

BIOLOGY - CLASS 06

Theme 01: Plant Life

Plants play an important role in our lives. As learnt in the previous classes, there exists a great variety of plant life on the planet Earth. Plants vary in size from minute microscopic forms to complex tall trees. Most of the tall trees belong to higher plants. Herbs and shrubs also constitute a large proportion of higher plants. In previous classes, children have already been familiarised with parts of a plant body (root, stem, leaf, flower, fruit and seed) and their functions. This topic aims at enabling children to know and learn more about the leaf, flower and fruit, including the arrangement, characteristics and functions of the parts of a leaf and flower. Modifications of leaves for performing special functions will also be covered in this topic.

Learning Outcomes:

Children will be able to:

01. Distinguish between leaves (reticulate vs parallel venation /simple vs compound leaves);
02. Recognize, identify and draw figures of leaf modifications for support, protection, reduction in water loss and vegetative propagation in leaf;
03. Recognize that flowers are of various shapes, sizes and colors and are an important part of the plant;
04. Collect and preserve various types of flowers;
05. Explain the structure and function of each whorl of flower (complete flower);
06. List the agents of cross pollination;
07. Learn the process of seed germination and list the conditions required for germination;
08. List common names of locally available plants;
09. List the various types of modifications for special functions such as vegetative propagation and storage.

Theme 02: The Cell

In this theme children will be introduced to the Cell. All living things consist of cells. A few organisms are single- celled (unicellular), while majority of the organisms are many-celled (multicellular). In structure, cells in plants and animals are quite similar, except for a few differences. Cells contain organelles which perform important functions for the sustenance of life. Plant cells are characterized by presence of a cell wall, plastids and a large vacuole whereas animal cells do not possess cell wall and plastids.

Learning Outcomes:

Children will be able to:

01. Identify differences in unicellular and multicellular organisms and cite examples;
02. Observe cell (plant and animal) under microscope and discuss in class;
03. Identify the different cell organelles (cell wall, cell membrane, nucleus, chloroplast, vacuole) and learn about their primary functions;
04. Distinguish and draw diagrams of a plant cell and an animal cell.

Theme 03: Human Body

The human body consists of a number of organ systems. Some of the major organ systems are the digestive, respiratory, circulatory, excretory, nervous and skeletal system. Each of these systems consists of organs, which help them perform specific functions. The expectation of this theme is to develop an understanding in children of the functioning of the digestive, respiratory and circulatory systems in the human body.

Learning Outcomes:

Children will be able to:

01. List the main parts and functions of each part of the respiratory system;
02. Distinguish between respiration and breathing;
03. Outline the mechanism of breathing and the role of diaphragm in inhalation and exhalation;
04. Name some common respiratory diseases;
05. Explain the main parts of the circulatory system;
06. List the components of blood and types of blood vessels;
07. Take their own/ others' pulse;
08. Demonstrate the significance of exercise and good food habits in keeping the heart healthy

Theme 04: Health and Hygiene

Health is defined as a state of complete physical, mental and social well-being. When diseases occur, the normal functioning of the body is disturbed. Hygiene includes all factors that contribute to healthy living. Three factors that are important for maintaining good health are balanced diet, personal cleanliness and public sanitation. This theme

focuses on enabling children to know and understand that diseases are broadly classified into communicable (or infectious) diseases, and non-communicable (non-infectious) diseases and also how diseases are transmitted and why it is essential to control them.

Learning Outcomes:

Children will be able to:

01. Explain the meaning of terms such as 'health', 'hygiene' and 'disease';
02. Relate the knowledge acquired to the personal experiences of diseases suffered, if any.
03. Relate the types of diseases on the basis of their transmission as infectious and non-infectious.
04. Spread awareness regarding diseases to friends and family

Theme 05: Adaptation

All living organisms, for their survival, need to be well-suited to the environment in which they live. To attain this, organisms develop some features which help them to survive and reproduce in their environment. Features so acquired help organisms to adapt to their particular environments. This theme enables children to understand how some plants and animals are adapted to live and survive in dry habitats, whereas others can live in water or on mountains, or fly in air.

