#### I. Levels of Organaisation

1.1. Cellular Level Organisation

| STANDARD | VI |
|----------|----|
|----------|----|

| Expected Specific<br>Outcomes of Learning  | Content in terms<br>of Concepts  | Curriculum<br>Transactional Strategies   | Illustrations   | Evaluation   | Suggested<br>No. of Periods |
|--|--|--|---|--|-----------------------------|
| 1  | 2  | 3  | 4   | 5  | 6                           |
| <ol> <li>Knows that cells are the basic fundamental units of life</li> <li>Understands that all life activities are ultimately performed at cellular level</li> <li>Realises that there are different types of cells to perform different functions</li> <li>Understands the basic differences between plant and animal cells</li> </ol> | <ul> <li>1.1. Cellular level of organization.</li> <li>1.1.1. Cell as the basic fundamental unit of life</li> <li>1.1.2. Different types of cells. Nerve cell, muscle cell, Blood cells, Parenchyma cells, Collenchyma cells, Collenchyma cells.</li> <li>1.1.3. Organisation of an animal cell and a plant cell</li> <li>1.1.4. Sizes of cells</li> <li>1.1.5. Single celled organisms</li> <li>1.1.6. Multicellular organisms</li> </ul> | <ol> <li>Observing different cells<br/>under microscope</li> <li>Using Charts showing<br/>different forms of<br/>unicelluar organisms</li> <li>Charts of plant and<br/>animal cells</li> </ol> | Diagrams of plant<br>cell and animal<br>cells<br>Diagrams of<br>different types of<br>cells | <ol> <li>How does a<br/>nerve cell differ<br/>from a muscle<br/>cell?</li> <li>What are the<br/>several types of<br/>blood cells?</li> <li>What are the<br/>units of<br/>measurement<br/>used in the<br/>study of cells?</li> <li>How do we<br/>consider<br/>multicellular<br/>animals as more<br/>advanced than<br/>unicellular<br/>organisms?</li> </ol> |                             |

#### DIRECTORATE OF SCHOOL EDUCATION, GOVERNMENT OF TAMILNADU, CHENNAI - 600 006. SCIENCE SYLLABUS - BIOLOGY I. Levels of Organaisation 1.2. Organisation at Tissue Level

| Expected Specific<br>Outcomes of Learning   | Content in terms<br>of Concepts  | Curriculum<br>Transactional Strategies  | Illustrations                                 | Evaluation  | Suggested<br>No. of Periods |
|---|--|---|---|---|-----------------------------|
| 1   | 2  | 3   | 4   | 5   | 6                           |
| <ol> <li>Understands that all<br/>cells in a tissue are<br/>similar</li> <li>Realises the need for<br/>different tissue types in a<br/>living organism</li> <li>Finds diversity among<br/>tissues</li> <li>Understands that<br/>structure and organiza-<br/>tion of tissues are<br/>function oriented.</li> </ol> | <ol> <li>Tissues - definition</li> <li>Types of tissues in plants and animals</li> <li>Types of tissues in plants and animals</li> <li>Functions of tissues</li> <li>Functions of tissues</li> <li>Growth and transformation of tissues.</li> <li>Animals with tissue level of organisation</li> </ol> | <ol> <li>Using Charts</li> <li>Observation of tissues<br/>under a microscope</li> <li>Practical demonstration<br/>of peeling tissues from<br/>onion or other sources<br/>and showing them<br/>under a microscope</li> </ol> | Diagrams of<br>different types of<br>tissues. | <ol> <li>What is division<br/>of labour and<br/>how is it<br/>achieved at<br/>tissue level?</li> <li>What is the<br/>advantage in<br/>having different<br/>types of tissues?</li> </ol> |                             |

## 1.3. Organs

| Expected Specific<br>Outcomes of Learning  | Content in terms<br>of Concepts  | Curriculum<br>Transactional Strategies   | Illustrations  | Evaluation  | Suggested<br>No. of Periods |
|--|--|--|--|---|-----------------------------|
| 1  | 2  | 3  | 4  | 5   | 6                           |
| <ol> <li>Realises that all Organs<br/>are made up of different<br/>types of cells</li> <li>Understands that organs<br/>are specific in their<br/>functioning</li> <li>Realises that working<br/>of an organ is<br/>controlled by nerves /<br/>hormones.</li> </ol> | <ul> <li>1.3.0. Organs -<br/>definition</li> <li>1.3.1. Different Organs<br/>in a multi-cellular<br/>organism.</li> <li>1.3.2. Organisation of<br/>an organ with<br/>different tissues<br/>to perform a<br/>specific function</li> <li>1.3.3. Control of<br/>functioning of<br/>organs.</li> </ul> | <ol> <li>A Chart showing an organ as an assemblage of different tissues.</li> <li>Diagram of different organs</li> </ol> | A diagram<br>showing an organ,<br>being made up of<br>different tissues. | What are the<br>tissues found in<br>an organ like<br>stomach / heart /<br>etc., |                             |

## 1.4. Organ System

| Expected Specific<br>Outcomes of Learning                                  | Content in terms<br>of Concepts            | Curriculum<br>Transactional Strategies                             | Illustrations                | Evaluation                                | Suggested<br>No. of Periods |
|--|--|--|------------------------------|---|-----------------------------|
| 1  | 2  | 3  | 4                            | 5   | 6                           |
| 1. Knows that an organ<br>system meant for a<br>particular role is made up | 1.4.0. Organ System definition             | A Chart showing different<br>organ Systems in an Animal<br>/ Plant | Diagrams of<br>Organ Systems | Differentiate<br>major function<br>of the |                             |
| of organs performing different functions.                                  | 1.4.1. Different types of<br>Organ Systems |  |                              | circulatory<br>system and                 |                             |
| 2. Realises that an organism   | 1. Digestive<br>System                     |  |                              | different<br>organs in it.                |                             |
| organ systems.   | 2. Circulatory<br>System                   |  |                              |   |                             |
| 3. Realises that his / her<br>body is made up of                           | 3. Muscular<br>System                      |  |                              |   |                             |
| several organ systems.   | 4. Root System                             |  |                              |   |                             |
|  | 5. Shoot System.                           |  |                              |   |                             |

