Class 9
Syllabus of Biology

TERM I
Chapter 5 - The Fundamental unit of life

a) Cell structure (April)

b) Cell organelles (May)
Chapter 6 - Tissues
a) Plant Tissue(July)
b) Animal Tissue(August)

Term II
Chapter 13 - Why do we fall ill (November and December)
Chapter 14 - Natural Resources(January)

Revision of First Term - September
Unit 1 Exam - October

Revision of Second Term - February
Final Exam - March

TERM I

Class IX ***Subject : Biology***

Topic 5: The Fundamental unit of life

(Part – 1)

1. ***Learning Objectives:- Students will be able***

(i) ***To explore and identify discovery of a dead and living cell.***

(ii) ***To identify the various parts of microscope, process of diffusion and osmosis.***

(iii) ***To recognize the shapes of cells of human body.***

2. ***Previous Knowledge Testing :-***

Some questions will be asked to test students :-

(i) ***Which basic material can be used to make wall?***

(ii) ***Which is the structural and functional unit of life?***

(iii) ***Can you see RBCs with naked eye?***

(iv) ***Which gases we inhale and exhale during breathing?***

3. ***Vocabulary used :- Cork, safranin, microscope organelles, diffusion, selectively permeable membrane, flexibility, hypotonic, isotonic, hypertonic, endocytosis.***

4. ***AIDS / Innovative methods***

(i) ***Microscope parts will be explained by sharing on the screen.***

(ii) ***Diagrams of different cells will be drawn by the teacher on white board on zoom app and students will draw side by side in notebook.***

(iii) **Students will make different shapes of cells using materials like thread,wool ,beads etc.**

(iv) **Activities based on osmosis in raisins and potato will be shown by the teacher through video.**

5. Procedure :-

- ***Term 'Biology' will be explained to the students. Parts of microscope will be shown. Various discoveries and the scientists who had discovered various cell organelles will be discussed. Topics diffusion & osmosis will be explained.Students will be made to read the content from NCERT one by one & underline the important term.***
- ***Diagrams of various cells from the human body will be shown by teacher sharing screen. Students will also frame questions side by side.***
- ***Digital content would be share to students.***

6. Participation of the students :-

(i) ***Students will read the content one by one from NCERT & underline the important terms.***

(ii) ***Students will frame questions & will be discussed.***

(iii) ***Students will draw the diagram related to content.***

7. Recapitulation :-

(i) Quiz will be conducted to recap the chapter.

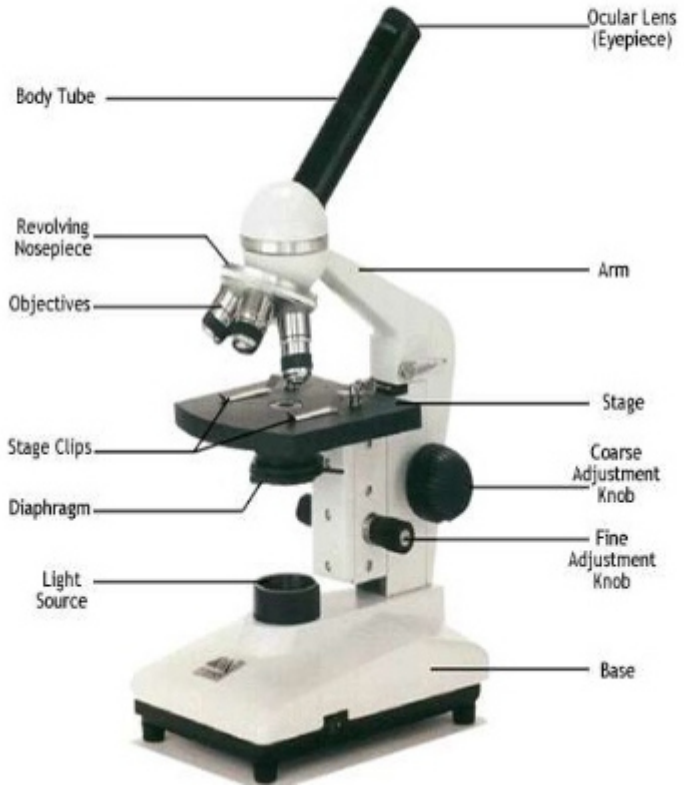
(ii) MCQ will be done.

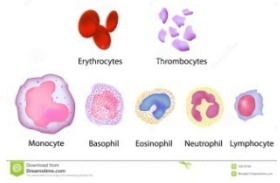
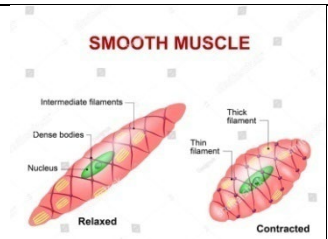
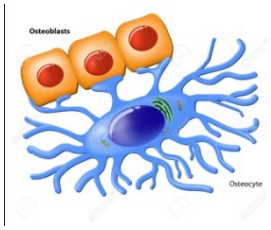
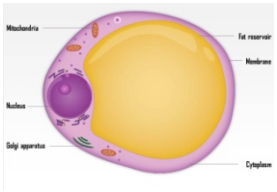
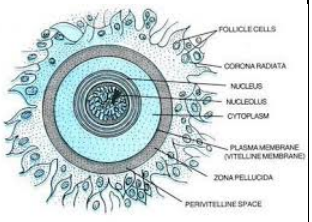
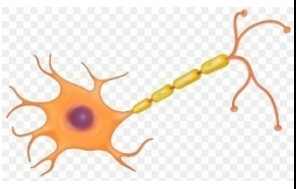
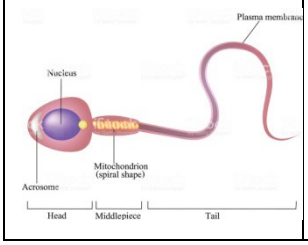
(iii) ***Class Assignment will be given.***

8. Art Integration :-

- ***Students will draw diagram of various shapes of cells present in human beings.***
- ***Students will make video on activity hypotonic,hypertonic and isotonic solution.***

SIMPLE MICROSCOPE:



Blood cells 		**Bone cell** 
Fat Cell 	**Ovum** 	**Nerve Cell** 
Sperm Cell 		

9. *Learning Outcomes:-*

(i) ***Students will be able to recognize the parts of microscope.***

(ii) ***Students will understand the differences between osmosis and diffusion by doing different activities.***

(iii) ***They would be able to identify shapes of various cells like onion and cheek cells.***

(iv) ***Students will develop the skill of drawing through diagram.***

10. Resources :-

(i) ***NCERT Book.***

(ii) ***Pradeep's Biology for class IX***

(iii) ***Biology Today – By Cordova Publications***

(iv) ***https://youtu.be/zPTwzDGdRCc***

(v) ***https://youtu.be/YB9o6Jg1EuM***

11. Co- Scholastic Activities:-

- ***Visual and thinking skills will be developed.***
- ***Creative skills will be learned.***

12. Assessment :-

- ***MCQ***
- ***Oral Tests***
- ***Written Tests***
- ***Periodic Test***
- ***Assignment***

Class IX

Subject : Biology

Topic : The Fundamental unit of life (Cell Organelles)

(Part – 2)

1. ***Learning Objective :-***

(i) ***To make the students able to distinguish between prokaryotic and eukaryotic cell.***

(ii) ***To make the students identify hypotonic, hypertonic and isotonic solution.***

(iii) ***To understand the structure and functions of various cell organelles.***

2. **Previous Knowledge Testing :-** ***Some questions will be asked to the students.***

(i) ***By which part,plants absorb water and from where?***

(ii) ***Name some stains used to stain the cells.***

(iii) ***Which is the fluid content in the cell?***

(iv) ***Which organelle in plant cell contain chlorophyll?***

(v) ***Why is the cell called structural and functional unit of life?***

3. ***Vocabulary Used:-***

Chromosomes, nucleoid, vesicles, cisternae, membrane biogenesis, cristae, leucoplast, turgidity, endocytosis.