Learning Outcomes:

Children will be able to:

01. Define adaptation and habitat;
02. Recall the names of plants and animals, and their adaptations studied in earlier classes;
03. Record the adaptations shown by plants and animals living in desert/ aquatic conditions;
04. Prepare a list of plants and animals occurring in different habitats with their common names and adaptations.

Dates	Lesson(s)
TERM 1	Plant life

Dates	Lesson(s)
(3 Jun – 19 Aug 2022)	The Cell
TERM 2 (13 Sep- 9 Dec 2022)	Human health and Hygiene
	Human body
TERM 3 (3 Jan 2023- 7 March 2023)	Biodiversity
	Crops and agricultural practices

Exam	Marks	Lesson(s)	Chapter Name	Mark division
First Mid Term	25	·Chapter 1	·Plant life	·25
First Term	40	·Chapter 1	·Plant life	·20
		·Chapter 2	·The cell	·20
Second Mid Term	25	·Chapter 3	·Health and Hygiene	·25

Second Term	80	<ul style="list-style-type: none"> ·Chapter 3 ·Chapter 4 	<ul style="list-style-type: none"> ·Human Health and Hygiene ·Human body 	<ul style="list-style-type: none"> ·40 ·40
Final	80	<ul style="list-style-type: none"> ·Chapter 5 ·Chapter 6 ·Chapter 2 ·Chapter 4 	<ul style="list-style-type: none"> ·Biodiversity ·Crops and agricultural practices ·The cell ·Human health and Hygiene 	<ul style="list-style-type: none"> ·30 ·30 ·10 ·10

BIOLOGY - CLASS 07

Theme 01: Tissue

In the previous class, children learnt about the cell, which is the basic unit of life in plants and animals. The cells are organized into tissues, organs, organ-systems and finally into an organism. The theme in this class will focus on enabling children to know about tissues and the different types of tissues in plants and animals.

Learning Outcomes:

Children will be able to:

01. Define the term 'tissue';
02. Relate that plants and animals have different types of tissues;
03. Explain the differences between meristematic and permanent tissues with examples;
04. Draw the relation between structure, location and function of different tissues;
05. Draw diagrams of different tissues and label them;

06. Classify the different types of animal tissues (epithelial, connective, muscular and nerve tissues) with functions.

Theme 02: Kingdom Classification

This theme gives an insight into the study of the types of Kingdoms in Plants and Animals. Living organisms are divided into two kingdoms – Kingdom Plantae and Kingdom Animalia. The kingdom Plantae includes plants, while the animals are included under kingdom Animalia. This two-kingdom classification was found inadequate in the light of disputed position of organisms like bacteria and fungi. In view of the objections to the two-kingdom system of classification, a Five-Kingdom Classification was proposed in 1969. The five Kingdoms are Monera, Protista, Fungi, Plantae and Animalia.

Learning Outcomes:

Children will be able to:

01. Explain the purpose and advantages of classification;
02. Explain the basis of 5-kingdom classification;
03. Differentiate between major groups of organisms;
04. Draw pictures of organisms representing each kingdom;
05. List the useful and harmful effects of bacteria and fungi;
06. Infer that complex organisms have evolved from simple organisms (evolution of life).

Theme 03: Plant Life

The theme Plant Life aims at promoting children's understanding that all living organisms despite their great diversity in shapes and sizes, show similarity in their activities. They all need food, energy, grow, remove waste materials from their bodies, reproduce and respond to their environment. Growth, excretion, reproduction and response to stimuli are some of the basic life processes. This theme will particularly focus on enabling children to understand the two important processes in plants of Photosynthesis and Respiration, differences between the two and factors affecting them.

