

Republic of the Philippines  
Department of Education  
DepEd Complex, Meralco Avenue  
Pasig City

# **K to 12 Curriculum Guide**

# **SCIENCE**

**(Grade 3 to Grade 10)**

January 31, 2012

## CONCEPTUAL FRAMEWORK

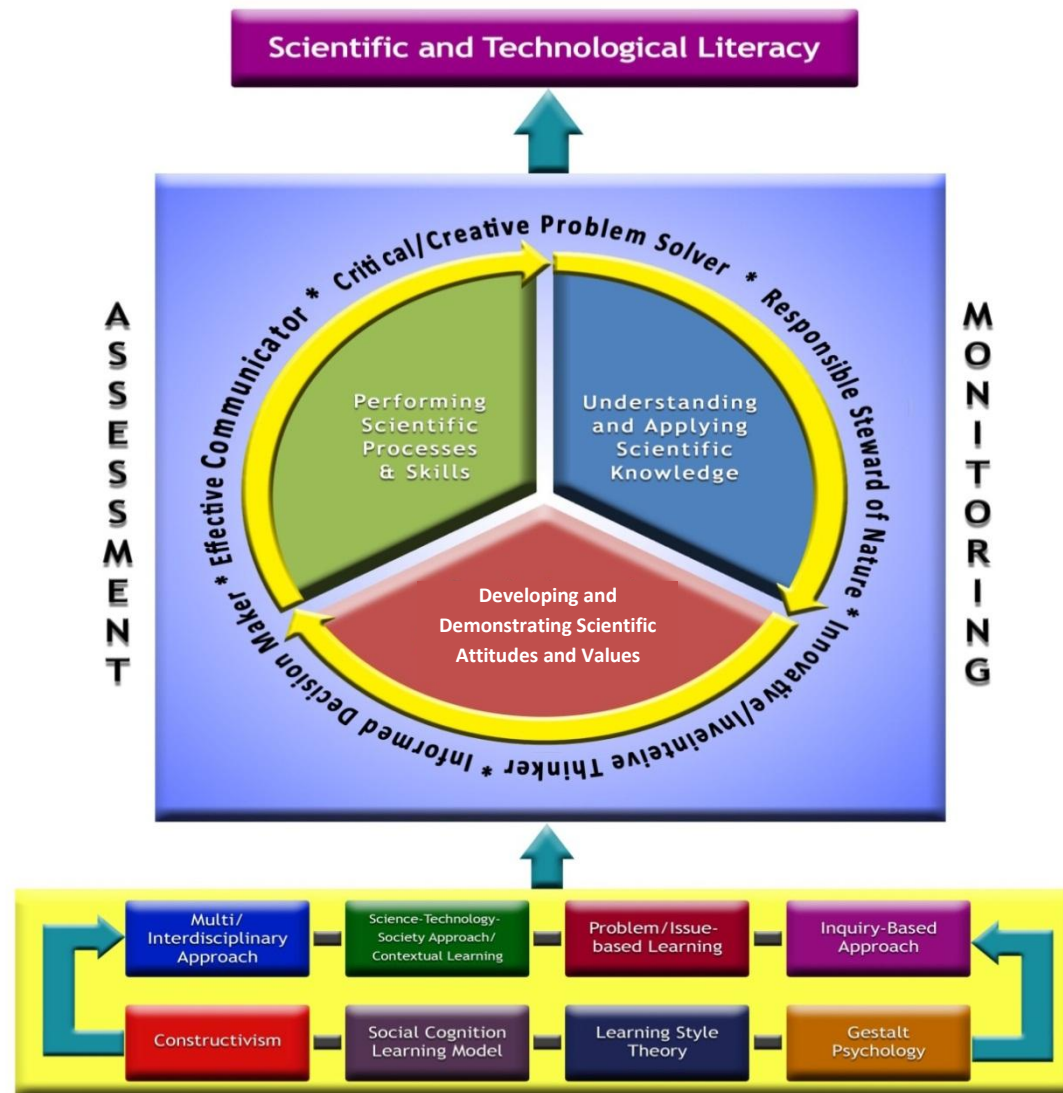
Science education aims to develop scientific literacy among students that will prepare them to be informed and participative citizens who are able to make judgments and decisions regarding applications of scientific knowledge that may have social, health, or environmental impacts.

The science curriculum recognizes the place of science and technology in everyday human affairs. It integrates science and technology in the civic, personal, social, economic, and the values and ethical aspects of life. The science curriculum promotes a strong link between science and technology, including indigenous technology, keeping our country's cultural uniqueness and peculiarities intact.

Whether or not students pursue careers that involve science and technology, the K to 12 science curriculum will provide students with a repertoire of competencies important in the world of work and in a knowledge-based society. The K to 12 science curriculum envisions the development of scientifically, technologically, and environmentally literate and productive members of society who manifest skills as a critical problem solvers, responsible stewards of nature, innovative and creative citizens, informed decision makers, and effective communicators. This curriculum is designed around the three domains of learning science: understanding and applying scientific knowledge in local setting as well as global, context whenever possible, performing scientific processes and skills, and developing and demonstrating scientific attitudes and values. The acquisition of these domains is facilitated using the following approaches: multi/interdisciplinary approach, science–technology society approach, contextual learning, problem/issue-based learning, and inquiry-based approach. The approaches are based on sound educational pedagogy namely: constructivism, social cognition learning model, learning style theory, and Gestalt psychology.

Science content and science processes are intertwined in the K to 12 curriculum. Without the content, learners will have difficulty utilizing science process skills since these processes are best learned in context. Organizing the curriculum around situations and problems that challenge and arouse students' curiosity motivates them to learn and appreciate science as relevant and useful. Rather than relying solely on textbooks, varied hands-on, minds-on, and hearts-on activities will be used to develop students' interest and let them become active learners.

As a whole, the K to 12 science curriculum is learner-centered and inquiry-based, emphasizing the use of evidence in constructing explanations. Concepts and skills in Life Sciences, Physics, Chemistry, and Earth Sciences are presented with increasing levels of complexity from one grade level to another (spiral progression), thus paving the way to deeper understanding of a few concepts. These concepts and skills are integrated rather than discipline-based, stressing the connections across science topics and other disciplines as well as applications of concepts and thinking skills to real life.



The Conceptual Framework of Science Education

**CORE LEARNING AREA STANDARD: (SCIENCE FOR THE ENTIRE K TO 12)**

The learner demonstrates understanding of basic science concepts, applies science process skills, and exhibits scientific attitudes and values to solve problems critically, innovate beneficial products, protect the environment and conserve resources, enhance the integrity and wellness of people, and make informed and unbiased decisions about social issues that involve science and technology. This understanding will lead to learner's manifestation of respect for life and the environment, bearing in mind that Earth is our ONLY HOME.

**KEY STAGE STANDARDS: (STANDARD FOR SCIENCE LEARNING AREA FOR K-3, 4-6, 7-10 AND 11-12)**

K – 3	4 – 6	7 – 10	11-12
At the end of Grade 3, the learners should have acquired healthful habits and developed curiosity about self and their environment using basic process skills of observing, communicating, comparing, classifying, measuring, inferring and predicting. This curiosity will help learners value science as an important tool in helping them continue to explore their natural and physical environment.	At the end of Grade 6, the learners should have developed the essential skills of scientific inquiry – designing simple investigations, using appropriate procedure, materials and tools to gather evidence, observing patterns, determining relationships, drawing conclusions based on evidence, and communicating ideas in varied ways to make meaning of the observations and/or changes that occur in the environment. The content and skills learned will be applied to maintain good health, ensure the protection and improvement of the environment, and practice safety measures.	At the end of Grade 10, the learner should have developed scientific, technological and environmental literacy so that they will not be isolated from the society where they live, will not be overwhelmed by change, and can make rational choices on issues confronting them. Having been exposed to scientific investigations related to real-life, they should recognize that the central feature of an investigation is that if one variable is changed (while controlling all others), the effect of the change on another variable is measured. The context of the investigation can be problems at the local or national level to allow them to communicate with students in other parts of the Philippines or even from other countries using appropriate technology.	At the end of Grade 12, the learner should have gained skills in obtaining scientific and technological information from varied sources about global issues that have impact on the country. They should have acquired attitudes that will allow them to innovate and/or create products useful to the community or country. They should be able to process information to get relevant data for a problem at hand. In addition, learners should have made plans related to their interests and expertise, considering the needs of their community and the country — to pursue either employment, entrepreneurship, or higher education.

Grade/Level	Grade Level Standards
Grade 1	<p>At the end of Grade 1, learners will use their senses to locate and describe the parts of their body and tell the shape, color, texture, taste, and size of things around them. They will differentiate sounds produced by animals, vehicles cars, and musical instruments. They will illustrate how things move. They will describe similarities and differences, given two things. They will use appropriate terms or vocabulary to describe these features. They will collect, sort, count, draw, take things apart, or make something out of the things. They will practice health habits (e.g., washing hands properly, choosing nutritious food) and help clean or pack away their toys. They will ask questions. They will give simple answer/ descriptions to probing questions.</p> <p><i>(Note: These competencies are developed in the learning areas of Mother Tongue, English, Health and Mathematics.)</i></p>
Grade 2	<p>At the end of Grade 2, learners will use their senses to describe more than two objects and using more than two properties. They can sort things in different ways and give a reason for doing so. They will describe the kind of weather or certain events in the home or school and express how these are affecting them. They will tell why some things around them are important. They will decide if what they do is safe or dangerous. They will give suggestions on how to prevent accidents at home (not playing with matches or sharp objects). They will switch off light when not in use or conserve water when taking a bath or brushing teeth. They will help take care of pets or of plants. They will tell short stories about what they do, what they have seen, or what they feel.</p> <p><i>(Note: These competencies are developed in the learning areas of Mother Tongue, English, Health and Mathematics.)</i></p>
Grade 3	<p>At the end of Grade 3, learners will describe the functions of the different parts of the body and things that make up their surroundings --- rocks and soil, plants and animals, the Sun, Moon and stars. They will also learn that things may be solid, liquid or gas while others may give off light, heat and sound. They will also observe changes in the conditions of their surroundings. These will lead learners to become more curious about their surroundings, appreciate nature, and practice health and safety measures.</p>
Grade 4	<p>After investigating, learners will identify materials that do not decay and use this knowledge to help minimize waste at home, school, and in the community. They will also investigate changes in the properties of materials when these are subjected to different conditions.</p> <p>The learners will describe the internal parts of the body and their functions in order to practice ways to maintain good health. They will classify plants and animals according to where they live and observe interactions among living things and their environment. They will infer that plants and animals have traits that help them survive in their environment.</p> <p>Learners will investigate which type of soil is best for certain plants and infer the importance of water in daily activities. They will learn about what makes up weather and apply their knowledge of weather conditions in making decisions for the day. Learners will also infer the importance of the Sun to life on Earth.</p> <p>Learners will investigate the effects of push or pull on the size, shape, and movement of an object</p>

Grade/Level	Grade Level Standards
Grade 5	<p>After investigating, learners will decide whether materials are safe and useful based on their properties. They will also infer that new materials may form when there are changes in properties.</p> <p>Learners will develop healthful and hygienic practices related to the reproductive system after describing changes that accompany puberty. They will compare different modes of reproduction among plant and animal groups and conduct an investigation on pollination. They will also make decisions about the preservation of estuaries and intertidal zones.</p> <p>Learners will recognize that different materials react differently with heat, light, and sound. They will relate these abilities of materials to their specific uses.</p> <p>Learners will describe the changes that earth materials undergo. They will learn about the effects of typhoons and make emergency plans with their families in preparation for typhoons. They will also observe patterns in the natural events by observing the appearance of the Moon</p>
Grade 6	<p>Learners will understand how the different organ systems work together. They will classify plants based on reproductive structures and animals based on the presence or lack of backbone. They will design and conduct an investigation on plant propagation. They will also learn about larger ecosystems such as rainforests, coral reefs, and mangrove swamps.</p> <p>Learners will recognize that when mixed together, materials do not form new ones thus these materials may be recovered using different separation techniques. Learners will also prepare useful mixtures such as food, drinks and herbal medicines.</p> <p>Learners will describe what happens during earthquakes and volcanic eruptions and demonstrate what to do when they occur. They will infer that the weather follows a pattern in the course of a year. They will learn about the solar system, with emphasis on the motions of the Earth as prerequisite to the study of seasons in another grade level.</p> <p>Learners will infer that friction and gravity affect how people and objects move. They will also discover that heat, light, sound, electricity, and motion studied earlier are forms of energy and these undergo transformation.</p>
Grade 7	<p>Learners will recognize the system of classification of matter through semi-guided investigations but emphasizing fair testing.</p> <p>Learners will describe what makes up the Philippines as a whole and the resources found in the archipelago. They will explain the occurrence of breezes, monsoons, and ITCZ and how these weather systems affect people. Using concepts in the previous grade, learners will demonstrate why the seasons change and how eclipses occur.</p>

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Grade/Level	Grade Level Standards
	<p>Learners will describe the motion of objects in terms of distance and speed and represent this in tables, graphs, charts, and equations. They will also investigate how various forms of energy travel through different media.</p> <p>After studying how organ systems work together in plants and animals in the lower grades, learners will now observe very small organisms and structures using a microscope. They will understand that living things are organized into different levels: cells, tissues, organs, organ systems, and organisms. These organisms comprise populations and communities which interact with nonliving things in ecosystems.</p>
Grade 8	<p>Learners will now recognize reproduction as a process of cell division resulting in growth of organisms. They will also deal deeper into the process of digestion studied in the lower grades giving emphasis on proper nutrition for overall wellness. This will lead them to participate in activities that will protect and conserve economically important species used for food.</p> <p>Learners will explain the behavior of matter in terms of the particles it is made of. They will also recognize that ingredients in food and medical products are made up of these particles and are absorbed by the body in the form of ions.</p> <p>Learners will explain how active faults generate earthquakes and how tropical cyclones originate from warm ocean waters. They will also learn about the other members of the solar system.</p> <p>Learners will investigate the effects of some factors on the motion of an object based on the Laws of Motion. They will also differentiate the concept of work as used in science and in layman's language. They will also learn about factors that affect the transfer of energy such as the molecular structure of the medium and temperature difference.</p>
Grade 9	<p>After learning about the digestive system, learners will now expand their knowledge to a deeper understanding of the respiratory and circulatory systems to promote overall health. They will also learn about some technologies that will introduce desired traits in economically important plants and animals.</p> <p>Learners will explain how new materials are formed when atoms are rearranged. They will also recognize that a wide variety of useful compounds may arise from such rearrangements.</p> <p>Learners will identify volcanoes in the community or region and distinguish between active and inactive ones. They will also explain how energy from volcanoes may be tapped for human use. Learners will also learn about climatic phenomena that occur on a global scale. They will also explain why certain constellations can be seen only at certain times of the year.</p>

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Grade/Level	Grade Level Standards
	Learners will predict the outcomes of interactions among objects in real life applying the laws of conservation of energy and momentum.
Grade 10	<p>Learners will now complete the study of the entire organism with their deeper study of the excretory and reproductive systems. They will also explain in greater detail how genetic information is passed from parents to offspring and how diversity of species increases the probability of adaptation and survival in changing environments.</p> <p>Learners will recognize the importance of controlling the conditions under which a phenomenon or reaction occurs. They will also recognize that cells and tissues of the human body are made up of water, a few kinds of ions, and biomolecules. These biomolecules may also be found in the food they eat.</p> <p>Learners will show that volcanoes and earthquakes occur in the same places in the world and that these are related to plate boundaries. Learners will also demonstrate ways to ensure safety and reduce damage during earthquakes, tsunamis, and volcanic eruptions.</p> <p>Learners will investigate factors that affect the balance and stability of an object to enable them to practice appropriate positions and movements to achieve efficiency and safety such as in sports and dancing. They will also analyze situations where energy is harnessed for human use whereby heat is released affecting the physical and biological components of the environment.</p>

## GRADE 3

GRADE 3 - Living Things and Their Environment FIRST QUARTER/FIRST GRADING PERIOD			
Content	Content Standards	Performance Standards	Learning Competencies



<b>Characteristics of Living Things</b>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding that living things breathe, eat, grow, move, reproduce, and react to light, touch, and temperature. These characteristics distinguish them from nonliving thing</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>tell whether a thing is living or nonliving given different samples.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>compares characteristics of a living and a nonliving thing</li> </ul>
<b>Parts and Functions of Living Things</b> <ul style="list-style-type: none"> <li><b>Humans</b></li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the external parts of the body, their functions, and healthful practices to take care of the human body</li> </ul>	<ul style="list-style-type: none"> <li>practices healthful habits and proper care of the sense organs and other external parts of the body</li> </ul>	<ul style="list-style-type: none"> <li>labels the external parts of the human body</li> <li>describes the parts of the human body and their functions</li> <li>identifies the sense organs: parts and functions</li> <li>describes how the sense organs work</li> <li>communicates proper ways and healthful practices to protect the sense organs and other external parts of the body</li> <li>makes a chart on proper ways of protecting these external parts</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<ul style="list-style-type: none"> <li><b>Animals</b></li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates proper ways of</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>describes/draws animals found in the</li> </ul>

