

SYLLABUS CONTENT

6 SYLLABUS CONTENT (P3 and P4)



About Diversity:

There is a great variety of living and non-living things in the world. Man seeks to organise this great variety of living and non-living things to better understand the world in which he lives. There are common threads that connect all living things and unifying factors in the diversity of non-living things that help him to classify them. This theme brings across the importance of maintaining diversity.

Note: * Lower Block
** Upper Block

Essential Takeaways:

- *There is a great variety of living and non-living things around us.*
- *Man can classify living and non-living things based on their similarities and differences to better understand them.*
- *Maintaining the diversity of living things around us ensures their continual survival.*

Key Inquiry Questions:

- *What can we find around us?*
- *How can we classify the great variety of living and non-living things?*
- *Why is it important to maintain diversity?*

Introducing the theme Diversity:



Things Around Us:

Based on the story of Carl Linnaeus and his classification as well as field trips to the school garden, students can observe and classify the diversity of living things and non-living things around them. Students can also be encouraged to give reasons and criteria for their groupings. Students can appreciate the importance of grouping when they are looking for a particular item in the supermarket or a certain resource in the library.



Idea from Mother Nature:

Based on the story of how George de Mestral and his dog's nature hike led to the invention of hook and loop fasteners, students can appreciate how careful observation and curiosity can lead to the invention of products, making use of properties of different materials.

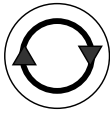


Seizing the Opportunity:

Based on the invention of sticky note pads, students can appreciate how scientists have creatively turned weak adhesives into making useful paper products.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Diversity of Living and Non-Living Things (P3 and P4)		
<ul style="list-style-type: none"> • *Describe the characteristics of living things. <ul style="list-style-type: none"> - need water, food and air to survive - grow, respond and reproduce • *Recognise some broad groups of living things. <ul style="list-style-type: none"> - plants (flowering, non-flowering) - animals (amphibians, birds, fish, insects, mammals, reptiles) - fungi (mould, mushroom, yeast) - bacteria <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>Recall of names of specific living things (e.g. guppy) and their characteristics (e.g. give birth to young alive) is not required.</i> 	<ul style="list-style-type: none"> • *<u>Observe</u> a variety of living and non-living things and <u>infer</u> differences between them. • *<u>Classify</u> living things into broad groups (in plants and animals) based on similarities and differences of common observable characteristics. 	<ul style="list-style-type: none"> • *Show <u>curiosity</u> in exploring the surrounding living and non-living things by asking questions. • *Value individual effort and team work by respecting different perspectives.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Diversity of Materials (P3 and P4)		
<ul style="list-style-type: none"> *Relate the use of various types of materials (ceramic, fabric, glass, metal, plastics, rubber, wood) to their physical properties. 	<ul style="list-style-type: none"> *Compare physical properties of materials based on: <ul style="list-style-type: none"> - strength - flexibility - waterproof - transparency - ability to float/sink in water <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>The focus is on how the properties of materials are used.</i> - <i>The “strength” of a material is its ability to be subjected to loads without breaking.</i> - <i>The “flexibility” of a material is its ability to bend without breaking.</i> - <i>A material is “waterproof” when it does not absorb water.</i> - <i>The “transparency” of a material refers to whether the material allows most/some or no light to pass through. (The use of terms – transparent/ translucent/opaque is not required).</i> 	<ul style="list-style-type: none"> *Show <u>objectivity</u> by using data and information to validate observations and explanations about the properties and uses of materials.

**About Cycles:**

There are repeated patterns of change in nature. Examples of these cycles are the life cycles of living things and the water cycle. Understanding these cycles helps Man to predict events and processes and to appreciate the Earth as a self-sustaining system.