4. ***AIDS / Innovative methods used to explain the topic :-***

(i) ***Screen sharing.***

(ii) ***2-D models of animal and plant cell.***

(iii) ***White Board of zoom app to draw diagrams.***

(iv) ***To prepare temporary mount of onion peel & check cell will be shown by activity.***

(v) ***Role Play on cell organelles.***

5. ***Procedure :-***

- ***Types of solutions, cell wall, prokaryotic cell, parts of nucleus will be explained cell organelles endoplasmic reticulum, Golgi apparatus, lysosomes, mitochondria, plastids, and vacuoles will be explained by sharing diagrams on screen.***
- ***Students will read the content from NCERT and will be made to underline the important terms.***
- ***Content will also be explained by sharing videos in class group.***
- ***Students will frame questions side by side & discussion will be done.***
- ***Questions will be discussed through examples from life.***

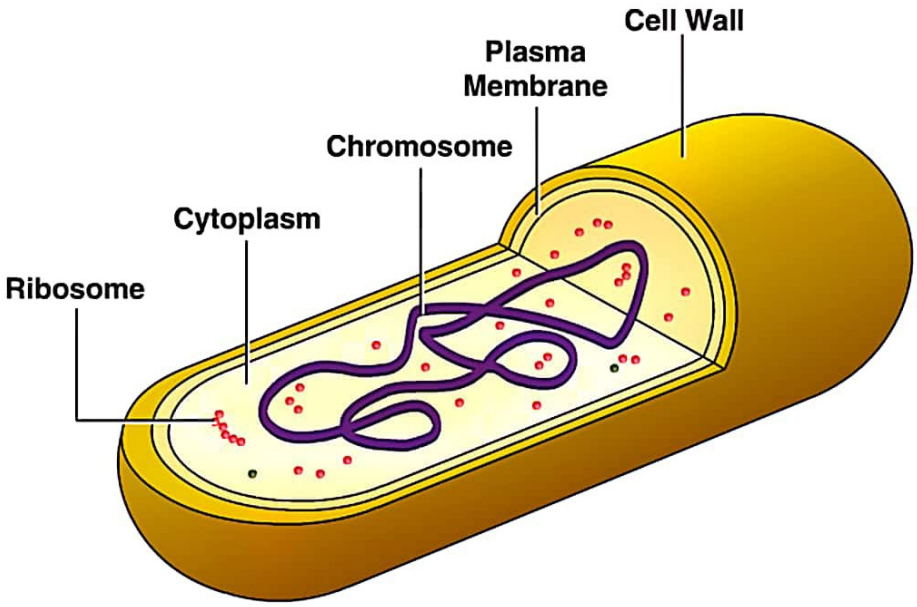
6. ***Participation of the students :-***

(i) ***Student will read the content one by one and underline the important terms.***

(ii) ***Students will frame questions and will be discussed.***

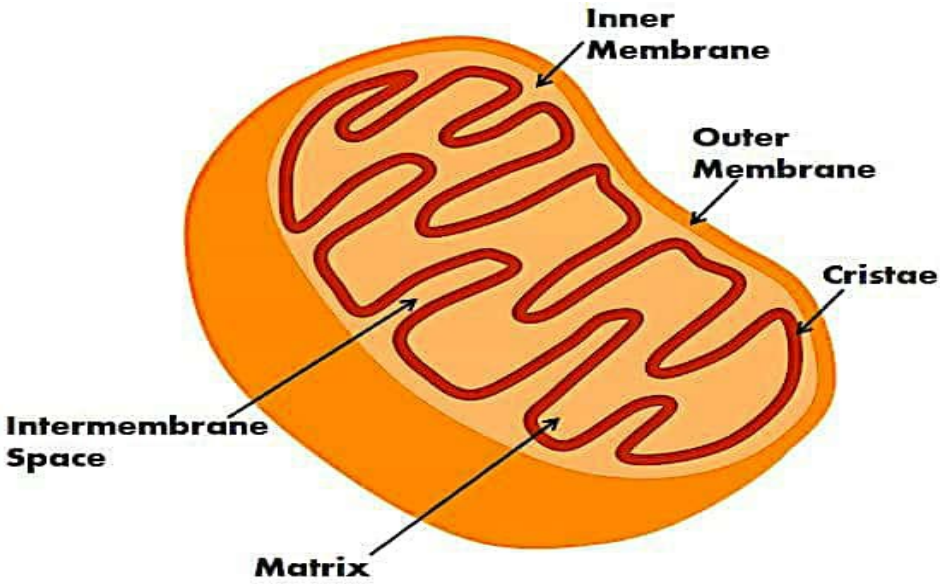
(iii) ***Students will observe how to remove peel from onion and take cells from cheek shared on the screen by the teacher.***

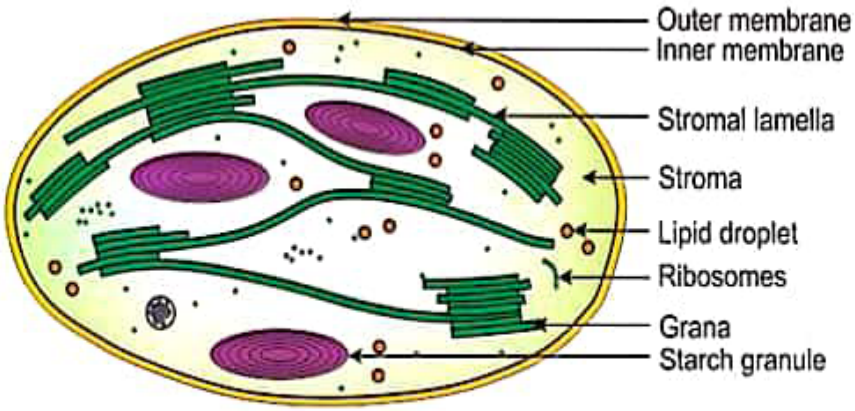
(iv) ***Roleplay on different cell organelles will be performed by students of various groups and group leader will make the video and will share in the classgroup.***



Prokaryotic Cell

Mitochondrion





Electron micrograph of a section of chloroplast

7. *Recapitulation :-*

(i) What are main parts of nucleus.

(ii) Differences between prokaryotic and eukaryotic cell.

(iii) Functions of various cell organelles.

(iv) Mitosis and meiosis.

(v) Why are lysosomes are called suicide bags.

