

SCIENCE

Theme 1: Human Body: Food we Eat

The underlying aim of this theme is to provide information about and discuss the various components of food and also develop an awareness regarding the importance of eating a balanced nutritious diet. The content would further help in developing skills such as, i.e., classification, and sensitivity towards environment and sensitivity towards wastage of food.

Learning Outcomes:

Children will be able to:

- ✓ discuss and share various kind of food items used by a family on various occasions;
- ✓ list out food items based on 'energy giving', 'body building' and 'protection from diseases';
- ✓ classify food items into various components based on their function and cite examples of each component of food;
- ✓ explain the need for balanced diet in their own words;
- ✓ discuss the need of each food component for healthy living;
- ✓ infer why different groups of people require different amount and kinds of food (child, adult, elders, etc.);
- ✓ suggest various ways to avoid food wastage;
- ✓ appreciate the need and importance of plants/ environment in our life;
- ✓ develop a sensitivity towards plants and the environment.

Human Body: Food We Eat		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p>Revisit concepts/ skills of learnt in Class III.</p> <ul style="list-style-type: none"> ➤ Food for energy, for work, food for growth (body building), food for protection from diseases. ➤ Components of food: Carbohydrates, Proteins, Fats, Vitamins, Minerals, Water and roughage as essential components. ➤ Examples of each group of food component. ➤ An idea of a balanced diet. ➤ Care of food to avoid wastage. 	<ul style="list-style-type: none"> ➤ Revisit concepts learnt in Class III and build on previous learning. ➤ Providing opportunities to children to share their personal experiences about the food they generally eat, what they like and do not like, different kinds of food available around them etc.; ➤ Providing opportunities to children to observe various kinds of food items, and list out those that provide energy, vitamins, minerals, body building/wear & tear (actual/visuals); ➤ Organizing group activities to classify food items based on their functions (energy giving, body building and protection from diseases); ➤ Showing documentary films/charts on balanced diet and later organizing a discussion; ➤ Conducting individual activities by 	<ul style="list-style-type: none"> ➤ Live experience of children related to food. ➤ Various kinds of food items (actual). ➤ Picture cards of different food items and their role. ➤ Documentary film on a balanced diet. ➤ Doctor and/or Dietician. ➤ Charts and visuals on food items. ➤ Magazines describing more information on food items (food of children, adults, elders). ➤ Children's portfolio ➤ Children's drawings. ➤ Worksheets provided/prepared by the teacher.

Human Body: Food We Eat

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
	<p>asking each child to make a menu of one week keeping the need for a balanced diet in view (under supervision of elders).</p> <ul style="list-style-type: none"> ➤ Discussing / interacting with the Dietician. ➤ Assigning individual/group projects to children on: <ul style="list-style-type: none"> • <i>Drawing pictures/ collecting pictures of each kind of group of food;</i> • <i>Preparing a component-wise chart on different food items with examples.</i> ➤ Discussing ways to avoid food wastage. ➤ Conducting activities in the school (tree plantation, care of plants) to develop a habit for care and protection of plants. 	

Integration: Languages, Health and Physical Education, Social Studies (Our State - Agriculture (Types of Crops))

Life Skills: Sensitivity towards plants/environment, appreciating the value of avoiding wastage of food.



Theme 2: Human Body: The Teeth

The main focus of this theme is to create awareness regarding the various kinds of teeth in human beings and the importance of dental care and regular check-ups. The theme will also focus on the need for daily brushing to keep teeth healthy and strong for healthy living.

Learning Outcomes:

Children will be able to:

- ☑ identify and name the different kinds of teeth in human beings;
- ☑ draw pictures of each kind of tooth and label the parts of a tooth;
- ☑ discuss the need for various kinds of teeth in human beings and explain their functions;
- ☑ infer why the old people, adults and children have different number of teeth;
- ☑ demonstrate healthy habits related to taking care of their teeth;
- ☑ give reasons why the gums and teeth get spoilt/damaged;
- ☑ suggest ways to keep teeth and gums healthy and strong;
- ☑ appreciate the importance of regular check-up of teeth;
- ☑ relate healthy food habits with the development of healthy teeth and proper brushing.

