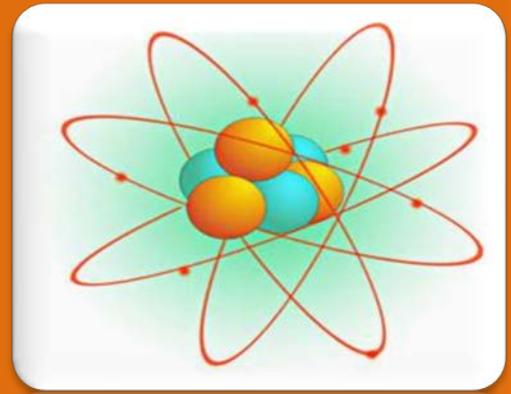


Science

- *Physics*
- *Chemistry*
- *Biology*

Physics



The Core concepts of Physics for Class VI are as follows:

Class VI

Physical Quantities and Measurement

Force

Energy

Light

Magnetism

Theme 1: Physical Quantities and Measurement

Whenever we make a measurement, we require a number which answers the 'how' part of it and a unit which tells us that we are talking about. The unit that is used for a physical quantity is universally accepted and used so that science is communicated and understood all over the world, without any ambiguities. Length, mass, and time are some of the physical quantities that are discussed in detail. They have their own units and symbols for representation. Different devices are required to make measurements of these quantities. How to use a device properly for measurement is an important aspect of learning physics. Children learn to develop skills of converting the magnitude of a physical quantity from one unit to its other related unit.

Learning outcomes:

Children will be able to:

- define length, mass and time;
- express length, mass, time, and area in proper units with proper symbols;
- measure length of objects using a ruler and a measuring tape;
- measure mass of an object using a beam balance and an electronic balance;
- measure time using a clock, a watch and a stop-watch;
- convert a physical quantity from one unit into other related units.

Physical quantities and measurement

Key Concepts	Suggested Transactional Processes	Suggested Learning resources																				
<p>➤ Measurement of Length:</p> <ul style="list-style-type: none"> ☛ Concept of length as distance between two points. ☛ Measurement of length. ☛ Units (with symbol and full name). <table border="1" style="margin-left: 20px; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 2px;">Name of unit</th> <th style="padding: 2px;">Symbol</th> </tr> </thead> <tbody> <tr><td style="padding: 2px;">centimetre</td><td style="padding: 2px;">cm</td></tr> <tr><td style="padding: 2px;">meter</td><td style="padding: 2px;">m</td></tr> <tr><td style="padding: 2px;">Kilometre</td><td style="padding: 2px;">km</td></tr> <tr><td style="padding: 2px;">inch</td><td style="padding: 2px;">inch</td></tr> <tr><td style="padding: 2px;">foot</td><td style="padding: 2px;">ft</td></tr> </tbody> </table> <p>➤ Measurement of Mass:</p> <ul style="list-style-type: none"> ☛ Concept of Mass as matter contained in an object. ☛ Measurement of Mass ☛ Units (with symbol and full name). <table border="1" style="margin-left: 20px; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 2px;">Name of unit</th> <th style="padding: 2px;">Symbol</th> </tr> </thead> <tbody> <tr><td style="padding: 2px;">milligram</td><td style="padding: 2px;">mg</td></tr> <tr><td style="padding: 2px;">gram</td><td style="padding: 2px;">g</td></tr> <tr><td style="padding: 2px;">kilogram</td><td style="padding: 2px;">kg</td></tr> </tbody> </table>	Name of unit	Symbol	centimetre	cm	meter	m	Kilometre	km	inch	inch	foot	ft	Name of unit	Symbol	milligram	mg	gram	g	kilogram	kg	<p>➤ Providing opportunities to children to:</p> <ul style="list-style-type: none"> ➤ Explain concepts of length as a distance between two points using objects in classroom like book, table, blackboard, length of classroom, etc. ➤ Explain different units of length like cm, m, km, inch, ft and the relation between them. ➤ Practice how to convert one unit into others. ➤ Explaining the concept of mass as matter contained in an object using objects around us. ➤ Explaining different units of mass like mg, g, kg and the relation between them. ➤ Explaining time in terms of hours, minutes and seconds. ➤ Explaining different units of time like seconds, minutes and hours and the relation between them. ➤ Exercise for developing the skill of conversion of one unit into others. 	<ul style="list-style-type: none"> ➤ Objects around us. ➤ Ruler and measuring tape. ➤ Video on measurement of length using a ruler and a measuring tape. ➤ Objects in classroom. ➤ Beam balance and Electronic balance. ➤ Video on measurement of mass using beam balance and electronic balance. ➤ Clock, watch, stop watch. ➤ Video on measurement of time using a clock, watch and stopwatch. ➤ Use of mobile to measure time interval. ➤ A set of objects of regular shapes. ➤ Graph papers. ➤ Pencils.
Name of unit	Symbol																					
centimetre	cm																					
meter	m																					
Kilometre	km																					
inch	inch																					
foot	ft																					
Name of unit	Symbol																					
milligram	mg																					
gram	g																					
kilogram	kg																					

