

CURRICULUM MAP

Science and Technology 7 (Second Edition)

Dear Teacher,

Greetings from Abiva Publishing House, Inc.!

Thank you for adopting our textbook/s. Your chosen series titles come with functional teachers guides (TG) that provide you with a detailed curriculum map (CM) per grade level. For your reference, we are providing you below some important keys to understanding and using the components, terminologies, and abbreviations found in this teacher's companion tool.

We hope you will find the following curriculum map most helpful in your daily planning and teaching tasks. Do suggest other ways we can make your chosen Abiva textbook/s more attuned to your needs as a teacher. You may send us your comments through our official website at wecare@abiva.com.ph.

Happy teaching!

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Curriculum Map Components and Content Sources

Key Stage Standards	Taken from the DepEd Curriculum Guide for Science
Grade Level Standards	Taken from the DepEd Curriculum Guide for Science
Content Standards	Taken from the DepEd Curriculum Guide for Science
Performance Standards	Taken from the DepEd Curriculum Guide for Science
Content	Taken from the textbook: <i>Science and Technology 7 (Second Edition)</i>
K to 12 Learning Competencies (MELCs included)	Taken from the DepEd Curriculum Guide for Science. The Most Essential Learning Competencies (MELCs) mandated by the DepEd are identified to guide teachers as they address the instructional needs of the learners while ensuring that curriculum standards are developed among home-schooling students in the new normal.
21st-Century Skills	Taken from "New Vision for Education: Unlocking the Potential of Technology," World Economic Forum® (2015)
Teaching Strategies/Differentiated Instruction	A variety of author-suggested instructional strategies to help the teacher deliver the lessons at varying levels of difficulty based on the students' learning styles.
Assessment	Assessment tools and strategies categorized as either Formative or Summative
Values Integration	A list of values that are inherent in the subject and developed through lesson discussions and skills exercises. The teacher, however, is encouraged to emphasize values that are aligned with the school's own core values.
Resources	A rundown of suggested instructional materials that may take the form of traditional resources, teacher-made resources, educational software, and other digital learning resources.



LEARNING SKILLS (Competencies): Communication • Collaboration • Critical thinking/problem solving • Creativity
LITERACY SKILLS (Foundation Literacies): Literacy and numeracy • Scientific literacy • ICT literacy • Financial literacy • Cultural literacy • Civic literacy
LIFE SKILLS (Character Qualities): Initiative • Persistence • Adaptability • Curiosity • Leadership • Social and cultural awareness • Career • Work ethics

Key Stage Standards (7–10)	<p>At the end of grade 10, the learners should have developed scientific, technological, and environmental literacy that would lead them to rational choices on issues confronting them. Having been exposed to scientific investigations related to real life, they should recognize that the central feature of investigations is that if one variable is changed (while controlling all others), the effect of the change on one variable can be measured. The context of the investigation can be problems at the local or national level to allow them to communicate with learners in other parts of the Philippines or even from other countries using appropriate technology.</p> <p>The learners should demonstrate an understanding of science concepts and apply science inquiry skills in addressing real-world problems through scientific investigations.</p>
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Grade Level Standards	<p>At the end of grade 7, learners can distinguish mixtures from substances through semi-guided investigations. They realize the importance of air testing when conducting investigations. After studying how organs systems work together in plants and animals in the lower grade levels, learners can use a microscope when observing very small organisms and structures. They recognize 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> <p>Learners can describe the motion of objects in terms of distance and speed, and represent this in tables, graphs, charts, and equations. They can describe how various forms of energy travel through different mediums.</p> <p>Learners can describe what makes up the Philippines as a whole and the resources found in the archipelago. They can explain the occurrence of breezes, monsoons, and ITCZs, and how these weather systems affect people. They can explain why seasons change and demonstrate how eclipses occur.</p>
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1st Quarter

Unit 1: <i>The Investigatory Process and Matter</i>		Time Frame: 50 hours	
Content Standards*	<p>The learners demonstrate an understanding of . . .</p> <ul style="list-style-type: none"> • scientific ways of acquiring knowledge and solving problems; • the properties of substances that distinguish them from mixtures; 	Performance Standards*	<p>The learners should be able to...</p> <ul style="list-style-type: none"> • perform in groups in guided investigations involving community-based problems using locally available materials; • prepare different concentrations of mixtures according to uses and availability of materials;

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	<ul style="list-style-type: none"> some important properties of solutions; and common properties of acidic and basic mixtures. 		<ul style="list-style-type: none"> investigate the properties of mixtures of varying concentrations using available materials in the community for specific purposes; make a chart, poster, or multimedia presentation of common elements showing their names, symbols, and uses; and properly interpret product labels of acidic and basic mixture, and practice safe ways of handling acids and bases using protective clothing and safety gear.
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Italicized text for **Content Standards and **Performance Standards** are add-on ones from the TG. This is applied throughout the CM.*

Chapter 1: The Investigatory Process			
Essential Questions**	<ul style="list-style-type: none"> How can the investigatory process be applied in daily situations? When does the investigatory process become valuable? What are some applications of an investigatory process? How can the design of an investigation be developed to show fair testing? How can learners recognize the system of classification of matter through teacher-facilitated investigations that emphasize fair testing? How can the components of a science investigation be applied in science experiments? How can a simple investigation be conducted using the inquiry approach? 	Enduring Understandings**	<ul style="list-style-type: none"> Scientific facts and technological breakthroughs are products of comprehensive research or investigatory process. The most crucial problems in society such as those on health, agriculture, and environment have been effectively solved using such processes and methods. Among other factors, the success of an investigatory process depends on the planned experimental design.

*** Contents for **Essential Questions (EQ)** and **Enduring Understandings (EU)** are set per unit in the textbook and by chapter in the teachers guide. The text under *Big Ideas* in the TG were considered for EU. Hence, these were integrated in the table above and not within each lesson in the CM. Furthermore, some EQs and EUs have come from the WT or are author-provided; these were considered as long as they are developed in the WT/TG content.*