Human Body: The Teeth		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Kind of teeth in the mouth and location. ➤ Structure and Functions of each kind of tooth. ➤ Diagram with labelling of parts of a tooth, number of teeth of each kind in: infants and adults. ➤ Care of Teeth and Gums: Causes of cavities/ deficiencies and steps to prevent them. ➤ Need for regular check-up to keep teeth healthy; importance of healthy dental care habits. ➤ Role of food in the development of healthy teeth and gums. 	<ul style="list-style-type: none"> ➤ Providing opportunities to children to share their personal experiences (when did milk teeth first appear, how many teeth do they have, etc.) ➤ Organizing simple activities individually and in small groups with children such as: <ul style="list-style-type: none"> ☛ <i>Counting one's own teeth and sharing with the peer group;</i> ☛ <i>Visiting a dentist/ inviting a dentist to conduct a question answer session in the class;</i> ➤ Organizing discussion in small groups on care of teeth; ➤ Providing opportunities to draw pictures of kinds of teeth and labelling them; ➤ Making models of various types of teeth; ➤ Showing a documentary on care of teeth/steps showing the process to clean teeth followed by group activities to demonstrate healthy ways of brushing one's teeth. ➤ Maintaining children's portfolio to keep their medical report for regular check-ups. ➤ Discussing / interacting with the Dentist. 	<ul style="list-style-type: none"> ➤ Children's own experiences. ➤ Tooth brush, Tongue cleaner ➤ Pictures on the process of cleaning the teeth, tongue etc. ➤ Film on care of teeth. ➤ Magnifying glass to observe teeth/gums. ➤ Medical reports of children.

Integration: Health and Physical Education

Life skills: Healthy habits for a healthy living

Theme 3: Human Body: The Digestive & Excretory Systems

The main objective of this theme is to create an awareness and understanding regarding the functioning of the digestive and the excretory systems in the human body. The theme also aims at promoting healthy habits for healthy living. While transacting this theme, the concepts covered in this theme may be related with the themes 'Food we Eat' and 'The Teeth' to develop a better understanding on related concepts.

Learning Outcomes:

Children will be able to:

- draw and label parts of the digestive system;
- name and identify organs of the digestive system;
- discuss the functions of the digestive system in the human body;
- explain the functions of each digestive organ in his/her own words;
- give reasons for chewing of food for better digestion;
- name and identify organs of the excretory system;
- explain and functions of each organ of the excretory system;
- draw and label parts of the excretory system;
- discuss the need for the excretory system in the body;
- identify various habits that help to keep the digestive and excretory organs healthy.

Human Body: The Digestive and Excretory Systems

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Organs of the digestive system (mouth, food pipe, stomach, liver, small and large intestine, rectum, anus). ➤ Functions of various organs in digestion, need for chewing food well, and for regular bowel movements. ➤ Need for water. ➤ Organs of the excretory system and their functions. ➤ Healthy habits related to digestion and excretion. 	<ul style="list-style-type: none"> ➤ Providing opportunities to children to share their own experiences. ➤ Drawing attention to the various organs in a model/chart of the digestive and excretory systems. ➤ Opportunities to draw pictures of both the systems and labelling the organs in both the systems. ➤ Discussing the importance of water in the process of digestion and excretion. ➤ Discussing the functions of the different organs of the digestive and excretory systems, through models/charts. ➤ Discussing healthy food habits related to digestion and excretion and relating them with the children's own experiences 	<ul style="list-style-type: none"> ➤ Pictures/charts of the digestive and excretory systems. ➤ Models showing various organs of digestive and excretory systems. ➤ e-programme/content on digestive/excretory systems. ➤ Cut out of the human body locating places of various organs of both the systems. ➤ Diagrams on the digestive and excretory systems made by children. ➤ Discussion on junk and healthy food items

Integration: Languages, Health and Physical Education.