- Measurement of Time:
- ☛ Concept of time and explanation in terms of hours, minutes and seconds.
 - ☛ Measurement of Time.
 - ☛ Units (with symbol and full name).

Name of unit	Symbol
Second	s
Minutes	min
Hour	h

(No distinction of SI, metric, MKS, CGS).

Life Skills: Health, Communication skills, problem solving, Cooperation and working together.

Integration: Mathematics, Chemistry, Biology, Technology in daily life.

Theme 2: Force

This theme will enable children to understand the terms force and friction. The push or pull of an object is called force. A force can cause a stationary object to move and can change the direction of a moving object. When an inflated football is pressed from all sides causes its shape to change. When a ball is rolled down on a floor, it stops after some time. Children will understand why this happens because the force acting between the surface of the ball and the floor slows down the ball. This force is called Friction. Friction can be static, sliding or rolling. There are situations where friction is advantageous and situations where it is disadvantageous.

Learning outcomes:

Children will be able to:

- define a force;
- explain that a force can change the state of motion;
- explain that a force can change the shape of an object;
- describe force of friction with examples from daily life;
- describe situations where static/ sliding / rolling frictions are in play;
- explain advantage and disadvantage of force of friction in daily life situations.

Force		
Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Force as a push or pull. ➤ Effects of force on <ul style="list-style-type: none"> ☛ Mass (No effect) ☛ Speed ☛ Direction (rest and motion) ☛ Change in shape and size ☛ Using real world examples only. ➤ Force of Friction: <ul style="list-style-type: none"> ☛ Types – Rolling, Sliding and Static. ☛ Advantages and Disadvantages. 	<ul style="list-style-type: none"> ➤ Demonstrating to and discussing with children: <ul style="list-style-type: none"> ☛ force as push or pull. ☛ that a force can change a state of motion. ☛ that a force can change shape of an object. ☛ the play of force of friction in an object in motion. 	<ul style="list-style-type: none"> ➤ A couple of tennis balls. ➤ An inflated football, ➤ A toy cart. ➤ Surface of a table. ➤ Video showing force, different types of frictional forces and effect of force.

Integration: Geography, Technology in daily life.

Life Skills: Communication, problem-solving.

Theme 3: Energy

The ability to do work is called energy. Machines help us to do work. For example, a bottle opener is a machine. A needle, a doorknob are also machines. Some machines are more complex than others. A simple machine changes the direction or the magnitude of force applied. The six simple machines are the lever, the pulley, the wheel-and-axle, the inclined plane, the wedge and the screw. On the basis of location of fulcrum (the pivot point), the load and the effort, levers be classified into three types or orders. The aim of this theme is to enable children know and understand about different types of machines and levers.

Learning outcomes:

Children will be able to:

- ☑ define what is a machine;
- ☑ describe simple machines with examples from daily life;
- ☑ describe different types of levers.