8. *Art Integration :-*

- ***Students will draw diagrams of various cell organelles by using different colours and materials like thread, wool,clay,beads etc.***
- ***Roleplay on cell organelles will be performed.***

9. *Learning Outcomes:-*

- ***Children will learn the structure and function of different cell organelles.***
- ***Reading skills while comprehending the questions asked will be developed.***
- ***Critical thinking skills through open questions will be learned.***
- ***Creativity will be developed by drawing diagrams.***

- ***Enactment skills will be learnt through roleplay.***

10. Resources :-

(i) NCERT Text Book for class IX

(ii) Biology today – By Cordova publication (IX).

(iii) Biology – By Dinesh publications (IX).

(iv) Link-https://youtu.be/IA0DhWDTUpU

11. CO-Scholastic Activities:-

- ***Thinking and communication skills will be learned.***
- ***Creative skills will be developed.***

12. Assessment:-

Students will be assessed on the basis of

- ***MCQ***
- ***Written Tests***
- ***Periodics***
- ***Assignment***

Assignment

1. ***Name the reticulum which has ribosomes attached to it.***
2. ***Name the cell organelle which is involved in the formation of lysosomes.***
3. ***What are the chromosomes made up of ?***
4. ***What will happen if a plant cell is placed in hypertonic solution ?***
5. ***When does chromatin change into chromosomes ?***
6. ***Name a membraneless cell organelle.***
7. ***What is the name of membrane surrounding sap vacuole ?***
8. ***By which process root hair absorb water from the soil ?***
9. ***Write composition of chromosomes ?***
10. ***Which object was used by Robert Hooke to observe cells ?***
11. ***What is the meaning of latin word 'Cell ' ?***
12. ***Name the process by which amoeba acquires its food.***
13. ***In which cell organelle,storage,packaging and modification of newly formed proteins occur ?***
14. ***Write types of cell division.***
15. ***In which type of cell division two identical daughter cells are formed ?***
16. ***Which organelle is called factory of ribosomes ?***
17. ***Where are genes located ?***
18. ***Name the organelle present only in plants which have their own genome and ribosomes ?***
19. ***Where stroma is present in a cell ?***
20. ***In which form does the mitochondria release energy ?***

Class IX

Subject : Biology

Topic : Chapter – 6 Tissue (Plant tissue)

(Part – 1)

1. ***Learning Objectives :-***

(i) ***To make the students understand the following topics.***

(ii) ***Define tissue.***

(iii) ***Types and sub types of various types of tissues.***

(iv) ***Classification of meristematic tissue on the basis of their location & function of each type.***

(v) ***Location, characteristics & functions of various types of plant tissue.***

2. ***Previous Knowledge Testing:-***

Some questions will be asked to students.

(i) ***Name the structural and functional unit of life.***

(ii) ***Have you seen T.S of root and stem?***

(iii) ***Have you observed different types of groups of cells in them?***

(iv) ***What is tissue?***

(v) ***What are the differences between animal and plant tissue?***

3. ***Vocabulary used :-***

meristematic, differentiation, parenchyma, collenchyma, sclerenchyma, aerenchyma, chlorenchyma, trachaids, vessels, epidermis, suberin, sieve tubes etc.

4. ***AIDS / Innovative methods used:-***

(i) ***Students will be shown difference in thickening of cell wall & inter cellular spaces by displaying on zoomscreen.***

(ii) ***Students will make permanent tissues using clay of different colours,threads and beads.***

(iii) ***Students will display difference in thickening of cell wall on a glass sheet or hard board.***

(iv) ***Diagrams of parenchyma,collenchymas and sclerenchyma will be drawned.***

5. ***Procedure :-***

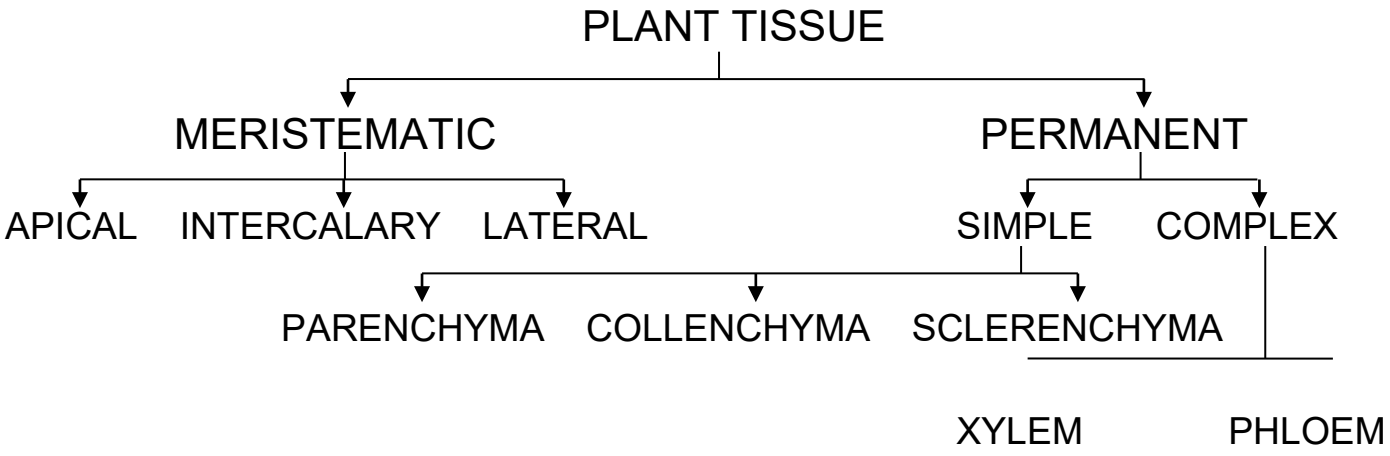
(i) ***Transverse section of stem will be drawn & brief explanation of various parts will be given.***

(ii) ***Classification of meristematic tissue will be explained drawing diagram on notebook and screen sharing to children.***

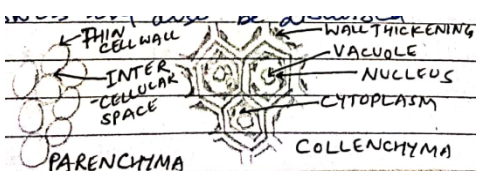
(iii) ***Location, characteristics and function of all the plant tissue will be discussed.***

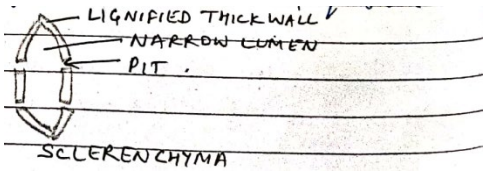
(iv) ***Difference between meristematic and permanent tissue will be discussed by involving students.***

(v) Differences among parenchyma, collenchyma and sclerenchyma will also be discussed.