Learning Outcomes:

Children will be able to:

01. Discuss and demonstrate that leaves perform the function of photosynthesis;
02. Enlist the factors affecting photosynthesis;
03. Draw picture of stomata and chloroplast;
04. Identify the difference between respiration and photosynthesis and relate that respiration and photosynthesis help maintain the balance of CO₂ and O₂ in the atmosphere;
05. Reason out that the energy produced in respiration is used up by the body to perform life-sustaining activities;
06. Differentiate between the aerobic and anaerobic respiration;
07. Discuss the need for growing more and more plants.

Theme 04: Human Body

In the previous classes, children were exposed to basic information regarding some of the organ systems in the human body (digestive, respiratory and circulatory systems). In this theme, children will study the excretory and nervous systems in the human body.

Learning Outcomes:

Children will be able to:

01. Define the term 'excretion' and its need/significance;
02. Draw the outline figure of the human body and mark the location of kidneys, skin, sweat glands and lungs;
03. Infer that the kidneys are very important as they filter the blood;
04. Identify various parts of the nervous system i.e. brain, spinal cord and nerves.
05. Discuss the need of spinal cord, brain, nerves for the body;
06. Relate that all parts of the body are connected to the brain through the nerves;
07. List some of the activities that are under the control of the nervous system.

Theme 05: Health and Hygiene

In the earlier classes children have learnt that diseases develop due to infections by micro-organisms, imbalances in diet and malfunctioning of vital body organs, and that hygiene is important to prevent spread of diseases. In this theme, children will know and understand the allergic reactions of the body due to certain substances in the environment and how they can be prevented.

Learning Outcomes:

Children will be able to:

01. Define the terms allergy and allergens and differentiate between them;
02. Identify the symptoms produced by allergens;
03. Infer that allergy can be seasonal or perennial;
04. Know the precautions to be taken if they suffer from any particular type of allergy.

Dates	Lesson(s)
TERM 1 (3 Jun – 19 Aug 2022)	Tissue
	Kingdom classification
TERM 2 (13 Sep- 9 Dec 2022)	Cell
	Human body
	Human health and hygiene
TERM 3 (3 Jan 2023- 17 March 2023)	Biodiversity
	Crops and agricultural practices

Exam	Marks	Lesson(s)	Chapter Name	Mark division
First Mid Term	25	·Chapter 1	·Tissue	·25

First Term	40	·Chapter 1	·Tissue	·20
		·Chapter 2	·Kingdom classification	·20
Second Mid Term	25	·Chapter 3	·The cell	·13
			·Human body	·12
Second Term	80	·Chapter 3	·The cell	·25
		·Chapter 4	·Human body	·30
		·Chapter 5	·Human health and hygiene	·25
Final	80	·Chapter 6	·Biodiversity	·30
		·Chapter 7	·Crops and agricultural practices	·30
		·Chapter 2		
		·Chapter 4	·Kingdom classification	·10
			·The cell	·10

BIOLOGY - CLASS 08

Theme 01: Transport of Food and Minerals in Plants

This theme deals with the movement of water containing minerals and food with plants. The exchange of water, gases, minerals and other substances into and out of the cells and also between neighbouring cells, takes place through a system called transportation

system. In unicellular organisms (Chlamydomonas) and simple multicellular organisms like Spirogyra, diffusion is a major method of transportation. Diffusion of water across a semipermeable membrane is called osmosis. In complex higher plants because of enormity of size and complex organization, there is an elaborate transportation system and transport occurs through a vascular system of independent channels or conducting tubes (xylem and phloem). In addition to transport, xylem tissue also provides mechanical strength to the plant body. Essential mineral nutrients are also needed for the healthy growth of plant. In the absence or non-availability of the essential element the plant shows specific deficiency symptoms.