Note:

* Lower Block

** Upper Block

Essential Takeaways:

- *There are repeated patterns of change around us.*
- *Observing cycles helps us to make predictions and understand things around us.*

Key Inquiry Questions:

- *What makes a cycle?*
- *Why are cycles important to life?*

Introducing the theme Cycles:**Travel Story:**

Get students to share their personal stories of day and night in different countries. This will help them recognise that people living in some countries experience longer/shorter days or nights. These countries have four seasons – summer, autumn, winter and spring.

**A Leader in Clean Water:**

Olivia Lum, our very own Singapore's entrepreneur, not only proposed a solution to our pursuit of clean water but also brought her research and development of water technology to the world. Her innovative problem solving and entrepreneurship have benefited not just Singapore but the world.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Cycles in Plants and Animals (P3 and P4)		
<ul style="list-style-type: none"> *Show an understanding that different living things have different life cycles. <ul style="list-style-type: none"> - Plants - Animals 	<ul style="list-style-type: none"> *<u>Observe</u> and <u>compare</u> the life cycles of plants grown from seeds over a period of time. *<u>Observe</u> and <u>compare</u> the life cycles of animals over a period of time (butterfly, beetle, mosquito, grasshopper, cockroach, chicken, frog). 	<ul style="list-style-type: none"> *Show <u>curiosity</u> in exploring the surrounding plants and animals and question what they find. *Show <u>concern</u> by being responsible towards plants and animals such as their own pets. *Value individual effort and team work.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Cycles in Plants and Animals (P5 and P6 Standard)		
<ul style="list-style-type: none"> ** Show an understanding that living things reproduce to ensure continuity of their kind and that many characteristics of an organism are passed on from parents to offspring. ** Recognise processes in the sexual reproduction of flowering plants. <ul style="list-style-type: none"> - pollination - fertilisation (seed production) - seed dispersal - germination <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>The use of specific terms (“self-pollination” and “cross-pollination”) to describe the pollination process is not required.</i> <ul style="list-style-type: none"> ** Recognise the process of fertilisation in the sexual reproduction of humans. <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>Students should know that ovaries produce eggs and the testes produce sperms.</i> - <i>Fertilisation occurs when a sperm fuses with an egg.</i> - <i>The fertilised egg develops in the womb.</i> 	<ul style="list-style-type: none"> **<u>Investigate</u> the various ways in which plants reproduce and <u>communicate</u> findings. <ul style="list-style-type: none"> - spores - seeds <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>Vegetative propagation methods such as stem cutting, grafting, marcotting are not required.</i> 	<ul style="list-style-type: none"> **Show <u>curiosity</u> in exploring the surrounding plants and animals by asking questions. **Show <u>concern</u> by being responsible towards plants and animals such as their own pets. **Value individual effort and team work by respecting different perspectives.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Cycles in Plants and Animals (P5 and P6 Standard)		
<ul style="list-style-type: none"> **Recognise the similarity in terms of fertilisation in the sexual reproduction of flowering plants and humans. 		

Learning Outcomes

Knowledge, Understanding and Application

Skills and Processes

Ethics and Attitudes

Cycles in Plants and Animals (P5 and P6 Foundation)

- ****State the processes in the sexual reproduction of flowering plants.**
 - pollination
 - fertilisation (seed production)
 - seed dispersal
 - germination

Note:

- *The use of specific terms ("self-pollination" and "cross-pollination") to describe the pollination process is not required.*

- ****State the process of fertilisation in the sexual reproduction of humans.**

Note:

- *Students should know that ovaries produce eggs and the testes produce sperms.*
- *Fertilisation occurs when a sperm fuses with an egg.*
- *The fertilised egg develops in the womb.*

- ****Observe and compare the various ways in which plants reproduce and communicate findings.**
 - spores
 - seeds

Note:

- *Vegetative propagation methods such as stem cutting, grafting, marcotting are not required.*

- ****Show curiosity** in exploring the surrounding plants and animals by asking questions.
- ****Show concern** by being responsible towards plants and animals such as their own pets.
- ****Value individual effort and team work** by respecting different perspectives.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Cycles in Matter and Water (P3 and P4)		
<ul style="list-style-type: none"> • *State that matter is anything that has mass and occupies space. • *Differentiate between the three states of matter (solid, liquid, gas) in terms of shape and volume. 	<ul style="list-style-type: none"> • *<u>Measure</u> mass and volume using appropriate apparatus. 	<ul style="list-style-type: none"> • *Show <u>curiosity</u> in exploring matter in the surroundings and question what they find.