Energy		
Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none">➤ Simple Machines:<ul style="list-style-type: none">• Basic Concept➤ Types of Simple Machines:<ul style="list-style-type: none">• Lever• Pulley➤ Different Orders of Levers	<ul style="list-style-type: none">➤ Identifying simple machines in devices used in daily life.➤ Explaining the level and location of fulcrum, load and effort with help of diagram.➤ Explaining and showing videos/pictures of the three types of levers.	<ul style="list-style-type: none">➤ Charts of simple machine.➤ Models of three types of levers.➤ Interactive videos on simple machines.

Integration: Mathematics, Technology in daily life.

Life Skills: Cooperation and working together, Problem-solving.

Theme 4: Light

Light is an important element that helps in making objects visible and travels in a straight line. When light falls on an object it casts a shadow. The earth and the moon and, in fact, planets cast their shadows in space. Sometimes, on a full-moon day, the moon passes through the shadow of the earth. The Earth casts two shadows that fall on the moon during a lunar eclipse. The umbra is a full dark shadow. The penumbra is a partial outer shadow.

Learning outcomes:

Children will be able to:

- ☑ give examples of evidence that light travels in a straight line;
- ☑ explain the formation of shadows;
- ☑ explain the occurrence of lunar eclipse;
- ☑ explain the term umbra and penumbra.

Light		
Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Rectilinear Propagation of Light. ➤ Shadows: <ul style="list-style-type: none"> ☛ Umbra ☛ Penumbra ☛ Natural Shadows – Eclipses 	<ul style="list-style-type: none"> ➤ Demonstration of activities to show that light travels in straight line. ➤ Demonstration of shadow and eclipse formation. 	<ul style="list-style-type: none"> ➤ Candle, a rubber tube, three identical cardboards, moulding clay (Rectilinear propagation of Light). ➤ Video on lunar eclipse.

Integration: Geography, Art

Life Skills: Cooperation and working together, problem solving.

Theme 5: Magnetism

Substances that have property of attracting iron are called magnets. The materials that get attracted towards a magnet are known as magnetic. For example, iron, nickel and cobalt. Materials that are not attracted towards a magnet are non-magnetic-for example, glass, plastic, wood. When a magnet is suspended freely, it always rests in the same direction. The end of the magnet that points toward North is called North pole. The end that points towards south is called South pole. This property of magnets helps us to find directions. Opposite poles of two magnets attract each other and similar poles repel one another. Each magnet is surrounded by a magnetic field. Permanent magnets retain their magnetism for a long time. Temporary magnets behave like a magnet only till they are under influence of a magnetic field.

Learning outcomes:

Children will be able to:

- state characteristics of a magnet;
- distinguish magnetic and non-magnetic substances;
- state the properties of magnets;
- recognise the magnetic field around a magnet;
- distinguish permanent and temporary magnets;
- list care and storage of magnets;
- discuss loss of magnetic property due to heating, hammering and electricity.

Electricity and Magnetism		
Key Concepts	Suggested Transactional Processes	Suggested Learning resources
<ul style="list-style-type: none"> ➤ Magnetic and non-magnetic substances. ➤ Characteristics of a magnet. ➤ Properties of magnets ➤ Magnetic field around a magnet. ➤ Permanent & temporary magnets and their uses ➤ Care & storage of magnets ➤ Demagnetization by heating, hammering and electricity. 	<ul style="list-style-type: none"> ➤ Engaging children in recognizing magnetic fields around a magnet. ➤ Explaining difference between permanent and temporary magnets and their uses. ➤ Explaining demagnetization by heating, hammering and electricity. 	<ul style="list-style-type: none"> ➤ Bar magnets. ➤ Iron nails and filings. ➤ Stand and thread to suspend a magnet. ➤ Compass. ➤ Videos about magnets and electromagnets. ➤ Video about Earth as a magnet

Integration: Geography, Technology in daily life.