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<ul style="list-style-type: none"> <li>Plants</li> </ul>	<p>the external parts and function, uses of animals, and the proper ways of caring for pets and farm animals</p> <ul style="list-style-type: none"> <li>demonstrates understanding of the external parts of plants and the functions of these parts <ul style="list-style-type: none"> <li>leaves</li> <li>stems</li> <li>flowers</li> <li>roots</li> <li>fruits</li> </ul> </li> </ul>	<p>caring for animals chosen as house pets and as farm animals</p> <ul style="list-style-type: none"> <li>demonstrates proper care of plants used as food and as sources of materials</li> </ul>	<p>immediate environment</p> <ul style="list-style-type: none"> <li>labels the external parts of animals</li> <li>observes and asks questions about the functions of the external parts of animals</li> <li>classifies the animals according to the presence/absence/number of certain parts</li> <li>states how animals are useful to humans</li> <li>communicates clearly the uses and the proper ways of caring for the animals functions, their uses to humans, and proper ways of caring for and choosing animals for house pets, farming and livelihood.</li> <li>labels the external parts of plants</li> <li>observes and ask questions about the functions of the external parts of plants</li> <li>describes special body parts of plants</li> <li>classifies plants according to stem characteristics (tree, shrub, vine, herb)</li> <li>compares and contrasts the structures and habitat of plants</li> <li>predicts the needs of plants</li> <li>communicates clearly the uses and the proper ways of caring for plants</li> </ul>
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<i>Content</i>	<i>Content Standards</i>	<i>Performance Standards</i>	<i>Learning Competencies</i>
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<b>Traits Passed on From Parents</b> <ul style="list-style-type: none"> <li>• Humans</li> <li>• Animals</li> <li>• Plants</li> </ul>	<i>The learner...</i>  demonstrates understanding that <ul style="list-style-type: none"> <li>• living things reproduce and children look like parents</li> <li>• some animals give birth to live young while some animals lay eggs</li> <li>• some groups of plants reproduce through seeds</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• predicts what children will look like based on traits of parents</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• infers which characteristics of children come from each of the parents</li> <li>• gives examples of animals that give birth to live young and that lay eggs</li> <li>• describe the structure of a seed</li> <li>• classify kinds of seeds</li> <li>• infer different ways of seed dispersal</li> <li>• conduct an investigation on the factors in the surroundings that affect seed germination</li> <li>• describe the changes observed in a germinating seed</li> <li>• measure changes in height of the growing plant</li> <li>• construct a graph showing data gathered while observing a growing plant</li> <li>• gives examples of plants that can grow from stem cuttings</li> </ul>
<b>Interactions of Living Things with the Environment</b> <ul style="list-style-type: none"> <li>• Basic needs</li> <li>• Feeding relationships</li> </ul>	demonstrates understanding that <ul style="list-style-type: none"> <li>• plants, animals, and humans have basic needs that come from the environment.</li> <li>• to meet these basic needs, living things interact with each other and with the nonliving components of the environment.</li> </ul>	<ul style="list-style-type: none"> <li>• engages in activities that promote protection and conservation of the environment that provides for the needs of humans, plants, and animals</li> </ul>	<ul style="list-style-type: none"> <li>• describes the need of humans for air, food, water, and shelter</li> <li>• concludes that these needs come from the environment</li> <li>• compare needs of animals with those of people</li> <li>• observes and asks questions about what animals eat</li> </ul>
<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>

	<i>The learner...</i>	<i>The learner...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>concludes that animals eat either plants, animals or both</li> <li>observes and asks questions about where animals live</li> <li>describes the needs of plants</li> <li>compare needs of plants with those of animals and people</li> <li>observes and asks questions about food of plants</li> </ul>
<b>GRADE 3 - Matter</b> <b>SECOND QUARTER/SECOND GRADING PERIOD</b>			
<b>Properties and Structure</b> <ul style="list-style-type: none"> <li>Characteristics of solids, liquids &amp; gases</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates ways of sorting materials and describing them as solid, liquid or gas based on properties such as having definite shape and volume, and ease of flow</li> </ul>	<ul style="list-style-type: none"> <li>devises ways of changing the form of a solid object to fit a desired purpose</li> </ul>	<ul style="list-style-type: none"> <li>recognizes that objects can exist as solid (S), liquid (L) or gas (G).</li> <li>classifies objects as S, L, G.</li> <li>demonstrates that solids, liquids, and gases have weight.</li> <li>demonstrates that solids, liquids and gases occupy space.</li> <li>differentiates the properties of solids, liquids and gases.</li> <li>recognizes that solids are made of different kinds of materials.</li> <li>recognizes that liquids also consist of different kinds of materials.</li> <li>investigates how different liquids flow</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
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<b>Changes in Solids, Liquids and Gases</b>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of the effect of temperature on solids and liquids.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>suggests ways of controlling temperature that will prevent/allow objects to change from solid to liquid or vice versa.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>investigates some materials that can exist as a solid or a liquid depending on the temperature.</li> </ul>
<b>GRADE 3 - Force and Motion</b> <b>THIRD QUARTER/ THIRD GRADING PERIOD</b>			
<b>Moving Objects</b> <ul style="list-style-type: none"> <li>Reference point</li> <li>Indicators of motion</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of position of people and objects as well as the factor that may cause change in their position,</li> </ul>	<ul style="list-style-type: none"> <li>provides accurate description of one's position/location with respect to a reference points</li> <li>constructs a toy that can be moved by winds, humans, water, or magnets (example: pinwheel, paper boat, toy car)</li> </ul>	<ul style="list-style-type: none"> <li>describes the position of a person or an object in relation to a reference point (e.g., chair, door, another person)</li> <li>infers occurrence of movement due to a change in position</li> <li>compares and contrasts the movements of objects</li> </ul>
<b>Sources and Uses of Light, Heat, Sound, and Electricity</b>	demonstrates understanding that <ul style="list-style-type: none"> <li>Light, heat and sound come from different sources</li> <li>Some objects produce their own light while others reflect light from other sources</li> </ul>	<ul style="list-style-type: none"> <li>practices safe and wise use of light, heat, sound, and electricity in daily life</li> </ul>	<ul style="list-style-type: none"> <li>observes and asks questions about sources of light, heat, sound, and electricity</li> <li>identifies various sources of light/heat based on pictures or actual sample of objects</li> <li>identifies examples of natural and artificial sources of light/heat</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
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	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>Some objects (e.g., toys, appliances) need electricity to work</li> </ul>		<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>distinguishes between objects that produce their own light and those that reflect light from another source</li> <li>produces various sounds using available materials</li> <li>improvises musical instruments (e.g., tambourine, musical bottles) using indigenous materials</li> <li>identifies the sources by the quality of sounds produced</li> <li>constructs a peephole to demonstrate that light is needed to see objects</li> <li>identifies toys that are run by electricity or battery</li> <li>identifies various uses of light, heat, sound, electricity, and magnets (e.g., light is needed to see objects, sound is needed for communication)</li> <li>identifies things or appliances at home and in school that needed electricity to work</li> <li>practices safety procedures when handling electrical appliances</li> <li>constructs toys that make use of magnets</li> <li>gives examples on the uses of magnets in daily-life activities</li> <li>discusses safety precautions related to the use of light/heat/sound/electricity/magnets</li> </ul>
<b>GRADE 3 - Earth and Space</b> <b>FOURTH QUARTER/FOURTH GRADING PERIOD</b>			

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>The Surroundings</b> <ul style="list-style-type: none"> <li>• People</li> <li>• Animals</li> <li>• Plants</li> <li>• Lakes, rivers, streams, hills and mountains</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• demonstrates understanding of the importance of things found in the surroundings.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• gets involved in taking care of his/her surroundings</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• observes and asks questions about the surroundings at home, in school, in the community, in the locality (town,city, province)</li> <li>• describes the landforms and bodies of water in the community</li> <li>• recognizes the importance of people, animals, plants, lakes, rivers, the sea, hills, and mountains in the surroundings.</li> </ul>
<b>Weather</b> <ul style="list-style-type: none"> <li>• Types of weather</li> <li>• Changes in weather</li> <li>• Effects of weather changes on activities in the community</li> <li>• Safety measures during different types of weather</li> </ul>	<ul style="list-style-type: none"> <li>• demonstrates understanding of the types of weather, characteristics of weather changes and how these relate to daily activities, health and safety.</li> </ul>	<ul style="list-style-type: none"> <li>• decides what to wear and what to do during different types of weather to protect and care for oneself.</li> </ul>	<ul style="list-style-type: none"> <li>• describes the weather for the day</li> <li>• describes the changes in the weather over a week</li> <li>• communicates how different types of weather affect activities in the community</li> <li>• demonstrates safety measures during certain types of weather</li> </ul>
<b>Natural Objects Seen in the Sky</b> <ul style="list-style-type: none"> <li>• During daytime</li> <li>• During nighttime</li> </ul>	<ul style="list-style-type: none"> <li>• demonstrates understanding of natural objects seen in the sky during day time and night time and how these affect the activities of people and the community</li> </ul>	<ul style="list-style-type: none"> <li>• plans activities that he/she can do during day and night that make him/her healthy and useful to his/her family and/or community</li> <li>• demonstrates ways to protect himself/herself in doing these activities.</li> </ul>	<ul style="list-style-type: none"> <li>• describes the natural objects that are found in the sky during daytime and nighttime.</li> <li>• communicates how the natural objects in the sky affect daily activities.</li> <li>• practices precautionary measures to avoid the harmful effects of the Sun's heat and light.</li> </ul>

**GRADE 4**

<b>GRADE 4 - Matter</b> <b>FIRST QUARTER/FIRST GRADING PERIOD</b>			
<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Properties and Structure</b> <ul style="list-style-type: none"> <li>Properties used to group and store materials</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates methods of grouping different materials based on:               <ul style="list-style-type: none"> <li>ability to absorb water</li> <li>ability to float or sink;</li> <li>whether decaying or non-decaying</li> </ul> </li> <li>demonstrates understanding on proper handling of waste material, and proper storage and safekeeping of useful/harmful materials</li> <li>demonstrates methods of grouping different materials that can be recycled, reduced, reused, recovered and repaired.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>safely stores properly-labeled materials based on their properties</li> <li>segregates materials which may be used/changed to make new products.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>groups materials to find out if these               <ul style="list-style-type: none"> <li>absorb water or not</li> <li>float or sink</li> <li>decay or not decay</li> </ul> </li> <li>investigates the causes and effects of decaying materials to health and safety.               <ul style="list-style-type: none"> <li>observes precautionary measures in conducting the investigation.</li> <li>communicates the results of the investigations.</li> </ul> </li> <li>identifies unused, spare, unwanted, leftover, trash materials at home, in school and in the community.</li> <li>communicates the importance or benefits of proper handling of waste materials.</li> </ul>
<b>Changes that Materials Undergo</b> <ul style="list-style-type: none"> <li>Changes that are useful</li> <li>Changes that are harmful</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of different ways of how materials can be changed and how materials change when exposed to certain conditions.</li> </ul>	<ul style="list-style-type: none"> <li>practices ways that prevent changes which may have harmful effects on the immediate environment and living organisms.</li> </ul>	<ul style="list-style-type: none"> <li>describes changes in materials when they are bent, pressed, hammered and cut</li> <li>explain how these changes are useful or harmful.</li> <li>conducts investigation to show changes in properties of materials when exposed to certain conditions such as temperature changes or when mixed with other materials.</li> <li>identifies the uses and sources of water.</li> <li>describes the properties of water that make it safe for drinking.</li> </ul>



GRADE 4 - Living Things and Their Environment SECOND QUARTER/SECOND GRADING PERIOD			
Content	Content Standards	Performance Standards	Learning Competencies
<b>Parts and Functions</b> <ul style="list-style-type: none"> <li><b>Humans</b> <ul style="list-style-type: none"> <li>-Major organs of the body</li> <li>-Caring for the major organs</li> <li>-Diseases that affect the major</li> </ul> </li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding that the brain, heart, lungs, liver, stomach kidneys, uterus, bones, and muscles are major internal organs that keep the rest of the body working properly.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>practices healthful habits to maintain proper functioning of the major internal organs of the body</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>infers the functions of the major organs based on experiences, readings, and other references</li> <li>communicates clearly that the major organs work together to make the body function properly</li> <li>collects, records, and organizes data on the causes and treatment of diseases of the major organs</li> <li>makes a chart on the proper ways of caring for the major organs of the body</li> </ul>
<ul style="list-style-type: none"> <li><b>Animals</b> <ul style="list-style-type: none"> <li>- Terrestrial animals</li> <li>- Aquatic animals</li> </ul> </li> </ul>	demonstrates understanding that <ul style="list-style-type: none"> <li>some animals live on land, others in water, others both on land and on water.</li> <li>body parts of animals are suited to where they live whether land or water</li> </ul>	<ul style="list-style-type: none"> <li>cares for and protects farm animals for livelihood</li> <li>chooses which animals to raise in a particular environment</li> </ul>	<ul style="list-style-type: none"> <li>describes the different places where animals live</li> <li>compares manner of movement of animals that live in water with those that live on land</li> <li>infers how structures help animals adapt and survive in their particular environment</li> <li>constructs a table on proper ways of caring for animals</li> </ul>

Content	Content Standards	Performance Standards	Learning Competencies
<ul style="list-style-type: none"> <li><b>Plants</b></li> <li>- Terrestrial plants</li> <li>- Aquatic plants</li> </ul>	<p><i>The learner...</i></p> <p>demonstrates understanding that</p> <ul style="list-style-type: none"> <li>many of the plants grow on land while some plants live and grow in water.</li> <li>body parts of plants help them survive where they whether on land or water</li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>cares for terrestrial and aquatic plants for livelihood</li> <li>chooses which plants to grow in a particular environment</li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>describes the different places where terrestrial and aquatic plants grow</li> <li>identifies the specialized structures of terrestrial and aquatic plants</li> <li>conducts simple investigation on the growth of plants given varying environmental conditions: light, water, temperature, and soil type</li> <li>communicates proper ways of caring for plants</li> </ul>
<p><b>Life Cycles</b></p> <ul style="list-style-type: none"> <li>Humans, Animals, and Plants</li> </ul>	<p>demonstrates understanding that</p> <ul style="list-style-type: none"> <li>different organisms go through different life cycles (e.g., human, dog, mongo)</li> <li>offspring resemble their parents but are not exactly the same</li> <li>some traits may be affected by the environment (e.g., nutrition affecting height and weight)</li> </ul>	<ul style="list-style-type: none"> <li>gives examples of inherited traits</li> <li>determines how characteristics may be affected by the environment (e.g., how nutrition affects height and weight)</li> </ul>	<ul style="list-style-type: none"> <li>compares traits of offspring with those of their parents</li> <li>infers which traits may have been inherited from parents</li> <li>describes the effect of the environment on certain traits</li> </ul>
<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>Beneficial interactions</li> <li>Harmful interactions</li> </ul>	<p>demonstrates understanding that</p> <ul style="list-style-type: none"> <li>plants use materials from the environment to make their own food.</li> </ul>	<ul style="list-style-type: none"> <li>determines the specific environmental conditions (e.g., shady, direct sunlight, moist, dry, freshwater, marine) where certain living things thrive best.</li> </ul>	<ul style="list-style-type: none"> <li>determines the factors / environmental conditions needed by living things to survive.</li> <li>conducts simple investigations on the needs of plants.</li> </ul>

Content	Content Standards	Performance Standards	Learning Competencies
	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>humans and animals eat plants and other animals</li> <li>to get food, humans and other animals interact with each other and their environment</li> <li>some of these interactions may be beneficial to some living things; other interactions may be harmful</li> <li>some structures help them get food</li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>determines the appropriate vegetable or farm animal to raise in specific habitats</li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>describes beneficial interactions between living things and their environment</li> <li>describes harmful interactions between living things.</li> </ul>
<b>GRADE 4 - Force and Motion</b> <b>THIRD QUARTER/THIRD GRADING PERIOD</b>			
<b>Effect of Force on Objects</b> <ul style="list-style-type: none"> <li>What force can do</li> <li>Measuring force</li> <li>Applications of force</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the effects of force on the movement, size, and shape of an object</li> </ul>	<ul style="list-style-type: none"> <li>performs a scientific investigation on the effects of force on objects</li> <li>demonstrates a sports skill involving application of force on objects like badminton, basketball, etc.</li> </ul>	<ul style="list-style-type: none"> <li>conducts a simple investigation to find out what force can do to the motion of an object</li> <li>uses appropriate measuring tools and express measurements using correct standard units</li> <li>presents the result of the investigations in different ways (e.g., use of information technology tools)</li> <li>infers that objects move due to the force exerted on them</li> <li>infers that objects can be compressed, stretched, twisted and bent due to the force exerted on them.</li> </ul>

