Theme 1: 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:

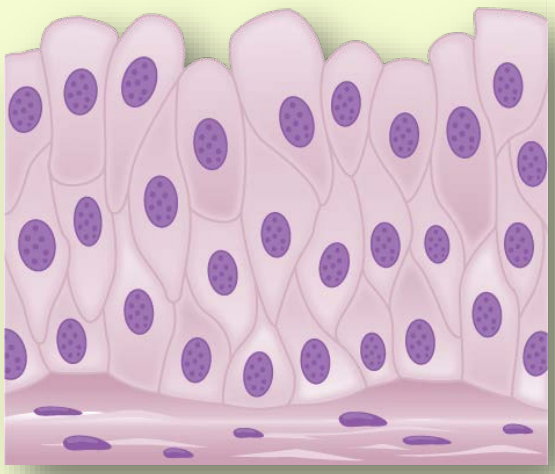
- define the term 'tissue';
- relate that plants and animals have different types of tissues;
- explain the differences between meristematic and permanent tissues with examples;
- draw the relation between structure, location and function of different tissues;
- draw diagrams of different tissues and label them;
- classify the different types of animal tissues (epithelial, connective, muscular and nerve tissues) with functions.

Tissue

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
Plant Tissues ▸ Definition of tissue. ▸ Classification of plant tissues: Meristematic and permanent (simple and complex). ▸ Meristematic tissues: characteristics (any two), simple structure, location, function, examples. ▸ Simple permanent tissues: parenchyma, collenchyma, sclerenchyma (simple structure, location and functions of each), examples. ▸ Complex permanent tissues: xylem, phloem (only nature of cells and function. Elements of xylem and phloem not to be mentioned).	▸ Showing and explaining the different plant tissues to children - their location, structure, characteristics and functions charts and models. ▸ Encouraging children to develop charts and models. ▸ Drawing of diagrams by children of kinds of tissues and differentiating between them. ▸ Collecting more information on plant tissues, such as tissue culture by children in groups or individually **Experiments** ▸ Keep a twig of petunia with white flowers in a beaker containing coloured water and observe the flowers after a few hours (flowers will become coloured). ▸ Perform an experiment and ask the children to observe and record what happens to the plant seedlings if the roots	▸ Permanent slides on kinds of tissues. ▸ Charts and models. ▸ PPTs and Videos on tissues. ▸ Photographs and pictures of tissues. 

Tissue

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
Animal Tissues • Epithelial tissue: simple location, and function (types of epithelial tissue not to be mentioned). • Connective tissue location and functions of areolar, adipose, bone, cartilage, blood, ligament, tendon. • Muscular tissue: location and one function of: ☛ *striated (voluntary or skeletal muscle),* ☛ *unstriated (involuntary/ smooth muscle),* ☛ *cardiac (specialized muscle*). • Nerve tissue: parts of neuron (cell body, Dendron, axon). ***Note**: Only basic structure and basic functions of the above mentioned tissues to be done.*	are removed and seedlings are kept in coloured water. **Animal Tissues** • Showing diagrams of the following tissues: Epithetical, Connective, Muscular and Nervous tissue, through charts and models. • Providing opportunities to children to: ☛ *draw diagrams of animal tissues.* ☛ *label them* ☛ *write functions of each kind of tissue* ☛ *collect more information on animal tissues* ☛ *model/charts of animal tissues.* • Showing children, the model of the nervous system and pictures of Dendron and axon. • Asking children to draw a diagram of nerve tissue. • Discussing functions of nervous system.	• Specimens, charts and models. • Models and pictures of nervous system. • Children's drawings.



Theme 2: 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:

- explain the purpose and advantages of classification;
- explain the basis of 5-kingdom classification;
- differentiate between major groups of organisms;
- draw pictures of organisms representing each kingdom;
- list the useful and harmful effects of bacteria and fungi;
- infer that complex organisms have evolved from simple organisms (evolution of life).

Kingdom Classification

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
▸ Meaning and concept of classification. ▸ Need and advantages of Classification. ▸ Characteristics of each kingdom with suitable examples: (i) Monera: bacteria - shape; useful bacteria, harmful bacteria (applications related to daily life to be discussed); (ii) Protista: *Amoeba* - basic structure and life processes (nutrition, locomotion, respiration, excretion and reproduction – by binary and multiple fission); (iii) Fungi: basic structure of mould, nutrition and respiration in mould, useful fungi, harmful fungi (applications related to daily life to be discussed); (iv) Plantae: characteristics and examples (classification of plantae not to be discussed); (v) Animalia (a) Vertebrates. (b) Invertebrates: 9 major Phyla, Porifera, Cnidaria, Coelenterata, Platyhelminthes, nematoda, Annelida, Arthropoda, Mollusca, Echinodermata) (Two characteristics and two examples of each Phylum).	▸ Providing opportunities for observation through visit to a nearby garden/zoo or a nature walk. ▸ Asking children to classify or group these plants and animals in their own way. ▸ Learning about different organisms belonging to each kingdom and asking them to write about examples of each kingdom. ▸ Drawing pictures of organisms belonging to each kingdom. ▸ Encouraging children to collect more information on each phylum. ▸ Assigning projects to make picture cards and writing their features on the other side.	▸ Plants and animals in their natural habitats. ▸ Zoo to see the diversity of life. ▸ Specimen from the laboratory. ▸ Charts, Models and photographs. ▸ PPTs and Videos. ▸ Picture cards.