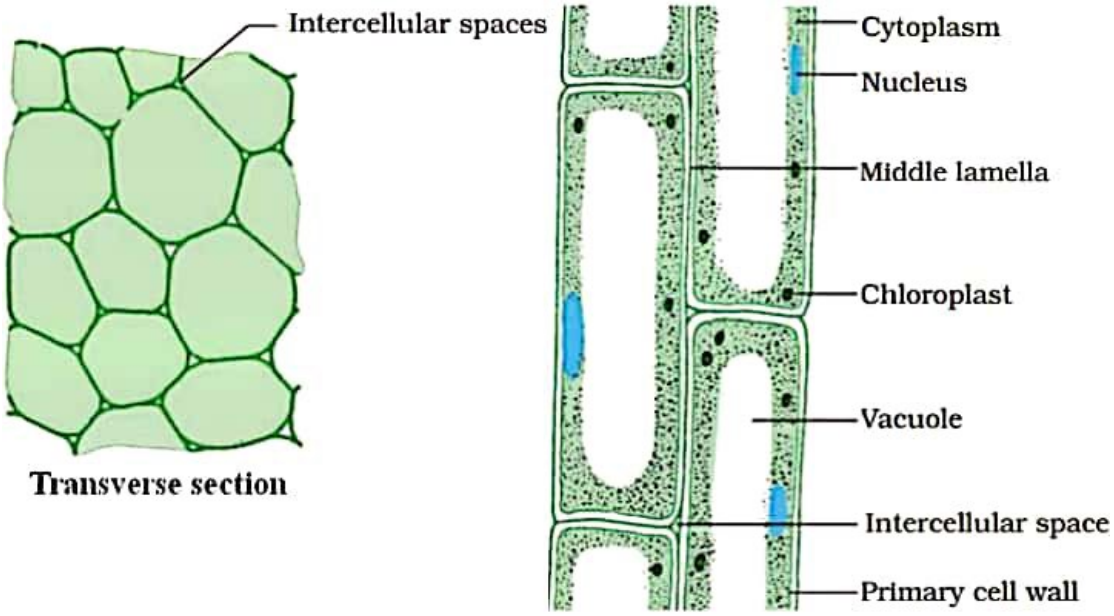


- ***Students will do activity by using clay & thread to show differences in thickness of cell wall and intercellular spaces.***
- ***Students will also read the content from NCERT one by one.***
- ***Students will also draw diagrams with the help of teacher.***
- ***Related questions answers will also be discussed.***