Content	Content Standards	Performance Standards	Learning Competencies
	<i>The learner...</i>	<i>The learner...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>investigates how the mass and shape of the object and the strength of the force acting on it affect its movement.</li> </ul>
<b>Magnetic Force</b>	<ul style="list-style-type: none"> <li>demonstrates understanding of the interaction between magnetic poles and the strengths of the magnet at different locations around it.</li> </ul>	<ul style="list-style-type: none"> <li>classify objects based on magnetic properties</li> </ul>	<ul style="list-style-type: none"> <li>explores the strength of the magnet at different locations/distances around it</li> <li>investigates how magnets interact with other magnets</li> </ul>
<b>Light, Heat, and Sound</b> <ul style="list-style-type: none"> <li>Properties of light and sound</li> </ul>	demonstrates understanding of the <ul style="list-style-type: none"> <li>propagation of light, heat and sound</li> <li>the observable properties/ characteristics of light, heat, and sound</li> </ul>	<ul style="list-style-type: none"> <li>protects himself/herself from exposure to excessive light, heat, and sound</li> </ul>	<ul style="list-style-type: none"> <li>traces the direction of light, heat, and sound from the source through a material</li> <li>shows that a shadow is formed when light is completely or partially blocked by an object</li> <li>infers that sounds travel through materials and in all directions</li> <li>observes formation of colors by allowing light to pass through a prism</li> <li>infers that echo is an evidence that sound can be reflected</li> <li>compares reflection of light on different surfaces (plane/curved mirrors, smooth/rough surface, still/disturbed water, shiny/dull surface)</li> <li>describes the behavior of light when it strikes an object (e.g. reflected, refracted, transmitted, absorbed)</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<ul style="list-style-type: none"> <li>Heat transfer</li> </ul>	<i>The learner...</i>	<i>The learner...</i>	<ul style="list-style-type: none"> <li>demonstrates how heat is transferred by conduction, convection and radiation (e.g., using a convection box, demonstrate how heat transfers through gases)</li> </ul>
<b>GRADE 4 - Earth and Space FOURTH QUARTER/ FOURTH GRADING PERIOD</b>			
<b>Top Soil</b> <ul style="list-style-type: none"> <li>Types of soil according to size of particles, and ability to hold water (sand, silt and clay)</li> <li>Suitability of soil to plant growth and development (presence of humus)</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of scientific inquiry and mathematical skills, and practices proper scientific attitudes and values when doing guided investigation on a problem related to soils.</li> </ul>	<ul style="list-style-type: none"> <li>chooses the right kind of plant for the type of soil in his/her community.</li> </ul>	<ul style="list-style-type: none"> <li>compares and contrasts the characteristics of the different types of soil using a chart</li> <li>conducts an investigation on what soil type is best for different plants.               <ul style="list-style-type: none"> <li>What is the problem being studied?</li> <li>What is the tentative answer to the problem?</li> <li>What is the basis for the tentative answer?</li> <li>List the factors that affect growth of plants.</li> <li>What factor is changed or manipulated in the study?</li> <li>What factors are kept the same?</li> <li>Which factor responded to the change?</li> <li>How was the factor that responded to the change measured?</li> <li>How were the observations presented?</li> <li>State the findings of the study in your own words.</li> </ul> </li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Water in the Environment</b> <ul style="list-style-type: none"> <li>Sources of water (spring, lakes, seas, rivers, streams, waterfalls and dams)</li> <li>Importance of water</li> <li>Wise use of water</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of sources of water in the community, suitability of water for human consumption and activities, and how to use water wisely for health and safety</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>uses water wisely in daily activities</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>identifies sources of water.</li> <li>communicates how water sources are used for human activities.</li> <li>infers the importance of water to daily activities</li> <li>describes ways of using water wisely.</li> <li>determines the effects of unwise use of water.</li> <li>recognizes that bodies of water are places where certain organisms live.</li> <li>describes the importance of the water cycle to life on Earth.</li> </ul>
<b>Weather</b> <ul style="list-style-type: none"> <li>What makes up the weather</li> <li>Instruments to measure the weather components</li> <li>Weather Chart</li> <li>Safety precautions</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the different components of weather, how to measure them, and that they change over short periods of time.</li> </ul>	<ul style="list-style-type: none"> <li>chooses activities appropriate for the kind of weather in his/her community</li> </ul>	<ul style="list-style-type: none"> <li>identifies the components that make up weather.</li> <li>describes the different types of clouds.</li> <li>uses a thermometer to measure the air temperature.</li> <li>uses a wind scale to estimate wind strength.</li> <li>uses a rain gauge to measure rainfall.</li> <li>identifies trends in a simple weather chart.</li> <li>applies knowledge of the weather condition in making decisions for the day.</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>The Sun</b> <ul style="list-style-type: none"> <li>• Importance of the Sun</li> <li>• Harmful effects of overexposure to the Sun</li> <li>• Safety precautions</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• demonstrates understanding of the benefits as well as harmful effects of the Sun.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• chooses activities that will take advantage of the benefits of the Sun while avoiding its harmful effects</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• finds out the importance of the Sun on the activities of people and animals.</li> <li>• investigates the importance of the Sun on plant growth and development.</li> <li>• infers that the Sun is the main source of heat and light on earth.</li> <li>• infers that the position of shadows changes with the movement of the Sun.</li> <li>• demonstrates how to use a compass in determining North, South, East, and West.</li> </ul>

## GRADE 5

GRADE 5 - Matter FIRST QUARTER/FIRST GRADING PERIOD			
Content	Content Standards	Performance Standards	Learning Competencies
<b>Properties and Structure</b> <ul style="list-style-type: none"> <li>Properties used to minimize waste</li> <li>Importance of reading product labels</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates ways of identifying useful materials using the 5R techniques for aesthetic and economic purposes.</li> <li>demonstrates understanding of good practices such as reading product labels, and storing harmful materials at home and in school.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>helps minimize waste by:               <ul style="list-style-type: none"> <li>- reusing and repairing objects and materials;</li> <li>- practicing the habit of reducing the amount/volume of different materials;</li> <li>- creating useful and valuable products from recyclable materials.</li> </ul> </li> <li>practices the habit of reading labels in food products, garments, household materials, and medicines for health and safety reasons.</li> <li>follows instructions written on product labels when handling, using and storing materials/products.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>uses the 5Rs (recycle, reduce, reuse, recover, and repair) techniques for aesthetic and economic purposes.</li> <li>sorts materials at home as useful or harmful.</li> <li>investigates the techniques of storing and safekeeping techniques done at home.</li> <li>communicates the results of the investigation.</li> <li>communicates good practices and safety precautions in storing and safekeeping of useful and harmful materials.</li> <li>communicates the importance of reading product labels such as those in food products, garments, household materials and medicines.</li> <li>infers the amounts of ingredients in food from product labels.</li> </ul>



<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Changes that Matter Undergoes</b> <ul style="list-style-type: none"> <li>Evidence of change</li> <li>Appropriate ways of storing materials</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding on the evidence of changes that materials undergo.</li> <li>demonstrates understanding of changes that occur in the environment.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>creates useful products as a result of changes done in the original materials.</li> <li>observes keenly signs of changes that may affect his/her health and safety.</li> <li>stores different kinds of materials in appropriate places.</li> <li>practices appropriate ways of avoiding the deterioration of quality of products and materials due to changes that may happen.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>investigates changes when no new materials are formed.</li> <li>investigates changes when new materials are formed.</li> <li>investigates different indicators of change</li> </ul>
<b>GRADE 5 - Living Things and Their Environment SECOND QUARTER/SECOND GRADING PERIOD</b>			
<b>Parts and Functions</b> <ul style="list-style-type: none"> <li><b>Humans</b> <ul style="list-style-type: none"> <li>stages of growth and development</li> <li>parts of the reproductive system</li> <li>development of secondary sex characteristics</li> <li>menstrual cycle</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding that girls and boys exhibit changes during puberty</li> </ul>	<ul style="list-style-type: none"> <li>explains changes in girls and boys undergoing puberty including development of secondary sex characteristics which indicate readiness for reproduction.</li> <li>practices ways of maintaining health and hygiene of the reproductive system.</li> </ul>	<ul style="list-style-type: none"> <li>identifies parts of the reproductive system and their functions</li> <li>describes secondary sex characteristics in girls and boys</li> <li>explains the menstrual cycle and how it indicates readiness for reproduction</li> <li>cites proper ways of maintaining health and hygiene of the reproductive system</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<ul style="list-style-type: none"> <li><b>Animals</b> <ul style="list-style-type: none"> <li>- Parts of the reproductive system of representative groups of animals and their functions</li> <li>- Differences in the modes of reproduction: external fertilization, internal fertilization <ul style="list-style-type: none"> <li>➤ Birds (duck)</li> <li>➤ Fishes (tilapia)</li> <li>➤ Toads/Frogs</li> <li>➤ Crustaceans (crabs and shrimps)</li> <li>➤ Dragonflies and butterflies</li> </ul> </li> <li>- Protecting habitats of animals</li> </ul> </li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>• demonstrates understanding about how animals reproduce</li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>• protects and conserves habitats of animals that provide opportunities for livelihood</li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>• compares males and females of different representative groups of animals</li> <li>• describes the reproductive systems of different animal groups using models, illustrations, and pictures</li> <li>• differentiates modes of reproduction of representative animals</li> </ul>
<ul style="list-style-type: none"> <li><b>Plants</b> <ul style="list-style-type: none"> <li>- Flowering plants (rice/corn, pechay, mongo)</li> <li>- Non-flowering plants (conebearing, ferns, liverworts)</li> <li>- Protecting habitats of plants</li> </ul> </li> </ul>	<p>demonstrates understanding that</p> <ul style="list-style-type: none"> <li>• plants are grouped according to distinguishing characteristics</li> <li>• flowering plants include, among others, having flowers that serve as reproductive organ for the plant and seeds that germinate to grow into a new plant</li> <li>• non-flowering plants use other structures for reproduction</li> </ul>	<ul style="list-style-type: none"> <li>• does backyard or urban gardening guided by the understanding of the factors in the environment that can affect the growth and development of plants</li> <li>• protects and conserves natural habitats of plants.</li> </ul>	<ul style="list-style-type: none"> <li>• classifies plants based on distinguishing characteristics: flowering and non-flowering</li> <li>• labels the structures of flowering plants</li> <li>• traces the life cycle of a flowering plant</li> <li>• describes flower parts involved in pollination</li> <li>• observes and asks questions about agents of pollination</li> <li>• designs and conducts a simple investigation on the process of pollination</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner...</i>	<i>The learner...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• shows through a diagram how pollination takes place</li> <li>• identifies rare plants found in the community or in other areas of the Philippines</li> <li>• cites benefits from flowering and non-flowering plants found in the community</li> <li>• communicates proper ways of caring for plants (including ways of caring for habitat)</li> </ul>
<b>Interactions Among Living Things in Estuaries and Intertidal Zones</b>	<ul style="list-style-type: none"> <li>• demonstrates understanding that more complex interactions among plants, animals, and their environment take place in larger habitats like estuaries and intertidal zones (where land &amp; water ecosystems overlap).</li> </ul>	<ul style="list-style-type: none"> <li>• protects and conserves habitats (like estuaries and intertidal zones) that serve as nurseries and breeding places for economically important living things.</li> </ul>	<ul style="list-style-type: none"> <li>• describes estuaries and intertidal zones</li> <li>• identifies plants and animals found in these habitats</li> <li>• estimates their relative population sizes</li> <li>• constructs food chains and webs to show feeding relationships among living things</li> <li>• classifies organisms as producers, consumers, scavengers, or decomposers according to their role in a food chain or food web</li> </ul>

<b>GRADE 5 - Force and Motion</b> <b>THIRD QUARTER/ THIRD GRADING PERIOD</b>			
<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Motion</b> <ul style="list-style-type: none"> <li>Measuring time and distance using standard units</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates skills in measuring, recording and analyzing distance and time</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>practices time management for long distance travels</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>measures the distance between a person/an object and another person/object</li> <li>describes the motion of an object by tracing and measuring its change in position (distance travelled) over a period of time</li> <li>uses appropriate measuring tools and expresses measurements using correct standard units</li> </ul>
<b>Heat, Light and Sound</b> <ul style="list-style-type: none"> <li>Effects on people</li> <li>Conductors of heat and electricity</li> <li>Preventing harm</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding on the effects of heat, light, and sound on people and objects</li> </ul>	<ul style="list-style-type: none"> <li>selects the right color of clothes for a particular weather condition</li> <li>develops a skill to play a specific musical instrument</li> </ul>	<ul style="list-style-type: none"> <li>qualitatively describe the effects of heat on different materials</li> <li>classifies materials as good and poor conductors of heat/electricity and identify their applications</li> <li>infers how color of an object affects its ability to absorb heat</li> <li>relates the ability of the material to block, absorb or transmit light to its use</li> <li>investigates the effects of tension, length and thickness of the string on the pitch of the sound produced by a stringed musical instrument</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner..</i>	<i>The learner...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>describes how sound changes as it goes nearer or farther from the source or the listener</li> <li>predicts the effects of noise vs. harmonious sound to people and the environment</li> <li>identifies preventive measures to protect oneself from dangers of loud sound</li> </ul>
<b>Electricity and Magnetism</b> <ul style="list-style-type: none"> <li>Circuits</li> <li>Electromagnets</li> </ul>	<ul style="list-style-type: none"> <li>demonstrate understanding of             <ul style="list-style-type: none"> <li>a simple DC circuit</li> <li>good and poor conductors of electricity</li> <li>the relationship between electricity and magnetism through the study of electromagnets</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>troubleshoots problems involving simple electrical connections</li> </ul>	<ul style="list-style-type: none"> <li>constructs a simple circuit to light up a bulb</li> <li>infers the conditions necessary to light a bulb</li> <li>classifies materials as good and poor conductors of electricity</li> <li>cites situations that show the importance or use of conductors of electricity</li> <li>investigates how changing the number or type of components like battery or bulbs, in a circuit can make bulbs brighter or dimmer</li> <li>classifies materials as good and poor conductors of electricity</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner ...</i>	<i>The learner ...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• cites situations that show the importance or use of conductors and electricity</li> <li>• investigates how magnets interact with other magnets</li> <li>• explores the strength of the magnet at different locations around it</li> <li>• infers that electricity can be used to produce magnets</li> <li>• given a set of materials, designs an experiment to determine the factors that affect the strength of the electromagnet</li> </ul>
<b>GRADE 5 - Earth and Space</b> <b>FOURTH QUARTER/FOURTH GRADING PERIOD</b>			
<b>Processes that Shape Earth's Surface</b> <ul style="list-style-type: none"> <li>• Weathering</li> <li>• Soil erosion</li> <li>• Other processes that shape the land surface</li> </ul>	demonstrates understanding of <ul style="list-style-type: none"> <li>• weathering, soil erosion and other processes that shape the land</li> <li>• how these affect living things and the environment, and</li> <li>• ways to reduce risks to health and safety.</li> </ul>	<ul style="list-style-type: none"> <li>• identifies areas around the home and at school which are prone to soil erosion.</li> <li>• helps reduce soil erosion around the home and at school.</li> </ul>	<ul style="list-style-type: none"> <li>• observes and ask questions on what happens during weathering process.</li> <li>• determines the effects of weathering on the environment and on living things.</li> <li>• determines the causes of soil erosion in the community.</li> <li>• investigates the effects of soil erosion on living things and the environment.</li> <li>• collects data on the extent of soil erosion in the community.</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner...</i>	<i>The learner...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>conducts a survey on community efforts and practices that reduce soil erosion.</li> <li>designs a simple investigation to prevent and/or reduce soil erosion.</li> <li>describes how running water shapes the land surface.</li> </ul>
<b>Weather Disturbances</b> <ul style="list-style-type: none"> <li>Observations during a typhoon or storm</li> <li>Development of typhoon or storm</li> <li>Storm signals and the Beaufort scale</li> <li>Weather instruments</li> <li>Changes in the environment before, during, and after a typhoon</li> </ul>	demonstrates understanding of <ul style="list-style-type: none"> <li>weather disturbances such as storm and typhoons</li> <li>how to cope with, reduce, and adapt to their effects</li> </ul>	<ul style="list-style-type: none"> <li>shows emergency preparedness before, during, and after a typhoon.</li> </ul>	<ul style="list-style-type: none"> <li>describes the effects of a typhoon on the community.</li> <li>describes the changes in the weather before, during and after a typhoon.</li> <li>determines wind direction using a wind vane.</li> <li>relates the occurrence of a typhoon to wind strength and rainfall</li> <li>explains the meaning of storm warning signals.</li> <li>prepares an emergency kit to be used at home.</li> <li>makes an emergency plan with your family in preparation for typhoons.</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>The Moon</b> <ul style="list-style-type: none"> <li>• Changes and patterns in the shape of the Moon</li> <li>• Phases of the Moon and length of a month</li> <li>• Beliefs and practices</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• demonstrates understanding of patterns in the changing shape of the Moon and its relation to the length of a month</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• discusses whether or not beliefs and practices about the phases of the Moon have scientific basis.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• observes and records the changes in the shape of the moon.</li> <li>• identifies patterns in the changes in the shape of the moon.</li> <li>• finds the connection between the phases of the moon and the length of a month</li> <li>• conducts a survey on the beliefs and practices of the community in relation to the phases of the moon.</li> </ul>
<b>The Stars</b> <ul style="list-style-type: none"> <li>• Patterns of stars (constellation)</li> </ul>	<ul style="list-style-type: none"> <li>• demonstrates recognition of the patterns in stars in the sky and the information people can derive from these patterns</li> </ul>	<ul style="list-style-type: none"> <li>• relates the constellations to the different compass directions.</li> </ul>	<ul style="list-style-type: none"> <li>• compares the stars in terms of brightness and color.</li> <li>• identifies star patterns using a chart</li> </ul>



