**NORTH-EX PUBLIC SCHOOL (Session 2020-21)**
**Class – X**
**Subject – Science (biology)**
**Chapter –6**
**Topic – transportation in plants and excretion**
**Worksheet No – 06**

***Note-** Before attempting the question and answers you must check the links given below which will help you understand the chapter thoroughly.
You can download the worksheets or if you do not have facility to get printout then you can ask your ward to copy the worksheet in a simple notebook and must do question answers in the notebook.
https://www.youtube.com/playlist?list=PLCzaIJYXP5YfapiiVBj-CYv93y0xzuKSX

## NOTES

# Transportation in Plants

Plant transport systems will move energy stores from leaves and raw materials from roots. These two pathways are constructed as independently organised conducting tubes.

One, the **xylem** moves water and minerals obtained from the soil.

The other, **phloem** transports products of photosynthesis from the leaves where they are synthesised to other parts of the plant.

## Transportation of water

In xylem tissue, vessels and tracheids of the roots, stems and leaves are interconnected to form a continuous system of water-conducting channels reaching all parts of the plant.

At the roots, cells in contact with the soil actively take up ions. This creates a difference in the concentration of these ions between the root and the soil. Water, therefore, moves into the root from the soil to eliminate this difference. This means that there is steady movement of water into root xylem, creating a column of water that is steadily pushed upwards.

Plants use another strategy to move water in the xylem upwards to the highest points of the plant body. Provided that the plant has an adequate supply of water, the water which is lost through the stomata is replaced by water from the xylem vessels in the leaf.

- In fact, evaporation of water molecules from the cells of a leaf creates a suction which pulls water from the xylem cells of roots. The loss of water in the form of vapour from the aerial parts of the plant is known as transpiration.

- Thus, transpiration helps in the absorption and upward movement of water and minerals dissolved in it from roots to the leaves.

- It also helps in temperature regulation. The effect of root pressure in transport of water is more important at night. During the day when the stomata are open, the transpiration pull becomes the major driving force in the movement of water in the xylem.

## Transportation of food and other substances

- This transport of soluble products of photosynthesis is called **translocation** and it occurs in the part of the vascular tissue known as **phloem.**
- Besides the products of photosynthesis, the phloem transports amino acids and other substances. These substances are especially delivered to the storage organs of roots, fruits and seeds and to growing organs.
- The translocation of food and other substances takes place in the sieve tubes with the help of adjacent companion cells both in upward and downward directions.

The translocation in phloem is achieved by utilising energy. Material like sucrose is transferred into phloem tissue using energy from ATP.

This increases the osmotic pressure of the tissue causing water to move into it. This pressure moves the material in the phloem to tissues which have less pressure. This allows the phloem to move material according to the plant's needs.

For example, in the spring, sugar stored in root or stem tissue would be transported to the buds which need energy to grow.

# Excretion

The process of the removal of the harmful metabolic wastes from the body is called excretion.

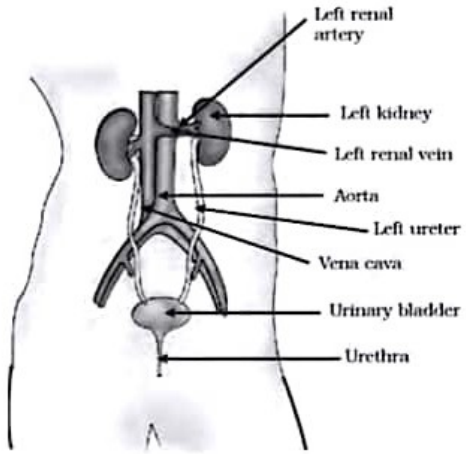
## Excretion in human beings

Excretory system of human beings includes :

1. A pair of kidney
2. A Urinary Bladder
3. A pair of Ureter
4. A Urethera

**Process of Excretion**

Renal artery bring in blood containing waste substances to the kidneys. Kidney filters blood. Urine produced in the kidneys passes through the ureters into the urinary bladder where it is stored until it is released through the urethera.




**Function of Kidney** : It is remove waste product from the blood i.e., urea which is produced in the liver.

**Nephron** : Each kidney has a large number of filtration units called nephrons. Nephron is the structural and functional unit of Kidney.

**Mechanism of Urine Formation** : The Urine formation involves three steps:

**1.Glomerular Filtration** : Blood is filtered from the glomerulus into Bowman Capsule of the nephron. This filtrate passes through the tubules of the nephron.

**2.Tubular re-absorption** : Now, useful substances from the filtrate Like ,
glucose, amino acids, salts and a major amount of water etc. are reabsorbed by the capillaries surrounding the nephrons into the blood.

**3.Secretion** : Urea, extra water and salts are secreted into the tubule which open up into the collecting duct & then into the ureter.

**Haemodialysis:** The process of purifying blood by an artificial kidney. It is meant for Kidney failure patient.

## Excretion in Plants

1. Oxygen released during photosynthesis.
2. They can get rid of excess water by transpiration
3. Wastes may be stored in leaves, bark etc. which fall off from the plant.
4. Many plants waste products are stored in cellular vacuoles.
5. Waste products stored as gums, resin in old Xylem
6. Plants excrete some waste into the soil around them.

**Worksheet**

1. Name the tissue that transports water and minerals in plants.
2. Define transpiration.
3. What is the structural and functional unit of kidney called?
4. How does transpiration help in upward transport of substances.
5. Draw a well labelled diagram of nephron. Explain the process of formation of urine in the human kidney.

6. What is translocation?
7. How is water absorbed by the roots of plants?
8. What do you mean by artificial kidney?
9. Draw a diagram of human excretory system and label the following:
    a. Kidney
    b. Ureter
    c. Urinary bladder
    d. Urethra
10. How do plants get rid of excretory products?

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