#### 1.5. Species

| Expected Specific<br>Outcomes of Learning   | Content in terms<br>of Concepts            | Curriculum<br>Transactional Strategies                          | Illustrations   | Evaluation                                     | Suggested<br>No. of Periods |
|---|--|---|---|--|-----------------------------|
| 1   | 2  | 3   | 4   | 5  | 6                           |
| 1. Knows that species are biological units. | 1.5.0. Species -<br>Definition.            | Pictures of related species of animals and plants can be shown. | Pictures showing<br>different species of<br>a particular group. | How do we<br>consider one<br>specific gorup of |                             |
| 2. Understands the species concept.         | 1.5.1. A brief idea of the species concept |   |   | organisms as one species?                      |                             |
|   |  |   |   |  |                             |
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|   |  |   |   |  |                             |

## 1.6. Population

| Expected Specific<br>Outcomes of Learning  | Content in terms<br>of Concepts   | Curriculum<br>Transactional Strategies  | Illustrations   | Evaluation   | Suggested<br>No. of Periods |
|--|---|---|---|--|-----------------------------|
| 1  | 2   | 3   | 4   | 5  | 6                           |
| <ol> <li>Knows that a population<br/>represents number of<br/>organisms of a particular<br/>species</li> <li>Understands the need for<br/>population studies.</li> </ol> | <ul> <li>1.6.0. Population concept</li> <li>1.6.1. Differences in the population strength of various organisms - pyramid</li> <li>1.6.2. Factors responsibile for population strength.</li> </ul> | Estimating population of<br>different plants / trees in the<br>school campus. | A pie diagram to<br>show population<br>(%) of different<br>organisms in a<br>specific place | <ol> <li>What is the<br/>population of<br/>India.</li> <li>How many<br/>Tigers are there<br/>in India?</li> <li>When was the<br/>last census<br/>taken?</li> </ol> |                             |

## 1.7. Community

| Expected Specific<br>Outcomes of Learning                                 | Content in terms<br>of Concepts   | Curriculum<br>Transactional Strategies                            | Illustrations                                     | Evaluation  | Suggested<br>No. of Periods |
|---|---|---|---|---|-----------------------------|
| 1   | 2   | 3   | 4   | 5   | 6                           |
| Understands the<br>components of any<br>community.                        | 1.7.0. Community<br>definition  | Class room discussion -<br>Chart showing pond as an<br>eco system | Diagrammatic<br>representation of<br>Food chain & | 1. Define<br>Community  |                             |
| Realises the<br>interdependence of different<br>organisms in a community. | <ul> <li>1.7.1. Biotic communities</li> <li>1.7.2. Organisation</li> <li>1.7.3. Components of a community <ol> <li>Producers</li> <li>Consumers</li> <li>Decomposers</li> </ol> </li> <li>1.7.4. Fresh water and Marine communities <ul> <li>Sandy Shore</li> <li>Rocky Shore</li> <li>Muddy Shore</li> </ul> </li> <li>1.7.5. Terrestrial, Aerial</li> </ul> | &<br>any one of the Terrestrial<br>ecosystem                      | Food web  | 2. What are the<br>differences<br>between Biotic<br>and Abiotic<br>factors? |                             |

#### 2.1. Bio-Diversity

| Expected Specific<br>Outcomes of Learning   | Content in terms<br>of Concepts  | Curriculum<br>Transactional Strategies  | Illustrations  | Evaluation  | Suggested<br>No. of Periods |
|---|--|---|--|---|-----------------------------|
| 1   | 2  | 3   | 4  | 5   | 6                           |
| <ol> <li>Knows that plants are<br/>called Vascular and Non-<br/>vascular.</li> <li>Realises that there are<br/>various forms of plants</li> <li>Understands that anatomy<br/>of plants differ.</li> </ol> | <ul> <li>2.1.0. Bio-Diversity of<br/>Plants</li> <li>2.1.1. Non-Vascular -<br/>Bryophytes</li> <li>2.1.1.1.Gametophyte</li> <li>2.1.1.2.Vegetative<br/>Reproduction</li> <li>2.1.1.3.Sexual<br/>Reproduction</li> <li>2.1.1.4.Sporophyte</li> <li>2.2.1.1.Vascular<br/>Structure -<br/>Pteridophyte -<br/>Fern -<br/>Nephrolepis</li> <li>2.2.1.1.Sporophyte</li> <li>2.2.1.2.Gametophyte</li> <li>2.2.1.3.Life Cycle</li> </ul> | Class Room Discussion -<br>using specimens slides and<br>charts<br>Fresh and preserved<br>specimens and charts to be<br>used for students | Diagrams of<br>Bryophytes,<br>vascular struc-<br>tures | Explain<br>gametophyte and<br>sporophyte with<br>examples<br>Explain the<br>concept of<br>alternation of<br>generations with<br>an illustration |                             |

## **2.2.** Organisation of Animals

| Expected Specific<br>Outcomes of Learning                    | Content in terms<br>of Concepts                  | Curriculum<br>Transactional Strategies   | Illustrations  | Evaluation  | Suggested<br>No. of Periods |
|--|--|--|--|---|-----------------------------|
| 1  | 2  | 3  | 4  | 5   | 6                           |
| Knows the phenomenon of<br>sexual dimorphism in<br>cockroach | 2.2.0. Organisation of<br>Animals<br>Cockroach - | (Cockroach and Frog) -<br>Charts showing morphology<br>Digestive System and Repro-<br>ductive system to be used. | Labelled sketches<br>of Digestive and<br>Reproductive<br>systems of<br>cockroach | 1. How does a<br>male cockroach<br>differ from a<br>female cock-<br>roach |                             |
| Understands the sexual dimorphism of Frog.                   | 2.2.1. Morphology<br>2.2.2. Digestive System     |  | Labelled sketches<br>of Digestive  | 2. What are the differences   |                             |
| Understands that a cock roach differs from a frog.           | 2.2.3. Reproductive<br>System                    |  | system and<br>Reproductive<br>system of Frog.                                    | digestive system<br>of cockroach<br>and Frog?                             |                             |
|  | 2.2.4. Frog -<br>External Morphol-<br>ogy        |  |  | 3. What are the male and female sex                                       |                             |
|  | 2.2.5. Digestive system                          |  |  | organs in frogs?  |                             |
|  | 2.2.6. Urino-genital<br>System                   |  |  |   |                             |
|  |  |  |  |   |                             |
|  |  |  |  |   |                             |
|  |  |  |  |   |                             |