Theme 4: Adaptation in Animals

The theme 'Adaptation in animals' would discuss need for adaptation in animals by referring to the different habitats. The theme would also discuss adaptations seen in the bodies of herbivores, omnivores and carnivores. Some key concepts such as need for adaptation, reasons for adaptation in animals would also be discussed to create awareness amongst children by using various examples.

Learning Outcomes:

Children will be able to:

- discuss the need for adaptation in animals to survive in their different habitats;
- enlist reasons of adaptation in animals: on land, in air and in water;
- give examples of adaptations of animals: on land and in water;
- relate modification of body parts in various animals due to food habits (herbivores, carnivores, omnivores);
- give examples of herbivores, carnivores and omnivores;
- develop empathy, love and concern for animals.

Adaptation in Animals		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Adaptation in animals. ➤ Need for adaptations in animals. ➤ Reasons of adaptations. ➤ Examples of adaptations in animals: on land, in water. ➤ Adaption in modification of body parts in herbivores, carnivores, omnivores. ➤ Examples of each. ➤ Care and concern for animals 	<ul style="list-style-type: none"> ➤ Sharing/listening to the experiences of children related to adaptation in animals. ➤ Showing a film/picture and then creating situations to identify adaptations in various animals have. ➤ Assigning project work to children in groups/individually to develop charts depicting adaptation in animals due to water, land, food habits; ➤ Assigning Project work to children in groups /individually to develop scrap books on adaptations in animals. 	<ul style="list-style-type: none"> ➤ Pictures of animals having adaptations. ➤ Flash cards. ➤ Digital images (in animals). ➤ Web map of animals showing adaptations on land. ➤ Web map of animals showing adaptations in water. ➤ Charts prepared by children. ➤ Documentary film on adaptation in animals.

Integration: Languages, Health and Physical Education, Social Studies (Our State-Landforms, Climate, vegetation)

Life Skills: Care and concern for animals

Theme 5: Adaptation in Plants

The theme 'Adaptations in Plants' is expected to provide awareness and information regarding the need for adaptation in plants on land, in water and due to variation in habitat, along with examples. The theme would also be expected to develop skills related to observation, concern and care for plants.

Learning Outcomes:

Children will be able to:

- discuss the need for adaptation in plants to survive in their habitat;
- enlist reasons of adaptations in plants on land, water, desert and hilly areas;
- give examples of plant adaptations on land, water, desert and hilly areas;
- draw pictures of various adaptations in plants.

Adaptation in Plants		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Need for adaptation in plants. ➤ Examples of adaptation of plants on land with examples. ➤ Examples of adaptation of plants in water with examples. ➤ Examples of adaptation of plants in desert with examples. ➤ Examples of adaptation of plants in hilly areas with examples. 	<ul style="list-style-type: none"> ➤ Sharing/listening to the learning experiences of children related to adaptation in plants. ➤ Showing various plants having adaptations due to their habitats. ➤ Creating situations to identify various other plants having (after seeing pictures/films) adaptations. ➤ Assigning project work to: <ul style="list-style-type: none"> ➤ develop charts depicting adaptation of plants in different habitats i.e. water, land, ➤ develop scrap book on adaptation in different plants with examples ➤ Drawing of pictures by children of different adaptations seen in plants. 	<ul style="list-style-type: none"> ➤ Pictures. ➤ Flash cards. ➤ Digital images (various plants). ➤ Web map of plants showing adaptations. ➤ Examples of adapted plants. ➤ Charts prepared by children. ➤ Documentary film on adaptation in plants.

Integration: Languages, Social Studies (Our State-Landforms, rivers, climate, vegetation)

Life skills: Concern for the environment

Theme 6: Plants in the Surroundings and Environment

The aim of this theme is to acquaint children with the classification of plants and functions of different parts of plants. The functions of leaves along with the processes of transpiration and photosynthesis will also be discussed in a simple manner. The theme would also highlight the significance of plants in our lives by taking different examples from children's daily lives.

