

SUBJECT : SCIENCE
 TOPIC : FUNDAMENTAL UNIT OF LIFE

Pre-content / Content / Post-content	Learning outcome / objectives	
	General	Specific
PRE-CONTENT: Teacher will ask few questions to motivate the students. CONTENT: 1. Discovery of cell 2. Unicellular and multicellular organisms 3. Types of cell 4. Shapes and sizes of cell 5. Components of cell 6. Structure and function of cell 7. Movement of substances into the cell. POST CONTENT: Students will discover how the complex functioning of the body is easily governed by systematic division of labour.	Students will be able to - develop interest for cytology. - develop creativity and curiosity. - develop reasoning and observation ability - identify the structure and function of cell. - observe and discover the movement of molecules of substances of different concentrations into the cell and relate it to day to day activities. - appreciate the co-ordination and co-operation of different cell organelles for proper functioning of a cell. - discover the effect of environment on diffusion and osmosis	Students will be able to- • appreciate the discovery of cell. • identify unicellular and multicellular organisms on the basis of their observation. • differentiate between prokaryotic and eukaryotic cell on the basis of their structure. • recognize the different shapes and sizes of cells of different organisms. • list the components of plant cell and animal cell. • relate the structure, functions of different components of plant and animal cells. • draw plant and animal cells and label their organelles and differentiate between animal cell and plant cell on the basis of their structure and function • develop the concept of exosmosis and endosmosis.

HOME WORK / ASSIGNMENTS: Students will be given questions from NCERT textbook

Diagrams from NCERT textbook will be given as home work for practice.

AND PROGRESS

MONTH : JULY

CLASS :IX

Teacher's activity	Students' activity	Teacher's observations and remedial action taken
Teacher will: - explain the history of cytology through ICR -Show pictures of unicellular and multicellular organisms -demonstrate different shapes of cell through activity - draw and explain the differences between plant and animal cell and also prokaryotic and eukaryotic cells. -explain the structure and function of cell organelles through PPT Annexure 5(A) Conduct an activity on Osmosis Annexure 5(B) Conduct an activity on Plasmolysis and deplasmolysis Post content discussion- -relate 'division of labour' with assigning different responsibilities to each student of the class	Students will: -note down the discoveries in tabular form -draw diagrams to comprehend the topic. -Prepare slides of onion peel and observe the plant cells in microscope -Prepare cheek cell slides and observe the cells through microscope -make charts of animal and plant cell as well as prokaryotic and eukaryotic cell for the class board. - draw the diagrams of various cell organelles and answer the questions based on the topic. Annexure 5(a) -Perform the activity and answer the questions based on it. Annexure 5(b) -Perform the activity and answer the questions based on it. -present their views on how proper coordination helps in proper functioning of any system.	Teacher will write the observations after completion of the topic/s

Teaching aids: Smart board ,ICR, Activities (Demonstration), Microscope, Leaf peel (Rheo leaf), onion peel and cheek cell.

Methodology / Innovative methods: Activity based collaborative learning (group discussion), question answer and discussion methods, audio visual , experimentation

Inter disciplinary links: Art – drawing skill developed, Maths- Cells have different shapes and sizes (onion peel cells-rectangular, size measurement in micron)

Language- Improvement in expression(history of cells.

Coordinator

HOD

Vice-Principal

Principal

Annexure 5(A).(a)
Osmosis- A Biophysical Phenomenon

Subject	Science
Class	IX
Chapter/Unit	Fundamental Unit of Life
Topic	To study the process of osmosis
Time	5 hours
Nature of Activity	Pair activity followed by Individual worksheet.

What will I learn (Learning Outcome)?

To explore the concept of osmosis.

Skills: Analyzing and Creating

What I have to do?

To study the process of osmosis in eggs.

What do I require?

Glass beaker, four raw eggs, sugar/salt solution, dil.hydrochloric acid and water.

What do I need to know?

Osmosis is the spontaneous net movement of solvent molecules through a selectively permeable membrane into a region of higher solute concentration, in the direction that tends to equalize the solute concentrations on the two sides.

Hypertonic Solution-A solution outside of a cell is called hypertonic if it has a greater concentration of solutes than the cytosol inside the cell

Hypotonic Solution-A solution outside of a cell is called hypotonic if it has a lower concentration of solutes relative to the cytosol.

Isotonic Solution- The solutions on either side of a cell membrane are isotonic if the concentration of solutes outside the cell is equal to the concentration of solutes inside the cell.