#### **2.3.** Nutrition in plants and animals

| Expected Specific<br>Outcomes of Learning  | Content in terms<br>of Concepts  | Curriculum<br>Transactional Strategies   | Illustrations   | Evaluation  | Suggested<br>No. of Periods |
|--|--|--|---|---|-----------------------------|
| 1  | 2  | 3  | 4   | 5   | 6                           |
| Knows that nutrition in<br>organisms is related to their<br>habitat.<br>Realises that organisms<br>have suitable adaptations<br>for their method of nutrition.<br>Wonders at the peculiar<br>modes of nutrition in<br>animals and plants | <ul> <li>2.3.0. Nutrition in plants and animals</li> <li>2.3.1. Autotrophic Photo synthetic Chemosynthetic</li> <li>2.3.2. Heterotrophic parasitic, symbiotic saprophytic</li> <li>2.3.3. Insectivorous Nepenthes, Drosera</li> <li>2.3.4. Symbotic - Utricularia</li> <li>2.3.5. Intra cellular - digestion - Extra cellular digestion</li> </ul> | <ol> <li>To put up sketches on the<br/>B.B. or Charts on the wall<br/>and discuss the salient<br/>features</li> <li>'Plants and animals are<br/>interdependent' This<br/>concept should be<br/>emphasised through<br/>pictures and charts</li> </ol> | <ol> <li>Picture of<br/>Insectivorous<br/>plants.</li> <li>Diagrams to<br/>differentiate<br/>Intra - and<br/>extracellular<br/>digestions.</li> <li>Pictures of<br/>Nepenthes<br/>and Drosera.</li> </ol> | <ol> <li>What is the<br/>similarity<br/>between<br/>phytosynthetic<br/>and<br/>chemosynthetic<br/>organization</li> <li>What is<br/>symbiosis?</li> <li>Explain the<br/>process of<br/>nutrition in<br/>insectivorous<br/>plants</li> </ol> |                             |

## STANDARD VII

## 2.4. Habitat Diversity

| Expected Specific<br>Outcomes of Learning   | Content in terms<br>of Concepts  | Curriculum<br>Transactional Strategies   | Illustrations   | Evaluation   | Suggested<br>No. of Periods |
|---|--|--|---|--|-----------------------------|
| 1   | 2  | 3  | 4   | 5  | 6                           |
| Understands the role of<br>aquatic plants in aquatic<br>ecosystem<br>Understands the role of<br>aquatic animal in the transfer<br>of energy.<br>Realizes the food value and<br>ornamental value of<br>mesophytes<br>Understands the role of<br>animals in pollination | <ul> <li>2.4. Habitat diversity</li> <li>2.4.1. Introduction</li> <li>2.4.2. Aquatic plants <ol> <li>Planktons</li> <li>Benthos</li> </ol> </li> <li>2.4.3. Aquatic animals</li> <li>Planktons <ol> <li>Planktons</li> <li>Deep sea animals</li> </ol> </li> <li>2.4.4. Terrestrial plants -mesophytes, xerophytes</li> <li>2.4.5. Terrestrial animals <ol> <li>Arboreal</li> <li>Aerial</li> <li>cave dwelling</li> </ol> </li> </ul> | Charts showing different<br>aquatic and Terrestrial<br>animals and their roles in<br>maintenances of Eco-Bal-<br>ance<br>Using actual specimens for<br>discussion on concepts<br>related to diverse habitats | <ol> <li>Diagrams of<br/>planktons</li> <li>Pictures of<br/>Deep sea<br/>animals,<br/>arboreal and<br/>cave dwellers</li> </ol> | Compare and<br>contrast<br>phytoplanktons<br>and Zooplanktons.<br>Discuss the role of<br>planktons in a food<br>chains<br>What is the role of<br>aquatic animals in<br>the transfer of<br>energy?<br>What is the role of<br>animals in<br>pollination?<br>What are the<br>adaptive features<br>of aerial and cave<br>dwelling animals? |                             |

#### Structural Organisation

## STANDARD VII

## 3.1 Cell Theory

| Expected Specific<br>Outcomes of Learning                     | Content in terms<br>of Concepts                         | Curriculum<br>Transactional Strategies                                | Illustrations  | Evaluation   | Suggested<br>No. of Periods |
|---|---|---|--|--|-----------------------------|
| 1   | 2   | 3   | 4  | 5  | 6                           |
| 1. Realises the cell as the basic unit of life                | 3.1.0. Cell Theory<br>3.1.1. History of cell<br>studies | 1. Observes the various<br>parts of a compound<br>microscope          | 1. Labelled<br>shetches of<br>simple animal<br>and plant cells | Differentiate a<br>prokaryotic and an<br>Eukaryotic cell.  |                             |
| 2. Relates discovery of microscope with the study of cell     | 3.1.2. Cell types<br>1. Prokaryotes                     | 2. Observes an onion peel<br>under a microscope                       | 2. A Picture<br>showing  | Provide examples<br>for organisms that<br>are prokaryotic. |                             |
| 3. Realises the significance of nuclues                       | 2. Eukaryotes<br>3. Sizes of cells                      | 3. Observes the External<br>and Internal structure of a<br>hen's egg. | and eukaryote<br>cells.  | cell differ from an<br>animal cell?                        |                             |
| 4. Understands that the cell size ranges from microns to cms. | 4. Animal cell<br>and Plant cell -<br>a comparison      | 4. Examining buccal<br>epithelial cells under a<br>microscope.        |  |  |                             |