## GRADE 6

GRADE 6 - Matter FIRST QUARTER/FIRST GRADING PERIOD			
<i>Content</i>	<i>Content Standards</i>	<i>Performance Standards</i>	<i>Learning Competencies</i>
<b>Properties and Structure</b> <ul style="list-style-type: none"> <li>• <b>Mixtures and their Characteristics</b> <ul style="list-style-type: none"> <li>– Heterogeneous mixtures</li> </ul> </li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• demonstrates understanding of the forms [solid (S), liquid (L), gas (G)], and classification of mixtures (solutions, colloids and suspensions), and</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• prepares beneficial and useful mixtures such as drinks, food, and herbal medicines.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• recognizes that mixtures are made of different forms (S,L, and G) of substances.               <ul style="list-style-type: none"> <li>- liquid mixtures (S,L)</li> <li>- liquid mixtures (S,L,G)</li> <li>- solid mixtures</li> <li>- gas mixtures</li> </ul> </li> <li>• demonstrates that some materials when mixed together form homogeneous (solutions) or heterogeneous (suspensions) mixtures.</li> <li>• communicates the uses of different mixtures.</li> </ul>
<ul style="list-style-type: none"> <li>– Colloids</li> </ul>			<ul style="list-style-type: none"> <li>• demonstrates the formation of colloids.</li> <li>• classifies colloids.</li> <li>• prepares useful colloids.</li> <li>• explains how colloids are utilized in technology.</li> <li>• evaluates the importance of colloids to daily life.</li> <li>• describes the biological and environmental impact of colloids like aerosol sprays, hair gel, and smoke.</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<ul style="list-style-type: none"> <li><b>Separating Mixtures</b></li> </ul>	<p><i>The learner ...</i></p> <ul style="list-style-type: none"> <li>demonstrates understanding of techniques used to separate components of mixtures</li> </ul>	<p><i>The learner ...</i></p> <ul style="list-style-type: none"> <li>separates desired materials from common and local products.</li> </ul>	<p><i>The learner ...</i></p> <ul style="list-style-type: none"> <li>describes ways of separating mixtures.</li> <li>conducts investigation on separating mixtures into individual components.               <ul style="list-style-type: none"> <li>communicates results of the investigation.</li> <li>discusses safety measures in separating mixtures.</li> </ul> </li> <li>reports on the benefits of separating components of mixtures in daily activities.</li> </ul>
<b>GRADE 6 - Living Things and Their Environment</b> <b>SECOND QUARTER/SECOND GRADING PERIOD</b>			
<p><b>Parts and Functions</b></p> <ul style="list-style-type: none"> <li>Human Body Systems               <ul style="list-style-type: none"> <li>Musculoskeletal</li> <li>Digestive system</li> <li>Respiratory system</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding that organs that have related functions work together to form organ systems.</li> </ul>	<ul style="list-style-type: none"> <li>explains how the nervous system controls and coordinates the different organ systems so that they work together</li> </ul>	<ul style="list-style-type: none"> <li>describes the structure of bones and muscles and how these structures work together to allow movement</li> <li>traces the path of food that he/she eats and major parts through which it passes</li> <li>traces the path of air that he/she inhales</li> <li>mentions the parts through which air passes and the functions of these parts</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<ul style="list-style-type: none"> <li>- Circulatory system</li> <li>- Nervous system</li> </ul>	<p><i>The learner ...</i></p> <ul style="list-style-type: none"> <li>• demonstrates understanding that the nervous system coordinates the functions of the different organ systems.</li> </ul>	<p><i>The learner ...</i></p> <ul style="list-style-type: none"> <li>• traces the path of message from the sense organs to the brain, then to muscles and bones, resulting in action</li> <li>• practices healthful habits to maintain proper functioning of body systems</li> </ul>	<p><i>The learner ...</i></p> <ul style="list-style-type: none"> <li>• traces the flow of blood through the body and the function of each part of the circulatory system</li> <li>• identifies the parts of the nervous system and their functions</li> <li>• traces the path of a message from the sense organs to the brain</li> <li>• explains how the nervous system controls and coordinates the different organ systems</li> <li>• collects, records, and organizes data on diseases affecting the organ systems.</li> <li>• communicates proper ways of taking care of the different organ systems</li> </ul>
<ul style="list-style-type: none"> <li>• Animals             <ul style="list-style-type: none"> <li>- Characteristics of vertebrates and invertebrates</li> <li>- Economic importance of vertebrates and invertebrates in the community</li> <li>- Rare animals in the community</li> <li>- Protecting and caring for animals</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• demonstrates understanding that animals that share some common characteristics and can be classified into groups             <ul style="list-style-type: none"> <li>- mammals</li> <li>- birds</li> <li>- fishes</li> <li>- amphibians</li> <li>- reptiles</li> <li>- insects, snails, worms, and other invertebrates</li> </ul> </li> <li>• demonstrates understanding that some animals have backbones (vertebrates); others do not (invertebrates).</li> </ul>	<ul style="list-style-type: none"> <li>• describes how animals can be used in environment-friendly livelihood projects</li> <li>• determines invertebrates and vertebrates of economic importance in your community (e.g., farm animals, earthworm, birds, pests)</li> <li>• practices ways of protecting and caring for animals</li> </ul>	<ul style="list-style-type: none"> <li>• describes distinguishing characteristics of vertebrates</li> <li>• describes distinguishing characteristics of invertebrates</li> <li>• classifies animals according to presence or absence of backbone</li> <li>• identifies rare animals found in the community</li> <li>• communicates proper ways of caring and protecting animals</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<ul style="list-style-type: none"> <li>Plants               <ul style="list-style-type: none"> <li>Parts of spore-bearing and cone-bearing plants</li> <li>Life cycles of ferns and mosses</li> <li>Vegetative plant propagation</li> </ul> </li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding that external characteristics of non-flowering plants have reproductive structures other than flowers (e.g., spores, cones)</li> <li>demonstrates understanding that new plants may be grown from other plant parts, or through techniques such as grafting, marcotting, etc.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>propagates economically important spore-bearing and cone-bearing plants using the various techniques</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>observes and describes parts of cone-bearing and spore-bearing plants</li> <li>traces the life cycles of ferns and mosses in non-flowering plants</li> <li>infers other modes of plant reproduction</li> <li>designs and conducts a simple investigation on vegetative plant reproduction</li> <li>shows and communicates propagation techniques</li> </ul>
<ul style="list-style-type: none"> <li>Interactions               <ul style="list-style-type: none"> <li>Physical conditions of tropical rainforests, coral reefs, and mangrove swamps</li> <li>Plants and animals living in these ecosystems</li> <li>Feeding relationships in these ecosystems</li> <li>Protecting and conserving tropical forest ecosystems</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of interactions in tropical rainforests ecosystem</li> </ul>	<ul style="list-style-type: none"> <li>protects and conserves ecosystems (like tropical rainforests, coral reefs, mangrove swamps) that serve as nurseries, breeding places, and habitats for economically important living things</li> </ul>	<ul style="list-style-type: none"> <li>describes tropical rainforests, coral reefs, mangrove swamps</li> <li>describes the physical factors in these ecosystems</li> <li>identifies plants and animals found in these ecosystems</li> <li>constructs food chains and webs to show feeding relationships among living things</li> <li>describes how living things interact with their physical environment</li> </ul>

<b>GRADE 6 - Force, Motion and Energy</b> <b>THIRD QUARTER/ THIRD GRADING PERIOD</b>			
<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Gravitation and Frictional Forces</b> <ul style="list-style-type: none"> <li>Observable effects of gravitational and frictional force</li> <li>Overcoming gravity and friction</li> </ul>	<i>The learner ...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of the observable effects of gravitational and frictional forces.</li> </ul>	<i>The learner ...</i> <ul style="list-style-type: none"> <li>devises ways on how to overcome the effects of gravity in performing a certain task</li> <li>select the right footwear appropriate for a specific sports activity</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates the effects of gravity on people and objects</li> <li>plans and conducts an investigation on how different surfaces affect the movement of an object</li> </ul>
<b>Energy</b> <ul style="list-style-type: none"> <li>Energy Forms and Transformation</li> <li>Simple machines</li> <li>Mechanical advantage</li> </ul>	demonstrates understanding of <ul style="list-style-type: none"> <li>kinetic and potential energy and their relationship</li> <li>the different kinds of simple machines and their uses in daily life activities</li> <li>the importance of energy efficiency in doing work</li> </ul>	<ul style="list-style-type: none"> <li>recognizes ways of harnessing energy for a particular task</li> <li>discovers ways of increasing potential energy needed to do a certain task</li> <li>demonstrates how common objects found at home or in school can be used as simple machines</li> <li>practices safety in handling tools or simple machines</li> </ul>	<ul style="list-style-type: none"> <li>infers that the energy of an object can take many forms</li> <li>infers that energy like sound, heat and electricity can be transformed from one form to another</li> <li>identifies electrical devices at home or in school that convert electrical energy to heat, light, sound, and motion</li> <li>cites examples that show objects having kinetic energy or potential energy due to position</li> <li>identifies simple machines found at home and in the community</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner...</i>	<i>The learner...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>manipulates simple machines to describe their characteristics and uses</li> <li>demonstrates practical and safe use of simple machines in daily activities</li> <li>proposes a plan to create a simple device that will help a person with grip problem perform with ease</li> <li>infers why energy efficiency is important in doing work</li> </ul>
<b>Electricity and Magnetism</b> <ul style="list-style-type: none"> <li>Consumption of electricity</li> <li>Conservation of electricity</li> <li>Energy efficient devices</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the household electrical energy consumption</li> </ul>	<ul style="list-style-type: none"> <li>practices electrical energy conservation at home and in school</li> </ul>	<ul style="list-style-type: none"> <li>conducts a simple investigation on the electric consumption and electric bills at home</li> <li>relates electrical energy consumption to the total kilowatt hour used as seen on the monthly electrical bill</li> <li>communicates clearly the importance of saving electrical energy at home, in school and in the community</li> <li>recognizes the importance of using energy-efficient devices</li> </ul>

GRADE 6 - Earth and Space FOURTH QUARTER/FOURTH GRADING PERIOD			
Content	Content Standards	Performance Standards	Learning Competencies
<b>Earthquakes and Volcanic Eruption</b> <ul style="list-style-type: none"> <li>Changes on Earth's surface as a result of earthquakes and/or volcanic eruption</li> <li>Common warning signs</li> <li>Disaster preparedness</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of natural calamities such as earthquakes, volcanic eruptions, and knowledge of emergency preparedness regarding these calamities</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>makes informed decisions on what to do for safety during and after a volcanic eruption</li> <li>makes emergency/disaster preparedness posters for the community in preparation for typhoons, volcanic eruptions and worst-weather conditions</li> <li>helps in promoting emergency preparedness in his/her community</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>describes what happens during an earthquake</li> <li>describes how the surface of the earth changes as a result of earthquakes</li> <li>gathers and reports data on earthquakes in his/her community or region</li> <li>describes what happens during a volcanic eruption</li> <li>describes how the surface of the Earth changes as a result of volcanic eruptions</li> <li>describes common warning signs that a volcano is about to erupt</li> <li>gathers and reports data on volcanic eruptions in your community or region</li> <li>prepares an emergency kit to be used at home</li> <li>makes an emergency plan with his/her family in preparation for earthquakes and volcanic eruptions</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Weather Patterns in the Philippines</b> <ul style="list-style-type: none"> <li>Weather patterns</li> <li>Seasons</li> <li>Effects of seasons on livelihood and health of people in the community</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of weather patterns and seasons in the country</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>chooses activities appropriate to the changing seasons and find ways to reduce risks.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>collects data on the weather in the span of a school year</li> <li>makes a chart showing collected weather data in an organized way.</li> <li>interprets record of the different weather data</li> <li>describes the seasons in the Philippines and their effects on livelihood and health of the people in the community</li> </ul>
<b>Motions of the Earth</b> <ul style="list-style-type: none"> <li>Rotation</li> <li>Revolution</li> <li>Effects of Earth's movement</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the motions of the Earth.</li> </ul>	<ul style="list-style-type: none"> <li>becomes aware that the motions of Earth follow a pattern and these influence various natural phenomena which affect human activities and the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Using models, shows <ul style="list-style-type: none"> <li>how day and night occurs on earth.</li> <li>the connection between Earth's rotation and the length of a day.</li> <li>the connection between Earth's revolution and the length of a year.</li> </ul> </li> </ul>
<b>The Solar System</b> <ul style="list-style-type: none"> <li>Planets (e.g., surface features, size and relative distance from the Sun)</li> <li>Model of the solar system</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of physical characteristics of the planets of our solar system.</li> </ul>	<ul style="list-style-type: none"> <li>discusses the characteristics of earth that support life.</li> </ul>	<ul style="list-style-type: none"> <li>compares the eight planets of our solar system</li> <li>constructs models of the solar system that show the relative sizes of each planet and the relative distances between the planets.</li> </ul>