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Content	K to 12 Learning Competencies*** (MELCs included)	21st-Century Skills	Teaching Strategies/ Differentiated Instruction	Assessment	Values Integration	Resources
<p><i>Components of Investigatory Process</i></p>	<p>S7MT-Ia-1 MELC Describe the components of a scientific investigation</p> <p><i>Describe a fair test</i></p> <p><i>Recognize the design of an investigation that shows fair testing</i></p>	<p>Collaboration and Critical Thinking Working with a group on activities and answering related questions and doing application tasks</p> <p>Critical Thinking and Problem Solving Applying and conducting a simple science investigatory project</p> <p>Numeracy Accuracy in measurement</p> <p>Civic Literacy Being aware that reducing or diluting liquid products and selling these adulterated or diluted ones are unethical practices</p>	<ul style="list-style-type: none"> • Direct instruction using lecture and discussion methods • Experiential learning using inquiry method, varied small group work activities • Interactive instructions • Cooperative learning • Post-activity discussions 	<p>Formative</p> <ul style="list-style-type: none"> • Diagnostic test (optional) • Seatwork • Assignments • Group activities <p>Summative Output of application tasks in given activities</p>	<p>Appreciating the importance of accuracy in measurement</p>	<ul style="list-style-type: none"> • LCD (or overhead projector) with projection screen • computer with internet connection • Big Ideas, Essential Questions, and important concepts written on manila paper or encoded in a PowerPoint presentation • laboratory equipment • experiment or activity materials • video clips, animations, or articles from online sources
<p><i>Applying the Investigatory Process</i></p>	<p><i>Conduct simple investigations involving processes that use materials available in the local community</i></p> <p><i>Select an interesting research problem for study</i></p> <p><i>Apply science research skills in</i></p>	<p>Collaboration Working from one small group to a big group (whole class) on sharing the inputs from each of the small groups</p> <p>Critical Thinking and Communication</p> <ul style="list-style-type: none"> • Analyzing and explaining the viability of the research topics or problems presented in 	<ul style="list-style-type: none"> • Direct instruction using lecture and demonstration methods • Data presentation to discuss line and bar graphs • Experiential learning using inquiry method • Varied small group work activities related to the applications of investigatory process • Using samples of 	<p>Formative</p> <ul style="list-style-type: none"> • Diagnostic test • Seatwork • Assignments • Individual work <p>Summative</p> <ul style="list-style-type: none"> • Essential questions • Chapter test • Reflection paper • Performance task 	<ul style="list-style-type: none"> • Realizing the value of planning • Being honest in reporting data • Showing cooperativeness • Having perseverance and determination in finishing a project • Being organized and systematic • Being accurate in 	<ul style="list-style-type: none"> • templates or samples of experimental designs • experiment or activity materials

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	<p><i>learning about environmental conditions, such as forest denudation, flooding, waste control, pollution, and biodiversity conservation</i></p>	<p>the table</p> <ul style="list-style-type: none"> • Formulating a viable research problem or topic research using given sources and guidelines • Determining the suitability of line and bar graphs in representing data pairs • Analyzing given situations to arrive at educated opinions • Preparing, reviewing, and critiquing investigative reports • Being able to justify opinions • Describing performance in activities and in formulating conclusions and recommendations • Recording hourly temperature and plotting the obtained data using line and bar graphs <p>Scientific Literacy Formulating a hypothesis</p> <p>Literacy Writing a summary of concepts learned in the lesson</p>	<p>statistical tools for analyzing data</p> <ul style="list-style-type: none"> • Comparing and contrasting • Cooperative learning activities 		<p>data interpretation</p> <ul style="list-style-type: none"> • Displaying fairness in judging or in having an opinion of others • Giving appreciation of the concepts or lessons learned and how these affect disposition in life 	
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****Italicized texts under K to 12 Learning Competencies column are add-ons. Such marking is applied throughout the CM.*

Chapter 2: Diversity of Materials in the Environment

Essential Questions	<ul style="list-style-type: none"> How will you investigate the properties of mixtures of varying concentrations using available materials in the community? How do substances and mixtures differ from each other? How do elements differ from compounds? How will you describe the properties of metals and nonmetals in terms of their luster, malleability, ductility, and conductivity? How will the properties of metals and nonmetals help you identify their uses at home and in industry? 	Enduring Understandings	<ul style="list-style-type: none"> The environment abounds with materials that possess diverse physical and chemical attributes. Under certain conditions, matter undergoes many observable changes. Physical and chemical changes occur as a result of the different behaviors of materials upon exposure to certain conditions, such as reaction with acids or changes in temperature.
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Content	K to 12 Learning Competencies (MELCs included)	21st-Century Skills	Teaching Strategies/ Differentiated Instruction	Assessment	Values Integration	Resources
<i>Substances and Mixtures</i>	S7MT-Ie-f-4 MELC Distinguish mixtures from substances based on a set of properties	Scientific Literacy and Civic Literacy Preparing interesting and marketable products with easy-to-follow steps and readily available materials or ingredients Collaboration Working with a group on observing properties of different substances before, during and after heating, and classifying these substances into elements or compounds	<ul style="list-style-type: none"> Presenting the items under <i>Big Ideas</i> as chapter introduction Indirect Instruction using cooperative “Learning Roundtable” for the chapter introduction Direct teaching and discussions 	Diagnostic Nongraded test on prior knowledge on the chapter topics to be discussed Formative <ul style="list-style-type: none"> Seatwork Homework Cooperative learning activities on the topics discussed 	Showing diligence and frugality in making simple yet marketable products	<ul style="list-style-type: none"> LCD (or overhead) projector with projection screen computer with internet connection flash cards with symbols of elements chalk or white board marker manila paper or its equivalent activity materials simple products (e.g., fruit jams, soy sauce, tomato sauce, mayonnaise, vinegar, liquid detergents, candles, fabric conditioners) video clips, animations, or

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						articles from online sources
<p><i>Elements: Metals, Nonmetals, and Metalloids</i></p>	<p>S7MT-Ig-h-5 MELC Recognize that substances are classified into elements and compounds</p> <p>S7MT-Ij-7 Describe some properties of metals and nonmetals such as luster, malleability, ductility, and conductivity</p>	<p>ICT Literacy</p> <ul style="list-style-type: none"> Doing a research for relevant information on the periodic table <p>Scientific Literacy</p> <ul style="list-style-type: none"> Classifying elements as metal, nonmetal, or metalloid and relating this knowledge to the arrangement of elements in the periodic table Testing the properties of metals and nonmetals and distinguishing one from the other based on properties <p>Collaboration</p> <ul style="list-style-type: none"> Working with a group in strengthening knowledge of element names Working with a group in producing a poster bearing slogans related to the given theme and to the topic discussed <p>Literacy</p> <ul style="list-style-type: none"> Writing a summary of concepts learned in the lesson Comparing and contrasting tentative 	<ul style="list-style-type: none"> Direct instruction using lecture and discussion methods Interactive instructions Game-based learning (“Name Me”) using flashcards with symbols of elements on them Experiential learning through poster making of elements and compounds and slogans Laboratory activities Cooperative learning activities 	<p>Formative</p> <ul style="list-style-type: none"> Seatwork Assignment <p>Summative</p> <ul style="list-style-type: none"> Essential questions Chapter test Reflection paper Performance task 	<ul style="list-style-type: none"> Showing care for the dignity of life and concern for the environment Being aware of the safety precautions when working with chemicals Taking care of the environment Being conscious of the proper handling, care, and storage of electronic devices Appreciating the concepts or lessons learned and how these affect disposition in life 	<ul style="list-style-type: none"> LCD (or overhead) projector with projection screen computer with internet connection periodic table of elements flashcards with symbols of elements written on them activity or experiment materials video clips, animations, or articles from online sources <ul style="list-style-type: none"> http://www.wikihow.com/Make-Your-Own-Soy-Sauce https://www.wikihow.com/Make-Fabric-Softener http://www.wikihow.com/Make-Mayonnaise http://www.wikihow.com/Make-Homemade-Candles