Learning Outcomes:

Children will be able to:

01. Learn about the existence of a transport system inside the plant body of complex multicellular
02. Higher plants;
03. Explain that transport in unicellular and simple multicellular plants takes place by diffusion;
04. Define and discuss diffusion, osmosis, transpiration, root pressure;
05. Perform experiments and demonstrate the process of osmosis;
06. Realize that the minerals required are either micronutrients or macronutrients depending upon the quantity required by the plants;
07. Relate that the deficiency or lack of essential nutrients leads to specific symptoms and diseases.
08. Define transpiration, interpret its role in xylem transport and know about the factors affecting rate of transpiration.
09. Demonstrate transpiration through simple experiments.

Theme 02: Reproduction in Plants and Animals

Reproduction is one of the most important functions of living organisms. It is essential for perpetuation of species. There are two ways by which living organisms give rise to new organisms – Asexual (vegetative propagation) and sexual reproduction. While asexual reproduction involves a single individual parent, sexual reproduction involves two different individuals of different sexes, one male and another female. In this theme children will learn more about various methods of vegetative/asexual reproduction in plants and animals, a brief account of fertilization and post fertilization changes in flower and main organs of reproductive system of human male and female.

Learning Outcomes:

Children will be able to:

01. Record during a visit to garden the common names of plants and how they are multiplied;
02. Observe and correlate butterflies and honeybees moving around flowers to the process of pollination;
03. Ask the gardener how he raises or multiplies plants like jasmine, rose, Bryophyllum, Chrysanthemum, Dahlia, potato and money plant;
04. Observe in a nursery how cuttings and budding methods of vegetative propagation are used for growing larger number of roses;
05. Observe how grass plants which are planted at some distance from each other cover the entire soil after some days due to vegetative propagation;
06. Recognize that sexual reproduction involves the fertilization of an egg cell by a sperm cell to produce offspring that may closely resemble the parents.

Theme 03: Ecosystems

A community of organisms (plants and animals) in a given area, live in harmony with the environment. There is a close interaction between the living (called biotic) and non-living (called abiotic) components of the environment. The study of interaction between biotic and abiotic components is known as ecology and the ecosystem is the basic unit of study. There are many types of ecosystems, namely aquatic (fresh water/ marine), terrestrial (forest/ grassland/ desert), etc. The composition of biotic community and the abiotic components (environment) varies in different ecosystems. Organisms develop adaptations suited to live in a particular environment. Living organisms, which may be producers (plants), consumers (animals) or decomposers (micro-organisms), are linked to each other through food chains. Ecosystems exhibit two important functional attributes (a) A unidirectional flow of energy from sun to producers to consumers and finally to decomposers, and (b) Cyclic flow of nutrients.

Learning Outcomes:

Children will be able to:

01. Define the terms ecosystem, producer, consumer, decomposer, food chain, food web and pyramid of numbers, with examples (technical terms);
02. Explain and analyze the biotic and abiotic components of an ecosystem;
03. Interpret the relationship between different biotic components in terms of food chain, food web and pyramid of numbers;
04. Evaluate the abiotic factors and their influence on biotic factors;
05. Describe and provide examples for interdependence relationships between organisms (symbiosis, parasitism and predation);
06. Draw relationship between the flora and fauna of a particular forest ecosystem;
07. Make a flow chart of a food chain and food web.

Theme 04: Human Body – Endocrine, Circulatory and Nervous Systems

This theme focuses on the nervous system. It aims at enabling children to know and understand that in human beings, there are two kinds of control and coordination (nervous and chemical). The nervous coordination is brought about by the nervous system, and the chemical coordination by the chemicals called hormones. Children will also learn about the hormonal system called endocrine system. In addition, this theme will build and expand on the respiratory, circulatory and systems, which were introduced in earlier classes.

Learning Outcomes:

Children will be able to:

01. Explain that in addition to nervous control, another control/coordination mechanism called hormonal control also exists in humans;
02. Define the terms – endocrine system, hormones, endocrine and exocrine glands;
03. Draw a diagram showing the location of endocrine glands in the body and describe the functions of hormonal glands namely the thyroid, adrenal, pituitary and pancreas;
04. Relate the knowledge gained and explain the changes in their own bodies;
05. Become aware about the changes that occur during adolescence and how to manage the emotional and physical changes;
06. Explain the techniques used in the management of stress;
07. Draw diagrams of the heart, circulatory system, neuron and reflex action;
08. List out the functions of the heart, nervous system, lymph, RBC and WBC.

