

CLASS 9

SUBJECT - SCIENCE (BIOLOGY)

TOPIC	LEARNING OUTCOMES	INNOVATIVE / ART INTEGRATION / EXPERIENTIAL LEARNING/ INTER DISCIPLINARY
THE FUNDAMENTAL UNIT OF LIFE	<p>The students will be able to:</p> <ul style="list-style-type: none">*Approximate different shapes & sizes of the cells.*Estimate about Microscopes & its Types.*Approximate Cell Theory*List the basic structural components of a cell and their functions.*Distinguish between Hypotonic, Hypertonic & Isotonic solutions.*Define genes and chromosomes.*Distinguish between prokaryotic & eukaryotic cells	<ul style="list-style-type: none">* Students will make different shapes of cells using materials like thread, wool ,beads etc. - Innovative, Inter disciplinary & Art integration*Students will draw diagram of various shapes of cells present in human beings. - Art integration* Students will make video on activity hypotonic, hypertonic and isotonic solution.*To prepare temporary mount of onion peel & check cell wall

	<p>with diagrams.</p> <ul style="list-style-type: none"> * Differentiate between osmosis and diffusion * Explain the structure and function of various cell organelles like Endoplasmic Reticulum, Golgi Apparatus, Lysosomes, Mitochondria, Plastids and Vacuoles . * Define Cell Division and Distinguish between Meiosis and Mitosis. * Explain the significance of division of labour 	<p>be done in lab - Experiential learning</p> <ul style="list-style-type: none"> * Activities based on osmosis in raisins and potato will be performed - Experiential learning * Role Play on various cell organelles will be performed - Innovative , Art integration and inter disciplinary * Draw diagrams of meiosis and mitosis with different colours to understand the basic difference between them - Art integration
TISSUES	<p>The students will be able to:</p> <ul style="list-style-type: none"> * Differentiate between the mode of living style of plants and animals. * Define meristematic tissue, it's importance and location in plant body with diagram. * Define permanent tissue, it's importance and location in plant body with diagrams. * Understand complex tissue, it's types, importance in plants with diagram.* Explain the diversity in the epidermis layer. * Define complex permanent tissue, it's importance and location in plant body with diagram.* Tell different types of animal tissue like epithelial tissue, connective tissue, 	<ul style="list-style-type: none"> * 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 - Innovative, Art integration and inter disciplinary * Activity showing the function of Xylem vessels in stem for carrying water will be performed - Experiential learning * Students will draw colourful diagrams of various types of animal tissues by using pencil colours - Art integration * To identify parenchyma, collenchyma and sclerenchyma

	<p>muscular tissue and nervous tissue with their location, importance and diagram.</p>	<p>tissues in plants from prepared slides. Draw their labelled diagrams - Art integration and experiential learning</p> <p>* To identify striped, smooth , cardiac muscle fibres and nerve cells in animal from prepared slides. Draw their labelled diagrams - Art integration and experiential learning</p>
<p>Improvement in Food resources</p>	<p>The students will be able to :</p> <ul style="list-style-type: none"> *Explain the importance of improvement of food resources. *Describe the dependence of humans on plants and animals. *Differentiate between kharif and rabi crops. *Explain various improved agricultural activities which includes crop variety improvement, crop production improvement, crop protection improvement. *Differentiate between Micronutrients and macronutrients with examples. *Differentiate between maures and fertilizers with examples. *Explain the importance of organic farming *Describe Irrigation and various irrigation systems. *Explain various Cropping Systems and patterns: Crop rotation, Mixed cropping, Inter-cropping. *Explain various method of protection of crop from pests, pathogens and weeds. 	<ul style="list-style-type: none"> *Students will make a collage on Kharif and Rabi crops - Art integration * Visit to school garden to see the basic difference between manures and fertilizers, and also observe growth pattern by the use of both - Experiential learning * Models of new methods of irrigation and their comparison with the old ones - Experiential learning * Understand the different cropping patterns by the use of different beads or pebbles of different colours representing different crops and importance of each pattern - Art integration and experiential learning *Pasting pictures of exotic and indian breeds of different cattle - Art integration and experiential learning * Tabular form difference between marine fisheries and inland fisheries with different

	<p>*Describe the ways for Storing of grains.</p> <p>*Explain Animal husbandry with respect to</p> <ul style="list-style-type: none">-Cattle farming -Poultry farming-Fish farming -Apiculture -Animal breeding	<p>colours, sketches etc. - Art integration</p>
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