Life Skills: Cooperation and working together, critical thinking.

Chemistry



The Core concepts of Chemistry for Class VI are as follows:

Class VI

Introduction to Chemistry

Elements, Compounds and Mixtures

Matter

Theme 1: Introduction to Chemistry

Chemistry finds applications in day-to-day life as well as in industries. Chemicals from simple to complex, are used in medicines, cosmetics, textile industry, agriculture, cleansing agents, etc. This theme will help children understand applications of Chemistry in their lives.

Learning Outcomes:

Children will be able to:

- discuss the importance of Chemistry in daily life and its role in different industries and life processes;
- list important applications of Chemistry in day to day life;
- list some industrial applications of Chemistry;
- discuss the bio-sketches of some great scientists and their works;
- appreciate the patience, perseverance, sacrifices and ethical conduct of scientists.

Introduction to Chemistry		
Key Concepts / Concerns	Pedagogy/ transactional strategies*	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Chemistry – meaning and importance. ➤ Development of Chemistry- A historical perspective. ➤ Notable chemists/ scientists and their contributions to Chemistry (at least 3 scientists). 	<ul style="list-style-type: none"> ➤ Discussing with children and explaining the meaning and importance of Chemistry in day to day life. ➤ Asking children to make a list of products used daily– pencil, rubber, paper, ink, shampoo, deodorants, perfumes, toothpaste, cosmetics. Discussing how Chemistry plays a role. ➤ Discussing the development of Chemistry from the historical perspective with facts -when alchemists attempted to convert cheap metals to gold using philosopher stone, find a chemical that would enable people live longer etc. However, they could not succeed in their efforts to find such miraculous techniques. But they were successful to some extent in developing processes to extract metals and prepare alloys which proved of great use. Refer to the iron pillar near Qutab Minar. ➤ Asking children to share photographs of great chemists such as Mendeleev, Lavoisier, Dalton and discussing their works in class. 	<ul style="list-style-type: none"> ➤ Children’s own experiences. ➤ Products used in daily life since the morning. ➤ Virtual tour of chemical industry/video. ➤ Photographs of scientists. ➤ Videos/PPTs.

Introduction to Chemistry

Key Concepts / Concerns	Pedagogy/ transactional strategies*	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Food and Chemistry. ➤ Cosmetics and Chemistry. ➤ Clothing and Chemistry. ➤ Chemicals as Medicines. ➤ Chemicals in Industries. 	<ul style="list-style-type: none"> ➤ Providing common examples of food preservatives, food processing. Common food products like salt, sugar, tea, milk, jams etc. ➤ Discussing some common examples like the constituents of talcum powder (names only). ➤ Discussing the journey from cotton to synthetic fabric such as terylene. ➤ Giving examples of simple chemicals such as aspirin, paracetamol in medicines. ➤ Giving examples of: cleansing agents (soaps and detergents), stain removals, etc. 	

Integration: Languages, Biology, Geography

Theme 2: Elements, Compounds and Mixtures

All materials / objects found around are either in solid, liquid or gaseous form and occupy space and have mass. In science, the term matter is used for all these materials. Chemically matter can be classified as element, compound and mixture. In nature, matter occurs mostly in the form of mixture. Importantly, substances are required in their pure form that is done by the separation of the components of a mixture by different techniques. The use of any particular separation technique depends upon the properties of the components of the mixture.

Learning Outcomes:

Children will be able to:

- define elements as made up of identical atoms;
- classify elements as metals and non-metals on the basis of their properties;
- define compound and mixture and discuss the points of difference between the two;
- use symbols of elements and molecular formulae of the compounds to represent their names as short hand notations;
- observe the separation of different components of samples of some mixtures;
- discuss the reasons for opting for a particular technique for separation of components of the mixture.