Learning Outcomes

Knowledge, Understanding and Application

Skills and Processes

Ethics and Attitudes

Cycles in Matter and Water (P5 and P6 Standard)

<ul style="list-style-type: none"> • **Recognise that water can exist in three interchangeable states of matter. • **Show an understanding of how water changes from one state to another. <ul style="list-style-type: none"> - Melting (solid to liquid) - Evaporation/Boiling (liquid to gas) - Condensation (gas to liquid) - Freezing (liquid to solid) • **Show an understanding of the terms melting point of ice (or freezing point of water) and boiling point of water. • **Show an understanding of the roles of evaporation and condensation in the water cycle. • **Recognise the importance of the water cycle. • **Recognise the importance of water to life processes. • **Describe the impact of water pollution on Earth's water resources. 	<ul style="list-style-type: none"> • **Compare water in 3 states. • **Investigate the effect of heat gain or loss on the temperature and state of water and <u>communicate</u> findings. <ul style="list-style-type: none"> - when ice is heated, it melts and changes to water at 0°C - when water is cooled, it freezes and changes to ice at 0°C - when water is heated, it boils and changes to steam at 100°C - when steam is cooled, it condenses to water • **Investigate the factors which affect the rate of evaporation and <u>communicate</u> findings. <ul style="list-style-type: none"> - wind - temperature - exposed surface area 	<ul style="list-style-type: none"> • **Show concern for water as a limited natural resource and the need for water conservation.
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Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Cycles in Matter and Water (P5 and P6 Foundation)		
<ul style="list-style-type: none"> • **Recognise that water can exist in three interchangeable states of matter. • **State how water changes from one state to another. <ul style="list-style-type: none"> - Melting (solid to liquid) - Evaporation/Boiling (liquid to gas) - Condensation (gas to liquid) - Freezing (liquid to solid) • **State the melting point of ice (or freezing point of water) and boiling point of water. • **Recognise the changes in states of water in the water cycle. • **Recognise the importance of the water cycle. 	<ul style="list-style-type: none"> • **<u>Compare</u> water in 3 states. 	<ul style="list-style-type: none"> • **Show <u>concern</u> for water as a limited natural resource and the need for water conservation.

**About Systems:**

A system is a whole consisting of parts that work together to perform a function(s). There are systems in nature as well as man-made systems. Examples of systems in nature are the digestive and respiratory systems. Examples of man-made systems are electrical systems. Understanding these systems allows Man to understand how they operate and how parts influence and interact with one another to perform a function.

Note:

* Lower Block

** Upper Block

Essential Takeaways:

- *A system is made of different parts. Each part has its own unique function.*
- *Different parts/systems interact to perform function(s).*

Key Inquiry Questions:

- *What is a system?*
- *How do parts/systems interact to perform function(s)?*

Introducing the theme Systems:**The Cell Story:**

Students can find out more about scientists such as Anton Leewenhoek, Robert Hooke who have contributed to the discovery and study of cells.