Learning Outcomes:

Children will be able to:

- ✓ identify plants as herbs, shrubs and trees;
- ✓ identify the kind of roots seen in plants (through observation);
- ✓ differentiate between tap and fibrous root (through observation);
- ✓ cite examples of plants with the tap and fibrous root systems;
- ✓ draw pictures and label each kind of root system;
- ✓ identify variations in leaves (observation);
- ✓ discuss the process of photosynthesis in their own words (simple non-technical language);
- ✓ demonstrate presence of iodine in a leaf through a simple experiment (with support of elders).

Plants in the Surroundings and Environment

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Parts of plants and their uses (Revisiting earlier concepts). ➤ Roots: kinds of roots, their functions and examples. ➤ Shoots: functions of the stem. ➤ Functions of the leaf: Photosynthesis, transpiration process (in simple language). ➤ Iodine test for starch in leaves. ➤ Products obtained from plants such as food items, wood, coir, rubber, fibres. 	<ul style="list-style-type: none"> ➤ Providing opportunities to observe various kinds of plants and categorizing them as herbs, shrubs and trees. ➤ Drawing pictures of leaves and colouring them. ➤ Showing through simple experiments different functions of the leaf (showing stomata, green pigment) to explain transpiration, photosynthesis (in simple language using non-scientific terms). ➤ Conducting simple experiments/ activities (hand lens) to locate stomata on the surface of leaf ➤ Providing opportunities to children to discuss various uses of plant products in our life, with examples ➤ Conducting experiment to demonstrate the process of photosynthesis ➤ Conducting experiment showing presence of starch in leaves using iodine test ➤ Providing opportunities to appreciate the significance of plants in our life. ➤ Creating a herbal garden. 	<ul style="list-style-type: none"> ➤ Various kind of leaves, different parts of plants ➤ Plant products-wood, coir, rubber. ➤ Hand lens. ➤ Apparatus required for experiments on photosynthesis and presence of iodine in leaves. ➤ Visuals /videos on the use of plants. ➤ Collection of products of plants. ➤ School's herbal garden.

Life Skills: Sensitivity towards plants and environment.

Theme 7: Air

'Air' is an important component for our life. Many activities are carried out with the help of air. This theme will help to develop clarity in children regarding properties of air, besides discussing the causes of air pollution and remedies for the same. The theme is also expected to develop experimental and observational skills.

Learning Outcomes:

Children will be able to:

- ☑ give reasons why air is important for living beings;
- ☑ demonstrate some properties of air through simple experiments (air has weight, occupies space, expands and has no colour);
- ☑ demonstrate the process of inhalation/exhalation of air;
- ☑ discuss causes of air pollution in the environment / surroundings;
- ☑ suggest ways/remedies to reduce air pollution in the environment;
- ☑ show concern about the environmental activities which cause air pollution.

Air		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p>Revision of Class III-Matter</p> <ul style="list-style-type: none"> ➤ Some properties of air i.e., occupy space, weight, expands, no colour. ➤ Composition of air (gases + water vapour). ➤ Process of breathing and burning. ➤ Causes of air pollution – dust, smoke, spitting (germs/bacteria, Virus), preventive measures to keep air clean. 	<ul style="list-style-type: none"> ➤ Revisiting concepts learnt in the earlier classes. ➤ Building on children's earlier learning. ➤ Conducting simple experiments to demonstrate that air has weight, occupies space, air expands. ➤ Arranging live demonstration to show the process of inhalation/ exhalation of air by lungs. ➤ Arranging a class activity for all children to demonstrate the process of breathing and deep breathing for healthy living. ➤ Organizing group discussions to identify causes of air pollution. ➤ Assigning projects (group work) to children to list down ways to prevent air pollution. ➤ Facilitating origami activities with children like making kites, aeroplanes, etc. ➤ Decorating the classroom by making small kites. 	<ul style="list-style-type: none"> ➤ Apparatus /objects required to conduct experiments. ➤ Project work report on causes of air pollution. ➤ Project work report on ways to prevent air pollution. ➤ Origami material.