Elements, Compounds and Mixtures

Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<ul style="list-style-type: none"> ▷ Element (a substance made up of identical atoms). ☛ Use of symbols as short hand notations of writing names of elements. ☛ Origin of symbols of elements. ☛ Names and symbols of first 20 elements. ☛ Molecules of elements contain atoms of the same element (O₂, N₂, H₂). ▷ Compound (two or more than two elements combine in fixed definite proportions to form a compound. Original properties of the constituent elements are lost 	<ul style="list-style-type: none"> ▷ Showing pictures of iron powder, sulphur powder and zinc granules. ▷ Taking examples of certain elements e.g. iron and discussing with children that it is made up of only one type of atoms i.e. iron atoms. Likewise, discussing other examples of elements also. ▷ Introducing symbols and emphasising that every element has a symbol. Showing the periodic table and drawing children's attention towards the symbols of elements. ▷ Explaining the basis on which symbols of the elements have been given, qualitative meaning of symbols which represent the name and one/two atom(s) of an element. Giving examples also. ▷ Using the molecular model kit to show the models of some atoms and molecules (O₂, N₂, H₂). ▷ Discussing that the molecules of compounds are made up of atoms of different elements in a fixed proportion. Examples of H₂O, CO₂, NO₂, CaO, ZnCl₂. 	<ul style="list-style-type: none"> ▷ Different samples of some metal and non-metals. ▷ Literature related to language of Chemistry. ▷ Periodic table of elements with names and symbols of elements. ▷ Molecular model kit If molecular kit is not available, balls and sticks models can be used. Models of some compounds using the kit. *using dough and straws or matchsticks.

Elements, Compounds and Mixtures

Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<p>and a substance with new properties is formed).</p> <ul style="list-style-type: none"> ☛ Molecules of compounds contain atoms of different elements. (H₂O, CO₂, NO₂, CaO, ZnCl₂). <p>➤ Mixture (components of more than one substance combine in any proportion, original properties of the components are retained).</p> <p>➤ Difference between mixtures and compounds (on the basis of proportion of combination of components and their properties).</p> <p>➤ Separation techniques of mixtures into their components:</p> <ul style="list-style-type: none"> ☛ Sieving ☛ Sedimentation ☛ Decantation ☛ Filtration ☛ Evaporation ☛ Magnetic Separation. 	<p>etc.</p> <p>➤ Taking examples of some mixtures such as solution of sugar, honey, milk and pointing out that the concentration of the components of the mixture can be different.</p> <p>➤ Differentiating between mixtures and compounds by taking examples to emphasise that in compounds, elements are combined in fixed proportion and properties of the compounds are quite different from those of the elements formed. Example of $C+O_2 \rightarrow CO_2$</p> <p>➤ Discussing details of the activity of the formation of FeS by heating Fe and S.</p> <p>➤ Providing opportunities to children to observe simple activities:</p> <ul style="list-style-type: none"> ☛ Filtration – (sand and water) ☛ Sedimentation (link to purification of water) ☛ Decantation (Tea brewing) ☛ Sublimation (Iodine crystals/ ammonium chloride), Naphthalene balls, Camphor. ☛ Evaporation (Salt water) ☛ Sieving (Rice powder/soil structure) ☛ Magnetic separation (Iron and sulphur) <p>➤ Discussing reasons for preferring a particular technique over another.</p>	<p>All the following experiments can be shown through virtual laboratory or videos.</p> <p>➤ Some samples of mixtures and compounds.</p> <p>➤ Iron powder, sulphur and iron sulphide to show different properties of iron sulphide. Iron gets attracted towards magnet, sulphur is yellow in colour and floats over water. But iron sulphide has altogether different properties.</p> <p>➤ Separation: filter paper, sieve, bar magnet, iodine, ammonium chloride, salt, tea leaves.</p>

Integration: Geography

Skills: Critical thinking, observation, systematic procedural development.

Theme 3: Matter

This theme focuses on enabling children to understand that matter around exists in different physical forms. i.e. solids, liquids and gases. One form can be converted into another. Matter expands on heating and on cooling, it contracts. Besides the physical changes, matter can also undergo chemical changes on heating.