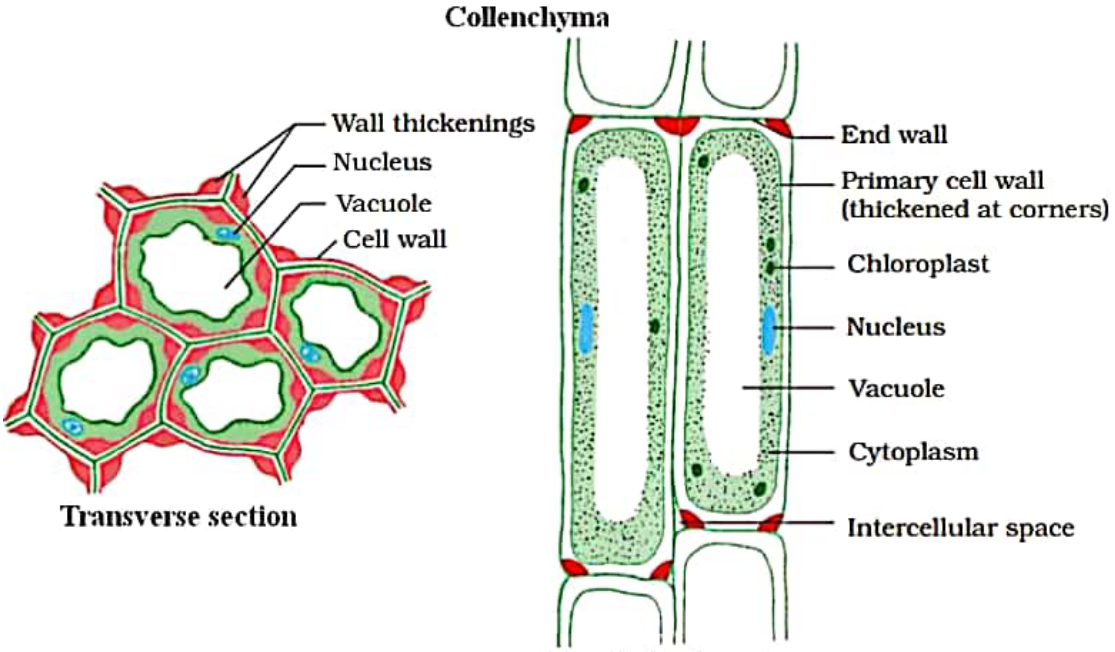
Parenchyma



Transverse section

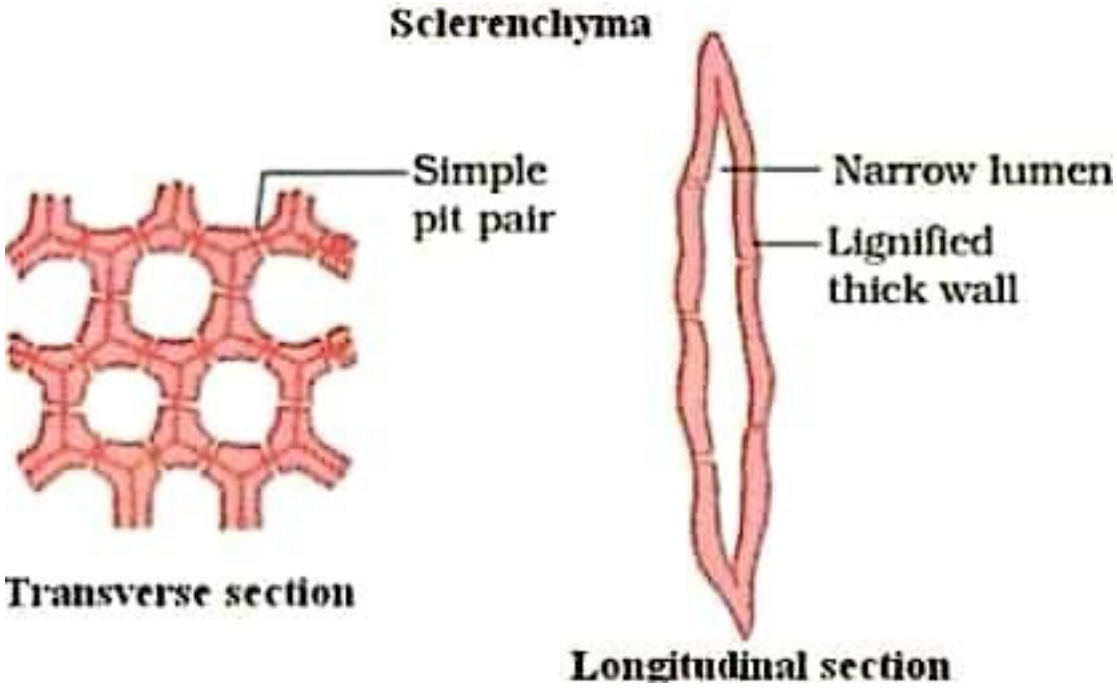
Longitudinal section

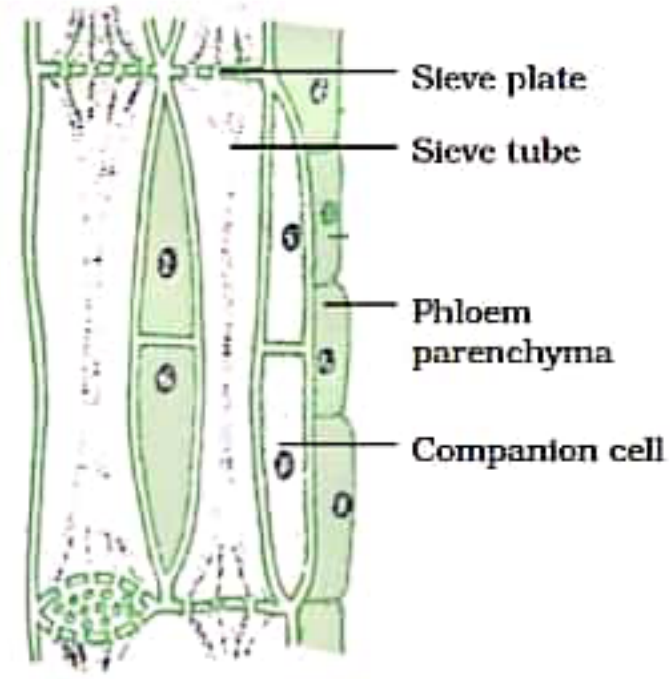
Collenchyma



Transverse section

Longitudinal section





Section of phloem

6. Participation of students :-

(i) Students will make parenchyma, collenchyma & sclerenchyma tissue with the help of threads & clay.

(ii) Students will draw diagrams in their note book.

(iii) NCERT and Extra Questions will be done in the notebook.

7. Recapitulation :- Teacher will ask some questions to students :-

(i) What is a tissue?

(ii) How Parenchyma, Collenchyma and Sclerenchyma differ in their thickening of cell wall?

(iii) Why vacuole in absent in meristermatic tissue.

(iv) What is role of epidermis?

(v) What is the reserve food for plant tissue?

(vi) Why are plant cells rigid in nature?

8. Art Integration :-

- *Students will show differences in wall thickenings and intercellular spaces by displaying on glass or hard board by using clay of different colours or by using threads.*
- *Activity showing the function of Xylem vessels in stem for carrying water will be performed and video will be made.*

9. Learning outcomes :-

(i) Students would be able to state the importance of different types of tissue.

(ii) Students will be able to classify different type of plant tissue.

(iii) Students would be able to draw diagrams of T.S of Parenchyma, Collenchyma and Sclerenchyma.

(iv) Students would also understand various functions of Parenchyma, Collenchyma & Sclerenchyma, Xylem and Phloem.

(v) Reading skills will be developed while comprehending the questions asked.

10. Resources :-

(i) NCERT Text Book of class IX

(ii) BIOLOGY – By Pardeep Publications (IX)

(iii) BIOLOGY TODAY – By Cordova Publications.

(iv) Link-https://youtu.be/-rGetleD-DI

11. CO-Scholistic Activities:-

- *Learning and visual skills will be developed.*
- *Acting skills will be learned by role play.*
- *Creative skills will be developed by drawing and making different permanent tissues.*

12. Assessment :-

- *Oral Test*
- *Written Test*
- *Activities*
- *MCQ*
- *Assignment*
- *Role Play*

Assignment

I. Very short answer questions:

1. *Name the vascular tissue in plants.*
2. *Name the tissue that helps in growth of plants.*
3. *How many types of meristematic tissue are there?Name them.*
4. *What is cambium?*
5. *Which meristem helps to increase the girth of stem or root?*
6. *Which form of permanent tissue help in storage of food?*
7. *Which tissue makes up the husk of coconut?*

II. *Short Answer Questions:*

8. ***What is a tissue? Give examples.***
9. ***What is differentiation?***
10. ***What is lignin? Where is it present and what is its use?***
11. ***What is stomata? What are its functions?Explain with diagram.***
12. ***Name the constituents of phloem.***
13. ***Name different types of simple permanent tissues.***
14. ***What are chlorenchymatous tissues?***
15. ***What is the role of epidermis in plants?***

III. *Long Answers Questions:*

16. ***Classify meristematic tissue according to their location.Give functions of each.***
17. ***Differentiate between:***

a) ***Parenchyma and Collenchyma***
b) ***Collenchyma and Sclerenchyma***
c) ***Xylem and Phloem***

Class IX

Subject : Biology

Topic : Chapter – 6 (Cont.) Animal Tissue Part-2

1. Learning Objectives :-

(i) Students will be able to understand the differences between animal and plant tissue.

(ii) Types and subtypes of animal tissue.

(iii) Students will be acquainted with the knowledge of location, characteristics and functions of epithelial tissue, connective tissue, muscular tissue and nervous tissue.

(iv) Comparison of plant and animal tissue.

2. Previous Knowledge Testing :-

Some questions will be asked to test students :-

(i) How our internal body parts are protected?

(ii) What are the components of blood?

(iii) Which tissue helps in movement of body organs?

(iv) Do we as animals have undifferentiated cells in our body?

3. Vocabolary Used :-

Epithelium, Columnar, cuboidal, squamous, intercalary disc, alveoli etc.

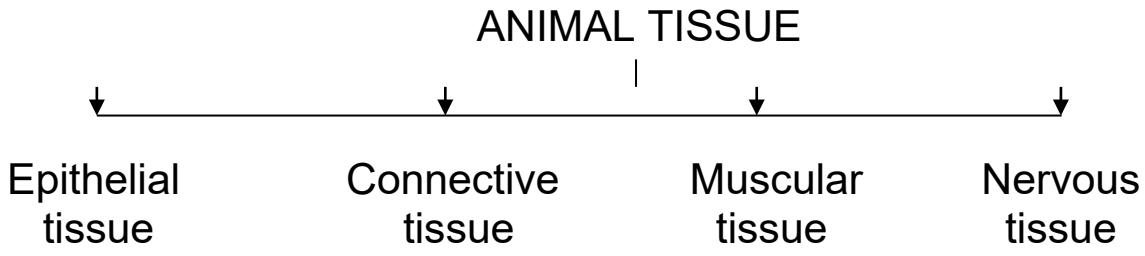
4. AIDS / Innovative methods used :-

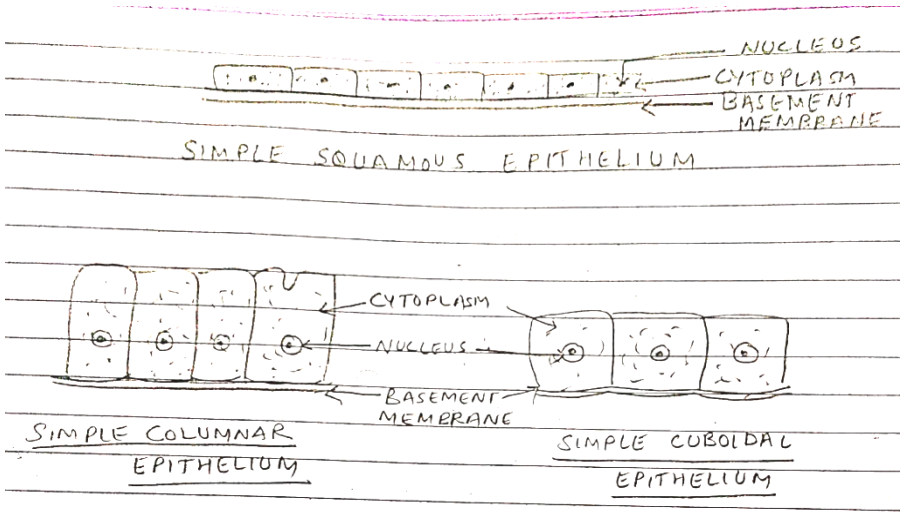
- ***Diagrams of striated,smooth and cardiac muscles will be drawn by the teacher and shared on the screen side by side.***