		<p>ideas about the topics at the start of the chapter against learnings after all discussions</p> <p>Communication</p> <ul style="list-style-type: none"> • Describing performance in activities and in formulating conclusions and recommendations • Presenting the results of the performance task via oral and written reports • Sharing research output with the class <p>Curiosity</p> <p>Identifying some household utensils and equipment used at home and determining the metals or composite materials present in them</p>			
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Chapter 3: Solutions, Acids, and Bases

Essential Questions	<ul style="list-style-type: none"> • How can an unknown solution be tested if it is saturated, unsaturated, or supersaturated? • How do the nature of solute and solvent, temperature, and pressure affect the solubility of substances? What are some daily activities that manifest the solubility of substances in gas, liquid, and solid matter? • What are the different ways of expressing concentrations of solutions quantitatively? How is the preparation of different concentrations of solutions useful at home and in industry? • What are some household materials that are acidic or basic in nature? What are the important uses of 	Enduring Understandings	<ul style="list-style-type: none"> • Solutions, acids, and bases are important in your day-to-day activities. • The food you eat, the liquids you drink, the products you use to clean your body, and the medicine you take, are some of the solutions, acids, and bases that are useful and essential.
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	<p>acids and bases at home? How can you examine if these household materials are acidic, basic, or neutral? What makes acids different from bases?</p> <ul style="list-style-type: none"> Why is it very important to know the pH value of household materials? 		
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Content	K to 12 Learning Competencies (MELCs included)	21st-Century Skills	Teaching Strategies/ Differentiated Instruction	Assessment	Values Integration	Resources
<p><i>Solutions</i></p>	<p>S7MT-Ic-2 MELC Investigate properties of unsaturated or saturated solutions</p> <p>S7MT-Id-3 MELC Express concentrations of solutions quantitatively by preparing different concentrations of mixtures according to uses and availability of materials</p>	<p>Collaboration</p> <ul style="list-style-type: none"> Working with a group to prepare juice drinks to introduce the lesson on solutions, and sharing the resulting product within the group Working with a group in preparing solutions using hot and cold liquids prior to discussion of temperature as factor of solubility Working in groups to test whether a solution is saturated, unsaturated, or supersaturated; and distinguishing them from one another <p>Communication</p> <ul style="list-style-type: none"> Citing examples of solutions as products for consumption Citing examples in which the “like dissolves like” 	<ul style="list-style-type: none"> Review of definition of terms from previous chapter Different groupings per activity for diversified interactions Direct instruction using lecture and demonstration methods in discussions of solubility, miscibility, and solution process Use of technology to present video clips, articles, pictures, or animations Experiential learning activities using exploratory, discovery, and/or laboratory methods Cooperative learning activities 	<p>Formative</p> <ul style="list-style-type: none"> Nongraded test on prior knowledge (diagnostic) Seatwork Homework <p>Summative Quizzes</p>	<ul style="list-style-type: none"> Knowing how to choose friends wisely Knowing how to treat differently-abled persons Participating in the campaign for environmental awareness on the effects of global warming Displaying cleanliness in the workplace Being cooperative with members of one’s group in performing experiments Building camaraderie and true friendship 	<ul style="list-style-type: none"> LCD (or overhead) projector with projection screen computer with internet connection pictures of household acids and bases plastic pitcher drinking glasses ladle or any utensil for stirring 30-g powdered juices in sachets (1 L pack) of any brand disposable cups for hot liquids stirrers sachets of 3-in-1 coffee mix of any brand illustration board pictures of fish kill scenarios lab materials and equipment materials for the activity or experiment

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		<p>principle is demonstrated</p> <p>Critical Thinking</p> <ul style="list-style-type: none"> Identifying the solute and solvent components of the given solutions Identifying and explaining the nature of substances that are soluble in water and <i>n</i>-hexane <p>Problem Solving, and Accuracy Solving problems by applying the principles and formulas to determine percent concentrations of solutions</p>				<ul style="list-style-type: none"> video clips, animations, or articles from online sources <ul style="list-style-type: none"> https://www.youtube.com/watch?v=GZi1pnwXLsU https://www.youtube.com/watch?v=O3qNNYJegLE https://www.youtube.com/watch?v=KNGC44RIMqc https://www.youtube.com/watch?v=e0PJedh38fg https://www.youtube.com/watch?v=V8vDIOFp4g8 https://newsinfo.inquirer.net/193251/another-fishkill-in-leyte-lake
<i>Acids and Bases</i>	S7MT-li-6 Investigate properties of acidic and basic mixtures using natural indicators	<p>Collaboration Working on activities with a group</p> <p>ICT Literacy Doing a research on hyperacidity, peptic and gastric ulcers, antacid treatments, and other topics related to the lesson to be discussed</p> <p>Critical Thinking</p> <ul style="list-style-type: none"> Preparing a natural indicator for acids and 	<ul style="list-style-type: none"> Direct Instruction using discussion and lecture methods Experiential learning using laboratory methods in the activities Comparing and contrasting Cooperative learning activities 	<p>Formative</p> <ul style="list-style-type: none"> Seatwork Homework <p>Summative</p> <ul style="list-style-type: none"> Quizzes Essential questions Chapter test Reflection paper Performance task 	<ul style="list-style-type: none"> Practicing safe handling of acids and bases Appreciating the concepts or lessons learned and how these affect disposition in life 	<ul style="list-style-type: none"> LCD (or overhead) projector with projection screen computer with internet connection empty sachets or containers (e.g., of toothpaste, shampoo, soap, perfume, mineral water, juice, medicines, vinegar) experiment or activity materials

		<p>bases from available materials</p> <ul style="list-style-type: none"> • Determining whether a tested household material is acidic or basic using the prepared indicator • Investigating the action of acids and bases on certain materials • Using empty product containers to classify products as acids or bases and justifying their answers <p>Communication</p> <ul style="list-style-type: none"> • Using a PowerPoint presentation to share the group's output with the class • Constructive critiquing of other groups' output • Describing performance in activities and in formulating conclusions and recommendations • Writing a summary of concepts learned in the lesson <p>Environmental Awareness Collecting and testing water samples from local sources</p>			<ul style="list-style-type: none"> • video clips, animations, or articles from online sources
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2nd Quarter

Unit 2: <i>Living Things and Their Environment</i>		Time Frame: 30 to 45 hours	
Content Standards*	<p>The learners demonstrate an understanding of . . .</p> <ul style="list-style-type: none"> the parts and functions of the compound microscope; the different levels of biological organization; the difference between animal and plant cells; organisms that can only be seen in the microscope, many of which consist of only of one cell; reproduction being asexual or sexual; and organisms interacting with each other and with their environment to survive. 	Performance Standards*	<p>The learners should be able to . . .</p> <ul style="list-style-type: none"> employ appropriate techniques using the compound microscope to gather data about very small objects; give a presentation on plant and animal reproduction through asexual and sexual means; decide on which means of asexual reproduction is appropriate to use in propagating economically important plants; and conduct a collaborative action to preserve the ecosystem in the locality.