Teacher's Activity

Teacher will brief the experiment and make arrangements for the required apparatus and chemicals.

Make pairs of students to perform the activity

How will I proceed?

➤ **Student's Activity**

1. Keep two eggs in two glasses containing dil. HCl for about one hour, to dissolve the shell of the eggs.
2. Wash the de-shelled eggs with water thoroughly and weigh them. Also weigh two shelled eggs.
3. Take four glasses -2 half filled with water(A and B), and the other 2with saturated sugar/salt solution (C and D).
4. Put one deshelled egg in the glasses A and C, and one shelled egg in the glasses B and D.

5. After about four hours, observe the four eggs and take their weight.
6. Record your observations.

What have I observed?

S.No		Initial weight (g)	Final weight (g)	Appearance
1.	Deshelled egg kept in water (Hypotonic solution) (Glass A)			
2.	Deshelled egg kept in sugar solution (Hypertonic solution) (Glass C)			
3.	Shelled egg kept in water (Hypotonic solution) (Glass B)			
4.	Shelled egg kept in sugar solution (Hypertonic solution) (Glass D)			

What have I learnt?

1. The de-shelled egg kept in hypotonic solution looks -----
2. The other de-shelled egg kept in the sugar solution (hypertonic solution) has -----in size.
3. There was no change in the size of-----eggs as no ----- took place.

What am I curious to learn?

Let us find out-

1. What will happen if I put a carrot in salt water ?
2. How is osmosis different from diffusion?
3. How does HCL dissolve the egg shell?

Let me evaluate myself

1. What is Osmosis?
2. What happens when a cell is placed in (a) hypotonic solution (b) hypertonic solution?
3. A man drinks a concentrated salt solution and vomits after sometime. Why?
4. A plant cell kept in distilled water does not burst. Why?
5. A deshelled boiled egg is placed in water. Will osmosis take place under these conditions? Explain.

Annexure 5(B).(b)
To explore the concept of plasmolysis and deplasmolysis.

Duration-40mins

Nature of the Activity- Individual

Learning Outcome- The students will be able to explore the concept of plasmolysis and deplasmolysis.

What we have to do?

To study the concept of plasmolysis and de-plasmolysis.

What do we require?

Slides, cover slips, microscope, dropper, brush, sugar solution (10%), water, Tradescantia/Rhoeo leaves and compound microscope

What do we need to know?

When cells are placed in concentrated solution (10%), the cell contents shrink resulting in plasmolysis . However, when these cells are placed in water, the cells recover due to deplasmolysis.

How will you proceed?

➤ **Teacher's Activity**

Teacher will brief the experiment (distribute student's activity sheet) and make arrangements for the required apparatus and chemicals.

➤ **Student's Activity**

1. Take out the epidermal peel from lower epidermis of the leaf.
2. Put a piece of peel in a drop of water on a clean slide and put a cover slip on it.
3. Observe the peel under the low power of the microscope. Notice the size of the vacuoles, and dark pink cytoplasm.
4. Remove the cover slip and add the sugar solution.
5. Wait for five minutes, and place the cover slip back on the peel.
6. Blot out the excess solution from the sides of the cover slip.
7. Focus the cells under low power and observe under a microscope.
8. Remove the cover slip and add water to the material.
9. Observe again under the microscope.

What do we observe?

Draw the diagrams of the cells observed, as in step 7 and 9.

What have you learnt?

1. Plasmolysis occurs due to

- a) Absorption
- b) Imbibition
- c) Endosmosis
- d) Exosmosis

2. When the plasmolysed cells are again placed in water, there is a recovery to the original condition due to endosmosis of water. This is called_____.

- a) Plasmolysis,
- b) Incipient Plasmolysis,
- c) Complete Plasmolysis,
- d) Deplasmolysis

What would I like to know?

1. What happens to the protoplast of the cells after 5 minutes. Name the phenomenon.

2. What happens when water is added to such cells? Name the phenomenon.

Extended learning

1. Take two slices of cucumber in two Petri dishes. In one, sprinkle salt and leave the other as such. State your observation pertaining to the difference in the surface of cucumber slices and amount of water released from both in the petridishes after 10 minutes.
2. What happens to a plant when excess chemical fertilizer is added?
3. Differentiate between incipient and evident plasmolysis.
4. Weeds can be killed by sprinkling salt in the soil on which they grow. Which phenomenon produces this effect?
5. How does plasmolysis help to understand the living nature of a cell?