- ***Digital content will be shared to students.***
- ***Presentation will be given by students on different types of tissues by showing diagrams.***

5. Procedure :-

- ***L-6 'tissues' will be continued. Topic 'animal tissue will be taken up. Types of animal tissue will be explained.***





- ***Location, characteristics and functions and types of animal tissues will be explained.***
- ***Students will read the content from NCERT book.***
- ***Related diagram will be drawn by the students with the help of teacher.***

- ***Related question answers will be discussed with the students.***

6. Participation of the students :-

(i) Students will draw diagrams of various types of tissues with the help of teacher.

(ii) Students will read the content one by one.

(iii) Students will frame questions to the topic.

(iv) NCERT Questions will be done in notebooks.

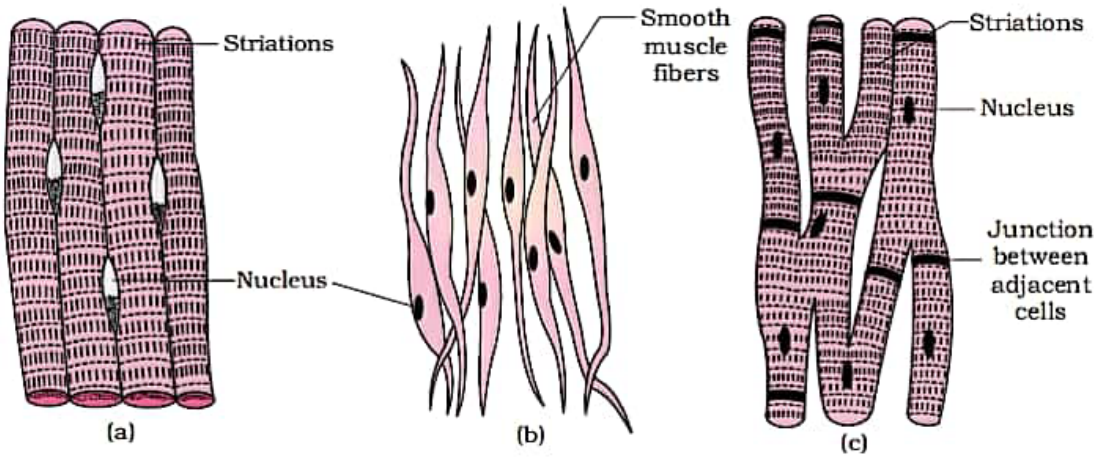
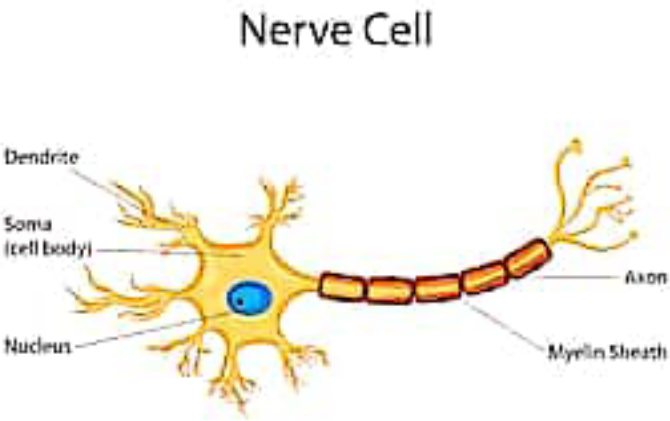


Figure 7.7 Muscle tissue : (a) Skeletal (striated) muscle tissue (b) Smooth muscle tissue (c) Cardiac muscle tissue



7. ***Recapitulation → Questions will be asked***

(i) What is the difference between

a) Blood and Lymph

b) Straited and Unstraited Muscle

c) Ligament and tendon

(ii) What are different types of epithelial tissue?

(iii) What is function of nervous tissue?

8. Art Integration :-

- ***Students will draw colourful diagrams of various types of animal tissues by using pencil colours.***

9. Learning Outcomes :-

(i) Students would understand the location, characteristics and functions of various types of animal tissue.

(ii) Students would be able to draw diagrams of various types of animal tissues.

(iii) Students would be able differentiate between bone and cartilage, tendon and ligament.

10. Resources :-

(i) NCERT science Text Book for Class IX

(ii) Biology Today – By Cordova Publication.

(iii) Biology – By Dinesh Publications (IX)

(iv) Link-https://youtu.be/8IANWaZLIvg

11. Co-Scholastic Activities:-

- ***Visual,learning and thinking skills will be developed.***
- ***Creative skills will be learned by drawing diagrams.***

12. ***Assessment :-***

- ***Oral Test***
- ***Written Test***
- ***Quiz***
- ***Periodic Test***
- ***Assignment***

Assignment

I. ***Name the following:-***

1. ***The fat storing tissue of our body →***
2. ***The animal tissue that links bone to another bone →***
3. ***The tissue which connects muscle to bone →***
4. ***The tissue that acts for transportation of oxygen →***
5. ***Epithelium present in the lining of alveoli →***
6. ***Tissue present in the brain →***
7. ***Tissue that forms innerlining of our mouth →***
8. ***Contractile proteins are found in →***

II. ***Answer the following:-***

1. ***Which are locations of cartilage in human body ?***
2. ***Explain the structure of nervous tissue with diagram ?***
3. ***Differentiate between***
   a) ***Bone and cartilage***
   b) ***Blood and lymph***
   c) ***Tendon and ligament***
4. ***What is epithelial tissue ?Write its functions ?***

TERM II

Class IX **Subject : Biology**

Topic : Why do we Fall ill

1. ***Learning Objectives :-Students will get knowledge about***
   - ***i. Health***
   - ***ii. Disease and its causes***
   - ***iii. Means of spread***
   - ***iv. Organ-Specific and tissue specific manifestation***
   - ***v. Principles of Treatment***
   - ***vi. Principles of Prevention***