Integration: Languages, Health and Physical Education, Social Studies (Pollution- its impact on the environment, The Earth- Atmosphere)

Theme 8: Materials and Solutions

The theme 'Materials and Solutions' is expected to develop in children an understanding of the meaning 'solute', 'solvent' and 'solution' through daily life examples. The theme would also deal with various methods of separation of insoluble material from water/liquids.

Learning Outcomes:

Children will be able to:

- discuss/share examples of solvent, solute and solution in day-to-day life;
- explain each term in their own words;
- conduct experiments to make solutions by using solute and solvent;
- identify various methods of separation of solute and solvent from solution;
- distinguish between the methods of sedimentation, filtration and evaporation;
- give an example of the methods of - sedimentation, filtration and evaporation;
- differentiate between soluble and insoluble substances in liquids;
- cite examples of soluble and insoluble substances.

Materials and Solutions		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p>Revisit learning of Class III</p> <ul style="list-style-type: none"> ➤ Definition- solvent, solute and solution, giving examples of each (simple language). ➤ Soluble and insoluble substances giving examples of each (solubility in oil, water) ➤ Method of separation: sedimentation, decantation, filtration, evaporation. 	<ul style="list-style-type: none"> ➤ Building on previous learning and concepts. ➤ Conducting simple experiments to demonstrate how to make solutions in various solvents. ➤ Conducting activities/ to demonstrate various ways of separating impurities from a solution. ➤ Conducting simple experiments showing soluble and insoluble substance in solvent. ➤ Encouraging children to cite examples of various solutions used in day-to-day life. ➤ Citing examples of the process of sedimentation, decantation, filtration and evaporation. ➤ Demonstrating to children in groups and as a whole class: <ul style="list-style-type: none"> ☛ the process of sedimentation (sand + water, clay + water); ☛ the process of decantation, filtration and evaporation (sugar in water). 	<ul style="list-style-type: none"> ➤ Collection of soluble and insoluble substances. ➤ Apparatus to show making of a solution. ➤ Sieving apparatus, filter paper. ➤ Apparatus to show evaporation activity.

Theme 9: Light

The expectation of this theme is to create awareness about various sources of light in the environment and simple properties of light, by taking examples from daily life. The theme is also expected to provide an understanding of how a shadow is formed and various uses of natural sources of light. The theme would also focus on how to save and conserve light energy in our day-to-day lives.

Learning Outcomes:

Children will be able to:

- ✔ identify various sources and uses of light in the environment;
- ✔ distinguish between natural and artificial sources of light;
- ✔ cite examples of natural and artificial sources of light;
- ✔ appreciate the use of natural source of light in our day-to-day life;
- ✔ differentiate between luminous and non-luminous objects;
- ✔ differentiate between transparent, translucent and opaque objects in the surroundings;
- ✔ cite examples of each type of object, i.e. transparent, translucent and opaque;
- ✔ explain the process of shadow formation in simple language.

Light		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Source of light: natural and artificial. ➤ Examples of sources of natural and artificial light. ➤ Luminous/non-luminous objects. ➤ Properties of light. ➤ Transparent, translucent and opaque objects. Examples of each category of objects. ➤ Uses of these objects in daily life. ➤ Formation of shadows (how a shadow is formed - not in technical terms). 	<ul style="list-style-type: none"> ➤ Creating situations for sharing personal experiences of children and discussing them. ➤ Demonstrating luminous and non-luminous objects (plain paper and paper with oil drop). ➤ Initiating discussion, asking questions related to light and its properties, showing simple activities/experiments. ➤ Organizing activities to identify different objects as transparent, translucent and opaque. ➤ Conducting experiments to demonstrate how shadow is formed. 	<ul style="list-style-type: none"> ➤ Pictures/live examples of various sources of light. ➤ Objects depicting transparent, translucent, opaque features. ➤ Photographs/Pictures on the process of shadow formation.

