

CLASS – IX
LESSON PLAN
CHAPTER-5: The fundamental unit of life.

Unit	Biology (Chapter 5: The fundamental unit of life)
Class Transaction	Total: 14 periods (approx. 40 min each)
Pre-requisite for the course	This lesson requires 1. Basic knowledge of cell 2. Basic knowledge of nucleus, cell organelles which students had already learnt in class VII and VIII
Assessment of qualifying knowledge	1. Written test 2. Lab activity 3. Group Discussion 4. HW notebook
Objective	Given the content (chapter) the students will be able to understand the structure of different components present in cell. They will be able to list the function of different cell organelles with 90 % accuracy. They will be able to understand the importance of each and every organelle contribution in proper functioning of the cells
Dimensions of Learning	DOL 1,2,3 and 4
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> Students will be able to 1. Distinguish between prokaryotic & eukaryotic cell 2. Draw a labeled diagram of a prokaryotic cell 3. Understand the structure of cell 4. Identify three essential parts of a cell 5. Understand the structure & functions of cell membrane and wall 6. Distinguish between Hypertonic, Hypotonic & Isotonic solution 7. List various cell organelles. 8. Understand functions & structure of various cell organelles. 9. Write names of various cell organelles. 10. Explain structure of various cell organelles. 11. Draw diagrams of various cell organelles. 12. To differentiate between plant cell & animal cell. <u>SKILLS</u>- Students would be able to 1. Appreciate the importance of cell and different cell organelles collaboratively.

	2. Use analytical skills to critically visualize the given scenario and use the concepts learnt in everyday problems. 3. Built character amongst themselves by discussing /communicating the equal contribution of plants and animal in maintaining life. 4. Create flow chart on the basis of cell organelles structure and functions. 5. Answer knowledge, understanding, application and diagrammatic skill based questions based on the topic. Attitudes and beliefs- <i>Students will be able to</i> Develop citizenship by visualizing and observing the given scenario in day to day lives of plants and animal cells contribution and present it in form of a skit to sensitize others
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Active learning- <i>Frayer Model</i> on prokaryotic cell. The students will draw 4 columns on a chart and will write about essential and non essential component of prokaryotic cell. (Critical thinking) Group learning- The class will be divided in the group of 5 students. <i>Circle the Sage</i>- The question will be asked by the teacher about the different solutions of osmosis and the students who knows the answer will stand at the various corners of the room. (Communication, Collaboration) Differentiation- The students in a group of 10 will be presenting a skit on all the organelles of the cell. (Character, Citizenship) Questioning- <i>Multiple level question</i>- Teacher will prepare a list of question about the functions of these organelles and will ask these questions during discussions. (Critical thinking, Communication) <i>Brain Storming</i> <i>Wipro technique</i>-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. Teacher will ask few questions to introduce the topic • List the examples of various kinds of organisms present around us • Classify them as unicellular and multicellular organisms <i>Introduction of the topic</i>- PPT and Digital Content would be shared <i>Guided practice followed by Independent Practice</i>- NCERT questions to be discussed in the classroom. Techniques to be used: Quiz

	Daily Practice Problem MCQ Peer Assessment Lab Activities Student -teacher interaction, Wipro- G.O.s(web chart, flow chart and differentiation table,compare- contrast matrix), silent/ loud reading, collaborative learning, Hands on experiment Experimental work Any Other
Resources	Text Book: NCERT text book for Science. Reference Book CBSE Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the Ncert questions. HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness.....1 mark Content.....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessments	4 UNIT TESTS (20, 20, 20,20)80 Marks HALF YEARLY EXAMINATION 80 Marks ANNUAL EXAMINATION 80 Marks PERIODIC TEST Average of the best two tests to be taken that will have a weightage of 10 marks. INTERNAL ASSESSMENT20 Marks • Periodical Test 10 Marks • Note Book Submission 05 Marks • Subject Enrichment 05 Marks
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For gifted students:</i> • NCERT/Exemplar questions to be done • Encouragement for referring other resources

	<i>For weak students:</i> • Ncert questions to be completed • Buddy help to be provided • Provide grade-up classes <i>For differently abled students:</i> • Ignore spelling mistakes. • Call parents at regular intervals • Provide grade-up classes
Marks	The weightage would be given by CBSE.

