BIOLOGY - SYLLABUS

8th CLASS

1. What is Science ?

1.1 Science - The individual perspective

1.2 Science - The Social perspective

1.3 Science and Change

1.4 How do scientists work ? - Scientific Method

1.5 Process Skills

1.6 Reading to learn - Writing to Communicate

1.7 Safety in the Laboratory - Safety in Science

1.8 Some of the divisions in Science (Science - Some Divisions)

2. Cell - The Basic Unit of Life

2.1 Discovery of the cell

- Observing cells in a match stick
- Observing cells in an onion peel
- Observing human cheek cells

2.2 Cell - Nucleus - Robert Brown Experiment

- Observing the Nucleus in onion peel
- Observing the Nucleus in human cheek cell

2.3 Diversity in cells

- Observing the cells in the leaf
- Observing the different cells in Human body.

3. Microbial World -1

3.1 Invention of Microscope - Discovery of Microorganisms

3.2 Groups of Microorganisms - Observation

- Observing microorganisms in water
- Observing fungi
- Observing Bacteria
- Observing Algae
- Observing Protozoans and Micro-arthropods
- Observing Soil Microorganisms

3.3 Viruses - Introduction

3. Microbial World - 2

3.1 Useful Microorganisms

3.1.1 Observing microorganisms in Maida - Yeast Mixture

3.2 Commercial use of Microorganisms

- Medicinal use of Microorganisms

3.2.1 Antiboitic - Invention of Penicillin

3.3 Vaccines

3.3.1 Invention of Vaccine against Smallpox

3.4 Soil Microorganisms and Soil Fertility

3.4.1 Nitrogen Fixation

3.5 Harmful Microorganisms

3.5.1 Microorganisms causing disease ins Man

3.5.2 Microorganisms causing diseases in Animals

3.5.3 Microorganisms causing diseases in Plants

3.6 Food Preservation

3.6.1 Preserving food in heat and cold method, packing

3.6.2 Pasteurisation

4. Reproduction in Animals

4.1 Oviparous and Viviparous Animals

4.2 Identifying the method of reproduction based on ears, hair on the skin and feathers

4.3 Kinds of / types of Reproduction in Animals - Sexual and Asexual Reproduction

4.4 Asexual Reproduction

4.4.1 Budding in Hydra

4.4.2 Binary fission in Amoeba

4.5 Sexual Reproduction

4.5.1 Male Reporductive System in Human Beings

4.5.2 Female Reproductive System in Human Beings

4.5.3 Fertilization - Development of an Embryo

- External and Internal Fertilization

4.6 Life cycle of Frog

4.7 Cloning

5. Adolescence

5.1 Changes at Adolescence

5.1.1 Measuring increase in Height and observing growth rate

5.1.2 Observing the changes in the body - Secondary sexual characters

5.1.3 Adam's apple - Voice change

5.2 Reproduction in Human Beings

5.2.1 Menstrual cycle

5.3 Child Marriages - Demerits

5.4 Adolescence - Behavioural changes

5.5 Adolescence - Effect of Endocrine glands

5.6 Adolescence and Health

- Sweat and Pimples
- Balanced Diet
- Hygiene / Cleanliness
- Physical Exercise

6. Biodiversity and its Conservation

6.1 Conference on Biodiversity - Information

6.2 Biodiversity

- Identifying biodiversity in the sorroundings
- Diverse world of life under microscope

6.2.1 Diversity / variations in plants

6.2.2 Observing variations in plants

6.2.3 Observing variations in animals

6.2.4 Observing variations in human beings

6.3 Degradation of forests - concept of Biodiversity

6.3.1 Endangered species, Endemic species

6.3.2 Information on Endangered species - Red Data Book

6.4 Biodiversity - Balance in Nature

6.5 Biodiversity and its Conservation

6.5.1 National Parks and Sanctuaries

6.6 Conservation of forests - preparation / making of recycled paper

7. Different Ecosystems

7.1 Concept of Ecosystem

7.1.1 Structure of an Ecosystem

7.2 Ecosystem - Relationship between biotic components

7.3 Changes in the Ecosystem

7.4 Types of Ecosystem :

- Grassland Ecosystem
- Forest Ecosystem
- Desert Ecosystem
- Fresh water Ecosystem
- Marine Ecosystem