## GRADE 7

GRADE 7 - Matter FIRST QUARTER/FIRST GRADING PERIOD			
<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>The Investigatory Process</b> <ul style="list-style-type: none"> <li>Ways of acquiring knowledge and solving problems</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of scientific way of acquiring knowledge and solving problems</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>conducts simple investigations using the inquiry approach</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>describes what is meant by fair test.</li> <li>recognizes that the design of an investigation should show fair testing.</li> <li>identifies the components of an investigation: research problem, hypothesis, method for testing hypothesis (identifying independent/dependent variables), and conclusions based on evidence</li> <li>conducts simple investigations using processes involving mixtures common to the locality.</li> <li>chooses an interesting topic for investigation.               <ul style="list-style-type: none"> <li>formulates a research problem.</li> <li>formulates a hypothesis.</li> <li>designs a procedure to test the hypothesis.</li> <li>collects, organizes and interprets data.</li> <li>makes conclusions based on the data, accounting and rejecting the hypothesis.</li> <li>writes a brief summary of the report.</li> <li>shares and presents the results of the investigations with other classmates or schoolmates.</li> </ul> </li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Diversity of Materials in the Environment</b> <ul style="list-style-type: none"> <li><i>Solutions</i></li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of solutions such as acids and bases and ways of describing their concentration.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>prepares different concentrations of mixtures considering the following:               <ul style="list-style-type: none"> <li>- has practical uses</li> <li>- prepared within the best possible period of time</li> <li>- easily available materials</li> <li>- with right composition and proportion of components.</li> </ul> </li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>investigates the different types of solutions.               <ul style="list-style-type: none"> <li>- unsaturated</li> <li>- saturated</li> <li>- supersaturated</li> </ul> </li> <li>explains the difference between Percentage by Weight and by Volume solutions.</li> <li>identifies and explains the factors affecting solubility.</li> </ul>
<ul style="list-style-type: none"> <li>Acids and Bases</li> </ul>		<ul style="list-style-type: none"> <li>interprets properly product labels of common acids and bases for safety and cost benefits.</li> <li>practices safe ways of handling acids and bases by using protective clothing and safety gears.</li> </ul>	<ul style="list-style-type: none"> <li>recognizes common acids and bases</li> <li>recognizes the concept of pH.</li> <li>investigates properties of acids and bases using natural indicators such as eggplant skin, mayana leaves or violet-colored camote leaves.</li> <li>investigates action of acids on metals and building materials.</li> <li>investigates action of bases on materials.</li> <li>practices safe handling of acids and bases.</li> <li>investigates neutralization of acids and bases.</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<ul style="list-style-type: none"><li>Substances and Mixtures</li></ul>	<i>The learner...</i> <ul style="list-style-type: none"><li>demonstrates understanding of the properties of substances which distinguish them from mixtures.</li></ul>	<i>The learner...</i> <ul style="list-style-type: none"><li>chooses appropriate materials available in the community for specific purposes.</li></ul>	<i>The learner...</i> <ul style="list-style-type: none"><li>recognizes that a substance has a unique set of properties.</li><li>investigates the properties of mixtures of varying concentrations.</li></ul>
<ul style="list-style-type: none"><li>Elements and Compounds</li></ul>	<ul style="list-style-type: none"><li>demonstrates understanding of classifying substances as elements or compounds and distinguishes between metals and nonmetals.</li></ul>		<ul style="list-style-type: none"><li>recognizes that substances are classified into elements and compounds.</li><li>recognizes that compounds consist of specific elements</li><li>gather information about common elements such as names, symbols and whether it is a metal or nonmetal from a Periodic Table</li></ul>
<ul style="list-style-type: none"><li>Metals and Nonmetals</li></ul>			<ul style="list-style-type: none"><li>demonstrates the different properties of metals and nonmetals such as luster, malleability, ductility, and conductivity.</li><li>recognizes the elements considered as metals and those that are nonmetals.</li></ul>
<b>GRADE 7 - Living Things and Their Environment SECOND QUARTER/SECOND GRADING PERIOD</b>			
<b>Parts and Functions</b> <ul style="list-style-type: none"><li>Levels of organization</li><li>Microscopy</li><li>Animal and plant cells</li><li>Microorganisms: Fungi, Protists, and Bacteria</li></ul>	<ul style="list-style-type: none"><li>demonstrates understanding of the different levels of organization</li><li>demonstrates understanding that aside from plants and animals, there are other much smaller organisms that can only be seen through the microscope; many of which consist of only one cell</li></ul>	<ul style="list-style-type: none"><li>employs appropriate techniques using standard tools or equipment to gather data about very small objects</li><li>recognizes that many organisms, including humans, have organ systems that work together to carry out essential processes of the body</li></ul>	<ul style="list-style-type: none"><li>differentiates organ systems, organs, tissues, cells from each other</li><li>identifies parts of the microscope and their functions</li><li>differentiates plant and animal cells according to presence or absence of certain organelles</li></ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>engages in activities that promote proper nutrition and healthful habits to maintain proper functioning of the organ systems</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>describes the structures of microorganisms using a microscope</li> <li>identifies beneficial and harmful microorganisms</li> <li>explains why the cell is considered the basic structural and functional unit of all organisms</li> </ul>
<b>Heredity: Inheritance and Variation</b> <ul style="list-style-type: none"> <li>Asexual reproduction in different organisms</li> <li>Sexual reproduction               <ul style="list-style-type: none"> <li>Union of egg cell and sperm cell during fertilization</li> <li>offspring are biologically similar to the parents but not identical</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding that reproduction can be asexual or sexual</li> </ul>	<ul style="list-style-type: none"> <li>recognizes which organisms multiply on their own through asexual and sexual means</li> <li>decides on which means of asexual reproduction is appropriate to use in propagating economically important plants</li> </ul>	<ul style="list-style-type: none"> <li>compares asexual and sexual reproduction</li> <li>describes the process of fertilization</li> <li>differentiates offspring resulting from asexual reproduction with that from sexual reproduction in terms of similarities to parents</li> </ul>
<b>Interactions</b> <ul style="list-style-type: none"> <li>Components of an ecosystem: biotic and abiotic</li> <li>Ecological relationships               <ul style="list-style-type: none"> <li>Producers and consumers</li> <li>Symbiotic relationships: parasitism, mutualism</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding that organisms interact with each other and with their environment to survive</li> </ul>	<ul style="list-style-type: none"> <li>initiates and/or participates in activities that protect and preserve ecosystems in the locality</li> </ul>	<ul style="list-style-type: none"> <li>identifies which of the things found in the environment are biotic or abiotic</li> <li>describes the different ecological relationships found in an ecosystem</li> <li>describes how energy is transformed through the feeding relationships</li> <li>predicts the effect of changes in one population on other populations in the ecosystem</li> <li>predicts the effect of changes in abiotic factors on the ecosystem</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
-non symbiotic relationships: competition, predation  -transfer of energy through trophic levels	<i>The learner...</i>	<i>The learner...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>explains the importance of individual and collective actions on protecting and preserving ecosystems</li> </ul>
<b>GRADE 7- Force, Motion and Energy</b> <b>THIRD QUARTER/ THIRD GRADING PERIOD</b>			
<b>Constant and Uniformly Accelerated Motions</b> <ul style="list-style-type: none"> <li>Motion of objects in terms of displacement, speed or velocity, and acceleration</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of constant and uniformly accelerated motion in one-dimension.</li> </ul>	<ul style="list-style-type: none"> <li>advocates road safety.</li> </ul>	<ul style="list-style-type: none"> <li>describes the motion of an object in terms of distance or displacement, speed or velocity, and acceleration.</li> <li>differentiates quantities (in terms of magnitude and direction) using the concepts of distance vs displacement and speed vs velocity</li> <li>creates and interprets visual representation of the motion of objects such as tape charts, motion graphs.</li> <li>solves problems involving constant and uniformly accelerated motion in one-dimension using scalar quantities.</li> <li>enumerates some technologies that make use of motion detectors and explains/describes their applications.</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<ul style="list-style-type: none"> <li>• Motion Detectors</li> </ul>	<i>The learner...</i>	<i>The learner...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• innovates/enhances a simple toy car to meet some standards through fair testing.</li> <li>• discusses various measures to improve road safety from the point of view of the physics involved.</li> </ul>
<b>Waves</b> <ul style="list-style-type: none"> <li>• Transverse vs longitudinal Waves</li> <li>• Mechanical vs electromagnetic waves</li> <li>• Characteristics of waves</li> </ul>	<ul style="list-style-type: none"> <li>• demonstrates understanding of waves as a carriers of energy.</li> </ul>		<ul style="list-style-type: none"> <li>• infers that energy, like light and sound, travel in the form of waves.</li> <li>• explains how waves carry energy from one place to another.</li> <li>• distinguishes between transverse and longitudinal waves and mechanical and electromagnetic waves.</li> <li>• creates a model to demonstrate the relationship among frequency, amplitude, wavelength, and wave velocity.</li> </ul>
<b>Sound</b> <ul style="list-style-type: none"> <li>• Characteristics of sound</li> </ul>	<ul style="list-style-type: none"> <li>• demonstrates understanding of the characteristics of sound such as pitch and loudness</li> </ul>	<ul style="list-style-type: none"> <li>• recognizes the use of indigenous materials in creating melodious music.</li> </ul>	<ul style="list-style-type: none"> <li>• uses the concepts of wavelength, velocity, and amplitude to describe characteristics of sound such as pitch, loudness and quality.</li> <li>• demonstrates changes in pitch and loudness using real or improvised musical instrument through fair testing.</li> <li>• explains sound production in the human voice box and how pitch, loudness and quality of sound vary from one person to another.</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner...</i>	<i>The learner...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>describes how organisms produce, transmit and receive sound of various frequencies (infrasonic, audible and ultrasonic sound).</li> <li>creates harmonious music using indigenous products.</li> </ul>
<b>Light</b> <ul style="list-style-type: none"> <li>Characteristics of light:</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the characteristics of light: intensity or brightness and color</li> </ul>	<ul style="list-style-type: none"> <li>appreciates proper lighting in doing various activities.</li> </ul>	<ul style="list-style-type: none"> <li>relates characteristics of light such as color and intensity to frequency and wavelength.</li> <li>designs and implements an experiment that shows that light travels in a straight line.</li> <li>investigates the relationship between light intensity and the distance from a light source through fair testing.</li> </ul>
<b>Heat</b> <ul style="list-style-type: none"> <li>Heat transfer</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the different modes of heat transfer: conduction, convection, radiation</li> </ul>	<ul style="list-style-type: none"> <li>chooses right materials for a particular purpose for cooking, food storage, and building homes.</li> </ul>	<ul style="list-style-type: none"> <li>infers the condition necessary for heat transfer to occur.</li> <li>conducts simple investigations to demonstrate the different modes of heat transfer.</li> <li>explains different modes of heat transfer in the molecular level.</li> <li>identifies good and poor conductors of heat and describe their specific uses</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Electricity</b> <ul style="list-style-type: none"> <li>Charges</li> <li>Charging processes</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of the different charging processes.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>protects himself/herself during thunderstorm.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>differentiates the three types of charges.</li> <li>demonstrates the different types of charging processes.</li> <li>explains the importance of earthing or grounding.</li> <li>describes how a lightning rod works.</li> </ul>
<b>GRADE 7 - Earth and Space FOURTH QUARTER / FOURTH GRADING PERIOD</b>			
<b>The Philippine Archipelago</b> <ul style="list-style-type: none"> <li>Location of the Philippines in relation to continents and oceans using a coordinate system</li> <li>Physical features of the Philippines</li> <li>Protection and conservation of natural resources</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the physical features of the Philippine archipelago and its natural resources, including the ways by which these resources are conserved and protected.</li> </ul>	<ul style="list-style-type: none"> <li>practices conservation and protection of resources (soil, water, rocks and minerals, fossil fuels) in the community.</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates how places on Earth may be located using a coordinate system.</li> <li>describes the location of the Philippines with respect to the continents and oceans of the world.</li> <li>describes the major landforms and bodies of water in the Philippines.</li> <li>recognizes that soil, water, rocks, coal, and other fossil fuels are Earth materials.</li> <li>recognizes that Earth materials provide many of our resources.</li> <li>describes ways of using Earth's resources wisely.</li> <li>investigates the effects of unwise use of Earth's resources.</li> </ul>



<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Interactions in the Atmosphere</b> <ul style="list-style-type: none"> <li>Land and sea breezes</li> <li>Monsoons</li> <li>Intertropical convergence zone</li> <li>Ozone depletion*</li> <li>Greenhouse effect*</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of the different phenomena that occur in the atmosphere and how they affect human activities.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>adapts and manages weather phenomena-related risks to human lives, properties, and the environment</li> <li>discusses how human activities contribute to or lessen ozone depletion and global warming</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>describes the different layers of the atmosphere.</li> <li>illustrates how some human activities affect the atmosphere. (*Ozone depletion is included here.)</li> <li>explains how energy from the sun enters the atmosphere. (*Greenhouse effect is included here.)</li> <li>accounts for the occurrence of land and sea breezes and monsoons.</li> <li>gives reasons for the occurrence of the intertropical convergence zone (ITCZ)</li> <li>describes the effects of certain weather systems in the Philippines</li> </ul>
<b>Seasons in the Philippines</b> <ul style="list-style-type: none"> <li>Relation of seasons to the position of the Sun in the sky</li> <li>Causes of seasons in the Philippines</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the relationships of the seasons and the position of the sun in the sky</li> </ul>	<ul style="list-style-type: none"> <li>plans activities appropriate to the seasons in the Philippines</li> </ul>	<ul style="list-style-type: none"> <li>using models, relates <ul style="list-style-type: none"> <li>the tilt of the Earth to the length of daytime</li> <li>the length of daytime to the amount of energy received</li> <li>the position of the Earth in its orbit to the height of the Sun in the sky</li> <li>the height of the Sun in the sky to the amount of energy received</li> <li>the latitude of an area to the amount of energy the area receives.</li> </ul> </li> <li>shows what causes the seasons in the Philippines to change using models</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Eclipses</b> <ul style="list-style-type: none"> <li>• Solar eclipse</li> <li>• Lunar eclipse</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• demonstrates understanding of the occurrence of eclipses.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• discusses whether or not beliefs and practices about eclipses have scientific basis.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• communicates how solar and lunar eclipses occur.</li> <li>• collects, records and reports data on the beliefs and practices of the community in relation to eclipses.</li> </ul>