Theme 05: Health and Hygiene

In the previous classes, children learnt about health, personal and public hygiene, balanced diet, deficiency diseases, life style associated health problems and diseases caused by infection. In this class this theme aims at enabling children to know more about communicable diseases and understand their mode of transmission and prevention. Further, they will also understand the role of the immune system of the body in resisting diseases and the concepts of vaccination and immunization. Children will also appreciate the importance of 'First Aid' and learn to undertake some simple common first aid measures to deal with emergency situations.

Learning Outcomes:

Children will be able to:

01. Identify some communicable diseases, their causative agents and symptoms;
02. Show concern towards maintaining personal hygiene and cleanliness of the surroundings;
03. List some common vector borne diseases;
04. Differentiate between vaccination and immunization;
05. List the harmful effects of consumption of tobacco, drinking alcohol and taking habit forming drugs;
06. Use some simple first aid methods in day to day emergency situations.

Theme 06: Food Production

Plants and animals provide a number of useful products to mankind. Plants are useful to us in many ways - as sources of food, fibre, timber, medicines, oils, dyes, resins and as ornamentals. Likewise, animals provide us milk, flesh, eggs, fibre, honey, silk, lac, and many more items. Micro-organisms like bacteria are also useful to us - in the production of cheese, bread, alcohol, vinegar and vaccines. There has been a great improvement in the techniques of food production and their scientific management over the years. This theme introduces children to the various methods of food production.

Learning Outcomes:

Children will be able to:

01. Discuss uses of bacteria in the food industry;
02. List importance of mushroom and yeast in the food industry;
03. Explain the meaning of agriculture, horticulture, pisciculture (fish farming), apiculture, sericulture, green revolution, white revolution and animal husbandry;
04. Identify and provide examples for various food crops and cash crops cultivated in India and make a list of useful cereal, fruit and vegetable plants;
05. List common names of (i) useful plants and animals, (ii) ornamental plants/decorative flowers;
06. List the milk-yielding (milch) animals, meat and egg-laying animals, draught animals and poultry

Dates	Lesson(s)
TERM 1	Transport of food and minerals in plants

(3 Jun – 19 Aug 2022)	Reproduction in plants
TERM 2 (13 Sep- 9 Dec 2022)	Reproduction in animals
	The cell
	Endocrine system and Nervous system
TERM 3 (3 Jan 2023- 17 March 2023)	Health and diseases
	Food production and resources
	Genetics and evolution

Exam	Marks	Lesson(s)	Chapter Name	Mark division
First Mid Term	25	·Chapter 1	·Transport of food and minerals in plants	·25

First Term	40	<ul style="list-style-type: none"> ·Chapter 1 ·Chapter 2 	<ul style="list-style-type: none"> ·Transport of food and minerals in plants ·Reproduction in plants 	<ul style="list-style-type: none"> ·15 ·25
Second Mid Term	25	<ul style="list-style-type: none"> ·Chapter 3 ·Chapter 4 	<ul style="list-style-type: none"> ·Reproduction in animals ·The cell 	<ul style="list-style-type: none"> ·12 ·13
Second Term	80	<ul style="list-style-type: none"> ·Chapter 3 ·Chapter 4 ·Chapter 5 	<ul style="list-style-type: none"> ·Reproduction in animals ·The cell ·Endocrine system and Nervous system 	<ul style="list-style-type: none"> ·20 ·30 ·30

Final	80	·Chapter 6	·Health and diseases	·20
		·Chapter 7		·20
		·Chapter 8	·Food production and resources	·20
		·Chapter 2		·10
		·Chapter 3	·Genetics and evolution	·10
			·Reproduction in plants	
			·Reproduction in animals	