Learning Outcomes:

Children will be able to:

- ✓ discuss the properties of solids, liquids and gases;
- ✓ classify the matter into solid, liquid and gas;
- ✓ discuss the inter-conversion of one state of matter into another;
- ✓ explain the effect of heat on matter showing change of state, expansion and chemical change.

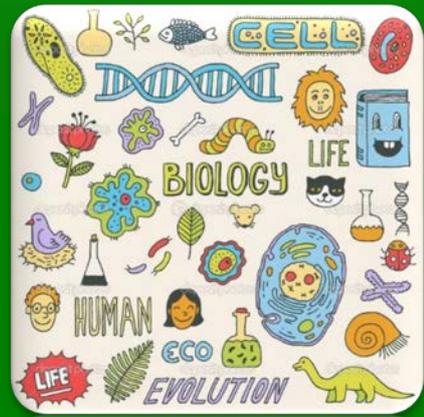
Matter		
Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<p>States of Matter</p> <ul style="list-style-type: none"> ➤ Classification of matter into solid, liquid and gas on the basis of properties (shape, volume). Factors responsible for the existence of matter in different states. ➤ Arrangement of atoms/ molecules in solids, liquids and gases: - intermolecular space, cohesive forces). ➤ There is space between the particles of matter. 	<ul style="list-style-type: none"> ➤ Showing pictures of some solids, liquids and gases and asking children to group them on the basis of their properties. Listing the properties on the basis of which children have done classification. From children's responses, concluding that volume and shape of the samples are the basic properties for their classification. ➤ Discussing these properties with reference to solids, liquids and gases in detail. (Egg in a bottle – Egg can be kicked out by blowing air inside the bottle) ➤ Sharing videos of inter conversion of solid (ice), liquid (water) and gas (vapour): children should arrive at the conclusion that solids have definite volume and shape, liquids have definite volume but no definite shape while gases have neither definite volume nor definite shape; use of a knife to cut a solid and a liquid (Apple, Milk). ➤ Discussing and explaining reasons for the difference in properties of the three states of matter is intermolecular forces, cohesive forces and Brownian movement among particles constituting matter. ➤ Smaller particles occupy spaces between the bigger particles. 	<ul style="list-style-type: none"> ➤ Different samples of solid, liquid, gases. ➤ Solid – wood, common salt, pen, pencil. ➤ Liquid – water, milk. ➤ Gas – balloons. ➤ Home activity for students- freezing of water and sublimation of camphor.

Matter		
Key Concepts / Concerns	Pedagogy/ Transactional Strategies*	Suggested Learning Resources
<p>➤ Effect of heat on matter (expansion, change of state and chemical change)</p>	<p>➤ Carrying out activities such as: -</p> <ul style="list-style-type: none"> ☛ Adding sugar to pebbles taken in a plastic container. ☛ Adding sand to glass balls. Sugar and sand go into the space between the pebbles and glass balls respectively. (Intermolecular spaces are occupied). <p>➤ Sharing videos of expansion of matter on heating, evaporation and condensation, freezing and sublimation.</p> <p>➤ Change of state- changing of ice to water to steam and reverse can be shown/ recalled.</p> <p>➤ Chemical change – Burning of candle.</p>	

Integration: Physics, Languages

Life skills: Cooperation and working together, creative thinking, decision making, conclusion drawing.

Biology



The core concepts of Biology for Class VI are as follows:

Class VI

Plant Life

The Cell

Human Body

Health and Hygiene

Theme 1: 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:

- ☑ distinguish between leaves (reticulate vs parallel venation /simple vs compound leaves);
- ☑ recognize, identify and draw figures of leaf modifications for support, protection, reduction in water loss and vegetative propagation in leaf;
- ☑ recognize that flowers are of various shapes, sizes and colours and are an important part of the plant;
- ☑ collect and preserve various types of flowers;
- ☑ explain the structure and function of each whorl of flower (complete flower);
- ☑ list the agents of cross pollination;
- ☑ learn the process of seed germination and list the conditions required for germination;
- ☑ list common names of locally available plants;
- ☑ list the various types of modifications for special functions such as vegetative propagation and storage.