2 ***Previous Knowledge Testing :-***

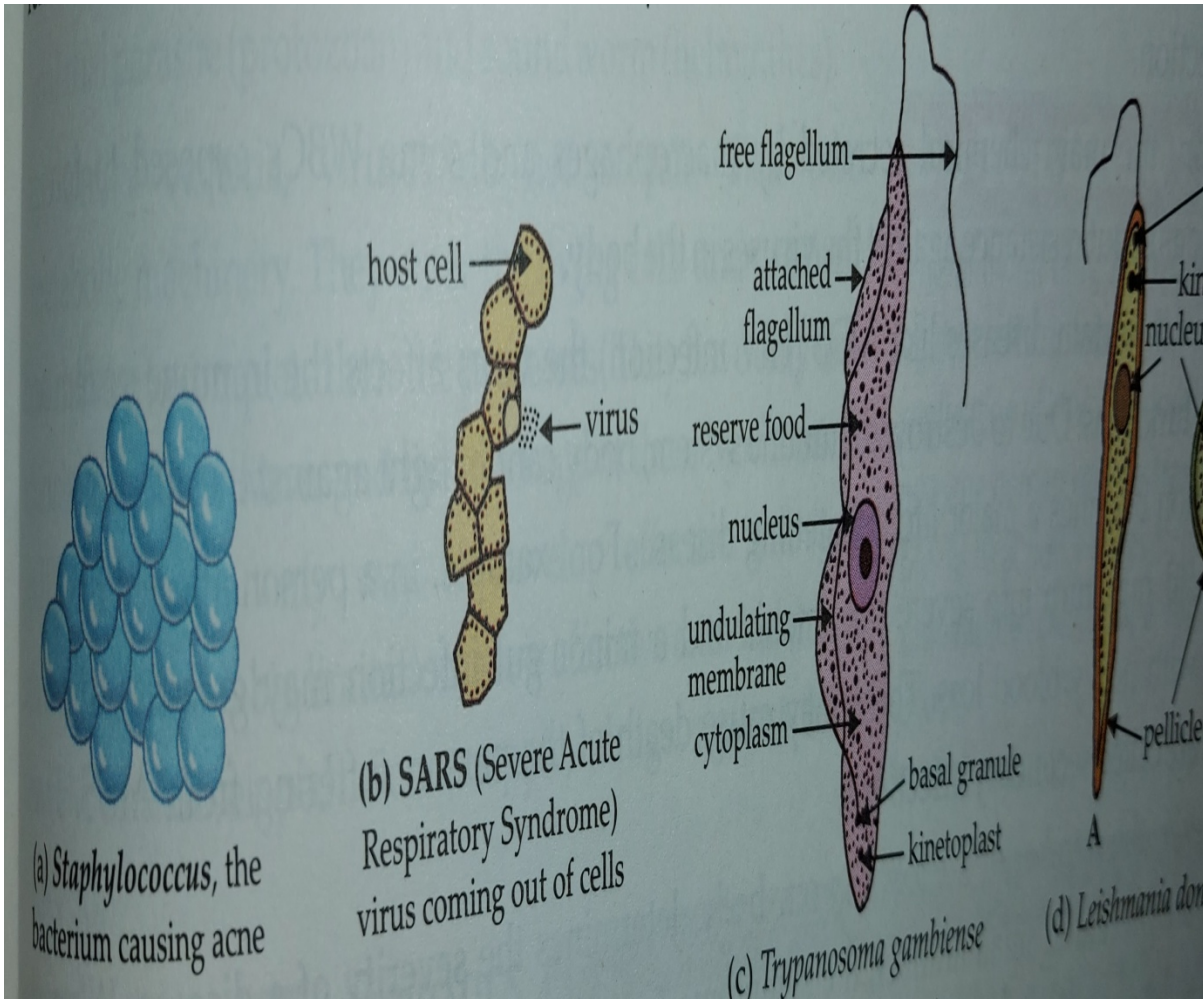
Following questions will be asked to test the previous knowledge about topic .

- ***i. Why do we fall ill?***
- ***ii. Are you healthy?***
- ***iii. Distinguish between healthy and disease free.***
- ***iv. What is health?***

3. ***Vocabulary used:-Environment, acute, chronic, peptic ulcers, Helicobacter Pylori, Antibiotic, Manifestations, Inflammation, treatment, prevention, immunization, immune.***

4. AIDS / Innovative methods used :-

- ***Chart on different diseases will be made.***
- ***Presentation on different diseases and their causative agent will be given by children online.***
- ***Table of different diseases and their causative agents will be made.***
- ***Presentation on Corona Virus will be given by children online.***



Common disease causing organisms

5. ***Procedure :-***

   (i) ***Reading and discussion of the topic will be done in the class.***

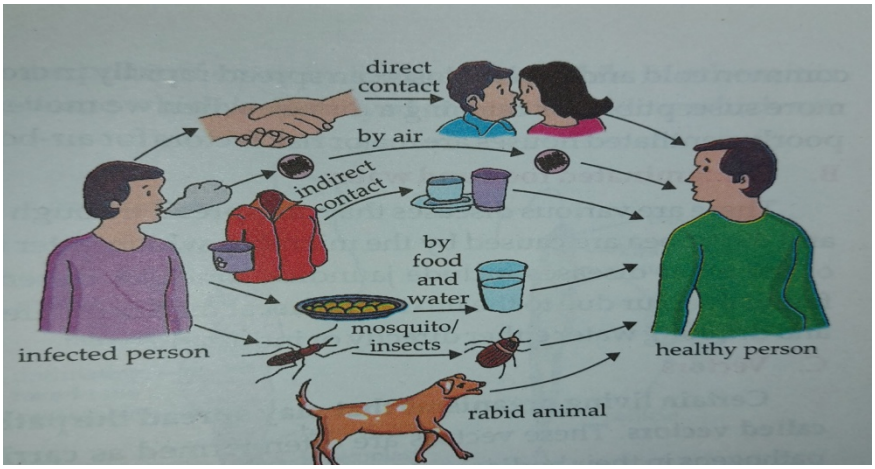
   (ii) ***Children will understand importance of microorganisms by presenting role play in online class.***

(iii) Related question answers will be discussed.

6. *Participation of the students :-*

Student will read and discuss the topic.

- *Related question answers and NCERT Questions will be done in notebook.*
- *Table on diseases will be made.*
- *Presentation by children on different diseases will be shared through videos.*



Common Methods of disease transmission

7. *Recapitulation*

1. *Name the microorganism which caused pandemic recently.*
2. *Name two diseases each caused by bacteria, virus,protozoa,fungi etc.*
3. *What are the means of spread of various diseases ?*
4. *What are infectious and non infectious diseases?*
5. *What is immunization?*

8. *Art Integration :-*

(i) Group discussion

(ii) Presentation online and through video

(iii) Chart making

(iv) Quiz

9. *Learning Outcomes :-*

(i) Students will learn about health and disease.

(ii) Students will also learn about different types of diseases, organ specific manifestation and tissue specific manifestation.

(iii) Students will come to know about the corona virus causing pandemic recently.

(iv) Infectious and Non infectious diseases?