**Frightening Lightning:**

Using the story of how Benjamin Franklin invented the lightning rod, students can appreciate how Man comes to understand the world around him and protect themselves against lightning.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Human System (P3 and P4)		
<ul style="list-style-type: none"> *Identify the organ systems and state their functions in human (digestive, respiratory, circulatory, skeletal and muscular). <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>This learning outcome introduces students to an overview of organ systems. Detailed knowledge of the muscular and skeletal systems (such as names of the bones/muscles in the body and descriptions of how they work) are not required.</i> <ul style="list-style-type: none"> *Identify the organs in the human digestive system (mouth, gullet, stomach, small intestine and large intestine) and describe their functions. 		<ul style="list-style-type: none"> *Show <u>curiosity</u> in exploring their own body and questioning about the structures or functions of the body.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Human System (P5 and P6 Standard)		
<ul style="list-style-type: none"> • **Recognise that air is a mixture of gases such as nitrogen, carbon dioxide, oxygen and water vapour. • **Identify the organs of the human respiratory and circulatory systems and describe their functions. <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>Detailed knowledge of respiratory system (e.g. alveoli) and circulatory system (e.g. heart chambers and valves) is not required.</i> <ul style="list-style-type: none"> • **Recognise the integration of the different systems (digestive, respiratory and circulatory) in carrying out life processes. 	<ul style="list-style-type: none"> • **<u>Compare</u> how plants, fish and humans take in oxygen and give out carbon dioxide. • **<u>Compare</u> the ways in which substances are transported within plants and humans. <ul style="list-style-type: none"> - plants: tubes that transport food and water - humans: blood vessels that transport digested food, oxygen and carbon dioxide <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>The use of names of specific tubes (xylem, phloem) and blood vessels (artery, vein, capillaries) is not required.</i> 	<ul style="list-style-type: none"> • **Show <u>objectivity</u> by seeking data and information to validate observations and explanations about their body.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Human System (P5 and P6 Foundation)		
<ul style="list-style-type: none"> • **Recognise that air is a mixture of gases such as nitrogen, carbon dioxide, oxygen and water vapour. • **Identify the organs of the human respiratory and circulatory systems and state their functions. <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>Detailed knowledge of respiratory system (e.g. alveoli) and circulatory system (e.g. heart chambers and valves) is not required.</i> 	<ul style="list-style-type: none"> • **Compare how plants and humans take in oxygen and give out carbon dioxide. <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>The use of names of specific tubes (xylem, phloem) and blood vessels (artery, vein, capillaries) is not required.</i> 	<ul style="list-style-type: none"> • **Show <u>objectivity</u> by seeking data and information to validate observations and explanations about their body.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Plant System (P3 and P4)		
<ul style="list-style-type: none"> • *Identify the different parts of plants and state their functions. - leaf - stem - root 	<ul style="list-style-type: none"> • *<u>Observe</u> plant parts. 	<ul style="list-style-type: none"> • *Show <u>curiosity</u> in exploring the surrounding plants and question what they find. • *Show <u>concern</u> by being responsible towards plants.