Plant Life		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p>THE LEAF</p> <ul style="list-style-type: none"> ➤ External structure (parts of a leaf in detail). ➤ Kinds of leaves (simple & compound). ➤ Types of venation (reticulate and parallel). ➤ Functions of leaf (main functions). ➤ Modifications (tendrils, spines, scale leaves). ➤ Insectivorous plants. Need for modification with an example. ➤ Vegetative propagation in leaf (example bryophyllum). 	<ul style="list-style-type: none"> ➤ Revisiting previous concepts and building on past learning. ➤ Promoting children's observation of plants in their surroundings, and drawing pictures with the common names of the plants written below the pictures. ➤ Asking children to draw different types of leaves, their structure and kinds and types of venation and modifications. ➤ Observing a pea plant, noting the tendril which is a modified leaf. ➤ Discussing the function of a tendril. ➤ Conducting activities which may be carried out at home to demonstrate photosynthesis and transpiration in leaves. 	<ul style="list-style-type: none"> ➤ PPTs Videos

Plant Life

Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p style="text-align: center;">THE FLOWER</p> <ul style="list-style-type: none"> ➤ Parts (4 whorls), structure and function of each whorl. ➤ Pollination (self and cross): An idea about agents of cross pollination (wind, water and insects – their examples). ➤ Fertilization: process in simple terms. ➤ Formation of fruit – fate of each part (whorl) of flower after fertilization. ➤ Parts of fruits: dry and fleshy, examples of dry and fleshy parts; parts of the pericarp of fleshy fruits (epicarp, mesocarp, endocarp) and function of each part. ➤ Seed- parts (cotyledon, embryo: Radicle, plumule) and types (monocot, dicot) ➤ Germination – conditions required for germination (moisture, warmth), seed germination of different seeds. 	<ul style="list-style-type: none"> ➤ Observing spines in the picture of a Cactus plant and stating their function. ➤ Drawing a diagram of the Cactus plant and labelling it. ➤ Asking children to observe a flower (such as china rose) and studying its different parts and whorls. ➤ Encouraging children to draw pictures of different flowers and labelling the parts observed (only complete flowers showing all 4 whorls). ➤ Studying and drawing pictures of different fruits (like pea, bean, mango, tomato, coconut); and seeds of maize, wheat/paddy (rice). ➤ Asking children to sow seeds in a petri dish containing a wet blotting paper to observe germination phenomenon. ➤ Asking learners to classify fruits as dry and fleshy. ➤ Developing a herbarium of flowers / leaves. ➤ Conducting simple activities to identify: cotyledon, monocot seeds, dicot seeds. ➤ Setting up experiments for seed germination in different seeds. 	<ul style="list-style-type: none"> ➤ Flowers – Petunia, China rose ; (any common flower) ➤ Fruits such as, pea, bean, mango, tomato, coconut. ➤ Germinated seeds.

Integration: Geography, Languages

Life Skill: Sensitivity towards environment

Theme 2: 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:

- ☑ identify difference in unicellular and multicellular organisms and cite examples;
- ☑ identify the different cell organelles (cell wall, cell membrane, nucleus, chloroplast, vacuole) and learn about their primary functions;
- ☑ distinguish and draw diagrams of a plant cell and an animal cell.

The Cell		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Plant cell: Cell organelles and their functions. ➤ Animal cell: Cell organelles and their functions. ➤ Diagrams of plant and animal cell. ➤ Only the following to be included: Cell wall, Cell membrane, Plastids, Nucleus, Vacuole, Cytoplasm – their structure and functions ➤ Differences between plant and animal cells. 	<ul style="list-style-type: none"> ➤ Drawing a diagram of plant and animal cell with labels nucleus, vacuoles, plastid, cell membrane and cell wall. ➤ Asking children to differentiate between plant and animal cells. ➤ Showing videos and PPTs on structure of the Cell. ➤ Assigning projects and preparation of models (individually or in groups) on plant and animal cell; ➤ Discussing the structure and functions of cell organelles; 	<ul style="list-style-type: none"> ➤ Videos, E.M. photographs and PPTs of plant and animal cells, listed cell organelles.