Topic	Day 1 Introduction to discovery and history of cell
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires • Basic knowledge of cell • Basic knowledge of nucleus, cell organelles which students had already learnt in class VII and VIII
Assessment of qualifying knowledge	Questions based on previous year chapter.
Objective	Given the content (chapter) the students will be able to understand discovery and history of cell
Dimensions of Learning	DOL 1,2
Learning Outcomes	KNOWLEDGE- <i>Students will know and understand</i> Students will be able to • Understand the structure of cell • Identify three essential parts of a cell SKILLS- <i>Students would be able to</i> • Appreciate the importance of cell and different cell organelles collaboratively. Attitudes and beliefs- <i>Students will be able to</i> Develop citizenship by visualizing and observing the given scenario in day to day lives of plants and animal cells contribution and present it in form of a skit to sensitize others
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Facilitator asks the students to observe an onion peel with naked eyes and then same peel with the help of microscope. The following questions will be asked to check their understanding: • How do onion peels look with the naked eyes? • How does the structure look with the microscope? • How are cells discovered and who discovered them? • Why cells are called structural and functional unit of life? • Why discovery of microscope is considered as an important invention in history of cytology? • Students will share the previous knowledge of neuron that they have learnt-2 min • Students' responses will be listed on the blackboard by using the KWL chart -5 minutes • Wipro Technique (KWL- What you Know, What you will Learn, What you have learned). <i>Guided practice followed by Independent Practice- NCERT questions to be</i>

	discussed in the classroom.
Closure	Summarization by student
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the Ncert questions.
Assessments	One minute test

Topic	Day 2 Classification of organisms on the basis of type of cell and nucleus
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires • Basic knowledge of cell • Basic knowledge of nucleus, cell organelles which students had already learnt in class VII and VIII
Assessment of qualifying knowledge	Written test
Objective	Students will be able to classify the different organisms on the basis of the type of nucleus and Number of cells present in them.
Dimensions of Learning	DOL 1,2
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> Students will be able to • Distinguish between prokaryotic & eukaryotic cell • Draw a labeled diagram of a prokaryotic cell • Understand the structure of cell <u>SKILLS</u>- <i>Students would be able to</i> • Appreciate the importance of cell and different cell organelles collaboratively.
Transaction Methodology (The teacher can use the mentioned techniques, wherever	Transaction would proceed in the following manner- Active learning- <i>Frayer Model</i> on prokaryotic cell. The students will draw 4 columns on a chart and will write about essential and non essential component of prokaryotic cell.(Critical thinking)

applicable, and can use any other too.)	
Closure	Student will study about the structural organization of the cell from home
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the Ncert questions.
Assessments	Oral questions

Topic	Day 3 Structural organization of the cell
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	Questions based on previous day transaction.
Assessment of qualifying knowledge	1 minute test
Objective	Students will be able to explain the structure and function of plasma membrane.
Dimensions of Learning	DOL 1,2,3
Learning Outcomes	KNOWLEDGE- <i>Students will know and understand</i> Students will be able to - Understand the structure & functions of cell membrane and wall SKILLS- <i>Students would be able to</i> - Appreciate the importance of cell and different cell organelles collaboratively.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- <i>Brain Storming (Collaborative)</i> Think pair share- Teacher will ask few questions to introduce the topic and students will think for a minute and then the students will share their views in pair. - Where is the cell membrane found? - What is its function? <i>Guided practice followed by Independent Practice-</i> NCERT questions to be discussed in the classroom.
Self Study,	Independent Practice: Students would do the questions in their H.W

Home Work, Assignments	notebooks as mentioned in the Ncert questions.
Assessments	One minute test

Topic	Day 4 Organization of cell
Class Transaction	Total: 14 periods (approx. 40 min each)
Pre-requisite for the course	This lesson requires Basic knowledge of cell Basic knowledge of nucleus, cell organelles which students had already learnt in class VII and VIII
Assessment of qualifying knowledge	Questions based on previous day transaction.
Objective	Students will be able to explain to explain the different type of osmosis.
Dimensions of Learning	DOL 1,2
Learning Outcomes	<u>KNOWLEDGE-</u> <i>Students will know and understand</i> Students will be able to • Understand the structure & functions of cell membrane and wall • Distinguish between Hypertonic, Hypotonic & Isotonic solution <u>SKILLS-</u> <i>Students would be able to</i> 1. Appreciate the importance of cell and different cell organelles collaboratively. 2. Use analytical skills to critically visualize the given scenario and use the concepts learnt in everyday problems.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Activity-The teacher will soak raisins in water, concentrated sugar solution and will ask following questions to check their understanding and students will write the observation in their copy. Competency- Critical thinking • What will happen if plant cell is kept in hypertonic solution? • What will happen if plant cell is kept in hypotonic solution? • What will happen if plant cell is kept in isotonic solution? <i>Guided practice followed by Independent Practice-</i> NCERT questions to be discussed in the classroom.