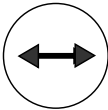
Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Plant System (P5 and P6 Standard)		
<ul style="list-style-type: none"> **Identify the parts of the plant transport system and describe their functions. <p><i>Note:</i></p> <ul style="list-style-type: none"> - Recall of the relative positions of water and food carrying tubes is not required. - The use of specific terms (“xylem” and “phloem”) is not required. 	<ul style="list-style-type: none"> **<u>Investigate</u> the functions of plant parts and <u>communicate</u> findings. - leaf - stem - root 	<ul style="list-style-type: none"> **Show <u>objectivity</u> by seeking data and information to validate observations and explanations about plant parts and functions.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Plant System (P5 and P6 Foundation)		
<ul style="list-style-type: none"> **Recognise how water is transported from the roots to other parts of the plant and how food is transported from the leaves to other parts of the plant. <p><i>Note:</i></p> <ul style="list-style-type: none"> - Recall of the relative positions of water and food carrying tubes is not required. - The use of specific terms ("xylem" and "phloem") is not required. 	<ul style="list-style-type: none"> **<u>Observe</u> and recognise the functions of plant parts and <u>communicate</u> findings. <ul style="list-style-type: none"> - leaf - stem - root 	<ul style="list-style-type: none"> **Show <u>objectivity</u> by seeking data and information to validate observations and explanations about plant parts and functions.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Cell System (P5 and P6 Standard)		
<ul style="list-style-type: none"> • **Show an understanding that a cell is a basic unit of life. • **Identify the different parts of a typical plant cell and animal cell and relate the parts to the functions. <ul style="list-style-type: none"> - parts of plant cell: cell wall, cell membrane, cytoplasm, nucleus and chloroplasts - parts of animal cell: cell membrane, cytoplasm, nucleus <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>Knowledge of specialised cells such as blood cells, muscle cells and nerve cells is not required.</i> 	<ul style="list-style-type: none"> • **<u>Compare</u> a typical plant and animal cell. 	<ul style="list-style-type: none"> • **Show <u>curiosity</u> in exploring the microscopic world and questioning what they find. • **Value individual effort and team work by respecting different perspectives.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Electrical System (P5 and P6 Standard)		
<ul style="list-style-type: none"> • **Recognise that an electric circuit consisting of an energy source (battery) and other circuit components (wire, bulb, switch) forms an electrical system. • **Show an understanding that a current can only flow in a closed circuit. • **Identify electrical conductors and insulators. 	<ul style="list-style-type: none"> • **Construct simple circuits from circuit diagrams. • **Investigate the effect of some variables on the current in a circuit and <u>communicate</u> findings. <ul style="list-style-type: none"> - number of batteries (arranged in series) - number of bulbs (arranged in series and parallel) 	<ul style="list-style-type: none"> • **Show concern for the need to conserve and to have proper use and handling of electricity. • **Value individual effort and team work by respecting different perspectives.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Electrical System (P5 and P6 Foundation)		
<ul style="list-style-type: none"> • **Recognise that an electric circuit consisting of an energy source (battery) and other circuit components (wire, bulb, switch) forms an electrical system. • ** State that a current can only flow in a closed circuit. • **Identify electrical conductors and insulators. 	<ul style="list-style-type: none"> • **Construct simple circuits from circuit diagrams. • **Investigate the effect of some variables on the current in a circuit and communicate findings. <ul style="list-style-type: none"> - number of batteries (arranged in series) - number of bulbs (arranged in series) 	<ul style="list-style-type: none"> • **Show concern for the need to conserve and to have proper use and handling of electricity. • **Value individual effort and team work by respecting different perspectives.

**About Interactions:**

Studying the interactions between and within systems enhances understanding of the environment and Man's role in it. Interactions occur within an organism, between organisms as well as between organisms and the environment. The interaction of Man with the environment drives the development of Science and Technology. At the same time, Science and Technology influences the way Man interacts with the environment. By understanding the interactions between Man and the environment, students can better appreciate the consequences of their actions and be responsible for their actions.

Note: *Lower Block
** Upper Block

Essential Takeaways:

- *There are interactions among Man, living and non-living things in the environment.*
- *Man can interact with the environment and make positive or negative impacts.*
- *Man plays an important role in conservation to ensure continuity of life and availability of resources.*

Key Inquiry Questions:

- *How does Man better understand the environment?*
- *What are the consequences of Man's interactions with the environment?*

Introducing the theme Interactions:**Did you see the apple fall?:**

Based on the story of Newton and how he first discovered gravity, students can appreciate how discoveries and inventions may come about through careful observations and inferences on interactions within or between different things in everyday life.

**Hello...:**

Based on the story of Alexander Graham Bell, whose mother and wife were deaf, students can appreciate how Bell's research into hearing and speech led him to experiment with hearing devices which eventually resulted in the invention of the telephone.