7.5 Ecosystem - Biotic and Abiotic components

- Producers
- Consumers
- Decomposers
- Abiotic Components

7.6 Energy Flow in an Ecosystem

8. Food Production from plants

8.1 Crops in India

8.1.1 Crops in our Village, District and State

8.2 Duration of crops

- Long-term crops and short-term crops
- Kharif crops and rabi crops
- Duration of night and its effect on crop production

8.3 Cultivation of Paddy

- Preparing the soil (ploughing, manuring)
- Leveling the soil
- Selection of seeds, cleaning the seeds
- Different types of sowing the seeds
- Developing seed beds
- Transplanting

8.4 Manures, Peticides.

8.4.1 Crop protection, methods of management

8.4.2 Identification of pests, controlling the pests

8.4.3 Pest controlling practices

8.5 Obtaining high yield

8.5.1 Manures / fertilizers - Natural and Artificial manures

8.5.2 Irrigation, modern methods of irrigation - Drip irrigation

8.5.3 Weeding methods

8.6 Rotation of crops - methods

8.7 Methods of storing grains - godowns and cold storage units

9. Food Production from animals

9.1 Animal Husbandry

9.1.1 Rearing animals - Rearing animals in villages - challenges

9.2 Milk Production

9.2.1 Milk collection - Pasteurization and Chilling

9.2.2 Selection of live stock

9.2.3 Livestock - Methods of Management

9.3 Poultry

- Types / varieties of hen - Broilers, Layers
- Poultry Farms, Incubator

9.4 Apiculture

9.4.1 Types of Honey bees and their life

9.4.2 Honey extraction sources of Nectar

9.5 Fisheries

Marine fishes

Fresh water fishes (Aqua culture)

10. Not for Drinking - Not for Breathing

10.1 Vehicles - Pollution check - Pollution under control certificate

10.2 Atmospheric pollution

10.2.1 Air pollution - Pollutants

10.2.2 Primary pollutants, Secondary pllutants

10.2.3 Pollution - The Reasons

- Natural Calamities
- Human Activities
- Nuclear Power Generation Plants
- Chemical fertilizers, Insecticides
- Deforestation
- Industrial Effluents - Chloro - fluro carbons
- Mining

10.2.4 Air Pollution - The Effects

- Aerosols, Hydrogen, Sulphide, Carbon monoxide

10.2.5 Air Pollution - Controlling Measures

10.3 Water Pollution

10.3.1 Testing the pollutants in water samples

10.3.2 Pollution of River Musi

10.3.3 Definite, Indefinite Pollutants

10.3.4 Plants - Nutrients

10.3.5 Biodegradable wastes

10.3.6 Heat - Water pollution

10.3.7 Solid wastes, toxic chemicals

10.3.8 Controlling water pollution

11. Why do we fall ill ?

11.1 Health - its significance - What do we mean by 'Being healthy'?

11.1.1 Individual, social problems

- Community Health, Personal Health

11.2 Distinction between 'Being healthy and Disease free'

11.3 Disease - and its causes

11.3.1 Infections and non-infections diseases

11.3.2 Short-term, Long-term diseases - Illhealth

11.3.3 Diseases - Carriers of diseases

Bacteria, Viruses, protozans etc.