#### Structural Organisation

## STANDARD VII

#### 3.2 Plant Tissues

| Expected Specific<br>Outcomes of Learning                          | Content in terms<br>of Concepts                                | Curriculum<br>Transactional Strategies                                  | Illustrations                           | Evaluation                                    | Suggested<br>No. of Periods |
|--|--|---|---|---|-----------------------------|
| 1  | 2  | 3   | 4                                       | 5   | 6                           |
| 1. Understands the internal structure of a plant                   | 3.2.0. Plant tissues<br>- Definition<br>3.2.1. Two major types | Charts to be used for<br>discussion                                     | 1. T.S. of a<br>sunflower<br>stem chart | 1. What are the<br>components<br>of an organ? |                             |
| 2. Understands that the<br>meristems are responsible<br>for growth | of plant tissues.<br>1. Meristematic<br>2. Permanant           | 1. Tissues from the internal<br>structure of the plants.<br>(Cucurbita) | 2. T.S. of<br>Cucurbita<br>stem chart   | 2. Why are some<br>parts of plants<br>soft?   |                             |
| 3. Recognizes that growth is continuous in Plants.                 | 3.2.2. Functions   | 2. Differences between tissues to be explained.                         |   | 3. Why does the wood look                     |                             |
| 4. Recognizes that, based on function tissues                      | 3.2.3. Simple and<br>complex tissues                           |   |   | hard?   |                             |
| organise themselves into<br>tissue systems.                        | 3.2.4. Introduction to tissue systems.                         |   |   | 4. Why do plants<br>grow<br>continuously?     |                             |
|  |  |   |   |   |                             |

#### **Structural Organisation**

## STANDARD VII

#### **3.3 Animal Tissues**

| Expected Specific<br>Outcomes of Learning                                | Content in terms<br>of Concepts                       | Curriculum<br>Transactional Strategies                                       | Illustrations                                     | Evaluation   | Suggested<br>No. of Periods |
|--|---|--|---|--|-----------------------------|
| 1  | 2   | 3  | 4   | 5  | 6                           |
| 1. Knows the concept of tissue organisation                              | 3.3.0. Animal Tissues<br>3.3.1. The tissue<br>concept | Observation of all tissues<br>(from prepared slides)<br>under the microscope | Lablelled<br>structures of<br>various<br>tissues. | 1. What type of<br>cell groups are<br>called tissues?  |                             |
| 2. Realises that organs are<br>made up of different<br>types of tissues. | 3.3.2. Types of Tissues<br>1. Epithelial              |  |   | 2. What are the various types of epithelial  |                             |
| 3. Visualises different tissues with specific functions.                 | 2. Muscular<br>3. Nervous                             |  |   | 3. What are the 3  |                             |
| 4. Understands the fluid nature of blood tissue.                         | 4. Bone<br>5. Blood                                   |  |   | types of<br>muscular<br>tissues?   |                             |
|  | 6. Reproductive                                       |  |   | 4. What are the<br>cells found in<br>blood and from<br>where do they<br>originate? What<br>are their<br>functions? |                             |

#### **Structural Organisation**

#### 3.4 Dermal System in plants

| Expected Specific<br>Outcomes of Learning  | Content in terms<br>of Concepts   | Curriculum<br>Transactional Strategies   | Illustrations  | Evaluation  | Suggested<br>No. of Periods |
|--|---|--|--|---|-----------------------------|
| 1  | 2   | 3  | 4  | 5   | 6                           |
| 1. Recognises that epidermis<br>on the plant is equall to<br>the skin of animals | 3.4.0. Types of Tissue<br>systems in a<br>plant. Three<br>types.  | <ol> <li>Epidermal hairs on plants<br/>like Jatropha, Cucurbita ,<br/>etc.,</li> </ol> | 1. Structure of<br>unicellular<br>and<br>multicellular | 1. What is the role of epidermis?                                   |                             |
| 2. Understands that the cuticle protects the plants                              | 3.4.1. Dermal system in plants  | 2. Stellate hairs to be shown  | nairs  | 2. What is the role of cuticle?                                     |                             |
| from excess heat.<br>3. Recognises the role of<br>hairs in plant.                | <ul> <li>3.4.2. Dermal system<br/>definition and<br/>function</li> <li>3.4.3. Epidermis -<br/>stomata - bark</li> </ul> | 3. stinging hairs to be shown.   | Examing plant<br>parts for<br>epidermal<br>appendages  | <ul><li>3. What is the role of stomata?</li><li>4. Why do</li></ul> |                             |
|  | 3.4.4. Hairy outgrowths<br>on stems and<br>roots.   |  |  | certain leaves<br>cause<br>irritation<br>when<br>touched?           |                             |
|  |   |  |  |   |                             |

#### **Structural Organisation**

#### 3.6. Dermal System in Animals

| Expected Specific<br>Outcomes of Learning  | Content in terms<br>of Concepts   | Curriculum<br>Transactional Strategies  | Illustrations                                      | Evaluation   | Suggested<br>No. of Periods |
|--|---|---|--|--|-----------------------------|
| 1  | 2   | 3   | 4  | 5  | 6                           |
| <ol> <li>Knows the basic<br/>organisation of skin</li> <li>Realises the</li> </ol>                             | 3.6.0. Dermal system in<br>Animals<br>3.6.1. Skin in man  | 1. Field collection of various<br>bird feathers could be<br>done  | A diagram<br>showing skin and<br>its various parts | 1. What is the role<br>of integument<br>in living plants<br>and animals?   |                             |
| <ol> <li>Realises the modifications of integument</li> <li>Knows the functions of skin derivatives.</li> </ol> | 3.6.2. Integumental<br>modifications<br>1. Glands<br>2. Nails, Horns,<br>Claws, & Hooves<br>3. Scales in fishes<br>4. Beaks and<br>feathers in Birds<br>5. Hair in<br>mammals | <ol> <li>Observes different types<br/>of scales in fishes</li> <li>Observing various<br/>museum specimens<br/>related to integument.</li> </ol> | Diagrams related<br>to beaks and feet<br>in birds  | <ul><li>and animals?</li><li>2. What are the integumental glands?</li><li>3. Name the dermal modifications in man.</li></ul> |                             |

#### Chapter – IV

## STANDARD VII

#### 4. Our Environment

| Expected Specific<br>Outcomes of Learning   | Content in terms<br>of Concepts  | Curriculum<br>Transactional Strategies  | Illustrations  | Evaluation  | Suggested<br>No. of Periods |
|---|--|---|--|---|-----------------------------|
| 1   | 2  | 3   | 4  | 5   | 6                           |
| 1. Understands that the<br>biosphere extends to<br>atmosphere,<br>hydrosphere and<br>lithosphere. | 4.1.0. Biosphere -<br>Definition<br>4.1.1. Living<br>components of<br>Biosphere  | <ol> <li>Charts to explain<br/>Lithosphere,<br/>Hydrophere and<br/>atmosphere.</li> </ol> | 1. Terrestriel<br>plants,<br>aquatic<br>plants<br>sketches.                        | 1. Explain the<br>interaction<br>between<br>Biotic and<br>abiotic factors<br>in a given |                             |
| 2. Understands the intractions between biotic and non-biotic components in biosphere              | <ul> <li>4.1.2. Non-living<br/>components of<br/>biosphere.</li> <li>4.1.3. Lithosphere<br/>hydrosphere,<br/>atmosphere</li> </ul> |   | 2. Diagram<br>showing<br>atmosphere,<br>biosphere,<br>Lithosphere,<br>hydrosphere, | ecosystem.<br>2. How do<br>matter and air<br>function as life<br>supporing<br>systems?  |                             |

