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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. |
| 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. |
| 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. |
| 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. |
| 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. |
| 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. |