Italicized text for **Content Standards and **Performance Standards** are add-on ones from the TG. This is applied throughout the CM.*

Chapter 4: <i>Levels of Organization of Living Things</i>			
Essential Questions**	<ul style="list-style-type: none"> How does biological organization arrange the different levels of life? How are the levels of biological organization different from each other? How are the levels of biological organization interdependent with one another? Why is viewing microscopic organisms using a microscope important? Why is being familiar with beneficial and harmful microorganisms important? How can the knowledge of cells promote proper nutrition and healthful habits and maintain proper functioning of the organ systems? How can the knowledge of the different levels of biological organization promote activities that 	Enduring Understandings**	<ul style="list-style-type: none"> Biological organization refers to the system of classification of the levels of living things arranged in hierarchical order. Each level of biological organization has specific description and function. Every level is interdependent with other levels. In all organisms, the cell is the basic structural and functional unit. Among living things are microorganisms. Microorganisms, which can be categorized as beneficial or harmful, can be studied using a magnification tool called a microscope. The microscope is an important tool as it can also be used to identify plant and animal cell structures. In humans, organ systems work together to carry out essential processes of the body. One should engage in activities that promote proper nutrition and healthful habits to maintain proper functioning of the organ systems.

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	protect, conserve, and preserve the ecosystem in a locality?		
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Content	K to 12 Learning Competencies*** (MELCs included)	21st-Century Skills	Teaching Strategies/ Differentiated Instruction	Assessment	Values Integration	Resources
<i>Biological Organization</i>	<i>Enumerate the different levels of biological organization</i>	<p>Communication</p> <ul style="list-style-type: none"> • Citing other examples of nonbiological items that show different levels of organization, and determining the common items among these and those of the biological levels of organization • Presentation of answers using a projector <p>Critical Thinking Constructing a visual aid to present the levels of biological organization</p> <p>ICT Literacy and Creativity Creating own video of song and dance of the levels of organization and sharing output on You Tube</p>	<ul style="list-style-type: none"> • Video presentations • KWL chart • Direct instruction using lecture and discussion methods • Using ICT tools for presentations • Experiential learning using laboratory methods in doing the activities 	<p>Formative</p> <ul style="list-style-type: none"> • Seatwork • Homework • Group activities • Reflection on the messages of the videos watched <p>Summative Quizzes</p>	Being cooperative with others when doing group activities	<ul style="list-style-type: none"> • LCD projector • computer with internet connection • TV set • PowerPoint presentation files (hard and soft copies) • microscopes • flash cards • concept strips • sheets of manila paper • marking pens • scissors • masking tape • experiment/activity materials • online materials/ video presentations <ul style="list-style-type: none"> ○ Levels of Organization Song by Patrick Haney from https://www.youtube.com/watch?v=XRe4s5NUY-U ○ Levels of Organization by D

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						<p>Watson from https://www.youtube.com/watch?v=tERLPI2vxxg</p> <ul style="list-style-type: none"> ○ Levels of organization of life song by Marna Coldwater from https://www.youtube.com/watch?v=q1PGPXhyCs ○ The Levels of Organization Song by JH Productions from https://www.youtube.com/watch?v=1ip5Dm7MZyc ○ Levels of Organization from slideshare.net/sth215/levels-of-organization ○ Levels of Organization (cell to organism) from slideshare.net/melindamacdonald/32-knp ○ Levels of biological organization from slideshare.net/CombrinkLisa/levels-of-biological-organization-58124752
<i>The Cell</i>	S7LT-IIa-1 MELC Identify parts of the microscope and their	Critical Thinking <ul style="list-style-type: none"> • Differentiating plant cells from animal cells and 	<ul style="list-style-type: none"> • Indirect Instruction using reflective discussions 	Formative <ul style="list-style-type: none"> • Seatwork • Laboratory activities 	Being creative in the use of old and recyclable materials	<ul style="list-style-type: none"> • LCD projector • computer with internet connection

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	<p>functions</p> <p>S7LT-IIb-2 MELC Focus specimens using the compound microscope</p> <p>S7LT-IIc-3 MELC Describe the different levels of biological organization from cell to biosphere</p> <p>S7LT-IIId-4 MELC Differentiate plant and animal cells according to presence or absence of certain organelles</p> <p>S7LT-IIe-5 MELC Explain why the cell is considered the basic structural and functional unit of all organisms</p>	<p>discussing these with confidence</p> <ul style="list-style-type: none"> Identifying parts of plant cells and animal cells Identifying the parts of a compound microscope Demonstrating correct use of the microscope Differentiating between prokaryotic and eukaryotic cells according to structure Examining the structures of plant and animal cells using a microscope <p>Creativity and Environmental Awareness Using old and recyclable materials to make 3D models of prokaryotic and eukaryotic cells</p> <p>Literacy Preparing a writeup of a project on making vegetable pickles and salted eggs or fish</p> <p>Accuracy Observing correct preparation of specimen slides</p>	<ul style="list-style-type: none"> Pictorial representation of the cells of different sizes Direct instruction using lecture and discussion methods with concept processing Online tools to reinforce discussion on cells Experiential learning using laboratory methods in doing the activities Enrichment activity on creating 3D models of prokaryotic and eukaryotic cells 	<p>Summative</p> <ul style="list-style-type: none"> Quizzes Practicum on identifying the parts of and proper use of the microscope before and after the laboratory activity Paper-and-pencil test Project: Light micrographs of microscopic objects (e.g., fish scales, pollen grains, orchid seeds) 		<ul style="list-style-type: none"> illustration of cells of varying sizes raw chicken and quail eggs pictures or illustrations of labeled parts of animal and plant cells activity or experiment materials online materials/ video presentations <ul style="list-style-type: none"> Cell theory and structure PPT from slideshare.net/allisonmiller1986/cell-theory-and-structure-ppt http://www.worldofteaching.com/cellbiology/powerpoints.html Cell theory & types of cells from slideshare.net/OhMiss/cell-theory-types-of-cells
<p><i>Human Organ Systems</i></p>	<p>S7LT-IIc-3 MELC Describe the different levels of biological</p>	<p>Collaboration Working on activities with a group</p>	<ul style="list-style-type: none"> Class game on the human organ systems Video presentation of the organ systems 	<p>Formative</p> <ul style="list-style-type: none"> Paper-and-Pencil test on Human Organs Group report Seatwork 	<p>Practicing healthy habits to take care of the body organs</p>	<ul style="list-style-type: none"> manila paper marker concept strips with the names of the