**Mouldy Discovery:**

Based on the story of how Alexander Fleming's accidental discovery of how penicillin in moulds could kill bacteria, students can appreciate how careful observations of happenings around them can lead to useful discoveries that could benefit generations to come.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Interactions of Forces (P3 and P4)		
<ul style="list-style-type: none"> *Recognise that a magnet can exert a push or a pull. *Identify the characteristics of magnets. <ul style="list-style-type: none"> - magnets can be made of iron or steel - magnets have two poles. A freely suspended bar magnet comes to rest pointing in a North-South direction - unlike poles attract and like poles repel - magnets attract magnetic materials <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>Recall of other magnetic materials such as nickel and cobalt is not required.</i> *List some uses of magnets in everyday objects. 	<ul style="list-style-type: none"> *<u>Compare</u> magnets, non-magnets and magnetic materials. *<u>Make</u> a magnet by the 'Stroke' method and the electrical method. 	<ul style="list-style-type: none"> *Show <u>curiosity</u> in exploring uses of magnets in everyday life and question what they find.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Interactions of Forces (P5 and P6 Standard)		
<ul style="list-style-type: none"> • **Identify a force as a push or a pull. • **Show an understanding of the effects of a force. <ul style="list-style-type: none"> - A force can move a stationary object - A force can speed up, slow down or change the direction of motion - A force can stop a moving object - A force may change the shape of an object • **Recognise and give examples of the different types of forces. <ul style="list-style-type: none"> - magnetic force - gravitational force - elastic spring force - frictional force <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>Direction of friction for “rolling objects” such as wheels and balls is not required.</i> <ul style="list-style-type: none"> • **Recognise that objects have weight because of the gravitational force acting on the object. 	<ul style="list-style-type: none"> • **Investigate the effect of friction on the motion of objects and <u>communicate</u> findings. • **Investigate the effects of forces on springs and <u>communicate</u> findings. 	<ul style="list-style-type: none"> • **Show <u>objectivity</u> by using data and information to validate observations and explanations about forces. • **Value individual effort and team work by respecting different perspectives.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Interactions of Forces (P5 and P6 Foundation)		
<ul style="list-style-type: none"> • **Identify a force as a push or a pull. • **State the effects of a force. <ul style="list-style-type: none"> - A force can move a stationary object - A force can speed up, slow down or change the direction of motion - A force can stop a moving object - A force may change the shape of an object • **Recognise and give examples of the different types of forces. <ul style="list-style-type: none"> - magnetic force - gravitational force - frictional force <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>Direction of friction for “rolling objects” such as wheels and balls is not required.</i> <ul style="list-style-type: none"> • **Recognise that objects have weight because of the gravitational force acting on the object. 	<ul style="list-style-type: none"> • **Investigate the effect of friction on the motion of objects and <u>communicate</u> findings. 	<ul style="list-style-type: none"> • **Show <u>objectivity</u> by using data and information to validate observations and explanations about forces. • **Value individual effort and team work by respecting different perspectives.

Learning Outcomes

Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Interactions within the Environment (P5 and P6 Standard)		
<ul style="list-style-type: none"> ● **Identify the factors that affect the survival of an organism. <ul style="list-style-type: none"> - physical characteristics of the environment (temperature, light, water) - availability of food - types of other organisms present (producers, consumers, decomposers) ● **Discuss the effect on organisms when the environment becomes unfavourable (organisms adapt and survive; move to other places or die). ● **Trace the energy pathway from the Sun through living things and identify the roles of various organisms (producers, consumers, predators, prey) in a food chain and a food web. ● **Differentiate among the terms organism, population and community. <ul style="list-style-type: none"> - An organism is a living thing. - A population is defined as a group of plants and animals of the same kind, living and reproducing at a given place and time. - A community consists of many populations living together in a particular place. ● **Show an understanding that different habitats support different communities (garden, field, pond, seashore, tree, mangrove swamp). 	<ul style="list-style-type: none"> ● **<u>Observe, collect and record</u> information regarding the interacting factors within an environment. 	<ul style="list-style-type: none"> ● **Show <u>concern</u> by being respectful and responsible towards the environment and the organisms living in it. ● **Show <u>concern</u> for Man's impact on the environment. ● **Value individual effort and team work.