Self Study, Home Work, Assignments	Students will make a flow chat in their notebooks on osmotic solutions.
Assessments	Correction of flow chart by the teacher.

Topic	Day 5 Structural Organization of the cell
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires knowledge for basic 3 components of cell.
Assessment of qualifying knowledge	One minute test
Objective	Student will be able to understand the structure and function of cell membrane and cell wall. They will also be able to compare them
Dimensions of Learning	DOL 2,3,4
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> Students will be able to • Understand the structure & functions of cell membrane and wall • List various cell organelles. <u>SKILLS</u>- <i>Students would be able to</i> Appreciate the importance of cell and different cell organelles collaboratively. Use analytical skills to critically visualize the given scenario and use the concepts learnt in everyday problems.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Group learning- The class will be divided in the group of 5 students. <i>Circle the Sage</i>- The question will be asked by the teacher about the different solutions of osmosis and the students who knows the answer will stand at the various corners of the room. (Communication, Collaboration)
Self Study,	Independent Practice: Students would do the questions in their H.W

Home Work, Assignments	notebooks as mentioned in the Ncert questions.
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Topic	Day 6 Nucleus – Structure and Function
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires • Basic knowledge of cell • Basic knowledge of nucleus, cell organelles which students had already learnt in class VII and VIII
Assessment of qualifying knowledge	Students have to write 5 key points from the last transaction.
Objective	Student will be able to explain the structure and function of nucleus
Dimensions of Learning	DOL 1,2,3
Learning Outcomes	<u>KNOWLEDGE</u> - Students will be able to explain the structure and function of nucleus.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Teaching strategy- Cubing- Students will sit in a group of 5 and will prepare a chart mentioning the structure and function of nucleus.
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the Ncert questions.
Assessments	2 min presentation by each group.

Topic	Day 7 Visit to lab for preparing temporary mount of onion peel
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires basic knowledge of apparatus required for preparing an onion peel mount.

Assessment of qualifying knowledge	Recap of the onion peel slide which they have observed in Class 8
Objective	Student will be able to prepare the temporary mount of onion peel.
Dimensions of Learning	DOL 2,3
Learning Outcomes	<u>SKILLS</u> - Students will be able to prepare and observe the cell organelles present in onion peel.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Hands on experience- In science lab, Student will prepare the onion peel slide from the raw onion using the equipments and the material (onion, forceps, safranin, glycerine, glass slide, cover slip and compound microscope.
Self Study, Home Work, Assignments	Independent Practice: Students will draw the diagram of onion peel observed by them.
Assessments	On the basis of the neatness, accuracy of the diagram drawn.

Topic	Day 8 Structure and function of different cell organelles
Class Transaction	Total: 14 periods (approx. 40 min each)
Pre-requisite for the course	This lesson requires basic knowledge of cell organelles.
Assessment of qualifying knowledge	One minute test
Objective	Student will be able to understand the structure of different cell organelles and they can also list the functions of them.
Dimensions of Learning	DOL 2,3
Learning Outcomes	<u>KNOWLEDGE</u> - Students will be able to Explain structure of various cell organelles. Draw diagrams of various cell organelles. <u>SKILLS</u> - <i>Students would be able to</i>

	Appreciate the importance of cell and different cell organelles collaboratively .
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Jigsaw strategy (Collaborative) - Students will be divided in the groups of 6 students and number the students as 1,2,3,4,5 and 6 in each group. And every student will be allotted one organelle. They will read, discuss and then expert groups will be formed in which all the students numbered 1 from each group will sit together and discuss amongst themselves that particular organelles. Same with 2,3,4,5,6. Then they will return back to their previous group and every student will share their view on each organelles in their group.
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the Ncert questions.
Assessments	2 minute discussion

Topic	Day 9 Structure and function of different cell organelles
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires basic knowledge of cell organelles which students had already learnt in class VII and VIII
Assessment of qualifying knowledge	Students have to write 5 key points from the last transaction.
Objective	Student will be able to understand the structure of different cell organelles and they can also list the functions of them.
Dimensions of Learning	DOL 2,3,4
Learning Outcomes	Students will be able to understand the structure and function of various cell organelles.
Transaction Methodology (The teacher can use the mentioned techniques,	Transaction would proceed in the following manner- Teaching strategy- Think pair and share- Students will think upon the topic and then will discuss their views in pair. 1 What are endoplasmic reticulum look like and where are they located in the cell? 2. What are the two different type of ER?

wherever applicable, and can use any other too.)	3. Name them and list their function. <i>Guided practice followed by Independent Practice-</i> NCERT questions to be discussed in the classroom.
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the Ncert questions.
Assessments	Summarization by students