## GRADE 8

GRADE 8 - Matter FIRST QUARTER/ FIRST GRADING PERIOD			
<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Particulate Nature of Matter</b>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>demonstrates understanding of the particulate nature of matter, explain the properties, physical changes, and structure of substances and mixtures.</li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>makes a chart, poster, or multimedia presentation of elements, ions, and compounds that are important to living organisms</li> <li>presents creatively how water behaves in its different states based on the arrangement of its particles (atoms and molecules)</li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>infers the particulate nature of matter from demonstration.</li> <li>explains the properties of solids, liquids, and gases using the particulate nature of matter.</li> <li>recognizes the different particles of matter as atoms and molecules.</li> <li>uses the particulate nature of matter to explain:               <ul style="list-style-type: none"> <li>- melting</li> <li>- freezing</li> <li>- evaporation</li> <li>- condensation</li> </ul> </li> <li>explains physical changes in terms of the arrangement and motion of atoms and molecules.</li> <li>uses models to represent elements, compounds, and mixtures.</li> <li>writes the names and symbols of the first 20 elements.</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Atomic Structure</b> <ul style="list-style-type: none"> <li>• Subatomic particles</li> <li>• Formation of ions</li> <li>• Formula of common ions</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• demonstrates understanding of the idea that the identity of a substance is determined by its atomic structure.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• interprets food labels in terms of amount of ions present in relation to the required daily mineral intake.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• names and describe the subatomic particles.</li> <li>• determines the number of protons, neutrons, and electrons in an atom.</li> <li>• recognizes that an element is identified by the number of protons in the nucleus.</li> <li>• explains how ions are formed.</li> <li>• determines the number of protons, neutrons, and electrons.</li> <li>• writes the formula of common ions.</li> </ul>
<b>Periodic Table of Elements</b> <ul style="list-style-type: none"> <li>• Development of the PT</li> <li>• Arrangement of elements</li> <li>• Reactive and nonreactive metals</li> </ul>	<ul style="list-style-type: none"> <li>• demonstrates understanding of the periodic table as an organizing tool to determine the chemical properties of elements. These chemical properties of elements depend on the outermost electrons in the atom.</li> <li>• demonstrates understanding of grouping elements as highly reactive metals, less reactive metals, highly nonreactive nonmetals and nonreactive gases.</li> </ul>		<ul style="list-style-type: none"> <li>• traces the development of the periodic table from observations based on similarities in properties of elements.</li> <li>• describes the arrangement of the elements in the periodic table.</li> <li>• gathers information about the elements from the periodic table.</li> <li>• uses the periodic table to predict the chemical behavior of an element.</li> <li>• describes and groups elements as: <ul style="list-style-type: none"> <li>- highly reactive metals</li> <li>- less reactive metals</li> <li>- highly reactive nonmetals</li> <li>- nonreactive gases</li> </ul> </li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner...</i>	<i>The learner...</i>	<ul style="list-style-type: none"> <li>appreciates the importance of knowing the properties of elements in:               <ul style="list-style-type: none"> <li>the human body</li> <li>technology</li> <li>environment</li> </ul> </li> </ul>
<b>GRADE 8 - Living Things and their Environment SECOND QUARTER/SECOND GRADING PERIOD</b>			
<b>Structures and Functions: Focus on the Digestive System</b> <ul style="list-style-type: none"> <li>Organs of the digestive system</li> <li>Chemical changes in food as it undergoes digestion brought about by gastric juices and digestive enzymes</li> <li>Diseases resulting from nutrient deficiency and ingestion of harmful substances</li> <li>Prevention, detection and treatment of diseases of the digestive system</li> <li>Contemporary health issues that promote proper nutrition and overall wellness</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the organs of the digestive system involving ingestion, absorption, assimilation and excretion</li> <li>demonstrates understanding of nutrients as raw materials for energy, growth and maintenance</li> <li>demonstrates understanding of diseases that result from nutrient deficiency and ingestion of harmful substances as well as prevention and treatment, including traditional and alternative medications</li> <li>demonstrates understanding of contemporary issues related to health including medical technologies</li> </ul>	<ul style="list-style-type: none"> <li>engages in practices that promote proper functioning of the digestive system</li> </ul>	<ul style="list-style-type: none"> <li>describes the coordinated functions of the organs of the digestive system</li> <li>traces the path of food as it is being digested</li> <li>explains how enzymes help in digesting food</li> <li>explains how digested food is absorbed through the villi and is carried through the bloodstream to the liver</li> <li>illustrates how diseases of the digestive system are detected, prevented, or treated</li> <li>reflects on healthful practices that affect the digestive system</li> <li>discusses contemporary health issues that promote proper nutrition and overall wellness.</li> <li>researches on certain technologies that are used to promote proper functioning of the digestive system</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Heredity: Inheritance and variation of Traits</b> <ul style="list-style-type: none"> <li>Organelles of the cell involved in cell division</li> <li>Stages of mitosis</li> <li>Stages of meiosis               <ul style="list-style-type: none"> <li>➤ Oogenesis</li> <li>➤ Spermatogenesis</li> </ul> </li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding that cells divide to produce new cells.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>explains the importance of mitosis in the growth, development, and repair of somatic cells</li> <li>explains the importance of variation in plant and animal breeding</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>identifies organelles that are involved in cell division</li> <li>describes and compares the processes of mitosis and meiosis, and their role in the cell division cycle</li> <li>compares the number of chromosomes of the daughter cells resulting from mitosis and meiosis</li> <li>differentiates oogenesis and spermatogenesis</li> <li>explains the significance of meiosis in maintaining the chromosome number</li> <li>describes how the union of egg and sperm cells results to variation</li> </ul>
<b>Biodiversity</b> <ul style="list-style-type: none"> <li>Species diversity</li> <li>Hierarchical taxonomic system of species</li> <li>Protection and conservation of rare and economically important species</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the concept of a species as a reproductively distinct group of organisms.</li> <li>demonstrates understanding that species are further classified into a hierarchical taxonomic system (domain, kingdom, phylum, class, order, family, genus, species)</li> </ul>	<ul style="list-style-type: none"> <li>initiates and participates in activities that protect and conserve rare and economically important species</li> </ul>	<ul style="list-style-type: none"> <li>explains the concept of species as a reproductively distinct group of organisms</li> <li>classifies organisms using the hierarchical taxonomic system (domain, kingdom, phylum, class, order, family, genus, species) based on structure and function</li> <li>explains the advantage of high biodiversity over low biodiversity</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Interactions</b> <ul style="list-style-type: none"> <li>Transformation of energy</li> <li>Biogeochemical cycles               <ul style="list-style-type: none"> <li>water cycle</li> <li>oxygen – carbon cycle</li> <li>nitrogen cycle</li> </ul> </li> <li>Impact of human activities in an ecosystem</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of the one way flow of energy and the cycling of materials in an ecosystem</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>makes informed decisions regarding food choices based on the trophic levels</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>describes the transfer of energy through the trophic levels</li> <li>analyzes the roles of organisms in the major biogeochemical cycles and processes</li> <li>explains how materials cycle in an ecosystem</li> <li>suggests ways to minimize human impact on the environment</li> <li>describe changes caused by organisms in their environment to ensure survival, which may affect the ecosystem</li> </ul>
<b>GRADE 8 - Force, Motion and Energy</b> <b>THIRD QUARTER/THIRD GRADING PERIOD</b>			
<b>Laws of Motion</b> <ul style="list-style-type: none"> <li>Law of Inertia</li> <li>Law of Acceleration</li> <li>Law of Interaction</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the Newton's three laws of motion: Law of Inertia, Law of acceleration, and Law of Interaction</li> </ul>	<ul style="list-style-type: none"> <li>observes road safety as a motorist or a pedestrian.</li> </ul>	<ul style="list-style-type: none"> <li>investigates the relationship of the amount of force applied and the mass of the object to the amount of change in the object's motion</li> <li>infers that when a body exerts a force on another an equal amount of force is exerted back on it</li> <li>models passengers body response to changes in motion</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner..</i>	<i>The learner..</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• develops a written plan and implement a “Newton’s Olympics”</li> <li>• observes and predict natural phenomena governed by laws of motion</li> <li>• demonstrates the effects of friction on a moving body</li> <li>• constructs a bottle rocket that has the greatest time of flight</li> <li>• designs and implements an experiment that will verify Newton’s 3rd law of motion</li> <li>• relates the laws of motion to bodies in uniform circular motion</li> <li>• infers that circular motion requires the application of constant force directed toward the center of the circle</li> <li>• identifies the manifestation of centripetal force in real-life circular motion</li> </ul>
<b>Work Power and Energy</b> <ul style="list-style-type: none"> <li>• Layman’s definition of work vs mechanical work</li> <li>• Situations where work is done and where work is not done</li> </ul>	<ul style="list-style-type: none"> <li>• demonstrates understanding of work using constant force, power, gravitational potential energy, kinetic energy, and elastic potential energy</li> </ul>	<ul style="list-style-type: none"> <li>• maximizes the benefits of energy while minimizing its use of its sources</li> </ul>	<ul style="list-style-type: none"> <li>• differentiates layman’s definition of work from mechanical work</li> <li>• determining if work is present in a given activity or not</li> <li>• relates power, work and time</li> <li>• computes for work done by a constant force</li> </ul>



<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner..</i>	<i>The learner..</i>	<i>The learner..</i> <ul style="list-style-type: none"> <li>differentiates potential and kinetic energy</li> <li>relates speed and position of object to energy possessed</li> <li>investigates elastic constant of various springs or rubber bands</li> <li>creates a mousetrap car that will travel the greatest distance and speed</li> </ul>
<b>Sound</b>	<ul style="list-style-type: none"> <li>demonstrates understanding of the propagation of sound through solid, liquid, and gas</li> </ul>		<ul style="list-style-type: none"> <li>compares the speed of sound through solids, liquids and gases</li> <li>infers how the molecular structure of a material affect speed of sound moving through it</li> <li>investigates the effect of temperature to speed of sound through fair testing</li> </ul>
<b>Light</b>	<ul style="list-style-type: none"> <li>demonstrates understanding of some properties and characteristics of visible light</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates care for eyes</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates the existence of the color components of visible light using a prism or diffraction grating</li> <li>infers that color is a manifestation of visible light's frequency or wavelength</li> <li>explains the hierarchy of colors in relation to energy</li> <li>explains that red is bent the least and violet is bent the most according to their wavelengths or frequency</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Heat</b>	<p><i>The learner..</i></p> <ul style="list-style-type: none"> <li>demonstrates understanding of heat and temperature and the effects of heat to a body</li> </ul>	<p><i>The learner..</i></p> <ul style="list-style-type: none"> <li>chooses appropriate materials for a specific function</li> </ul>	<p><i>The learner..</i></p> <ul style="list-style-type: none"> <li>differentiates between heat and temperature in the molecular level</li> <li>demonstrates why touching is not an accurate way to measure temperature</li> <li>cites examples in real life and industries that apply expansion of materials (e.g. expansion slots of bridges, wine commerce, tooth filling materials)</li> <li>investigates the relationship between amount of heat transferred to temperature difference or heat capacity or mass using fair testing</li> <li>explains the conditions necessary to change the state of matter</li> <li>infers that change of state requires no change in temperature</li> </ul>
<b>Electricity and Magnetism</b>	<ul style="list-style-type: none"> <li>demonstrates understanding of current- voltage-resistance relationship, electric power, electric energy, and home circuitry</li> </ul>	<ul style="list-style-type: none"> <li>practices safety in handling electrical devices</li> </ul>	<ul style="list-style-type: none"> <li>infers the relationship between current and charge</li> <li>creates models or cites analogies for electrical charge, current, voltage, power and resistance</li> <li>differentiates voltage from current and identify which causes physiological effects</li> <li>explains the function of a resistor and identify household examples</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner...</i>	<i>The learner..</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>investigates the effect of using one or two batteries to various ways of connecting two light bulbs (series and parallel connections)</li> <li>explains using series connection how current through our body lessens with protective boots and gloves</li> <li>explains the advantage of parallel wiring in homes</li> <li>differentiates electrical power and energy</li> <li>compares power rating and energy consumption of various electrical appliances</li> <li>discusses the dangers of overloading an electrical circuit</li> <li>explains why ground is zero potential</li> <li>explains the functions of circuit breakers, fuses, earthing, double insulation and other safety devices in the home</li> </ul>
<b>GRADE 8 - Earth and Space FOURTH QUARTER/FOURTH GRADING PERIOD</b>			
<b>Earthquakes and Faults</b> <ul style="list-style-type: none"> <li>Active and inactive faults</li> <li>How movements along faults generate earthquakes</li> <li>Earthquake focus and epicenters</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the relationship between faults and earthquakes.</li> </ul>	<ul style="list-style-type: none"> <li>makes informed decisions based on knowledge of the location of active faults in the community.</li> </ul>	<ul style="list-style-type: none"> <li>describes what a fault is.</li> <li>using models or illustrations, explains how movements along faults generate earthquakes.</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<ul style="list-style-type: none"> <li>Intensity and Magnitude</li> <li>Earthquake preparedness</li> <li>How earthquake waves provide information about the interior of the Earth.</li> </ul>	<i>The learner...</i>	<i>The learner..</i> <ul style="list-style-type: none"> <li>shows emergency preparedness (includes following advisories given by responsible government agencies) before, during and after an earthquake</li> </ul>	<i>The learner..</i> <ul style="list-style-type: none"> <li>differentiates the epicenter of an earthquake from its focus</li> <li>differentiates the intensity of an earthquake from its magnitude</li> <li>Identifies faults in the community</li> <li>differentiates between active and inactive faults</li> <li>explains how earthquake waves provide information about the interior of the earth</li> </ul>
<b>Understanding Typhoons</b> <ul style="list-style-type: none"> <li>How typhoons develop</li> <li>Why the Philippines is prone to typhoons</li> <li>How landforms and bodies of water affect typhoons</li> <li>Philippine Area of Responsibility</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of formation of typhoons.</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates precautionary measures before, during, and after a typhoon</li> <li>includes following advisories, storm signals, and calls for evacuation given by responsible government agencies</li> <li>participates in activities that lessen the harmful effects of typhoons</li> </ul>	<ul style="list-style-type: none"> <li>explains how typhoons develop</li> <li>infers why the Philippines is prone to typhoons</li> <li>explains how landforms and bodies of water affect typhoons</li> <li>traces the path of typhoons that enter the Philippine Area of Responsibility (PAR) using a topographic map and tracking data</li> </ul>
<b>Other Members of the Solar System</b> <ul style="list-style-type: none"> <li>Comets</li> <li>Meteors</li> <li>Asteroids</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of characteristics of meteors and comets.</li> </ul>	<ul style="list-style-type: none"> <li>discusses whether or not beliefs and practices about comets and meteors have scientific basis.</li> </ul>	<ul style="list-style-type: none"> <li>compares and contrasts comets, meteors, and asteroids.</li> <li>predicts the appearance of comets based on recorded data of previous appearances.</li> <li>explains the regular occurrence of meteor showers.</li> </ul>

## GRADE 9

## GRADE 9 – Matter

## FIRST QUARTER/ FIRST GRADING PERIOD

<i><b>Content</b></i>	<i><b>Content Standards</b></i>	<i><b>Performance Standards</b></i>	<i><b>Learning Competencies</b></i>
<b>Chemical Bonding</b> <ul style="list-style-type: none"> <li>• Metallic Bonding</li> <li>• Ionic and Covalent Bonding</li> </ul>	<i>The learner...</i> <p>demonstrates understanding of:</p> <ul style="list-style-type: none"> <li>• the patterns observed in the number of outermost electrons of atoms, which are the ones involved in chemical bonding</li> <li>• interactions between submicroscopic components of different substances that lead to atomic or molecular rearrangements forming new substances</li> <li>• the concept that atoms and molecules combine in definite ratios to form larger structures with a new set of properties</li> <li>• the type of bond that carbon forms explains the diversity of carbon compounds</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• conducts a survey of organic and inorganic compounds found in natural resources of the Philippines</li> <li>• indicates the uses of these compounds based on their properties and present data in a poster, chart, or multimedia presentation</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• explains properties of metals in terms of their structure</li> <li>• recognizes different types of compounds (ionic or covalent) from their properties such as melting point, hardness, polarity, and electrical and thermal conductivity</li> <li>• recognizes different types of elements that combine to form specific types of compounds (combination of metals and nonmetals)</li> <li>• writes chemical formulas of ionic and covalent compounds formed by the first 20 elements</li> <li>• explains the formation of ionic compounds and covalent compounds in terms of ionization energy and electron affinity</li> <li>• infers trends in ionization energy and electron affinity.</li> <li>• explains chemical changes in terms of the breaking of bonds and the rearrangement of atoms to form new substances</li> </ul>

<i><b>Content</b></i>	<i><b>Content Standards</b></i>	<i><b>Performance Standards</b></i>	<i><b>Learning Competencies</b></i>
<b>The Variety of Carbon Compounds</b>	<i>The learner ...</i>	<i>The learner...</i>	<ul style="list-style-type: none"><li>describes how the structure of carbon atom affects the type of bonds it forms.</li><li>recognizes the general classes of organic compounds and their uses.</li></ul>
<b>Mole Concept</b>		<ul style="list-style-type: none"><li>designs an educational game involving mole concept.</li></ul>	<ul style="list-style-type: none"><li>uses the mole concept to express mass of substances.</li><li>determines the mass of a given number of moles of a substance.</li><li>determines the number of moles of a substance, given its mass.</li><li>determines the percentage of composition of a compound given its chemical formula and vice versa.</li></ul>
<b>GRADE 9 - Living Things and Their Environment SECOND QUARTER/SECOND GRADING PERIOD</b>			
<b>Respiratory and Circulatory Systems Working with the Other Organ Systems</b>	<p>demonstrates understanding of</p> <ul style="list-style-type: none"><li>how the different parts and functions of the circulatory and respiratory systems and how they work with the other organ system to transport oxygen-rich blood and nutrients to the different parts of the body</li></ul>	<ul style="list-style-type: none"><li>practices healthful habits to maintain proper functioning of the organs of the respiratory and circulatory systems</li></ul>	<ul style="list-style-type: none"><li>describes the parts and functions of the circulatory system</li><li>explains the mechanism on how the circulatory system transports nutrients, gases, and other molecules to and from the different parts of the body</li><li>explains how harmful substances affect the respiratory and circulatory systems</li></ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>the prevention, detection, and treatment of diseases affecting the circulatory system</li> </ul>	<p><i>The learner ...</i></p>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>explains how lifestyle (e.g., regular exercise, smoking) affects the functioning of the circulatory system</li> <li>makes a chart of diseases affecting the circulatory system and their prevention, detection, and treatment</li> </ul>
<p><b>Heredity: Inheritance and Variation</b></p> <ul style="list-style-type: none"> <li>Haploid number of chromosomes in gametes</li> <li>Location of genes in chromosomes</li> <li>Restoration of the diploid number of chromosomes in the offspring through fertilization</li> <li>Expression of the genetic information as physical traits in the offspring</li> </ul>	<p><i>demonstrates understanding of</i></p> <ul style="list-style-type: none"> <li>that genetic information is organized in genes on chromosomes</li> <li>that traits of an organism are transmitted to the offspring through the genes found in chromosomes.</li> </ul>	<ul style="list-style-type: none"> <li>illustrates how traits of economically important plants and animals are improved through breeding</li> </ul>	<ul style="list-style-type: none"> <li>explains how fertilization produces a diploid zygote out of haploid gametes</li> <li>describes the location of genes in chromosomes</li> <li>explains how genes are responsible for specific traits</li> <li>identifies phenotypes as the expression of inherited characteristics</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Life Energy</b> <ul style="list-style-type: none"> <li>From Light Energy to Chemical Energy of Food <ul style="list-style-type: none"> <li>Structure and function of plant parts and organelles involved in photosynthesis</li> <li>Photosynthesis</li> <li>Light-dependent reactions</li> <li>Light-independent reactions and synthesis of glucose</li> </ul> </li> <li>Generation of chemical energy (ATP) through respiration <ul style="list-style-type: none"> <li>Structure and function of mitochondrion as the main organelle involved cellular respiration <ul style="list-style-type: none"> <li>Aerobic respiration</li> <li>Anaerobic respiration</li> </ul> </li> </ul> </li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of life energy processes</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>applies farming practices that relate knowledge of photosynthesis that may result to increased yield</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>associates photosynthesis and respiration with appropriate cell structures</li> <li>provides evidence that plants can manufacture their own food</li> <li>differentiates basic features of photosynthesis and respiration</li> <li>explains the importance of photosynthesis to other organisms</li> </ul>