#### Chapter - IV

|   | Expected Specific<br>Outcomes of Learning  | Content in terms<br>of Concepts   | Curriculum<br>Transactional Strategies  | Illustrations   | Evaluation   | Suggested<br>No. of Periods |
|---|--|---|---|---|--|-----------------------------|
|   | 1  | 2   | 3   | 4   | 5  | 6                           |
|   | 1. Recalls the role of sun<br>as ultimate source of<br>energy                                    | 4.2.0. Energy Flow -<br>Definition<br>4.2.1. Food Chain                   | 1. A Simple food chain<br>starting with plants<br>ending with carnivores<br>to be explained - using<br>charts | 1. Different<br>types of food<br>chain &<br>Sketches  | 1. What is the<br>role of<br>planktons in a<br>pond? |                             |
| 2 | <ol> <li>Recognizes the importance of plants in energy flow.</li> <li>Understands the</li> </ol> | 4.2.2. Concept of<br>consumers -<br>Primary,<br>Secondary,<br>Decomposers | 2. The idea of producers<br>primary and secondary<br>consumers to be  | 2. Sketches on<br>ecological<br>pyramid   | 2. How is energy<br>transfered<br>from sunlight?     |                             |
|   | different food chains in environment.  | 4.2.3. Introduction to<br>ecological<br>Pyramids                          | emphasized - using<br>charts  | 3. Food web<br>sketch   | 3. What happens<br>to the dead<br>organic            |                             |
|   | <ol> <li>Understands the energy<br/>flow in ecological<br/>pyramids.</li> </ol>                  | 4.2.4. Food web<br>4.2.5. Energy transfer.                                | source of energy to be<br>emphasized - using<br>charts  | 4.<br>Comprehensive<br>sketch of<br>energy flow<br>from the sun<br>to the earth<br>through<br>plants and<br>animals |  |                             |

#### Chapter - IV

| Expected Specific<br>Outcomes of Learning   | Content in terms<br>of Concepts  | Curriculum<br>Transactional Strategies   | Illustrations  | Evaluation   | Suggested<br>No. of Periods |
|---|--|--|--|--|-----------------------------|
| 1   | 2  | 3  | 4  | 5  | 6                           |
| 1. Recognises the special characters seen in aquatic plants.  | 4.3.0. Adaptation of plants and animals  | <ol> <li>Morphological<br/>adaptation of aquatic<br/>plants to be explained<br/>with plants like Lotus,</li> </ol> | 1. Sketches of<br>aquatic and<br>xerophytic<br>plants. | 1. How do to the aquatic plants float?   |                             |
| <ul> <li>2. Recognises special characters seen in xerophytic plants.</li> <li>4.3.1. Adaptation of hydrophytes</li> <li>4.3.2. Adaptation of xerophytes</li> <li>4.3.3. Aquatic adaptation - fish</li> <li>4.3.4. Terrestrial adaptation - cockcoach</li> </ul> | <ul> <li>4.3.1. Adaptation of<br/>hydrophytes</li> <li>4.3.2. Adaptation of<br/>xerophytes</li> <li>4.3.3. Aquatic<br/>adaptation - in<br/>fish</li> </ul> | Eichornia.<br>2. Adaptation of xerohytes<br>to be explained with<br>plants like Opuntia.                           |  | 2. What is the<br>reason for<br>water droplets<br>floating on<br>leaves of<br>lotus? |                             |
|   | 4.3.4. Terrestrial<br>adaptation - in<br>cockcoach   |  |  | 3. Why does<br>opuntia<br>possess<br>spines?   |                             |
|   |  |  |  | 4. Why are the<br>leaves of<br>certain plants<br>thick and<br>leathery?              |                             |

#### Chapter - IV

| Expected Specific<br>Outcomes of Learning                              | Content in terms<br>of Concepts                        | Curriculum<br>Transactional Strategies   | Illustrations               | Evaluation  | Suggested<br>No. of Periods |
|--|--|--|-----------------------------|---|-----------------------------|
| 1  | 2  | 3  | 4                           | 5   | 6                           |
| 1. Regconises the inter<br>relationship between<br>plants.             | 4.4.0. Animal - plants<br>association.<br>4.4.1. Inter | <ol> <li>Parasitic plants like<br/>Cuscuta can be shown.</li> <li>Enimeters like Van de</li> </ol> | 1. Sketches of<br>Epiphytes | 1. Explain the<br>role of root<br>nodules in<br>leguminous  |                             |
| 2. Understands that some plants live at the                            | relationship<br>between plants.                        | 2. Epiphytes like Vanda<br>can be shown  | 2. Diagram of root nodules  | plants.   |                             |
| expense of other plants.   | 4.4.2. Parasitism -<br>Plasmodium,<br>Ascaris          | 3. Root nodules on<br>leguminous plants can<br>be shown  |                             | 2. How is an<br>Epiphyte able<br>to lead an   |                             |
| plants live on other<br>plants without harming                         | 4.4.3. Commensalism -<br>sea anemone on                | 4. Sketches of Sea   |                             | independent<br>existence?   |                             |
| 4. Understands the<br>relationship between<br>fungi and higher plants. | 4.4.4. Symbiosis<br>4.4.5. Leach.                      | anemone, Plasmodium,<br>Ascaris, Cockroach   |                             | 3. Give any 3<br>illustrations<br>explaining<br>symbiosis.  |                             |
|  |  |  |                             | 4. Explain<br>commensalism<br>with an<br>illustration<br>from the plant<br>world and the<br>animal world. |                             |