Topic	Day 10 Structure and function of different cell organelles
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires basic knowledge of cell and cell organelles which students had already learnt in class VII and VIII
Assessment of qualifying knowledge	2 minute test
Objective	Student will be able to understand the structure of different cell organelles and they can also list the functions of them.
Dimensions of Learning	DOL 3,4
Learning Outcomes	Students will be able to explain the structure and function of mitochondria and lysosomes.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Teaching strategy(wipro) -Think pair share Activity: Questioning strategy-Give instructions for creating a rubric . Reminds students that each question in the assessment should have a rubric that indicates clear and measurable components. 1 How many membrane are present in mitochondria? 2What is their function and how they are helpful in production of ATP? 3. Why are lysosomes known as suicide bags? <i>Guided practice followed by Independent Practice-</i> NCERT questions to be discussed in the classroom.

Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the Ncert questions.
Assessments	Closure of the topic and correction done by teacher.

Topic	Day 11 Visit to lab for preparing temporary mount of human cheek cell
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires basic knowledge of human cheek cells.
Assessment of qualifying knowledge	Oral questions asked by the teacher on previous knowledge.
Objective	Students will be able to make temporary mount of human cheek cell.
Dimensions of Learning	DOL 2,3 and 4
Learning Outcomes	<u>SKILLS</u> - Students will be able to prepare a temporary mount of cheek cell.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Teacher will demonstrate the method of preparing the temporary mount of cheek cells by using the material (toothpick for scratching the inner layer of the cheeks gently, glass slide, cover slip, methylene blue, compound microscope.
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the Ncert questions.
Assessments	On the basis of the neatness, accuracy of the diagram drawn.

Topic	Day 12 Structure and function of different cell organelles
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires basic knowledge of cell and its cell organelles.

Assessment of qualifying knowledge	One minute test
Objective	Student will be able to understand the structure of different cell organelles and they can also list the functions of them.
Dimensions of Learning	DOL 2,3 and 4
Learning Outcomes	<u>KNOWLEDGE</u> - <i>Students will know and understand</i> Students will be able to Understand functions & structure of various cell organelles. Write names of various cell organelles.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Activity: Circle the sage- Collaborative group work- Student will discuss the role of different plastids and size of vacuoles present in different cells in their own respective group in two circles. Students will create flow chart on the basis of cell organelles structure and functions. Answer knowledge, understanding, application and diagrammatic skill based questions based on the topic. Following questions will be asked by the teacher to check their understanding. 1. How many type of plastids are there? 2. Name them and list their functions. 3. Why they are absent in animal cell? 4 Why vacuoles are prominent in size in plant cell? 5. Why vacuoles are more in number in animal cell? 6. Enlist the functions of vacuoles in plant and animal cell. <i>Guided practice followed by Independent Practice-</i> NCERT questions to be discussed in the classroom. .
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the Ncert questions.
Assessments	Oral questions

Topic	Day 13 Structure and function of different cell organelles
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires basic knowledge of cell and cell organelles.
Assessment of	Students have to write 5 key points from the last transaction.

qualifying knowledge	
Objective	Student will be able to understand the structure of different cell organelles and they can also list the functions of them.
Dimensions of Learning	DOL 2,3 and 4
Learning Outcomes	KNOWLEDGE- <i>Students will know and understand</i> Students will be able to Understand functions & structure of various cell organelles. Write names of various cell organelles. SKILLS- <i>Students would be able to</i> Create flow chart on the basis of cell organelles structure and functions. Answer knowledge, understanding, application and diagrammatic skill based questions based on the topic.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Differentiation- The students in a group of 10 will be presenting a skit on all the organelles of the cell. (Character, Citizenship) <i>Guided practice followed by Independent Practice-</i> NCERT questions to be discussed in the classroom.
Assessments	Summarization by students.

Topic	Day 14 Mitosis and Meiosis
Class Transaction	(approx. 40 min each)
Pre-requisite for the course	This lesson requires basic knowledge of the previous concepts.
Assessment of qualifying knowledge	1 minute written test
Objective	Student will be able to understand the structure of different cell organelles and they can also list the functions of them.
Dimensions of	DOL 2,3 and 4

Learning	
Learning Outcomes	<u>KNOWLEDGE</u> - Students will be able to differentiate between mitosis and meiosis.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Quiz- Students will be given time to observe and discuss the mitosis and meiosis from NCERT. Students will be divided in the team of two (Team A and Team B). On the basis of their observation, they will answer the question asked by teacher. Closure by the teacher.
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the Ncert questions.
Assessment	Oral questions of quizzes.