<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Interactions</b> <ul style="list-style-type: none"> <li>Decomposition</li> <li>Nutrient cycling Population growth &amp; carrying capacity</li> </ul>	<i>The learner ...</i>  <i>demonstrates understanding that</i> <ul style="list-style-type: none"> <li>microorganisms have essential roles in nutrient cycling.</li> <li>an ecosystem can only support a limited number of organisms</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>relates overcrowding in fish pens to eutrophication and fish kills</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>designs and conduct an experiment using yeast or other suitable organisms to evaluate the relationship between population growth and carrying capacity</li> </ul>
<b>GRADE 9 - Force, Motion and Energy</b> <b>THIRD QUARTER/THIRD GRADING PERIOD</b>			
<b>Projectile Motion</b> <ul style="list-style-type: none"> <li>Motion in two dimension</li> <li>Impulse and Momentum</li> <li>Elastic and inelastic collision</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of projectile motion, impulse and momentum, conservation of momentum.</li> </ul>	<ul style="list-style-type: none"> <li>advocates road safety.</li> </ul>	<ul style="list-style-type: none"> <li>describes motion in two dimension.</li> <li>identifies any projectile is moving under the influence of gravity.</li> <li>explains why projectiles travel with two independent motions.</li> <li>computes for unknown variables using equations for horizontal and angled projectiles.</li> <li>proposes ways to enhance sports related to projectile motion.</li> <li>explains the dangers of celebratory firing.</li> <li>relates impulse and momentum to cause and effect.</li> <li>analyzes factors required to produce a change in momentum.</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner...</i>	<i>The learner...</i>	<ul style="list-style-type: none"> <li>analyzes one-dimensional elastic and inelastic collision and recoil situations.</li> <li>examines effects and predict causes of collision-related damages/injuries.</li> </ul>
<b>Work Power and Energy</b> <ul style="list-style-type: none"> <li>Changes in form of mechanical energy</li> <li>Conservation of energy</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of conservation of mechanical energy.</li> </ul>	<ul style="list-style-type: none"> <li>manages energy sources suitable to one's lifestyle</li> </ul>	<ul style="list-style-type: none"> <li>explains how different types of mechanical energy change its form.</li> <li>uses the equation for conservation of energy in solving for unknowns.</li> <li>explains energy transformation in various activities/events (e.g. waterfalls, archery, amusement rides).</li> <li>creates ball launchers that can project a ball to a great distance.</li> </ul>
<b>Sound</b> <ul style="list-style-type: none"> <li>Resonance</li> <li>Interferences</li> <li>Waves and building designs</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of sound resonance, interference, and basic acoustics.</li> </ul>	<ul style="list-style-type: none"> <li>chooses appropriate materials for a specific function</li> </ul>	<ul style="list-style-type: none"> <li>creates a model to explain natural frequency of matter.</li> <li>explains how resonance causes sound production in musical instruments.</li> <li>investigates the conditions required for resonance to occur in various media.</li> <li>creates models to illustrate constructive and destructive interferences.</li> <li>cites advantages and disadvantages and applications of interference.</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner ...</i>	<i>The learner ...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>explains how knowledge of properties of waves is applied in building designs.</li> <li>identifies sources of noise in different environment and explain how noise can be reduced to acceptable levels.</li> </ul>
<b>Light</b> <ul style="list-style-type: none"> <li>Motion of light</li> <li>Transparent, translucent or opaque materials</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates propagation of light through various media</li> </ul>	<ul style="list-style-type: none"> <li>chooses appropriate materials for a specific function</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates the straight line motion of light</li> <li>realizes that opaque materials cast shadows</li> <li>investigates the varying size and shape of shadows due to movement of light source</li> <li>classifies materials as transparent, translucent or opaque</li> <li>investigates the effect light incident to a material</li> </ul>
<b>Heat</b> <ul style="list-style-type: none"> <li>Natural heat transfer</li> <li>Heat loss through conduction, convection or radiation</li> <li>Preventing heat transfer</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the relationship among heat, work, and efficiency</li> </ul>	<ul style="list-style-type: none"> <li>chooses appropriate materials for a specific function</li> </ul>	<ul style="list-style-type: none"> <li>cites examples of natural heat transfer</li> <li>evaluates natural and man-made designs that prevent or promote heat loss through conduction, convection or radiation</li> <li>explains why wasted energy cannot be prevented</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
			<p><i>The learner ...</i></p> <ul style="list-style-type: none"> <li>identifies relevant design home/building designs related to heat transfer</li> <li>investigates the effectiveness of indigenous materials in promoting or preventing heat transfer</li> </ul>
<b>Electricity and magnetism</b> <ul style="list-style-type: none"> <li>Electromagnetic effects</li> </ul>			<ul style="list-style-type: none"> <li>sketches magnetic fields</li> <li>demonstrates the generation of electricity by movement of a magnet through a coil</li> <li>investigates factors that affect strength of magnetic field of an electromagnet</li> <li>makes a model on how a magnetic field exerts a force on a wire</li> <li>constructs a simple galvanometer using a compass and wire and explain its function</li> <li>interprets the operation of a simple generator</li> <li>describes the design of a simple electric motor</li> <li>constructs a simple door bell or burglar alarm</li> </ul>

Grade 9 - Earth and Space FOURTH QUARTER/FOURTH GRADING PERIOD			
<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Volcanoes and the Interior of the Earth</b> <ul style="list-style-type: none"> <li>Active and inactive volcanoes</li> <li>Different types of volcanoes</li> <li>What happens when volcanoes erupt</li> <li>Energy form volcanoes</li> <li>How volcanoes provide information about the interior of the Earth.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of the interior of the Earth using information from volcanoes</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>makes informed decisions based on identified permanent danger zones around active volcanoes</li> <li>shows emergency preparedness before, during and after a volcanic eruption</li> <li>includes following advisories regarding alert levels and calls for evacuation given by responsible government agencies</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>identifies the volcanoes in the community (or in the region)</li> <li>differentiates between active and inactive volcanoes</li> <li>describes the different types of volcanoes</li> <li>using models or illustrations, explains what happens when volcanoes erupt</li> <li>using diagrams, illustrates how energy from volcanoes may be tapped for human use</li> <li>explains how volcanoes provide information about the interior of the Earth</li> </ul>
<b>Climate</b> <ul style="list-style-type: none"> <li>Factors that affect climate</li> <li>Global climate phenomenon</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the factors that affect climate, the effects of changing climate, and how to adapt to them</li> </ul>	<ul style="list-style-type: none"> <li>participates in activities that reduce risks and lessen effects of climate change</li> </ul>	<ul style="list-style-type: none"> <li>explains how different factors affect the climate of an area</li> <li>describes certain climatic phenomena that occur on a global level (global warming and El Niño are included here)</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Constellations</b> <ul style="list-style-type: none"> <li>• Characteristics of stars</li> <li>• Arrangement of stars in a group</li> <li>• Changing position of constellations during the night and at different times of the year</li> <li>• Beliefs and practices about constellations and astrology</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• demonstrates understanding of the factors that affect climate, the effects of changing climate, and how to adapt to them.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• demonstrates understanding of the factors that affect climate, the effects of changing climate, and how to adapt to them</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>• infers the characteristics of stars based on the characteristics of the Sun</li> <li>• infers that the arrangement of stars in a group (constellation) does not change</li> <li>• observes that the position of a constellation changes in the course of a night</li> <li>• using models, shows which constellations may be observed at different times of the year</li> </ul>

## GRADE 10

GRADE 10 - Matter FIRST QUARTER/FIRST GRADING PERIOD			
<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Gas Laws</b> <ul style="list-style-type: none"> <li>Kinetic Molecular Theory</li> <li>Volume, pressure and temperature relationship</li> <li>Ideal gas law</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of the relationships among temperature, volume and pressure of gases through the kinetic molecular theory.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>applies the Kinetic Molecular theory in explaining everyday situations involving gases.</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>investigates the relationship between:               <ul style="list-style-type: none"> <li>volume and pressure at constant temperature of a gas</li> <li>volume and temperature at constant pressure of a gas</li> <li>explains these relationships using the kinetic molecular theory.</li> </ul> </li> <li>cites situations that demonstrate the relationship between:               <ul style="list-style-type: none"> <li>volume and pressure at constant amount and temperature of a gas</li> <li>volume and temperature at constant amount and pressure of a gas</li> </ul> </li> <li>performs calculations using the ideal gas law</li> </ul>
<b>Biomolecules</b> <ul style="list-style-type: none"> <li>Elements present in biomolecules</li> <li>Carbohydrates, lipids, proteins, and nucleic acids.</li> <li>Food labels</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of biomolecules which are made mostly of a limited number of elements, such as carbon, hydrogen, oxygen and nitrogen. Together with water and a few kinds of ions, these biomolecules make up cells and tissues.</li> </ul>	<ul style="list-style-type: none"> <li>interprets food labels in terms of percentage composition in relation to the required daily intake of carbohydrates/sugars, proteins, and fats.</li> </ul>	<ul style="list-style-type: none"> <li>recognizes the major categories of biological molecules such as carbohydrates, lipids, proteins, and nucleic acids.</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Chemical Reactions</b>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>demonstrates understanding of chemical reactions associated with biological and industrial processes affecting life and the environment.</li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>using any form of media, presents the effects of chemical reactions on biological and industrial processes affecting life and the environment.</li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>describes the four general types of chemical reactions.</li> <li>applies the principles of conservation of mass to chemical reactions</li> <li>balances equations, given the formulas for reactants and products.</li> <li>enumerates and explains the factors affecting rates of chemical reactions.</li> <li>recognizes that all chemical reactions are accompanied by energy change.</li> <li>identifies chemical reactions involved in biological and industrial processes affecting life and the environment.</li> <li>describes chemical reactions involved in plant growth, food digestion and spoilage.</li> <li>describes the effects of various factors on the rate of chemical reactions.</li> <li>explains how the factors affecting rates of chemical reactions are applied in food preservation and materials production, control of fire, pollution, and corrosion.</li> <li>recognizes the importance of controlling rates of reactions in technology.</li> </ul>



Grade 10 - Living Things and Their Environment SECOND QUARTER/SECOND GRADING PERIOD			
<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Coordinated Functions of the Organs of the Reproductive System</b>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>demonstrates understanding of               <ul style="list-style-type: none"> <li>the structure and function of the reproductive system</li> <li>hormones involved in the female and male reproductive systems</li> <li>feedback mechanisms involved in the female reproductive system (e.g., menstrual cycle)</li> <li>process of fertilization</li> <li>development of the zygote</li> </ul> </li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>practices healthful habits to maintain proper functioning of the organs of the reproductive system</li> </ul>	<p><i>The learner...</i></p> <ul style="list-style-type: none"> <li>describes the functions of the major parts of the reproductive organs</li> <li>explains the roles of hormones involved in the female and male reproductive systems</li> <li>summarizes the process of reproduction using a concept map</li> </ul>
<b>Heredity: Inheritance and Variation</b>	<ul style="list-style-type: none"> <li>demonstrates understanding               <ul style="list-style-type: none"> <li>that the information passed from parents to offspring is coded in DNA molecules</li> <li>of the structure of DNA molecules</li> <li>of the DNA replication</li> <li>genetic information stored in DNA is used to direct the synthesis of proteins</li> <li>of process of protein synthesis</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>explains how heritable characteristics can be observed in an organism's phenotype – molecular or whole-organism level</li> </ul>	<ul style="list-style-type: none"> <li>describes the structure of the DNA molecule</li> <li>explains the process of DNA replication</li> <li>explains the process of protein synthesis</li> <li>explains how mutations may cause changes to the structure and function of a protein</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner...</i> <ul style="list-style-type: none"> <li>• how mutations in a gene influence the structure or function of proteins</li> <li>• that mutations that occur in sex cells can be passed on to the offspring's.</li> </ul>	<i>The learner...</i>	<i>The learner...</i>
<b>Evolution</b>	demonstrates understanding <ul style="list-style-type: none"> <li>• that evolution explains both the unity and diversity of species</li> <li>• of the Theory of Natural Selection</li> <li>• of the scientific evidence of natural selection</li> </ul>	<ul style="list-style-type: none"> <li>• explains how species diversity increases the probability of adaptation and survival of organisms in changing environments</li> </ul>	<ul style="list-style-type: none"> <li>• describes the theory of natural selection</li> <li>• explains how natural selection can result to speciation and extinction</li> <li>• explains how fossil records, comparative anatomy and genetic information provide evidence of evolution</li> <li>• explains the importance of adaptation as a mechanism for species survival</li> </ul>
<b>GRADE 10 - Force, Motion and Energy</b> <b>THIRD QUARTER/ THIRD GRADING PERIOD</b>			
<b>Center of Mass and Equilibrium</b>	<ul style="list-style-type: none"> <li>• demonstrates understanding of balance, stability, and strength.</li> </ul>	<ul style="list-style-type: none"> <li>• practices appropriate positions or movements to achieve efficiency and safety in performing sports activities such as basketball, soccer, tennis, and swimming</li> </ul>	<ul style="list-style-type: none"> <li>• applies Newton's laws of motion to describe translational equilibrium</li> <li>• explains the conditions for translational equilibrium</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner...</i>	<i>The learner...</i>	<ul style="list-style-type: none"> <li>• constructs free body diagrams</li> <li>• applies vector techniques to translational equilibrium problems</li> <li>• determines the center of mass of various objects</li> <li>• explains the conditions for rotational equilibrium</li> </ul>
<b>Characteristics of Fluids and Solids</b>	<ul style="list-style-type: none"> <li>• demonstrates understanding of the differences between fluids and solids in terms of molecular structure, compressibility and density</li> <li>• applies knowledge of hydraulic systems to real life situations</li> </ul>	<ul style="list-style-type: none"> <li>• solves problems involving pressure and buoyancy, hydraulic systems, and pressure</li> </ul>	<ul style="list-style-type: none"> <li>• differentiates fluids from solids in terms of molecular structure, compressibility and density</li> <li>• demonstrates how temperature affect density</li> <li>• explains the relationship between fluid pressure and depth or density and cite real life examples</li> <li>• differentiates gauge, atmospheric and total pressure</li> <li>• demonstrates real-life examples involving atmospheric pressure</li> <li>• cites examples of hydraulic systems and relate to pressure</li> <li>• explains Pascal's principle</li> <li>• conducts a fair test to identify which factors determine whether a given object will float or sink</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner...</i>	<i>The learner...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>explains how buoyancy is controlled in nature (e.g., fish, humans, and sharks) and in constructed devices (e.g., submarines, airplanes, airships, scuba gear, and hot air balloons)</li> <li>compares different fluids to determine how they alter the buoyant force on a given object</li> <li>solves problems involving pressure and buoyancy</li> </ul>
<b>Waves</b>	<ul style="list-style-type: none"> <li>demonstrates understanding of the different regions of the electromagnetic waves</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of balance, stability, and strength</li> <li>protects oneself from the dangers brought about by different regions/forms of electromagnetic radiation</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of balance, stability, and strength</li> <li>compares the relative wavelengths of different forms of electromagnetic radiation</li> <li>explains uses of the different forms of EM radiation</li> <li>creates models on how materials react to EM radiation other than light (e.g. glass is opaque to some UV rays)</li> <li>explains the effects of EM radiation to living things</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
<b>Sound</b>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of the Doppler effect</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>demonstrates understanding of balance, stability, and strength</li> <li>infers the relative motion or position of the source of sound based on the quality of sound reaching the listener</li> </ul>	<i>The learner...</i> <ul style="list-style-type: none"> <li>illustrates the effect of relative motion of source and receiver to the wavelength and frequency of sound</li> <li>derives Doppler effect equation for sound</li> <li>applies the equation to situations showing various motion of observer and sound source</li> </ul>
<b>Light</b>	<ul style="list-style-type: none"> <li>demonstrates understanding of the images formed by the different types of mirrors and lenses</li> </ul>	<ul style="list-style-type: none"> <li>makes informed choices on selecting the right type of mirrors or lenses for specific purposes</li> </ul>	<ul style="list-style-type: none"> <li>predicts the qualitative characteristics (orientation, type and magnification) of images formed by plane and curved mirrors</li> <li>performs experimentations to test predictions and summarize their findings</li> <li>applies ray diagramming techniques in describing the characteristics and positions of images formed by lenses</li> <li>identifies ways in which the properties of mirrors and lenses determine their use in optical instruments (e.g. camera, binoculars)</li> </ul>
<b>Electricity and Magnetism</b> <ul style="list-style-type: none"> <li>Transmission of energy</li> <li>Power generation and energy losses</li> </ul>	<ul style="list-style-type: none"> <li>appreciates the role of the entire grid network in delivering electricity from the power plants to schools, homes and industries</li> </ul>	<ul style="list-style-type: none"> <li>avoids danger from high voltage wires</li> <li>conserves electricity</li> </ul>	<ul style="list-style-type: none"> <li>explains generation and transmission of electricity through power stations</li> <li>enumerates various ways of generating electricity in the Philippines and state the transformation of energy for each (e.g. hydroelectric, geothermal or wind power plant)</li> </ul>