11.3.4 How does a disease spread ?

11.3.5 Disease causing organisms (Pathogens) - the changes in organ systems in the body

11.4 Prevention of diseases - Principles, Actions

BIOLOGY - SYLLABUS

9th CLASS

1. Cell structure and functions

1.1 Typical cell

1.1.1 Comaparing Plant and Animal cell

1.1.2 Cell membrane (Plasma membrane)

- Cell wall
- Nucleus
- Eukaryotic cell
- Prokaryotic cell
- Cytoplasm

1.1.3 Protoplasm - Cytoplasm

1.1.4 Cell organells - Endoplasmic Reticulum
- Ribosomes
- Lysosomes
- Golgi complex
- Mitochondria
- Vacuoles

1.2 Plastids - Chloroplasts

1.3 Are cells flat ?

1.4 Where do cells form from ?

2. Plant tissues

2.1 Parts of the plants - their functions

2.1.1 Observing the cells in leaf and onion peels

2.1.2 Observing the cells in root tip

2.1.3 Observing growing roots in onion

2.2 Plants - Tissues
- Meristematic tissues
- Dermal tissue
- Ground tissue
- Vascular tissue

2.2.1 Meristematic tissues
- Apical meristem
- Lateral meristem
- Intercalary meristem

2.3 Observing the tissues in transverse section of a dicot steam

2.4 Dermal tissue - observing epidermal cells in Rheo leaf

2.5 Grond tissue - Parenchyma, Sclerenchyma, Collenchyma

2.5.1 Parenchyma - Chlorenchyma, Aerenchyma, Storage tissue

2.6 Vascular Tissue - Xylen, Phloem (Vascular Bundles)

3. Animal Tissues

3.1 Organ systems - functions

3.1.1 Observing tissues

3.1.2 Observing the cells in the blood sample

3.2 Different types of Animal tissues
- Epithelial Tissues
- Connective tissue
- Muscular Tissues
- Nervous tissue

3.3 Epithelical tissue - Columnar, Cuboidal, Squanous Epithelial tissue - characteristics.

3.4 Connective tissue - Aereolar, Adipose, Skeletal tissue
- Bone, Cartilage, Ligament, Tendon

3.5 Blood Tissue

3.5.1 Blood tissue - Red Blood Cells, White Blood Cells,

Blood - Platelets

White Blood Cells - Granulocytes (Nutrophile, Basophile, Esinophile

- Agranulocytes (Lymphocytes, monocytes)

