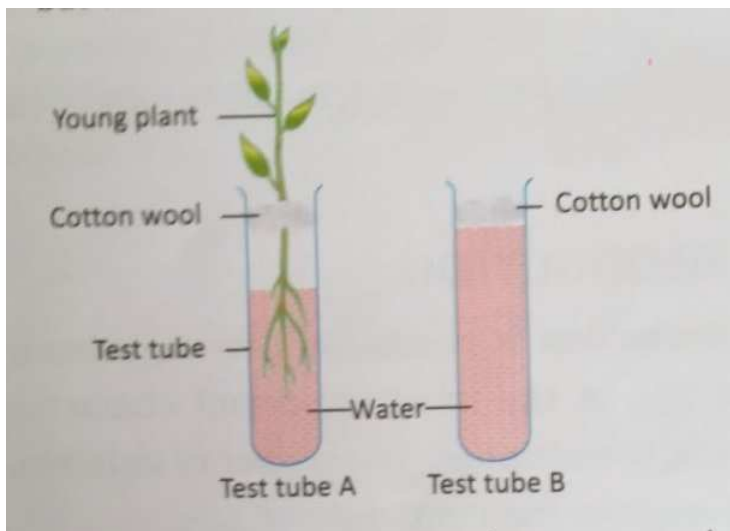
Q6. Answer in detail:-

- (a) What is the importance of transpiration?
- (b) Observe the experimental setup and answer the following questions. This setup was placed in sunlight for one hour.



- (1) What phenomenon does this experiment demonstrate?
- (2) Why was the plant covered with a polythene?
- (3) What will you observe if the setup is placed inside the room.

c).In the experimental setup as shown in the fig.
the water level in test tube A fell down but not in
test tube B.Why?



The End.