Theme 3: 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 and respiratory systems in the human body.

Learning Outcomes:

Children will be able to:

- ☑ name the organs of the digestive system;
- ☑ state functions of the organs of the digestive system;
- ☑ list the main parts and functions of each part of the respiratory system;
- ☑ distinguish between respiration and breathing;
- ☑ outline the mechanism of breathing and the role of diaphragm in inhalation and exhalation.

Human Body		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<p>Digestive System</p> <ul style="list-style-type: none"> ➤ Revisit previous learning. ➤ Organs of the digestive system; function of each organ. <p>Respiratory System</p> <ul style="list-style-type: none"> ➤ Main parts (nose, pharynx, larynx, trachea, bronchi, lungs); functions of each part of the respiratory system. ➤ Difference between respiration and breathing. ➤ Mechanism of breathing (physical process with respect to diaphragm and ribs-inhalation and exhalation). 	<ul style="list-style-type: none"> ➤ Discussing with children about their own experiences. ➤ Providing opportunities to: <ul style="list-style-type: none"> ☛ <i>label its parts.</i> ☛ <i>describe functions of each organ.</i> ➤ Discussing and finding out: <ul style="list-style-type: none"> ☛ <i>causes of indigestion.</i> ☛ <i>healthy and unhealthy food habits.</i> ☛ <i>ways to keep on oneself healthy.</i> ➤ Assigning Projects individually to interview three people and find out about their food habits. Sharing the same in class. ➤ Asking children to: <ul style="list-style-type: none"> ☛ <i>observe through diagram/images different parts of the human respiratory system;</i> ☛ <i>draw pictures of respiratory system and label its parts;</i> ☛ <i>discuss the process of respiration;</i> ☛ <i>discuss the effects of increased physical activity on breathing.</i> 	<ul style="list-style-type: none"> ➤ Picture of Digestive system ➤ Children’s drawings. ➤ Interview. ➤ Report on project work. ➤ PPTs and videos. ➤ Family doctor/Other Doctors. ➤ Models and charts ➤ PPTs and videos

Integration: Chemistry, Health and Physical Education

Theme 4: 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:

- explain the meaning of terms such as 'health', 'hygiene' and 'disease';
- relate the knowledge acquired to the personal experiences of diseases suffered, if any.
- relate the types of diseases on the basis of their transmission as infectious and non-infectious.
- spread awareness regarding diseases to friends and family.

Health and Hygiene		
Key Concepts	Suggested Transactional Processes	Suggested Learning Resources
<ul style="list-style-type: none"> ➤ Types of diseases (communicable and non-communicable). ➤ Communicable diseases: bacterial and viral (common examples of each). ➤ Modes of transmission of diseases (air, water, food, insects). ➤ Ways to prevent communicable diseases. ➤ Hygiene – ways to keep the surroundings clean, safe disposal of garbage, healthy practices for hygiene. 	<ul style="list-style-type: none"> ➤ Building on previous learning and concepts. ➤ Discussing with children: <ul style="list-style-type: none"> ☛ names of some diseases and their symptoms; ☛ prevention of diseases while sharing their experiences. ➤ Asking children to relate their experiences when they had a particular disease/ seen patient in the family. ➤ Organizing brainstorming sessions to discuss: <ul style="list-style-type: none"> ☛ disposal of garbage, its segregation ☛ healthy practices for hygiene ☛ ways to keep the surroundings clean 	<ul style="list-style-type: none"> ➤ PPTs. ➤ Videos. ➤ Discussion on disposal practices

Integration: Health and Physical Education

Life Skill: Health awareness, concern for environmental cleanliness