3.5.2 Blood Flow, Blood clotting

3.6 Blood Groups - Universal Acceptors, universal donors, Blood grouping - Testing.

3.7 Nervous tissue

4. Movement of materials across the cell membrance

4.1 The Substances that get into and go out of the cell

4.1.1 Solutions and their concentration (Sugar solution)

4.1.2 Observing the changes of kishmish when placed in sugar solution and tap water.

4.2 Osmosis - the flow of liquids through selectively permiable membrane

4.2.1 Filtration

4.2.2 Functions of Plasma membrane

4.2.3 Flow of substances through Plasma membrane

4.2.4 Importance of Osmosis in living organisms

4.3 Diffusion

5. Diversity in living organisms

5.1 Observing diversity in plants

5.1.1 Identifying the plants based on selected characters / features

5.1.2 Observing the seeds

5.1.3 Observing the characters of monot and dicot plants

5.2 Diversity in animals

5.2.1 Observing external characters in Insects

5.2.2 Variations / Diversity in Human beings, Diversity in plants (based on selected characters)

5.3 Classification - the concept, its need - evolution of life

5.3.1 Classification - its Historic elements; binomial nomenclature

5.3.2 Method of classification - the five kingdom classification proposed by Whittaker

● Monera ● Protista ● Plantae ● Fungi ● Animalia

5.4 Classification of Plant Kingdom

5.5 Classification of Animal Kingdom

6. Sense Organs

6.1 Sense organs - Opinions of our ancestors

6.2 What do our sense do ? / How do sense organs help us ?

6.2.1 Stimulus - Response

6.3 Eye-its structure, cells and tissues / structure of the eye-cells - and tissues in the eye

6.3.1 Functioning of the eye

6.3.2 Eye and Illusions

6.3.3 Taking care of our eyes, diseases and defects of the Eye - An understanding

6.4 Ear - its external and internal structure

6.4.1 Ear - the hearing / auditory sensation

6.4.2 Functions of the ear, caring for the ears

6.5 Structure of the Nose

6.5.1 The smell or olfactory sense - How do we know the sense of smell ?

6.5.2 Taking care of nose

6.6 Structure of the Tongue

6.6.1 How do we know the taste ?

6.6.2 Taking care of the Tongue

6.7 Structure of the skin

6.7.1 How does the skin convey the sense of touch ?

6.7.2 Skin diseases, taking care of skin

7. Animal behaviour

7.1 Animals behave in different ways / or Animals exhibit different behaviour

7.2 Different types of Animal behaviour

- Instinct
- Imprinting
- Conditioning
- Imitation

7.3 Pavlov Experiments on conditioning

7.4 Human behaviour : Instinct, imitation, conditioning

7.4.1 Investigating behaviour in the field, laboratory

7.4.2 Investigation in the field - tagging

7.5 Animals - and their intelligence

8. Challenges in improving agricultural products

8.1 Relationship between growth of population and the need for food

8.2.1 Need of improving agricultural produce

8.2 How to increase the food production ?

- High yielding varieties
- Irrigation facilities

8.2.1 Relationship between water and crop yield.

8.2.2 Plant nutrients / or nutrients needed by the plants

8.2.3 Crop Rotation

8.2.4 Cultivating mixed crops

8.2.5 Organic manure

8.2.6 Chemical Fertilizers

8.3 Soil testing

8.4 Conventional manures

- Vermi compost
- Panchagavya

8.5 Organic farming

8.5.1 The long-term effect of chemical fertilizers on the yield of the crop

8.6 Crop protection

8.6.1 Weeds

8.6.2 Plant - Diseases - Prevention (Pesticides)

9. Adaptations in different Ecosystems

9.1 Ecosystems

9.1.1 Ecosystems - Adaptations in Plants

9.2 Desert Ecosystem - Adaptations in plants and animals

9.3 Aquatic Ecosystem - Adaptations in plants and animals

9.3.1 Marine Ecosystem - Adaptations in plants and animals

9.3.2 Aquatic organisms - The secrets of swimming

9.3.3 The zones in the marine ecosystem on the basis of availability of light at different depths.

- Euphotic zone
- Bathyal zone

- Abyssal zone

9.3.4 Zones in the fresh water Ecosystem
- Littoral zone
- Limnetic zone
- Profundal zone

9.4 Water salinity - Adaptations

9.5 Adaptations to temperature in plants, animals
- Hibernation and Aestivation
- Symbiosis (Lichens)

9.6 Adaptations - Evolution (story of Darwin's Finches)

10. Soil Pollution

10.1 What is soil ?

10.1.1 What is soil ?

10.1.2 Soil properties - Physical, Chemical and Biological properties of the soil

10.2 Soil fertility

10.3 Soil pollution

10.3.1 Fertility of soil due to decomposition of wastes

10.3.2 Soil pollution - Wastes
- Biodegradable wastes
- Non-biodegradable wastes

10.4 Causes of land pollution

10.4.1 Manures and Chemicals

10.4.2 Biomagnification

10.4.3 Solid wastes