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	<p>organization from cell to biosphere</p> <p><i>Differentiate cells, tissues, organs, and organ systems</i></p>	<p>Critical Thinking</p> <ul style="list-style-type: none"> • Identifying the functions of the major organs in the assigned organ system and sharing their output with the class • Matching the given function with the correct organ system • Constructing a concept map to show the relationship between the organ systems <p>Communication</p> <ul style="list-style-type: none"> • Sharing own reactions/additional information to other groups' outputs • Explaining how knowledge of cells promote proper nutrition and healthful habits to maintain proper functioning of the organ systems to other groups' outputs • Explaining the need for coordinated functioning of the organ systems • Reporting of group output 	<ul style="list-style-type: none"> • Interactive instruction through small group activity • Enrichment activities • Direct instruction through lecture/discussions • Group activities 	<p>Summative</p> <ul style="list-style-type: none"> • Output for application tasks in activities • Paper-and-pencil test 		<p>organ systems written on them</p> <ul style="list-style-type: none"> • smaller concept strips with the functions of the organ systems written on them • masking tape • activity or experiment materials • online materials/ video presentations <ul style="list-style-type: none"> ○ http://www.worldofteaching.com/biologypowerpoints.html ○ http://www.iteachbio.com/Anatomy-Physiology/anat-phys.html
<i>Microorganisms</i>	<p>S7LT-If-6 Identify beneficial and harmful microorganisms</p>	<p>Collaboration Working on activities with a partner or group</p>	<ul style="list-style-type: none"> • Direct instruction through lectures • Indirect instruction using the guided inquiry in the discussion of microorganisms 	<p>Formative</p> <ul style="list-style-type: none"> • Graphic organizer showing body organs or body parts affected by microorganism, mode of transmission, and 	<ul style="list-style-type: none"> • Being aware of the beneficial and harmful effects of microorganisms • Showing care for and conservation of water resources 	<ul style="list-style-type: none"> • LCD projector • list of diseases and corresponding disease-causing microbial agent

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		<p>Critical Thinking</p> <ul style="list-style-type: none"> • Culturing microorganisms through the hay infusion method • Identifying the characteristics of red tide • Identifying nitrogen-fixing bacteria • Identifying human diseases caused by bacteria and viruses • Identifying the characteristics of fungi <p>Productivity Performing the activities in an appropriate amount of time and finishing each within that allotted time</p> <p>ICT Literacy Doing research on specific topics, including assessment, retrieval, presentation and exchange of relevant information</p>	<ul style="list-style-type: none"> • Experiential learning using inquiry or laboratory methods for the activities • Interactive instructions • Enrichment activity using role-play • Lectures • Exploratory activities 	<p>manner of cure for each of the given diseases</p> <ul style="list-style-type: none"> • Seatwork <p>Summative</p> <ul style="list-style-type: none"> • Essential questions • Chapter test • Performance task 	<ul style="list-style-type: none"> • Giving appreciation to scientists' contribution to science 	<ul style="list-style-type: none"> • activity or experiment materials
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****Italicized texts under K to 12 Learning Competencies column are add-ons. Such marking is applied throughout the CM.*

Chapter 5: Reproduction: Biological Mechanism of Heredity

Essential Questions	<ul style="list-style-type: none"> • Why is reproduction a biological mechanism of heredity? • How is asexual reproduction different from sexual reproduction? • How are the types of asexual reproduction applied in the propagation of economically important plants? • How are sexually reproduced offspring different from asexually reproduced offspring? 	Enduring Understandings	<ul style="list-style-type: none"> • Reproduction is the biological mechanism by which hereditary traits are transmitted from generation to generation. Reproduction on the level of cells occur by either mitosis or meiosis. In organisms, reproduction can be sexual or asexual. • In sexual reproduction, the offspring produced are biologically similar but not identical to the parents. Sexually reproducing organisms produce sex cells or gametes. The union of the egg cell of the female organism and the sperm cell of the male organism is called <i>fertilization</i>.
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			<ul style="list-style-type: none"> Asexual reproduction does not involve sex cells. In asexual reproduction, organisms produce offspring that are identical to them.
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Content	K to 12 Learning Competencies (MELCs included)	21st-Century Skills	Teaching Strategies/ Differentiated Instruction	Assessment	Values Integration	Resources
<i>Reproduction</i>	<i>Distinguishing the different stages/phases of meiosis and mitosis</i>	<p>Collaboration, Critical Thinking and Scientific Literacy</p> <ul style="list-style-type: none"> Distinguishing the different stages of mitotic phase Creating models of the different stages of mitosis using throw-away materials Making a diagram of the different stages of mitosis <p>Communication</p> <ul style="list-style-type: none"> Writing a paper or preparing a PowerPoint presentation containing information about the significance of mitosis to a person's well-being Presenting output for the diagram of different stages of mitosis to the class <p>ICT Literacy Doing research on the significance of mitosis to cancer</p>	<ul style="list-style-type: none"> Read aloud of chapter introduction and prompting students to give reactions Direct instruction using lecture and discussion methods Experiential learning through small group activities 	<p>Diagnostic Paper-and-pencil test on prior knowledge on reproduction</p> <p>Formative</p> <ul style="list-style-type: none"> Seatwork or quizzes Homework Group activities <p>Summative Paper-and-pencil test</p>	Understanding the significance of mitosis to a person's development	<ul style="list-style-type: none"> LCD projector personal computer with internet connection teacher-made PowerPoint presentation laboratory materials or equipment activity or experiment materials colored pictures or illustrations of the different stages of mitosis throw-away materials (e.g., cardboards, old CDs, bottle caps, strings) online material/ video presentation <ul style="list-style-type: none"> “Cell Division Mitosis and Meiosis” from www.slideshare.net/catherinepatterson/cell-division-mitosis-and-meiosis-presentation