Integration: Social Studies (Motions of the Earth)

Theme 10: Measurement

The theme 'Measurement' is expected to develop an awareness and understanding of the need for a unit of measurement to explain any object, process and phenomenon. The theme would also discuss various measuring instruments used in daily life. The emphasis of this unit is not only to develop scientific understanding but also to create a functional understanding of measurement in children.

Learning Outcomes:

Children will be able to:

- ✔ appreciate the need for measurement of various things/phenomenon;
- ✔ identify various instruments used for measurement;
- ✔ differentiate various instruments based on their uses in daily life;
- ✔ give examples of unit of measurement of some objects;
- ✔ cite examples of activities where unit of measurement is required.

Measurement		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Need for measurement ➤ Examples of measurement in daily life (buying goods, watching time) ➤ Simple description of instruments used for measurement (ruler, tape, weighing machine, thermometer, clock) ➤ Use of each instrument, how to read/use them. 	<ul style="list-style-type: none"> ➤ Providing opportunities for discussion, interaction among peer group; child and teacher. ➤ Creating situations in the classroom for questioning, making questions. ➤ Demonstrating each instrument to observe and describe. ➤ Discussing uses of each instrument in daily life. ➤ Demonstrating 'How to use' with instructions. 	<ul style="list-style-type: none"> ➤ Discussion/question answer interaction among children and teacher ➤ Instruments used for measurement (scale, tape, weighing machine, ruler, clock, etc.) ➤ Examples/situations where unit of measurement is required ➤ Children's drawings.

Integration: Mathematics (Measurement)



Theme 11: Push and Pull

In this theme, children will learn that pushes and pulls are examples of Force which can change the shape/ direction of an object. Children will also be familiarized with the various kinds of forces experienced in day-to-day life.

Learning Outcomes:

Children will be able to:

- ☑ discuss examples of push and pull seen in day-to-day life;
- ☑ differentiate between push and pull and give examples of each;
- ☑ describe push and pull in their own words (not definition);
- ☑ identify various kind of forces seen in day-to-day life (muscular, gravitational, magnetic, frictional);
- ☑ explain each force in their own words;
- ☑ cite examples of each force by relating it with daily life;
- ☑ demonstrate push and pull situation in a group activity (with safety precautions).

Push and Pull		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ The concept/ meaning of push and pull and difference between the two; ➤ Examples of push and pull. ➤ Force: meaning in simple terms, changes shape of objects and direction; ➤ Meaning of various types of forces – muscular, gravitational, magnetic and frictional. 	<ul style="list-style-type: none"> ➤ Showing and discussing the difference between push and pull and citing examples of each in groups; ➤ Sharing/showing push and pull situations as a demonstration activity and later involving students to do it in groups; ➤ Demonstrating various kinds of forces through simple activities, ➤ Organizing group activities for demonstration of various kinds of forces by children and explaining them in their own words 	<ul style="list-style-type: none"> ➤ Apparatus/Objects to demonstrate push and pull ➤ Pictures of examples of push and pull in real life situations.

Integration: Physical Education.



Theme 12: Friction as a Force

In this theme, children will build on their previous knowledge of Forces and learn more about Friction as a force and the role it plays in our lives. The theme will focus on uses of friction and also on concept formation by using simple examples.

Learning Outcomes:

Children will be able to:

- cite examples of friction observed in daily life and explain friction in their own words;
- explain uses and harmful effects of friction in daily life;
- conduct simple activities/experiments demonstrating friction.

Friction as a Force		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Friction – meaning, concept. ➤ How to reduce friction (oil, powder). ➤ Uses of friction. ➤ Harmful effects of friction. ➤ Examples of friction. 	<ul style="list-style-type: none"> ➤ Providing opportunities to children to discuss / share their experiences. ➤ Conducting activities / experiments that demonstrate friction. ➤ Creating situations to demonstrate friction on various kinds of surfaces. ➤ Asking children to identify situations where friction may be harmful. 	<ul style="list-style-type: none"> ➤ Children’s experiences. ➤ Oil, powder and other objects that can illustrate friction. ➤ Different surfaces ➤ Playing Carom Board.