#### Chapter - IV

## STANDARD VII

#### **Our Environment**

| Expected Specific<br>Outcomes of Learning                                       | Content in terms<br>of Concepts                           | Curriculum<br>Transactional Strategies         | Illustrations                      | Evaluation                             | Suggested<br>No. of Periods |
|---|---|--|------------------------------------|--|-----------------------------|
| 1   | 2   | 3  | 4                                  | 5                                      | 6                           |
| 1. Knows wild life  | 4.5.0. Wildlife<br>management                             | 1. Description of wild animals and their       | 1. Provide a<br>table              | 1. What is a sanctuary                 |                             |
| 2. Realises the need for protection of wild life.                               | 4.5.1. Wild life<br>ecosystem                             | importance in wild<br>ecosystem - using charts | containing<br>names of<br>National | 2. Why should the wild                 |                             |
| <ol> <li>Wonders at different<br/>types of wild fauna and<br/>flora.</li> </ol> | 4.5.2 Role of<br>government in<br>conserving wild<br>life | 2. Video clippings of wild life sanctuaries.   | Park and<br>animals<br>protected.  | animals and<br>plants be<br>protected? |                             |
| 4. Understands the term<br>'endangered' and<br>'extinct'                        | life.   | 3. Visit to various sanctuaries.               |                                    | 3. What is extinction?                 |                             |

#### Chapter - IV

| Expected Specific<br>Outcomes of Learning            | Content in terms<br>of Concepts                          | Curriculum<br>Transactional Strategies   | Illustrations                            | Evaluation   | Suggested<br>No. of Periods |
|--|--|--|--|--|-----------------------------|
| 1  | 2  | 3  | 4  | 5  | 6                           |
| 1. Recognizes the effect of pollution on environment | 4.6.0. Pollution -<br>Definition<br>4.6.1. Air pollution | 1. Discharge of industrial<br>waste, sewage in to<br>water reserviors and<br>their pollution effect to | 1. Photograph<br>of a polluted<br>region | 1. What is the<br>role of<br>Pollution<br>Control            |                             |
| 2. Understands the effect                            | 4.6.2. Water pollution                                   | charts   |  | Dodiu.   |                             |
| of non-degradable<br>pollutant like a                | 4.6.3. Land pollution                                    |  |  | 2. Where are   |                             |
| polythene bag on environment.                        | 4.6.4. Noise pollution                                   |  |  | "No horn"<br>areas located.                                  |                             |
| 3. Knows noise as a pollutant                        |  |  |  | 3. What is 'pure'<br>water?                                  |                             |
|  |  |  |  | 4. Why should<br>we carry cloth<br>bags for<br>shopping?     |                             |
|  |  |  |  | 5. How does<br>cigarrette<br>smoking affect<br>other people? |                             |

#### Chapter – V

| STANDARD VII   |  | Application Biology                    |  |   |                             |
|--|--|--|--|---|-----------------------------|
| Expected Specific<br>Outcomes of Learning                        | Content in terms<br>of Concepts                    | Curriculum<br>Transactional Strategies | Illustrations                              | Evaluation                                    | Suggested<br>No. of Periods |
| 1  | 2  | 3                                      | 4  | 5   | 6                           |
| 1. Knows the damage caused by pests.                             | 5.1.0. Pests and<br>management                     | 1. A chart showing plant pests         | 1. Sketches of<br>Life cycles of<br>pests. | 1. What is a stem borer?                      |                             |
| 2. Recognises<br>"environment friendly"<br>pest control methods. | 5.1.1. House pests like<br>cockroaches,<br>beetles | 2. Documentary film by<br>ICAR         |  | 2. How does a<br>beetle enter<br>into a mango |                             |
| 3. Realises extent of damage (in terms of                        | 5.1.2. Pests of stored<br>food grains.             |  |  | nut?  |                             |
| rupees) caused by pests.   | agricultural<br>crops<br>(Rice Vegetables          |  |  | 3. Can we control pests?                      |                             |
|  | Fruits,<br>Sugarcane)                              |  |  | 4. What is the difficulty in storing grains?  |                             |
|  |  |  |  |   |                             |
|  |  |  |  |   |                             |
|  |  |  |  |   |                             |

#### Chapter - V

#### STANDARD VII **5.2 Timber Yielding Plants** Curriculum **Expected Specific** Content in terms Suggested Evaluation Illustrations Outcomes of Learning **Transactional Strategies** No. of Periods of Concepts 2 3 4 5 1 6 1. Recollects the uses of 5.2.0. Timber yeilding 1. Enumeration of the 1. Diagrams of 1. What is soft various forests products. plants. uses of wood and wood timber wood? products - using charts. yielding 5.2.1. Uses of wood plants 2. Illustrates different kinds 2. What are the 5.2.2. Sandal of timber properties of hard wood? 5.2.3. Teak 3. Realises the natural damages caused due to 5.2.4. Forest fires -3. What are the Charcoal timber cutting modern substitutes for wood?

#### Chapter - V

## STANDARD VII

## 5.3. Application Biology

| Expected Specific<br>Outcomes of Learning   | Content in terms<br>of Concepts   | Curriculum<br>Transactional Strategies | Illustrations   | Evaluation  | Suggested<br>No. of Periods |
|---|---|--|---|---|-----------------------------|
| 1   | 2   | 3                                      | 4   | 5   | 6                           |
| <ol> <li>Knows the varieties of<br/>honey bees</li> <li>Realises the role of<br/>honey bees in<br/>pollination</li> <li>Medicinal value of<br/>honey</li> </ol> | <ul> <li>5.3.0. Apiculture</li> <li>5.3.1. Newton's beehive, Maintenance of gardens with flowering plants</li> <li>5.3.2. Rearing bees</li> <li>5.3.3. Products, from apiculture</li> </ul> | 1. Visiting an apiary                  | <ol> <li>Structre of<br/>Newton's<br/>beehive</li> <li>Diagram of a<br/>natural<br/>beehive.</li> </ol> | <ol> <li>What is a<br/>Queen bee?</li> <li>What are<br/>drones?</li> <li>What are the<br/>uses of<br/>honey?</li> <li>How does<br/>honey bees<br/>communicate?</li> <li>What is<br/>'Royal Jelly'?</li> </ol> |                             |