Learning Outcomes

Knowledge, Understanding and Application

Skills and Processes

Ethics and Attitudes

Interactions within the Environment (P5 and P6 Standard)

- ****Recognise that adaptations serve to enhance survival and can be structural or behavioural.**
 - cope with physical factors
 - obtain food
 - escape predators
 - reproduce by finding and attracting mates or dispersing seeds/fruits

Note:

- *Students are introduced to the types of dispersal methods and physical characteristics of different fruits and seeds in the theme of Cycles. The focus in this theme is to help students recognise that physical characteristics are the “structural adaptations” which help fruits and seeds in their dispersal.*

- ****Give examples of man’s impact, (both positive and negative) on the environment.**

Note:

- *Positive impact: e.g. Conservation, Reforestation*
- *Negative impact: e.g. Depleting natural resources, deforestation, pollution (land/water/air), global warming*

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Interactions within the Environment (P5 and P6 Foundation)		
<ul style="list-style-type: none"> • **Identify the factors that affect the survival of an organism. <ul style="list-style-type: none"> - physical characteristics of the environment (temperature, light, water) - availability of food - types of other organisms present (producers, consumers, decomposers) • **Trace the energy pathway from the Sun through living things and identify the roles of various organisms (producers, predators, prey) in a food chain. • **Recognise that different habitats support different organisms (garden, field, pond, seashore, tree, mangrove swamp). • **Recognise that adaptations serve to enhance survival and can be structural or behavioural. <ul style="list-style-type: none"> - cope with physical factors - obtain food - escape predators - reproduce by finding and attracting mates or dispersing seeds/fruits 	<ul style="list-style-type: none"> • **<u>Observe</u>, <u>collect</u> and <u>record</u> information regarding the interacting factors within an environment. 	<ul style="list-style-type: none"> • **Show <u>concern</u> by being respectful and responsible towards the environment and the organisms living in it. • **Show <u>concern</u> for Man's impact on the environment. • **Value individual effort and team work.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Interactions within the Environment (P5 and P6 Foundation)		
<p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>Students are introduced to the types of dispersal methods and physical characteristics of different fruits and seeds in the theme of Cycles. The focus in this theme is to help students recognise that physical characteristics are the “structural adaptations” which help fruits and seeds in their dispersal.</i> <ul style="list-style-type: none"> ● **Give examples of man’s impact, (both positive and negative) on the environment. <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>Positive impact: e.g. Conservation, Reforestation</i> - <i>Negative impact: e.g. Depleting natural resources, deforestation, pollution (land/water/air), global warming</i> 		

**About Energy:**

Energy makes changes and movement possible in everyday life. Man uses various forms of energy for many different purposes. Man is not the only animal that needs energy; all living things obtain energy and use it to carry out life processes. Understanding this theme will allow students to appreciate the importance and uses of energy and the need to conserve it.

Note:

* **Lower Block**

** **Upper Block**

Essential Takeaways:

- *Energy is required to enable things to work or move.*
- *There are different forms of energy and they can be converted from one form to another.*
- *Some sources of energy can be depleted and Man plays an important role in energy conservation.*

Key Inquiry Questions:

- *Why is energy important?*
- *How is energy used in everyday life?*
- *Why is it important to conserve energy?*

Introducing the theme Energy:**The Light Bulb Story:**

Using the story of Thomas Edison and his invention of the light bulb, students can appreciate how creativity and perseverance have led to an invention that brings light to Mankind.

**The Thermometer Story:**

Since the first mercury thermometer by Daniel Gabriel Fahrenheit, students can appreciate how scientists have built on each others' creations and tap on advances in technology to make a range of thermometers to quantify heat in different contexts.

