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| **CLASS : IX****SUBJECT : BIOLOGY****ANNUAL PEDAGOGICAL PLANS** |
| Chapter  | Learning objectives | Methodology | Activities | Learning outcomes |
| Fundamental unit of life | Students shall be able to-* Explain and apply cell theory.
* Understand the differences between prokaryotic and eukaryotic cell, and plant cell and animal cell.
* Describe the major components of the cell like cell membrane, nucleus and organelles like ER, GA, lysosomes, mitochondria, plastids and vacuoles.
* Gain a basic understanding of two types of cell divisions – mitosis and meiosis.

  | Lecture, stimulatory questioning, drawing diagrams and labeling, textual questions, content mapping, flow charts | * Role play on functions of different organelles.
* Lab activity – students will learn to prepare a slide of onion peel and human cheek cell and visualize the differences between plant and animal cell.
* Creating model of cell using everyday materials.
 | * Students are able to compare and contrast their observations on structure of plant cell and animal cell.
* They are able to draw the diagrams of plant and animal cell.
* They are able to draw analogies of cell organelles with their function.
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| Tissues  | Students shall be able to-* Differentiate between plant and animal tissues
* Classify plant and animal tissues
* Give structural and functional comparisons of various plant and animal tissues
 | Lecture, stimulatory questioning, drawing diagrams and labeling, textual questions, content mapping, flow charts, group discussion | * Creating crosswords on plant and animal tissues
* Preparing PPT on plant and animal tissues
* Lab activity – observing permanent slides of plant tissues and animal tissues
 | * Students are able to comprehend the locational, functional and structural differences between different plant and animal tissues.
* They are able to understand the role of tissues in the hierarchy of biological organization.
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| Diversity in living organisms | Students shall be able to-* Explain the need for classification
* Understand the basic criteria and significance of scientific naming
* Correlate hierarchy and classification
* Learn the five kingdom system of classification
* Categorize the major groups of plant and animal kingdoms based on their characteristics
 | Lecture, stimulatory questioning, drawing diagrams and labeling, textual questions, content mapping, flow charts, group discussion, tables of classification | * Lab activity – study of various plant and animal specimens, their classification and their characteristics
* Study of important monocot and dicot features after collection of parts like root, leaf, flower and seed, and pasting them on chart to show the differences.
 | * Students are able to appreciate the huge biodiversity all over the world.
* They are able to learn the scientific names of many common plants and animals
* They are able to identify and classify organisms after studying the classification criteria.
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| Why do we fall ill? | Students shall be able to-* Understand and explain the concept of health and disease
* Differentiate between acute and chronic diseases , and communicable and non communicable diseases
* Learn about the various classes of pathogens and their mode of action and examples of diseases caused by them
* Highlight the principles of treatment (general and specific)
 | Lecture, stimulatory questioning, drawing diagrams and labeling, textual questions, content mapping, flow charts, group discussion | * Chart presenting the common vaccines given to children
* Role play on common diseases like Malaria, AIDS, cholera, tuberculosis
* Chart on awareness about vector borne diseases and AIDS to recognize World AIDS day.
* Conducting a survey in family and locality on common diseases, their causes and means of communication
 | * The students are able to appreciate the importance of good health.
* They are able to relate nutrition and good health.
* They are also able to realize the importance of preventive measures by giving examples.
* They are also able to understand the difference between direct and contributory causes of diseases.
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| Natural resources | Students shall be able to-* Classify the types of natural resources
* Discuss the sources, effects and prevention of water, soil and air pollution
* Discuss and draw biogeochemical cycles
* Relate the effects of green house gases with global warming and green house effect
 | Lecture, stimulatory questioning, textual questions, content mapping, flow charts, group discussion, mineral cycles, Venn diagram, pie chart, demonstration | * Interdisciplinary activities (Biology and Geography)

(a)Chart on biogeochemical cycles(b)Model of water cycle* Lab activity – (a)formation of clouds in a plastic bottle

(b)study of various components of a given soil sample | * The students are able to understand the phenomena of wind and cloud formation.
* They are able to appreciate the cycling of various minerals in the nature.
* They are able to learn the importance of sustainable management and conservation of natural resources.
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| Improvement in food resources | Students shall be able to-* Explain plant breeding experiments
* Describe the need and methods for improvement in crop yields
* Express the differences between manures and fertilizers
* Discuss about irrigation, cropping pattern and nutrient management
* Explain organic farming plan
* Discus about good animal husbandry practices wrt cattle, poultry, fish farming and bee keeping
 | Lecture, stimulatory questioning, textual questions, content mapping, flow charts, group discussion | * Lab activity –

(a)testing the presence of starch in the given samples(b)testing the presence of adulterant metanil yellow in Dal* Interdisciplinary activity (biology and economics) - Chart showing differences between conventional and modern practices of farming.
* Collecting information on Bt Cotton (GMC)
 | * The students are able to value the food resources and avoiding its wastage.
* They are able to understand their role in sustainable management of food resources.
* They are able to appreciate the various measures taken to improve the quantity and quality of both animal and plant food.
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