#### Chapter – V

# STANDARD VII5.3.Expected SpecificContent in terms

## 5.3. Application Biology

| Expected Specific<br>Outcomes of Learning  | Content in terms<br>of Concepts  | Curriculum<br>Transactional Strategies   | Illustrations                            | Evaluation  | Suggested<br>No. of Periods |
|--|--|--|--|---|-----------------------------|
| 1  | 2  | 3  | 4  | 5   | 6                           |
| 1         1. Knows the bioecology of ornamental fishes.         2. Understanding the importance physico-chemical factors of water         3. Wonders at several types of ornamental fishes | 2<br>5.6.0. Ornamental<br>fishes - Types<br>5.6.1. Aquarium and<br>relaxation<br>5.6.2. Maintenance of<br>ornamental<br>fishes - water<br>quality and food<br>application. | 3 1. Maintain an aquarium in the school. | <b>4</b><br>1. Diagram of<br>an aquarium | <ol> <li>What are the problems encountered in maintaining an aquarium?</li> <li>How will you differentiate male and a female guppy</li> <li>Can we use chlorinated</li> </ol> | 6                           |
|  |  |  |  | <ul><li>chlorinated water in an aquarium?</li><li>5. Why do we use an aerator?</li></ul>  |                             |
|  |  |  |  |   |                             |

#### Chapter – V

## STANDARD VII

#### 5.4. Vermiculture

| Expected Specific<br>Outcomes of Learning  | Content in terms<br>of Concepts   | Curriculum<br>Transactional Strategies        | Illustrations  | Evaluation  | Suggested<br>No. of Periods |
|--|---|---|--|---|-----------------------------|
| 1  | 2   | 3   | 4  | 5   | 6                           |
| <ol> <li>Knows the need for<br/>vermiculture</li> <li>Role of verms in fertility<br/>of the soil and<br/>decomposition of<br/>organic matter.</li> </ol> | <ul> <li>5.4.0. Vermiculture - need</li> <li>5.4.1. Vermiculture - Technology</li> <li>5.4.2. Advantages of vermiculture</li> </ul> | 1. Planning a vermiculture pit in the school. | <ol> <li>Pictures of<br/>earthworm.</li> <li>Photographs<br/>of a project<br/>site.</li> </ol> | <ol> <li>Describe how<br/>vermiculture<br/>is done in the<br/>field<br/>condition?</li> <li>What are the<br/>benefits of<br/>vermiculture?</li> </ol> |                             |

#### Chapter – V

## STANDARD VII

## 5.5. Spices yeilding plants

| Expected Specific<br>Outcomes of Learning                            | Content in terms<br>of Concepts                                 | Curriculum<br>Transactional Strategies                  | Illustrations                                | Evaluation                         | Suggested<br>No. of Periods |
|--|---|---|--|------------------------------------|-----------------------------|
| 1  | 2   | 3   | 4  | 5                                  | 6                           |
| 1. Knows the different products of spices                            | 5.5.0. Spices yieding plants                                    | 1. Use charts   | 1. Display<br>turmeric                       | 1. How are<br>spices               |                             |
| <ol><li>Classifies the spices<br/>based on the plant part.</li></ol> | 5.5.1. Spices from<br>underground<br>parts (Turmeric)           | 2. The spices can be shown                              | cinnamoum<br>cloves,<br>pepper,<br>chillies, | 2. Give the                        |                             |
| 3. Infers the uses of spices.  | 5.5.2. Spices from<br>Barks (Ex)<br>cinnamon                    | 3. Collection of spices in small bottles could be done. | mustard, etc.,                               | turmeric,<br>pepper and<br>mustard |                             |
| 4. Realises that spices are needed to make the food more attractive  | 5.5.3. Spices from<br>flower buds like<br>cloves.               |   |  | 3. Mention the uses of             |                             |
| 5. Know that southern<br>India is famous for<br>spices               | 5.5.4. Spices from<br>fruits (Pepper,<br>Chillies,<br>Cardamon) |   |  | pepper.                            |                             |
|  | 5.5.5. Spices from<br>seeds (mustard)                           |   |  |                                    |                             |
|  |   |   |  |                                    |                             |

#### Chapter - V

|  |   | o.r. Application Diology               |   |   |                             |
|--|---|--|---|---|-----------------------------|
| Expected Specific<br>Outcomes of Learning  | Content in terms<br>of Concepts   | Curriculum<br>Transactional Strategies | Illustrations                           | Evaluation  | Suggested<br>No. of Periods |
| 1  | 2   | 3                                      | 4                                       | 5   | 6                           |
| <ol> <li>Understands the use of<br/>oil as a cooking<br/>medium.</li> <li>Understands the use of<br/>oil in medicine.</li> </ol> | 2<br>5.7. Vegetable oils -<br>introduction<br>5.7.1. Sources for oils<br>5.7.2. Oil extraction<br>5.7.3. Nutritive valve of<br>oils | 3 1. Exhibiting oils and their sources | <b>4</b><br>1. Pictures of oil<br>Seeds | 5<br>1. What is<br>safflower oil?<br>2. What is rice<br>bran oil? | 6                           |
|  |   |  |   |   |                             |