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<p><i>Types of Reproduction</i></p>	<p>S7LT-Ilg-7 MELC Differentiate asexual reproduction from sexual reproduction in terms of: 7.1 number of individuals involved 7.2 similarities of offspring to parents</p> <p>S7LT-Ilg-8 Describe the process of fertilization</p>	<p>Critical Thinking and Scientific Literacy</p> <ul style="list-style-type: none"> Identifying the reproductive parts of a flower Comparing the characteristics of offspring formed through sexual reproduction from those formed through asexual reproduction Recognizing methods of asexual reproduction in plants Distinguishing features of asexual and sexual reproduction Deriving the etymology of given scientific terms <p>Communication</p> <ul style="list-style-type: none"> Explaining the functions of each reproductive part of a flower Naming five flowering plants that have complete floral structure Providing own definitions of the given terms and communicating these with the class Enumerating the characteristics of 	<ul style="list-style-type: none"> Motivation activities such as asking the students to tell something about their favorite flowers; eliciting ideas on sexual reproduction in animals and on producing an offspring plant from a parent plant Read-alouds Lectures and discussions using PowerPoint presentations Experiential learning through small group activities Presentation of plant parts Pictorial representation of animals that undergo asexual reproduction Question-and-answers Giving a situation and eliciting students' opinions about it 	<p>Formative</p> <ul style="list-style-type: none"> Seatwork Homework Paper-and-pencil tests Group activities <p>Summative</p> <ul style="list-style-type: none"> Essential questions Output for application tasks in activities Teacher-made test Chapter test Performance task 	<ul style="list-style-type: none"> Appreciating that knowledge of plant reproduction can enable one to propagate the same variety of plants Showing care, protection, and preservation for marine wildlife and exotic species in the Philippines Protecting biodiversity in the Philippines 	<ul style="list-style-type: none"> concept strips or meta cards activity or experiment materials cartolina marking pens PowerPoint presentations on sexual reproduction in animals and on seahorses plant parts (e.g., potato with buds, <i>gabi</i>, ginger, stem of <i>pobreng kahoy</i>) pictures of animals and other organisms that reproduce asexually pictures of orchids, philodendron, bamboo, banana, and coconut plants as examples of plants used in tissue culture. online materials/ video presentations <ul style="list-style-type: none"> "Sexual Reproduction in Plants" from https://www.youtube.com/watch?v=R8_ScKzLafE "Class 7 Science Reproduction in Plants Asexual Reproduction" from https://www.youtube.com/watch?v=R8_ScKzLafE
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		<p>offspring formed by either sexual or asexual reproduction</p> <p>Collaboration and Creativity</p> <ul style="list-style-type: none"> • Creating and playing board games on sexual reproduction in plants • Creating foldables that present the distinguishing characteristics of sexually and asexually produced organisms <p>ICT Literacy</p> <ul style="list-style-type: none"> • Making a slide presentation or short video about the sexual reproduction in plants • Doing a research on hydroponics and its mechanics <p>Critical Thinking, Communication, and Social Awareness</p> <p>Giving perceptive comments and reactions on the Reproductive Health Bill</p> <p>Social awareness</p> <p>Visiting a plant breeding farm, nursery, or greenhouse in the locality to learn more about cultivating plants</p>				<p>.com/watch?v=idCPXINpwvY</p> <ul style="list-style-type: none"> ○ “Boosting coffee production via somatic embryogenesis” from https://www.philstar.com/business/agriculture/2015/12/26/1536479/business ○ “How a Banana Tissue Culture is Now Helping the Industry” from https://businessmirror.com.ph/2018/08/12/how-a-banana-tissue-culture-is-now-helping-the-industry/ ○ “ENVIRONMENT: PHILIPPINE BIODIVERSITY: Going, going, gone?” from https://edgedavaonet/feature/2018/04/07/environment-philippine-biodiversity-going-going-gone/ ○ “Public urged: Help rescue wildlife” from https://businessmirror.com.ph/2017/07/23/public-urged-help-rescue-wildlife/
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		<p>Literacy and Communication Reading about the principles and application of plant tissue culture and sharing own learning with the class</p>			
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Chapter 6: Interactions in an Ecosystem

Essential Questions	<ul style="list-style-type: none"> What are the two components of an ecosystem, and how do they differ from each other? How do the two components of an ecosystem affect one another? How are the interactions among organisms and with the environment considered as coping mechanisms for survival? How do the different ecological relationships contribute to the balance of nature? How is energy transformed through feeding relationships? How do changes in one population affect other populations, and how can these be predicted? How can changes in abiotic factors be predicted? How can people protect and conserve the environment? 	Enduring Understandings	<ul style="list-style-type: none"> Organisms interact with each other and with their environment in order to survive. An ecosystem is composed of abiotic and biotic components. Different ecological relationships can be found in an ecosystem, and transformation of energy occurs through the various feeding relationships. The effect of changes in abiotic factors can be predicted. Moreover, the effects of changes in one population on other populations can also be predicted. Natural and human-made environmental disturbances disrupt the balance of nature. Thus, individual and collective actions play an important role in protecting and conserving the environment.
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Content	K to 12 Learning Competencies (MELCs included)	21st-Century Skills	Teaching Strategies/ Differentiated Instruction	Assessment	Values Integration	Resources
<i>Basic Components of an Ecosystem</i>	S7LT-IIIh-9 MELC Differentiate biotic from abiotic	Collaboration Working on activities with a group	<ul style="list-style-type: none"> Read-alouds Direct instruction using lecture and discussion methods 	Diagnostic Suggested (or teacher-made) test in the TG about the interactions in an ecosystem	<ul style="list-style-type: none"> Practicing measures to protect aquatic ecosystems 	<ul style="list-style-type: none"> LCD projector personal computer with internet connection

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<p><i>Major Types of Ecosystem</i></p>	<p>components of an ecosystem</p> <p>S7LT-Ilj-12 MELC Predict the effect of changes in abiotic factors on the ecosystem</p>	<p>Critical Thinking</p> <ul style="list-style-type: none"> Identifying the biotic and abiotic components of the given ecosystems Observing interactions in an ecosystem Identifying scavengers and determining their role in an ecosystem <p>Communication</p> <ul style="list-style-type: none"> Naming and describing three examples each of natural and artificial ecosystems Naming as many producers, composers, and decomposers and identifying them as first-, second-, or third-order consumers Describing the given biomes in terrestrial ecosystems Explaining how decomposers affect the fertility of the soil Reporting the results of group activities to the class <p>Curiosity and Social Awareness Naming the different types of ecosystems and determining how each affects the ecosystem.</p>	<ul style="list-style-type: none"> Use of concept mapping or concept strips on the basic components of the ecosystem Interactive instruction using brainstorming or peer to peer discussion among the members of the group Presentation of illustration of food chain Experiential learning through small group activities 	<p>Formative</p> <ul style="list-style-type: none"> Seatwork or quizzes Group activities <p>Summative Output for application tasks in activities</p>	<ul style="list-style-type: none"> Valuing the preservation of endangered species Protecting and preserving ecosystems in the locality 	<ul style="list-style-type: none"> illustration of a food chain manila paper masking tape marking pens concept strips or meta cards activity or experiment materials laboratory materials or equipment
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<p><i>Ecological Relationships in an Ecosystem</i></p>	<p>S7LT-IIh-10 MELC Describe the different ecological relationships found in an ecosystem</p> <p>S7LT –II i-11 Predict the effect of changes in one population on other populations in the ecosystem</p>	<p>Critical Thinking Identifying the interactions among organisms in a community</p>	<ul style="list-style-type: none"> • Unlocking of difficult terms • Direct instruction using lecture and discussion methods • Interactive discussions • Read-alouds • Experiential learning through small group activities 	<p>Formative</p> <ul style="list-style-type: none"> • Seatwork or quizzes • Homework • Group activities <p>Summative Output for application tasks in activities</p>	<p>Knowing how changes in one population affect the other populations in an ecosystem</p>	<ul style="list-style-type: none"> • activity or experiment materials • laboratory materials or equipment
<p><i>The Biotic Community</i></p>	<p>S7LT-IIh-10 MELC Describe the different ecological relationships found in an ecosystem</p>	<p>Collaboration Working on an activity with a group</p> <p>Critical Thinking and Creativity</p> <ul style="list-style-type: none"> • Identifying a biotic community • Making own illustration of a biotic community <p>Communication</p> <ul style="list-style-type: none"> • Presenting own illustration to the class by describing the components of the community and explaining the interactions among them 	<ul style="list-style-type: none"> • Direct instruction using lecture and discussion methods • Experiential learning through small group activities 	<p>Formative Group activity</p> <p>Summative Output for application tasks in activities</p>	<p>Appreciating how organisms present in a biotic community interact with each other</p>	<ul style="list-style-type: none"> • activity or experiment materials • laboratory materials or equipment
<p><i>Energy Transfer in an Ecosystem</i></p>	<p><i>Describe how energy is transformed through the feeding relationships</i></p>	<p>Critical Thinking</p> <ul style="list-style-type: none"> • Identifying whether an organism is a producer, consumer, or decomposer in a biotic community 	<ul style="list-style-type: none"> • Having the students recall the meanings of <i>first-, second-, and third-order consumers</i> • Read-alouds 	<p>Formative</p> <ul style="list-style-type: none"> • Seatwork • Homework • Group activities 	<p>Learning about situations where human beings can be a first-, second-, or third-order consumers</p>	<ul style="list-style-type: none"> • flash cards or concept strips with matching definitions • activity or experiment materials