10.4.4 Deforestation

10.4.5 Urbanization

10.4.6 Pollution of undreground soil

10.5 Effects of soil pollution on Environment

10.6 Control measures of soil pollution

10.6.1 Bioremidiation, soil conservation

11. Biogeochemical cycles

11.1 Pollution, concept of biogeochemical cycles in relation to the ecosystems - an understanding

11.2 Water cycle

11.3 Nitrogen cycle

11.3.1 Nitrogen fixation

11.3.2 Nitrification

11.3.3 Assimilation

11.3.4 Ammonification

11.3.5 Denitrification

11.3.6 Nitrogen cycle and human intervention

11.4 Carbon cycle

11.4.1 Photosynthesis - Carbon - fixation

11.4.2 Carbondioxide cycling and storage

11.4.3 Carbon cycle - Human intervention
- Global warming
- The green house effect

11.5 Oxygen cycle

11.5.1 Oxygen cycle

11.5.2 Ozone layer and its effect

BIOLOGY - SYLLABUS

10th CLASS

1. Nutrition

1.1 Life process- Introduction
- 1.1.1 Autotrophic and heterotrophic nutrition

1.2 Photosynthesis
- 1.2.1 Understand the concept of photosynthesis
- 1.2.2 Raw materials required for photosynthesis - H_2O, CO_2 sunlight
- 1.2.3 Process of releasing oxygen in photosynthesis
- 1.2.4 Necessity of light for formation of carbohydrate
- 1.2.5 Chlorophyll - Photosynthesis
- 1.2.6 Where does photosynthesis takes place
- 1.2.7 Mechanism of photosynthesis : (i) Light reaction, (ii) Dark reaction

1.3 Nutrition in organisms
- 1.3.1 How do the organisms obtain the food?
- 1.3.2 Cuctuta - Parasitic nutrition

1.4 Digestion in human beings
- Process of movement of food through alimentary canal
- Litmus paper test ● Enzyme ● Flow chart of Human digestive system

1.5 Healthy points about oesophagus

1.6 Malnutrition -disease ● Kwashiorkore ● Marasmus ● Obesity
- 1.6.1 Diseases due to vitamin deficiency

2. Respiration

2.1 Respiration - discovery of gases involved in respiration
- 2.1.1 Different stages of respiration
- 2.1.2 Expiration, inspiration
- 2.1.3 Pathway of air
- 2.1.4 Epiglottis - Pathway of air.

2.2 Respirating system in human being
- 2.2.1 Exchange of gases (alveolies to Blood capillaries)
- 2.2.2 Mechanism of transport of gases
- 2.2.3 Transport of gases (Capillaries to cells, cells to back)

2.3 Cellular respiration
- 2.3.1 Anaerobic respiration
- 2.3.2 Aerobic respiration
- 2.3.3 Fermentation

2.4 Respiration - Combustion
- Liberating heat during respiration

2.5 Evolution of gaseous exchange

2.6 Plant respiration
- 2.6.1 Transportation of gases in plants
- 2.6.2 Respiration through roots
- 2.6.3 Photosynthesis - respiration

3. Transportation

3.1 Internal structure of Heart
- 3.1.1 Blood vessels and blood transport
  - ● Blood capillaries ● Arteries veins

3.2 Cardiac cycle
- 3.2.1 Single circulation, double circulation

3.3 Lymphatic system

3.4 Evolution of transport system

3.5 Blood pressure

3.6 Blood clotting

3.7 Trasnportation in plants
- 3.7.1 How water is absorbed
- 3.7.2 Root hair absorbtion
- 3.7.3 What is root pressure?

3.7.4 Mechanism of transportation of water in plants - Transportation, Root pressure, ascent of sap. Cohesive adhesive pressure

3.7.5 Transportation of Minerals

3.7.6 Transportation of food material

4. Excretion

4.1 Excretion in Human beings

4.2 Excretory system

4.2.1 Kidney

4.2.2 Kidney internal structure

4.3 Structure of Nephron

● Malphigion tubules ● Nephron

4.4 Formation of urine

- Glomerular filtration
- Tubular reabsorption
- Tubular secretion
- Formation of hypertonic urine

4.4.1 Ureter

4.4.2 Urinary bladder

4.4.3 Urethra

4.4.4 Urine excretion

4.4.5 Urine composition

4.5 Dialysis - Artificial kidney

4.5.1 Kidney transportation

4.6 Accessory Excretery organs in human beeing (Lungs, skin, liver large intestine)

4.7 Excretion in other organisms

4.8 Excretion in plants

4.8.1 Alkaloids

4.8.2 Tannin

4.8.3 Resin

4.8.4 Gums

4.8.5 Latex

4.9 Excretion, Secretion

5. Control & coordination

5.1 Stimulus and response

5.2 Integrated system - Nerves coordination

5.3 Nerve cell structure

5.4 Pathways from stimulus to response

5.4.1 Afferent nerves

5.4.2 Efferent nerves

5.5 Reflex arc

5.5.1 Reflex arc

5.6 Central nervous system

● Brain ● Spinal nerves

5.7 Peripherial nervous system

5.8 Coordination without nerves

5.8.1 Story of insulin

5.8.2 Chemical coordination - endocrine glands

5.8.3 Feedback mechanism

5.9 Autonomous nervous system

5.10 Coordination in plants - Phytohormones

5.10.1 How plant shows responses to stimulus

5.10.2 Tropic movements in plants

6. Reproduction

6.1 Growth of bacteria in milk.

6.2 Asexual reproduction

6.2.1 fission, budding, fragmentation, parthenocarpy, parthenogensis, regeneration