**The SARS Story:**

A group of scientists and engineers in Singapore responded quickly to help detect people with fever by developing the infrared fever screening system. This has helped combat the SARS (Severe Acute Respiratory Syndrome) outbreak.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Energy Forms and Uses (P3 and P4)		
<ul style="list-style-type: none"> *Recognise that an object can be seen when it reflects light or when it is a source of light. <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>The laws of reflection are not required.</i> <ul style="list-style-type: none"> *Recognise that a shadow is formed when light is completely or partially blocked by an object. 	<ul style="list-style-type: none"> *<u>Investigate</u> the variables that affect shadows formed and <u>communicate</u> findings. <ul style="list-style-type: none"> - shape, size and position of object(s) - distance between light source-object and object-screen <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>The use of terms – transparent/translucent/opaque is not required.</i> 	<ul style="list-style-type: none"> *Show <u>objectivity</u> by using data and information to validate observations and explanations about light.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Energy Forms and Uses (P3 and P4)		
<ul style="list-style-type: none"> • *List some common sources of heat. • *State that the temperature of an object is a measurement of its degree of hotness. • *Differentiate between heat and temperature. <ul style="list-style-type: none"> - heat is a form of energy - temperature is a measurement of the degree of hotness of an object • *Show an understanding that heat flows from a hotter to a colder object/region/place until both reach the same temperature. • *Relate the change in temperature of an object to the gain or loss of heat by the object. • *List some effects of heat gain/loss in our everyday life. <ul style="list-style-type: none"> - contraction / expansion of objects (solid, liquid and gas) - change in state of matter • *Identify good and poor conductors of heat. <ul style="list-style-type: none"> - good conductors: metals - poor conductors: wood, plastics, air 	<ul style="list-style-type: none"> • *<u>Measure</u> temperature using a thermometer and a datalogger with temperature/heat sensors. 	<ul style="list-style-type: none"> • *Show <u>objectivity</u> by seeking data and information to validate observations and explanations about heat.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Energy Forms and Uses (P3 and P4)		
<p><i>Note:</i></p> <ul style="list-style-type: none"> - Recall of the rate of heat transfer of specific materials (such as different types of metals) is not required. 		

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Energy Forms and Uses (P5 and P6 Standard)		
<ul style="list-style-type: none"> • **State that living things need energy to carry out life processes. • **Recognise that the Sun is our primary source of energy (light and heat). • **Differentiate the ways in which plants and animals obtain energy. 	<ul style="list-style-type: none"> • **Investigate the requirements (water, light energy and carbon dioxide) for photosynthesis (production of sugar and oxygen) and <u>communicate</u> findings. 	<ul style="list-style-type: none"> • **Show <u>objectivity</u> by using data and information to validate observations and explanations about photosynthesis.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Energy Forms and Uses (P5 and P6 Foundation)		
<ul style="list-style-type: none"> **Recognise that the Sun is our primary source of energy (light and heat). 	<ul style="list-style-type: none"> **<u>Investigate</u> the requirements (water, light energy and carbon dioxide) for photosynthesis (production of sugar and oxygen) and <u>communicate</u> findings. 	<ul style="list-style-type: none"> **Show <u>objectivity</u> by using data and information to validate observations and explanations about photosynthesis.

Learning Outcomes		
Knowledge, Understanding and Application	Skills and Processes	Ethics and Attitudes
Energy Conversion (P5 and P6 Standard)		
<ul style="list-style-type: none"> • **Recognise that energy from most of our energy resources is derived in some ways from the Sun. • **Recognise and give examples of the various forms of energy. <ul style="list-style-type: none"> - kinetic energy - potential energy - light energy - electrical energy - sound energy - heat energy <p><i>Note:</i></p> <ul style="list-style-type: none"> - <i>The use of specific terms (“chemical energy”, “gravitational potential energy” and “elastic potential energy”) is not required.</i> 	<ul style="list-style-type: none"> • **<u>Investigate</u> energy conversion from one form to another and <u>communicate</u> findings. 	<ul style="list-style-type: none"> • **Show <u>concern</u> for the need to conserve energy usage in our everyday life.