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		<ul style="list-style-type: none"> • Illustrating a food chain and a food web • Assigning organisms in each trophic level and explaining what happens to the energy and to the number of organisms in each level • Determining how much energy is transferred in a food chain 	<ul style="list-style-type: none"> • Direct instruction using flash cards or concept strips with matching definitions • Experiential learning through small group activities 	<p>Summative</p> <ul style="list-style-type: none"> • Output for application tasks in activities 		<ul style="list-style-type: none"> • manila paper • marking pen
<p><i>Population: A Changing Entity</i></p>	<p>S7LT –II i-11 Predict the effect of changes in one population on other populations in the ecosystem</p>	<p>Numeracy and Problem Solving</p> <ul style="list-style-type: none"> • Computing for population density using the given formula • Deriving the formulas for computing for the land area or the number of populations from the formula for population density <p>Collaboration, Critical Thinking, and Numerical Literacy</p> <ul style="list-style-type: none"> • Defining <i>population</i> • Determining the population density in an area • Calculating the population density of the class, presenting the findings to the class, and discussing the importance of determining the population density of a community 	<ul style="list-style-type: none"> • Direct instruction using lecture and discussion methods • Read-alouds • Indirect instruction • Experiential learning through small group activities • Post-laboratory discussions 	<p>Formative</p> <ul style="list-style-type: none"> • Paper-and-pencil test • Homework • Group activities <p>Summative</p> <ul style="list-style-type: none"> • Pencil and paper test • Output for application tasks in activities 	<ul style="list-style-type: none"> • Realizing the significance of population density in a community • Recognizing the relationship between population growth and availability of resources 	<ul style="list-style-type: none"> • activity or experiment materials • online materials/ video presentations <ul style="list-style-type: none"> ○ “Lynx-Snowshoe Hare Cycle” from https://www.enr.gov.nt.ca/en/services/lynx/lynx-snowshoe-hare-cycle ○ “The Rise and Fall of the Canada Lynx and Snowshoe Hare” in blogs.britannica.com/2011/06/rise-fallcanada-lynx-snowshoe-hare/

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		<ul style="list-style-type: none"> Plotting a line graph of the changes in a population Interpreting the relationships between the populations of different organisms using a graph Inferring the factors that cause population change <p>ICT Literacy and Environmental Awareness</p> <ul style="list-style-type: none"> Doing a research on the causes behind the decline in the populations of endangered wildlife animals Proposing measures or actions that can be taken to protect the populations of endangered animals from further threat <p>Communication Writing a brief report on endangered species and sharing it with the class</p>				
<i>Ecological Balance in Nature</i>	<i>Explain the importance of the collective actions on protecting and conserving the ecosystems</i>	<p>Collaboration Doing an activity in a group</p> <p>Critical Thinking Determining the different kinds of environmental disturbances and how</p>	<ul style="list-style-type: none"> Direct instruction using lecture and discussion methods Guided KWL group activity on natural and human-made disturbances on the environment 	<p>Formative Group activity on explaining the balance of nature</p> <p>Summative Output for applications in the given activity</p>	Being responsible in helping restore the balance in disturbed ecosystems	<ul style="list-style-type: none"> thirty metastrips for each group masking tape envelopes with headers corresponding to the KWL activity

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		<p>these affect living and nonliving things</p> <p>Communication and Environmental Awareness</p> <ul style="list-style-type: none"> Presenting the output from the KWL group activity to the class and comparing and discussing it to the other groups' outputs Explaining the balance in nature Describing several human practices that lead to the destruction or restoration of balance in nature Naming other factors that contribute to the disruption of the balance of nature Describing (or measuring, if applicable) the given factors that affect the living organisms in an ecosystem and writing own observations 	<ul style="list-style-type: none"> Read-alouds Experiential learning using the lecture and laboratory methods through small group activities Post-laboratory discussions 			<ul style="list-style-type: none"> activity or experiment materials
<i>Biogeochemical Cycles of Matter</i>	<i>Identifying the biogeochemical cycles of matter</i>	<p>Communication</p> <ul style="list-style-type: none"> Answer questions on the biogeochemical cycles of matter <p>Creativity Making a poster-slogan about caring for the environment</p>	<ul style="list-style-type: none"> Direct instruction using lecture and discussion methods PowerPoint presentations on the different biogeochemical cycles of matter Pre-laboratory discussions 	<p>Formative</p> <ul style="list-style-type: none"> Probing questions or a quiz about the biogeochemical cycles of matter Seatwork <p>Summative</p> <ul style="list-style-type: none"> Essential questions 	<ul style="list-style-type: none"> Being honest in recording results of field work Showing care for and protection of the aquatic ecosystems Realizing the value of and practicing water conservation 	<ul style="list-style-type: none"> PowerPoint presentations of the three biogeochemical cycles map of the area to be studied in the field work

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		<p>Environmental Awareness</p> <ul style="list-style-type: none"> • Identifying ways to contribute to the protection of the Philippines' aquatic ecosystems • Identifying actions and measures to help prevent water pollution <p>ICT Literacy, Collaboration, and Communication Searching the internet for companies or organizations in own city or municipality that make use of hydroponic gardening, visiting one with classmates, and sharing learning experiences with the class</p>		<ul style="list-style-type: none"> • Chapter test • Output for activity under Enrichment • Performance task 	<ul style="list-style-type: none"> • Showing awareness of the proper disposal of plastic materials and other kinds of wastes 	<ul style="list-style-type: none"> • camera, tablet, or cell phone with camera online materials/video presentations <ul style="list-style-type: none"> ○ "The Philippine Marine Biodiversity: A Unique World Treasure, One Ocean of the Fisheries Improved for Sustainable Harvest Project (FISH)" from http://oneocean.org/flash/philippine_biodiversity.html ○ Tumampos, Stephanie. "Threats to PHL rich marine biodiversity," <i>Business Mirror</i> from https://savethephilippinecoralreefs.wordpress.com/2013/03/23/threats-to-phl-rich-marine-biodiversity/ ○ de Vera, Maru and Adrian William Tan, "Water Pollution in the Philippines" from http://waterstuffinph.blogspot.com/
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3rd Quarter

Unit 3: Motion, Wave, and Energy		Time Frame: 50 hours	
Content Standards*	<p>The learners demonstrate an understanding of . . .</p> <ul style="list-style-type: none"> motion in one dimension; waves as a carrier of energy; the characteristics of sound; the characteristics of light; how heat is transferred; and charges and the different charging processes. 	Performance Standards*	<p>The learners shall be able to . . .</p> <ul style="list-style-type: none"> conduct a forum on mitigation and disaster risk reduction; and suggest proper lighting in various activities.