10. *Resources :-*

i. Cordova – Biology by Cordova publication

ii. NCERT

iii. Link-https://youtu.be/p5SgDoAA66U

11. *Co-Scholastic activities :-*

- *Group discussion*
- *Keen observation*
- *Critical thinking*
- *Communication skill by presentation*
- *General awareness skill will be developed*

12. *Assessment:-*

- *Oral Test*
- *Written Test*
- *Periodic Test*
- *Presentation*
- *Assignment*

Assignment

1. ***Define Health?***
2. ***Write differences between symptom and sign?***
3. ***Write differences between healthy and disease free?***
4. ***Classify the causes of diseases and explain them?***
5. ***Write two examples of diseases caused by viruses,bacteria,protozon,vectors.***
6. ***Name the causative agent of peptic ulcers.***
7. ***How antibiotics work against bacterial infection.***
8. ***Why do antibiotics not work against viral infections?***
9. ***What is the full form of AIDS.What is its causative organism?What are its modes of transmission and symptoms?What preventive measures can be taken to prevent the disease?***
10. ***What do you understand by organ specific and tissue specific manifestations?Explain with the help of example?***
11. ***Write the causative agents for following diseases sleeping sickness,kala azar,ascariasis,malaria,acne.***
12. ***Write the symptoms for each lungs and brain if they are the target organs of a disease.***
13. ***Write differences between acute and chronic diseases.***
14. ***How can we prevent diseases?***
15. ***Why making antiviral medicines is harder than making antibacterial medicines?***
16. ***Name some diseases for which vaccines are available.***
17. ***Define inflammation?***

Class IX ***Subject : Biology***

Topic : Natural Resources

This topic will be assessed by the teacher for internal assessment parameter

1. ***Learning Objective :- Students will learn about***

i. ***Air, The role of atmosphere in climate control.***

ii. ***Rain, Water-A wonderful Liquid***

iii. ***Water pollution, Soil Pollution***

iv. ***Biogeo chemical cycles.***

v. ***The water cycle***

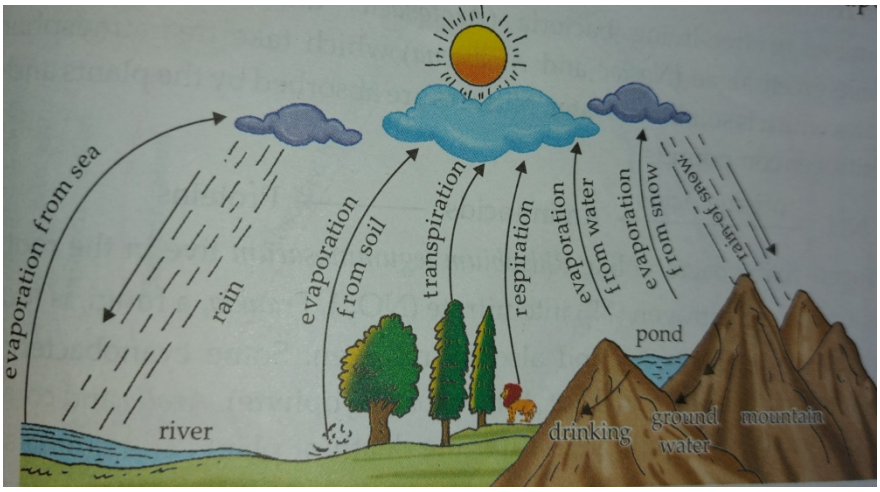
vi. ***The Nitrogen cycle***

vii. ***The carbon cycle***

viii. ***The oxygen cycle***

ix. ***The greenhouse effect***

x. ***Ozone Layer***



Water Cycle in Nature

2. *Participation of the students :-*

(i) ***Student will read the topic.***

(ii) ***Student will give online presentation on various topics like water cycle, carbon cycle, nitrogen cycle, and oxygen cycle,air,water,soil pollution etc.***

(iii) ***Different cycles will be drawn and shown during presentation.***

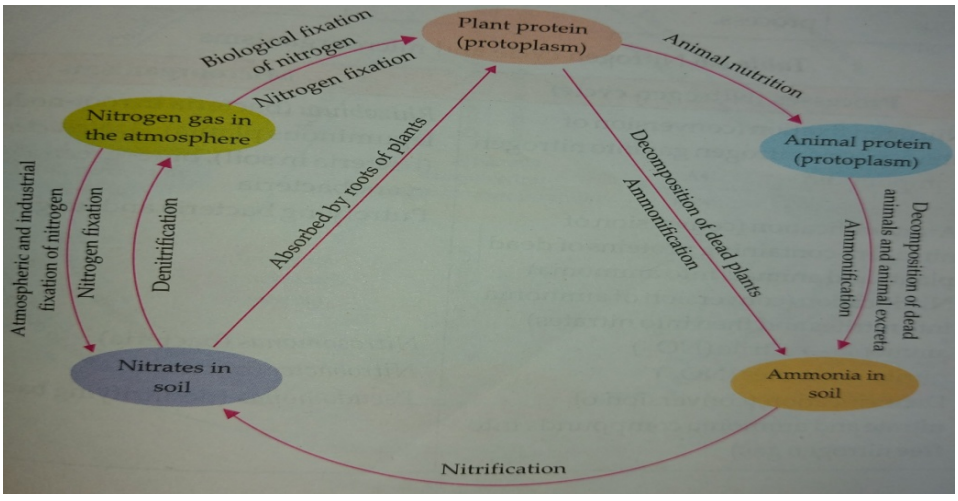
(iv) ***Videos on different pollutions will be shared.***

3. *Learning Outcomes :-*

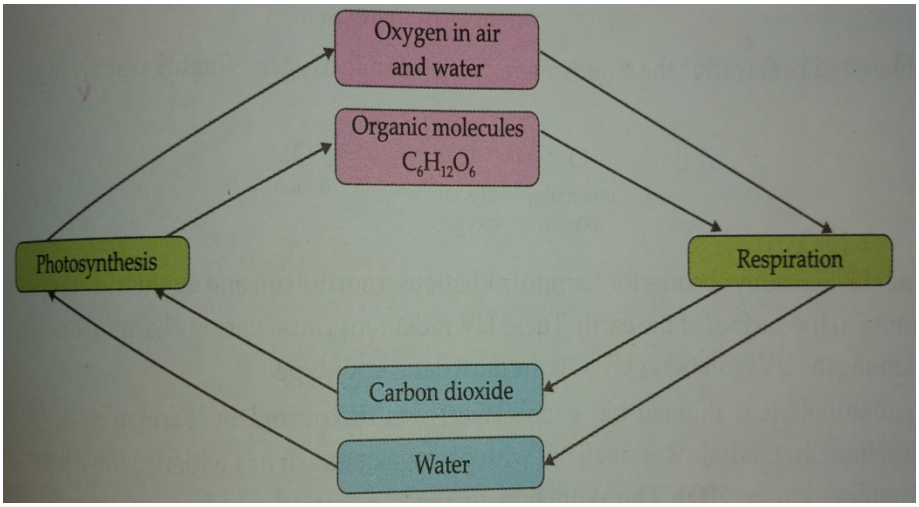
i. ***Students will learn about types of pollution.***

ii. ***Students will also learn about, water cycle, oxygen cycle, carbon cycle, nitrogen cycle.***

iii. ***Students also learn about ozone layer, green house effect.***



Nitrogen Cycle



Oxygen Cycle

4. ***Resources :- Cordova – Biology by Cordova publication***
    - ***NCERT Book.***
    - ***Digital Content***
5. ***Art Integration :-***
    - ***Group discussion***
    - ***Chart Making***
    - ***Presentation***
6. ***CO-Scholastic Activities:-***
    - ***Visual skills***
    - ***Learning skills***
    - ***Creative skills***
    - ***Communicative skills will be developed***
7. ***Assessment:- On the basis of presentation***