6.2.2 Vegetative propagation

- Natural vegetative propagation through roots, stem, leaves
- Artificial propagation - cuttings, layering and grafting

6.2.3 Formation of spores

- Sporophyll

6.3 Sexual reproduction

Reproduction in human beings

6.3.1 Male reproductive system

6.3.2 Female reproductive system

6.3.3 Child birth

6.4 Sexual reproduction in plants

6.4.1 Flower - reproductive parts, unisexual, bisexual flowers, self and cross pollination.

6.4.2 Pollen grain

6.4.3 Structure of ovule, ovary; double fertilisation

6.4.4 Germination of seeds

6.5 Cell division - Cell cycle

6.5.1 Cell division in humn beings

6.5.2 Cell cycle - G_1, S, G_2 and M phases

6.5.3 Mitosis

6.5.4 Meiosis

6.6 Reproductive health - HIV/ AIDS

6.6.1 Birth control methods

6.6.2 Fighting against social ills

6.6.3 Teenage motherhood, stop female foeticide

7. Coordination in Life Processes

7.1 Hunger

7.1.1 Effect of hunger stimulus

7.2 Relation between taste and smell

7.2.1 Relation between taste of tongue and palate

7.3 Mouth - a mastication machine

7.3.1 Action of Saliva on flour

7.3.2 Observing the pH of mouth

7.4 Passage of food through oesophagus

7.4.1 Peristaltic movement in oespaphagus

7.5 Stomach is mixer

7.5.1 Movement of food from stomach to intestion.

7.5.2 Excretion of waste material

8. Heredity

8.1 New Characters - variation

8.2 Experiments conducted by Mendal (F1 generation, F2 generation), Mendel's Laws

8.2.1 F_1 generation self pollination

8.2.2 Phenotype

8.2.3 Genotype

8.3 Parents to offsprings

8.31 How the characters exhibit?

8.3.2 Sex determination in human beings

8.4 Evolution

8.4.1 Genetic drift

8.5 Theories of organic evolution

8.5.1 Lamarckism
8.5.2 Darwinism
8.5.3 Darwin theory in a nut shell

8.6 Origin of species
8.6.1 How the new species orginates

8.7 Evolution - Evidences
8.7.1 Homologous organs - analogous organs
8.7.2 Embrylogical Evidence
8.7.3 Fossils Evidences

8.8 Human Evolution
8.8.1 Human Beings: Museum of vestigial organs

9. Our Environment

9.1 Ecosystem - Food chain
9.1.1 Number Pyramid
9.1.2 Biomass Pyramid
9.1.3 Energy pyramid

9.2 Human activities - Their effect on ecosystem
9.2.1 Story of Kolleru lake
9.2.2 Edulabad resorvoir - Effect of heavy metals
9.2.3 Sparrow campaign

9.3 Biological pest control measures
- Crop rotation
- Knowing the history of pests
- Sterility
- Gene mutation
- Concern towards environment

10. Natural resources

10.1 Case study - Agricultural land (past and present)

10.2 Case study - Water management
- Community based particing
- Farmer based intervention
- Waste land cultivation

10.3 Water resources in the Telugu States

10.4 Natural resources around us

10.5 Forest Renewable resources
10.5.1 Soil
10.5.2 Bio-diversity

10.6 Fossil fuels
10.6.1 Minerals

10.7 Conservation, Redue, Reuse, Recycle, Recover
10.7.1 Conservation groups