<b>Content</b>	<b>Content Standards</b>	<b>Performance Standards</b>	<b>Learning Competencies</b>
	<i>The learner...</i>	<i>The learner...</i>	<i>The learner...</i> <ul style="list-style-type: none"> <li>describes energy loss in transmission cables and explain how this is prevented</li> <li>infers the advantages of high voltage transmission</li> <li>explains the importance of a national grid network</li> <li>explains how power generation is related to renewable energy sources</li> </ul>
<b>Grade 10 - Earth and Space</b> <b>FOURTH QUARTER/ FOURTH GRADING PERIOD</b>			
<b>Plate Tectonics</b> <ul style="list-style-type: none"> <li>Volcanoes, earthquake epicenters, and mountain ranges</li> <li>Their relationship to the plate boundaries</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates understanding of the relationship among location of volcanoes, earthquake epicenters and mountain ranges</li> </ul>	<ul style="list-style-type: none"> <li>demonstrates ways to ensure disaster preparedness during earthquakes, tsunamis, and volcanic eruptions</li> <li>suggests ways by which he/she can contribute to government efforts in reducing damage due to earthquakes, tsunamis, and volcanic eruptions</li> </ul>	<ul style="list-style-type: none"> <li>identifies places in the world where volcanoes are located.</li> <li>identifies places in the world where earthquakes commonly occur.</li> <li>identifies places in the world where mountain ranges are found.</li> <li>using maps, locates active volcanoes, earthquake epicenters, and mountain ranges to explain their relationship to the plate boundaries.</li> <li>simulates how underwater earthquakes generate tsunamis.</li> </ul>

## CURRICULUM DEVELOPERS/REVIEWERS/WRITERS/REACTORS in the DEVELOPMENT of K to 12 CURRICULUM

## SCIENCE

## A. Learning Area Team (LAT) Review with designated LAT CONVENOR

Date: September 16, 2011  
 September 19, 2011  
 October 6, 2011  
 October 17, 2011

NAME	DESIGNATION	OFFICE/SCHOOL
1. <b>Dr. Merle Tan - Convenor</b>	Executive Director	UP NISMED
2. Vivien M. Talisayon	VPAA	PWU
3. Leticia V. Catris	Professor VI	PNU/DOST
4. Ma. Cristina D. Padolino	President	CEU
5. Marlene Ferido	Science Education Specialist	NISMED
6. Rolando M. Tan	Science Education Specialist	NISMED
7. Editha Villaflor	Science Education Specialist	NISMED
8. Risa Reyes	Science Education Specialist V	NISMED
9. Aida Yap	Science Education Specialist IV	NISMED
10. Amelia Punzalan	Science Education Specialist IV	NISMED
11. Maria Helen Catalan	Science Education Specialist I	NISMED
12. Rodolfo Treyes	Science Education Specialist III	NISMED
13. May Chavez	Science Education Specialist I	NISMED
14. Ivy P. Mejia	Science Education Specialist II	NISMED
15. Eligio Obille Jr.	Science Education Specialist I	NISMED
16. Cerilina Maramag	Science Education Specialist I	NISMED
17. Dennis Danipog	Science Education Specialist I	NISMED
18. Jacqueline Rose Gutierrez	Science Education Associate II	NISMED
19. Frederick del Rosario	Head Teacher III	BNABS
20. Zenaida Bojo		UPIS
21. Merie Gerlie Capiral		RMHS

**B. Workshop on Determining Gaps Between BEC Grade 6 Competencies and the K to 12 Grade 7 Competencies**

Venue: DAP, Tagaytay City  
Date: September 7-9, 2011

NAME	DESIGNATION	OFFICE/SCHOOL
1. Trinidad Logarto	SEPS	DepEd, CDD-BEE

**C. Workshop on the Development of Learning Competencies and Teaching Guides**

Venue: DAP, Tagaytay City  
Date: July 18-19, 2011

NAME	DESIGNATION	OFFICE/SCHOOL
1. Ms. Maria Carmela A. Boncodin	Faculty	La Salle Green Hills
2. Dr. Merle C. Tan	Director	UP NISMED

Venue: DAP, Tagaytay City  
Date: July 18-22, 2011

NAME	DESIGNATION	OFFICE/SCHOOL
1. Aylen V. Tuvilla	Teacher	DepEd Ro 6
2. Minerva C. David	Teacher	DepEd – Rizal
3. Rubie Arre	Teacher	Araullo High School
4. Arthur Sacatropes	ES	EED, RO III
5. Bryan R. Simara	Documentor	DepEd
6. Marivic Abcede	EPS	BSE
7. Rosalinda Ferrer	EPS II	BSE
8. Ma. Amparo R. Ventura	EPS	BSE
9. Fe M. Villalino	ES	C.O/SDD-BEE
10. Trinidad L. Lagarto	SEPS	C.O/CDD-BEE
11. Zenaida G. Concon	ES	C.O/SPED-BEE

**D. Writeshop on the Finalization of the Curriculum Standards**

Venue: RELC, Calabarzon  
Date: May 19-21, 2011

NAME	DESIGNATION	OFFICE/SCHOOL
1. Dr. Merle C. Tan	Director	UP NISMED
2. Dr. Rosanelia T. Yangco	Chair, Division of Curriculum and Instruction	UP, College of Education



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3. Ms. Maria Carmela A. Boncodin	Faculty	La Salle Green Hills
4. Ms. Trinidad M. Lagarto	Senior Education Program Specialist	DepEd, CDD-BEE
5. Ms. Ana Marie B. Piaoan	Faculty	T.D. & S Hope Christian Academy

## E. Workshop on the Review and Refinement of the K to 12 Curriculum Framework and Standards

Venue: DAP, Tagaytay City

Date: May 10-13, 2011

NAME	DESIGNATION	OFFICE/SCHOOL
1. Ms. Maria Carmela A. Boncodin	Faculty	La Salle Green Hills
2. Dr. Rosanelia T. Yangco	Chair, Division of Curriculum and Instruction	UP, College of Education
3. Ms. Olivia Caling	Faculty	R. Magsaysay High School, Manila
4. Ms. Digna Paningbatan	Master Teacher I	Quezon City Science High School
5. Ms. Maria Amparo Ventura	EPS	DepEd, BSE
6. Ms. Rosario Extremadura	Faculty	A. Bonifacio Elem., School
7. Ms. Marivic C. Abcede	EPS	DepEd, BSE
8. Ms. Zenaida Concon	EPS	DepEd, BEE
9. Ms. Fe M. Villalino	EPS	DepEd, BEE
10. Ana Marie B. Piaoan	Faculty	T.D. & S Hope Christian Academy

## F. Consultative Workshops for the Validation of the K to 12 Curriculum Framework and Standards

1. Regions IV-A, IV-B, V and NCR

Venue: Bulwagan ng Karunungan

Date: April 27, 2011

NAME	DESIGNATION	OFFICE/SCHOOL
1. Rosalinda U. Ferrer	Education Program Supervisor II	BSE – Deped
2. Marilyn V. Marco	Education Program Supervisor II	Deped RO V
3. Digna C. Paningbatan	Master Teacher I	Quezon City Science High School
4. Rogelio F. Amabilis	Teacher I	Commonwealth E.S.
5. Zenaida P. Cristobal	Teacher I	Deped – Antipolo National H.S.
6. Michelle M. Daniel	Teacher I	Deped Legaspi City; Legaspi City HS
7. Ma. Veronica L. Piedragoza	Master Teacher II	Deped
8. Ruturia D. Luan	ES 1	Malabon City
9. Dolores J. Agong	EPS 1	Antipolo City

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10. Jennifer A. Tinaja	MT 1	Mandaluyong
11. Vivian B. Intatano	MT 1	Manila
12. Trinidad M. Lagarto	SEPS	CDD-BEE

## 2. Regions I,II,III and CAR

Venue: Teachers' Camp, Baguio City

Date: April 29, 2011

NAME	DESIGNATION	OFFICE/SCHOOL
1. Melchor P. Pablico	Assistant Principal	St. Louis University – Lab. Elem School
2. Gladys Sibayan	Principal	UC Grade School/High School
3. Adelfa C. Alcanzaren	Teacher I	Bangued East District – Deped Abra
4. Honorio A. Manzano	Teacher	SLU – Lab. High School
5. Apolonia G. Dalanao	EPS – I	Deped – Kalinga Division
6. Constancia B. Poclis	Master Teacher I	La Trinidad Central, Deped, Benguet
7. Petronila A. Payawan	President	Muñoz Associate of Private School
8. Gayle Zannett A. Luyun	Head Teacher III	EVHS
9. Norma C. Guillermo	Asst. Chief EED	Deped RO2
10. Ruby M. Rodriguez	Subject Area Chair	St. Paul University
11. Marlon A. Uson	Teacher III	Deped – Olongapo City National HS
12. Gloria C. Nemedez	Teacher III	Deped – Division of Pangasinan II – Juan G. Macaraeg National High School
13. Charito O. Somera	Teacher III	Deped – La Union
14. Echel S. Antero	Principal	First City Providential College
15. Marilou B. Gawiden	Teacher	Univ. Of Cordilleras
16. Lucila C. Baricaua	EPS	DepEd, Div. Of Cagayan
17. Robely M. Binag	Master Teacher I	Ilagan West Central School
18. Lilia B. Goc Oban	EPS	DepEd Car, Regional Office

## 3. Regions VI,VII and VIII

Venue : Ecotech, Lahug Cebu City

Date : May 4, 2011

NAME	DESIGNATION	OFFICE/SCHOOL
1. Violeta B. Maravilla	Master Teacher II	Cebu City, R-VII
2. Jennalyn M. Oira	Teacher I	Batingue Elementary School, R-VII
3. Carmen J. Ipo	Principal	Cadiz City, R-VI
4. Dafrosa D. Benting	EPS	Toledo City, R-VII

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5. Delia C. Mabao	Master Teacher I	Toledo City, R-VII
6. Bernadetta C. Berdin	HS Principal	Maasin City, R-VII
7. Lengie S. Dalupan	Head Teacher	Ormoc City, R-VIII
8. Ma. Lani A. Aguirre	Faculty	Mandaue City, R-VII
9. Miguel Ramon M. Calibjo	Teacher	Antique, R-VI
10. Julieta M. Catipay	Chairman Science Area	Cebu City, R-VII
11. Dr. Gaudencio C. Aljibe Jr.	EPS	Eastern Samar
12. Sylvie S. Calago	Teacher	SFAS
13. Miguel Ramon M. Calibso	Head Teacher VI	Antique National School

4. Regions IX,X and ARMM  
 Venue: RELC, Cagayan de Oro City  
 Date: May 5,2011

NAME	DESIGNATION	OFFICE/SCHOOL
1. Evelyn D. Ayap	Teacher III	Deped – Bislig City
2. Marlynda Q. dela Pena	Sec. Sch. Principal I	Deped – Bislig City
3. Deminda A. Sanchez	Principal I	Deped – Agusan del Norte
4. Mary Louie Galauna	EPS	Deped – Surigao City
5. Monalisa G. Tolang	Master Teacher II	Deped – Tabon M. Estrella NHS
6. Eva M. Olofernes	Teacher	Northern Mindanao College
7. Concepcion D. Bucod	Science Coordinator	XUGS
8. Earlge Ray Louie R. Gomez	Science Teacher	Corpus Christi School
9. Leah B. Chan	Faculty	International School
10. Aris Rusiance	Teacher	CUBED
11. Linda D. Saab	Teacher	Deped – Camiguin
12. Maria Victoria Sacote	MT - I	Deped - Camiguin
13. Rosita A. Cang	Teacher	Deped
14. Deonalyn H. Oblina	Teacher	Deped – Lanao del Norte
15. Olga C. Alonsabe	Teacher	Deped – Misamis Oriental
16. Ramel P. Cael	ES II	Deped RO 9
17. Jessah U. Sedrome	Master Teacher I	Deped
18. Moraida P. Mecampang	Teacher	Deped LS 1-A

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## 5. Regions XI,XII, ARMM (Shariff Kabunsuan,Maguindanao)

Venue: RELC, Davao Cityand CARAGA

Date: May 6, 2011

NAME	DESIGNATION	OFFICE/SCHOOL
1. Rolito C. Requerme	ESP	DepEd ARMM
2. Norie Manalinta	ESP I	DepEd Maguindanao I
3. Amiliana L. Jabines	Master Teacher I	Alabel NHS, Sarangani, Region XII
4. Lorna Q. Escarcha	Faculty	Polytechnic College of Davao del Sur
5. Virginia C. Balucas	TIC	DepEd ARMM Maguindanao II
6. Editha P. Paraguas	EPS - I	Gen. Santos City
7. Agnes A. Sagsagat	Teacher II	Matina CES, Matina, Davao City
8. Amy P. Castro	SST	Mamasapano NHS – Maguinadanao I
9. Salvacion P. Bacaltos	Teacher	Davao Wisdom Academy
10. Precious Joy A. Villacastin	Master Teacher II	DepEd Digos City
11. Jereza N. Recibe	Master Teacher I	Bula National School of Fisheries
12. Emiliana L. Jabines	Master Teacher I	Alabel NHS DepEd
13. Aura S. Bartolome	EPS	BEE Regional Office – ARMM
14. Merliza M. Murray	EPS	DepEd Maguindanao

## G. Workshop on the K to 12 Curriculum Mapping

Venue: DAP, Tagaytay City

Date: March 16-18,2011

NAME	DESIGNATION	OFFICE/SCHOOL
1. Trinidad Lagarto	SEPS	CDD- BEE
2. Zenaida Concon	EPS	SPED - BEE
3. Nerissa Beltran	ES	CDD - BEE
4. Marivic Abcede	ES	SDD - BSE
5. Rosalinda Ferrer	EPS II	SDD – BSE
6. Joseph Jacob	EPS	BSE
7. Arnold Sinen	EPS	HS Division of San Pablo City, Laguna

**SECRETARIAT**

NAME	DESIGNATION
1. Rachelle C. Fermin	DepEd
2. Prescy Ong	DepEd
3. Magdalena Mendoza	DAP
4. Tristan Suratos	DAP
5. Kimberly Pobre	DAP
6. Cristina Villasenor	DAP
7. Lani Garnace	DAP
8. Kidjie Saguin	DAP
9. Maria Boncan	Accountant, DepEd
10. Daylinda Guevarra	Accountant, DepEd
11. Fenerosa Maur	Accountant, DepEd
12. Divina Tomelden	Accountant, DepEd
13. Nilva Jimenez	Disbursing Officer, DepEd

**FACILITATORS/ SUPPORT TEAM**

NAME	DESIGNATION
1. Irene C. De Robles	CDD – BEE
2. Jose Tuguinayo, Jr.	CDD – BSE
3. Marivic Abcede	CDD – BSE
4. Mirla Olores	SPED – BEE
5. Simeona Ebol	CDD – BEE
6. Fe Villalino	SDD – BEE

**ADVISORY TEAM**

NAME	DESIGNATION
1. Usec. Yolanda S. Quijano	Undersecretary, DepEd OSEC
2. Dr. Lolita Andrada	Director, BSE – DepEd, Pasig
3. Dr. Angelita Esdicul	Director, BEE – DepEd, Pasig
4. Dr. Ricardo de Lumen	OIC, Director III – Tech Voc, DepEd
5. D. Paraluman R. Giron	Chair, K – 10 TWG
6. Dr. Avelina T. Liagas	Consultant, TEC, DepEd
7. Dr. Dina Ocampo	Dean, COE, UP Diliman

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8. Dr. Ester Ogena	President, PNU
9. Dr. Brenda B. Corpuz	Technical Adviser to the Office of USEC, Programs and Standards
10. Dr. Dennis Faustino	Headmaster, SMS Sagada, Mt. Prov.
11. Dr. Merle Tan	Director, UP – NISMED
12. Dr. Cristina Padolino	President, CEU
13. Mr. Napoleon Imperial	CHED
14. Diane Decker	Consultant, MTB – MLE
15. Dr. Nelia Benito	Director, NETRC
16. Dr. Socorro Pilor	Director, IMCS
17. Dr. Beatriz Torno	Executive Director, TEC
18. Dr. Carolina Guerrero	Director, BALS
19. Dr. Irene Isaac	Director, TESDA
20. Dr. Imelda Taganas	Director, TESDA