## STANDARD VII

## 5.7. Application Biology

## Chapter - VI Health and hygiene

| STANDARD VII6.1. Vitamins and Minerals6.2. Food Deficiency Diseases  |  |   |   |   |                             |
|--|--|---|---|---|-----------------------------|
| Expected Specific<br>Outcomes of Learning  | Content in terms<br>of Concepts  | Curriculum<br>Transactional Strategies                  | Illustrations   | Evaluation  | Suggested<br>No. of Periods |
| 1  | 2  | 3   | 4   | 5   | 6                           |
| <ol> <li>Realises vitamin as<br/>additional food factors<br/>for normal functioning<br/>of the body.</li> </ol>                  | 6.1.1. Vitamin and<br>Minerals<br>6.1.2. Types of vitamins<br>- sources and<br>uses  | 1. Prepared charts on<br>vitamins and their<br>sources. | 1. Pictures of<br>vitamin<br>sources<br>Diagram related | 1. List the<br>vitamins and<br>deficiency<br>diseases.  |                             |
| 2. Understands the natural sources of vitamins.  | 6.2.0. Food deficiency<br>disease.<br>6.2.1. Protein   | 2. Pictures showing dificiency diseases.                | to<br>1. obesity<br>2. vitamin                          | 2. List the<br>mineral<br>deficiency  |                             |
| 3. Knows that vitamins<br>deficiency will cause<br>diseases  | deficiency<br>diseases.,<br>Vitamin<br>dificiency<br>diseases.   |   | deficiencies  | 3. What are the<br>ways of<br>tackling  |                             |
| 4. Understands the role of minerals in normal functioning of the body.   | Mineral<br>dificiency<br>diseases  |   |   | vitamin and<br>minerals in<br>our country?  |                             |
| <ul><li>5. Realises the importance of balanced diet.</li><li>6. Understands the effect of pesticides on food resources</li></ul> | <ul> <li>Both in animals<br/>and plants.</li> <li>6.3.1. Nutritional<br/>Diseases in human</li> <li>obesity Diabetics</li> <li>Cancer, Vitamin<br/>Deficiency</li> <li>6.3.2. Balanced Diet</li> </ul> |   |   | <ul><li>4. Explain toxicol-<br/>ogy with<br/>examples</li><li>5. Mention the<br/>calorie require-<br/>ment for Indian</li></ul> |                             |
|  | 6.3.3. Toxicology  |   |   | Men and<br>Women  |                             |

#### Chapter - VI

|   | o.o. Dental care and oral hygicite   |  |                       |  |                             |  |
|---|--|--|-----------------------|--|-----------------------------|--|
| Expected Specific<br>Outcomes of Learning       | Content in terms<br>of Concepts  | Curriculum<br>Transactional Strategies   | Illustrations         | Evaluation   | Suggested<br>No. of Periods |  |
| 1   | 2  | 3  | 4                     | 5  | 6                           |  |
| 1. Knows diphyodont nature in man               | 6.3.0. Dental care and<br>oral hygiene   | 1. A chart showing different types of teeth  | 1. Diagram of a tooth | 1. What are the differences  |                             |  |
| 2. Knows the adult dental formula               | 6.3.1. Structure and<br>arrangement of<br>teeth  | 2. A model showing teeth arrangement   |                       | teeth and<br>permanent<br>teeth?   |                             |  |
| 3. Relates teeth problem<br>with general health | <ul> <li>6.3.2. Care of teech</li> <li>6.3.3. Tooth diseases <ol> <li>Dental caries</li> <li>Infections</li> </ol> </li> <li>6.3.4. Gums - <ul> <li>Pyorrhoea</li> </ul> </li> </ul> | <ul> <li>3. Teacher may give a project :</li> <li>4. Analysing the teeth in the lower jaw and upper jaw of selected students.</li> </ul> |                       | <ul><li>2. What is the function of molars and premolars?</li><li>3. What are wisdom teeth?</li></ul> |                             |  |
|   | 6.3.5. Halitosis<br>6.3.6. Mumps   | 5. Collect specimens of teeth from a dentist and preserve them.  |                       |  |                             |  |

## STANDARD VII

## 6.3. Dental care and oral hygiene

#### Chapter - VI

## STANDARD VII

#### 6.4. Zoonotic diseases

| Expected Specific<br>Outcomes of Learning   | Content in terms<br>of Concepts   | Curriculum<br>Transactional Strategies                                 | Illustrations   | Evaluation  | Suggested<br>No. of Periods |
|---|---|--|---|---|-----------------------------|
| 1   | 2   | 3  | 4   | 5   | 6                           |
| <ol> <li>Realises the need to<br/>keep pets</li> <li>Realises the role of<br/>animals in human life</li> <li>Knows how the animals<br/>are infected</li> <li>Understands the spread<br/>of the zoonofic diseases</li> </ol> | 6.4.0. Zoonotic<br>diseases<br>6.4.1. Man and animal<br>relationships -<br>pets, pests.<br>6.4.2. Diseases caused<br>by animals<br>- Rabies,<br>Anthrax<br>- Hydatidosis<br>- Leptospirosis<br>6.4.3. Protection from<br>zoonotic<br>diseases<br>6.4.4. Protection of pet<br>animals<br>- Vaccination<br>- Medication | 1. A chart showing various<br>animals and the<br>diseases they spread. | 1. Discussion of<br>charts<br>outlining<br>various<br>zoonotic<br>diseases. | <ol> <li>Why is Rabies<br/>considered a<br/>dangerous<br/>disease?</li> <li>What are the<br/>common<br/>diseases<br/>associated<br/>with pet dogs<br/>and cats?</li> <li>Name the<br/>vaccinations<br/>used to<br/>immunize the<br/>animals?</li> <li>What is<br/>leptospirosis?</li> </ol> |                             |

## Chapter - VI

| STANDARD VII 6.5. Food poisoning Food spoilaged and food preservation   |   |  |   |   |                             |
|---|---|--|---|---|-----------------------------|
| Expected Specific<br>Outcomes of Learning   | Content in terms<br>of Concepts   | Curriculum<br>Transactional Strategies   | Illustrations                           | Evaluation  | Suggested<br>No. of Periods |
| 1   | 2   | 3  | 4                                       | 5   | 6                           |
| <ol> <li>Realises the importance<br/>of natural fresh food.</li> <li>Understands the<br/>concept of food<br/>poisoning</li> <li>Recognises factors that<br/>could cause food<br/>poisoning</li> <li>Understands principles<br/>of food preservation.</li> </ol> | <ul> <li>6.5.0. Food poisoning</li> <li>6.5.1. Factors causing food poisoning, washing fruits before eating</li> <li>6.5.2. Food poisoning and health</li> <li>6.5.3. Food adulterants</li> <li>6.5.4. Spoilage of food-Causative factors</li> <li>6.5.5. Food preservation - various methods.</li> </ul> | <ol> <li>A chart showing food<br/>adulterants and their<br/>sources</li> <li>Bringing samples of<br/>preserved food for<br/>discussion in class</li> </ol> | 1. Relevant<br>Diagrams<br>and Pictures | <ol> <li>Mention the<br/>micro<br/>organisms<br/>responsible<br/>for food<br/>poisoning?</li> <li>What are food<br/>additives ?</li> <li>How is dry<br/>fish prepared?<br/>What is the<br/>principle<br/>involved in it?</li> <li>Can we use<br/>pesticides and<br/>chemical<br/>fertilizers in<br/>farming?</li> </ol> |                             |