Life Skill: appreciate diversity of life

Theme 3: 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:

- discuss and demonstrate that leaves perform the function of photosynthesis;
- enlist the factors affecting photosynthesis;
- draw picture of stomata and chloroplast;
- identify the difference between respiration and photosynthesis and relate that respiration and photosynthesis help maintain the balance of CO2 and O2 in the atmosphere;
- reason out that the energy produced in respiration is used up by the body to perform life-sustaining activities;
- differentiate between the aerobic and anaerobic respiration;
- discuss the need for growing more and more plants.

Plant Life

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
Photosynthesis ▸ Definition, basic process, factors affecting photosynthesis: (light, carbon dioxide, water, chlorophyll), significance of photosynthesis, setup. ▸ Experiment to demonstrate photosynthesis process. **Respiration** ▸ Basic process, word equation; respiration as a process which releases energy; respiration in plants: two types (aerobic and anaerobic: basic concept, word equations for both, examples). ▸ Respiration and photosynthesis in plants, difference in both processes.	▸ Revisiting previous concepts. ▸ Building on children's previous learning. ▸ Asking children to observe the colour of leaves and also name plants that have yellow or red coloured leaves, discussing the reasons for such colours. ▸ Providing opportunities for observation of stomata and chloroplasts present in the leaves using a microscope. ▸ Drawing picture of stomata and chloroplast and labelling their parts. ▸ Summarizing the process of photosynthesis with the help of a word equation (No symbols) ▸ Demonstrating experiments in setup on photosynthesis and respiration with the support of elders. ▸ Demonstrating to children the hydrilla experiment to show evolution of oxygen during	▸ Charts. ▸ Plants like hydrilla (water plant), mushroom, money plant, yeast, leaves of croton, *Rhoeo* (*to see colour of leaves and performing experiments*). ▸ Permanent slides/fresh preparations of epidermal peels of leaves (to observe stomata) and Hydrilla leaf to study stomata and plastids. ▸ PPTs, videos.

Plant Life		
Key Concepts	**Suggested Transactional Processes**	**Suggested Learning Resources**
	photosynthesis. - Discussing the difference between aerobic and anaerobic respiration and citing examples of both. - Discussing differences between the respiration and photosynthesis process in plants and asking children to explain both the processes in their own words.	

Theme 4: Human Body

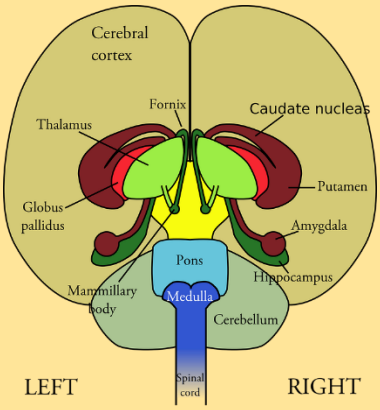
In the previous classes, children were exposed to basic information regarding some of the organ systems in the human body (digestive, respiratory and circulatory systems). In this theme, children will study the excretory and nervous systems in the human body.

Learning Outcomes:

Children will be able to:

- define the term 'excretion' and its need/significance;
- draw the outline figure of the human body and mark the location of kidneys, skin, sweat glands and lungs;
- infer that the kidneys are very important as they filter the blood;
- identify various parts of nervous system i.e. brain, spinal cord and nerves.
- discuss the need of spinal cord, brain, nerves for the body;
- relate that all parts of the body are connected to the brain through the nerves;
- list some of the activities that are under the control of the nervous system.

Human Body

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
Excretory System **Excretion: Definition.** ▸ Organs and their excretory products (kidneys, sweat glands, lungs); ▸ Renal Excretory System - kidneys, ureter, urinary bladder, urethra (location and functions to be explained along with diagram); ▸ Role of kidneys infiltration of blood through millions of nephrons (details not required, structure of nephron not to be discussed); common disorders of the urinary system: Urinary Tract Infection, kidney stone. **Nervous System** ▸ Main parts: brain, spinal cord, nerves. ▸ Brain: cerebrum, cerebellum, medulla oblongata (location and function). ▸ Spinal cord: location and function. ▸ Nerves: what are nerves; their general function.	▸ Building on children's previous learning. ▸ Explaining the various parts of excretory and nervous system with the help of charts, models, PPTs and videos. ▸ Explaining the difference between excretory and waste products. ▸ Asking children to draw labelled diagrams of the following: ☛ *The excretory system showing the various parts along with labelling.* ☛ *The nervous system – the brain, spinal cord, and nerves.* ▸ Discussing common disorders of the urinary system. ▸ Assigning group projects on making models and charts on both systems. ▸ Providing children opportunities to share their personal experiences.	▸ Charts and models. ▸ PPTs and videos. ▸ Model of the brain and human excretory system. ▸ Children's drawings. 

Theme 5: 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:

- define the terms allergy and allergens and differentiate between them;
- identify the symptoms produced by allergens;
- infer that allergy can be seasonal or perennial;
- know the precautions to be taken if they suffer from any particular type of allergy.

Health and Hygiene

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
Allergy • Concept of allergy. • Allergens: Common allergens like dust, pollen grain, mites, strong sunlight, particular food items. • Entry routes of allergens: mouth, nose, skin. • Symptoms of allergic reaction. • Types of allergies: seasonal and perennial with examples. • Precautions and care to be taken by a person who is prone to allergies.	• Enlisting causes of allergy. • Discussing with children the concept of allergy, explaining the various aspects of entry route of allergens, symptoms produced, precaution to be taken to control allergic reactions. • Providing opportunities for discussion with the school physician. • Organising group discussion on prevention and care of allergy. • Discussing various ways to keep oneself healthy and safe.	• PPTs, Videos, photographs • Permanent/temporary slide of *Aspergillus* conidiophores • Photographs/ slide showing mites, pollen, etc. in house dust. • Physician.

Integration: Health and Physical Education
Life Skill: Health awareness