* *Italicized text for **Content Standards** and **Performance Standards** are add-on ones from the TG. This is applied throughout the CM.*

Chapter 7: Constant and Accelerated Motion			
Essential Questions**	<ul style="list-style-type: none"> How do scientists describe motion? When is motion observed? How is the motion of a body described? How is the speed of a body in motion determined? How do you describe the motion of a body in uniform speed? How do you describe the motion of a body with varying speeds? When is accelerated motion observed? How can one's understanding of motion help in improving road safety measures? 	Enduring Understandings**	<ul style="list-style-type: none"> All things, whether living or nonliving, have the capacity or the tendency to move by itself or upon the application of a certain amount of force or energy. Any drastic increase in an object's motion or of the force or energy applied to it may result to unfavorable outcomes.

** *Contents for **Essential Questions (EQ)** and **Enduring Understandings (EU)** are set per unit in the textbook and by chapter in the teachers guide. The text under Big Ideas in the TG were considered for EU. Hence, these were integrated in the table above and not within each lesson in the CM. Furthermore, some EQs and EUs have come from the WT or are author-provided; these were considered as long as they are developed in the WT/TG content.*

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Content	K to 12 Learning Competencies*** (MELCs included)	21st-Century Skills	Teaching Strategies/ Differentiated Instruction	Assessment	Values Integration	Resources
<i>Natural and Violent Motions</i>	<i>Classifying motion into natural or violent</i>	<p>Collaboration</p> <ul style="list-style-type: none"> Working with others in a group activity <p>Communication</p> <ul style="list-style-type: none"> Explaining the reason behind the grouping of pictures in the activity done Writing a summary of learnings about motion based on several scientists' ideas 	<ul style="list-style-type: none"> Read aloud of chapter introduction and objectives Direct instruction using lecture and discussion methods Presentation of the different ideas of motion of several scientists 	<p>Diagnostic Determining students' prior knowledge on the chapter topics</p> <p>Formative Group activity</p> <p>Summative Test/Summarization Activity</p>	Appreciating the concept of motion	<ul style="list-style-type: none"> pictures of moving and stationary bodies manila paper
<i>Reference Point</i> <i>Distance and Displacement</i>	<p>S7FE-IIIa-1 MELC Describe the motion of an object in terms of distance or displacement, speed or velocity, and acceleration</p> <p>S7FE-IIIa-2 Differentiate quantities in terms of magnitude and direction</p>	<p>Critical Thinking Examining pictures of objects that move from one point to another and inferring the definition of rectilinear motion</p> <p>Numeracy and Problem Solving Determining the speed by dividing the distance traveled by the time</p>	<ul style="list-style-type: none"> Picture Analysis as motivational activity Activity "Who Is the Fastest of Them All?" Direct instruction using lecture and discussion methods 	<p>Formative Answering given questions about the topics discussed</p> <p>Summative Applications</p>	Being aware of the normal time spent on accomplishing certain tasks	<ul style="list-style-type: none"> pictures of objects that move from one point to another recording timer pen and paper for recording
<i>Speed</i> <i>Velocity</i>	<p>S7FE-IIIa-1 MELC Describe the motion of an object in terms of distance or displacement, speed or velocity, and acceleration</p>	<p>Collaboration Working with a group on a given activity</p> <p>Critical Thinking Plotting a motion graph of three boys and determining the fastest runner from the</p>	<ul style="list-style-type: none"> Direct instruction using lecture and discussion methods Experiential learning through small group activities Using graphs to explain the concepts of 	<p>Formative</p> <ul style="list-style-type: none"> Seatwork Homework <p>Summative</p> <ul style="list-style-type: none"> Output from Application from the given activity Teacher-made quiz 	Reflecting on the statement "Accelerate in being good to yourself and your neighbor; decelerate in doing vices or bad habits."	<ul style="list-style-type: none"> paper tape graphing paper activity or experiment materials recording timer

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	<p>S7FE-IIIa-2 Differentiate quantities in terms of magnitude and direction</p> <p>S7FE-IIIb-3 MELC Create and interpret visual representation of the motion of objects such as tape charts and motion graphs</p>	<p>graph</p> <p>Communication</p> <ul style="list-style-type: none"> • Describing the motion of given objects • Answering questions based on the computed data • Describing how a body moves at uniform or varying speed/s • Reporting to class the activity results <p>Numeracy</p> <ul style="list-style-type: none"> • Solving problems about uniform speed • Computing the speeds of given objects • Constructing a distance-time graph of the data collected from an experiment 	<p>instantaneous speed or velocity, average velocity, and accelerated motion</p> <ul style="list-style-type: none"> • Group activities • Reflections 			
Acceleration	<p>S7FE-IIIa-1 MELC Describe the motion of an object in terms of distance or displacement, speed or velocity, and acceleration</p> <p>S7FE-IIIb-3 MELC Create and interpret visual representation of the motion of objects such as tape charts and motion graphs</p>	<p>Collaboration</p> <ul style="list-style-type: none"> • Working with a group on given activities <p>Critical Thinking</p> <ul style="list-style-type: none"> • Plotting data on a graph • Making observations • Answering questions • Forming conclusions • Making a summary of findings • Determining the straight-line motion of a body in terms of its acceleration 	<ul style="list-style-type: none"> • Direct instruction using lecture and discussion methods • Experiential learning through small group activities • Independent study 	<p>Formative</p> <ul style="list-style-type: none"> • Seatwork • Homework • Group activities <p>Summative</p> <ul style="list-style-type: none"> • Essential questions • Chapter test • Performance task 	<ul style="list-style-type: none"> • Having a sense of responsibility • Applying the concepts learned in observing traffic rules to prevent accidents • Giving appreciation for how the concepts learned will affect or change one's own disposition in life 	<ul style="list-style-type: none"> • activity or experiment materials • laboratory materials /equipment

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		<p>Communication</p> <ul style="list-style-type: none"> • Group discussion • Reporting activity results <p>Numeracy Solving problems</p> <p>Literacy</p> <ul style="list-style-type: none"> • Writing a summary of the concepts learned in the chapter <p>Creativity and Productivity Presenting the summary of learnings from the lessons through concept map, poem, jingle, brochure, or debate</p>			
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****Italicized texts under K to 12 Learning Competencies column are add-ons. Such marking is applied throughout the CM.*

Chapter 8: Waves			
Essential Questions	<ul style="list-style-type: none"> • How are waves generated? • How are the different kinds of waves different from one another? How are they similar? • What is the difference between wave pulse and wave train? • How do mechanical waves differ from electromagnetic waves? • What makes transverse waves different from longitudinal waves? • What is the difference between rarefaction and compression? 	Enduring Understandings	<ul style="list-style-type: none"> • Energy produces different forms of waves that are either visible or invisible. One example is radio waves. • Waves are an indispensable part of our lives. Cellular phones, AM/FM radio sets, television sets, and radar systems in airports cannot function without radio waves.

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Content	K to 12 Learning Competencies (MELCs included)	21st-Century Skills	Teaching Strategies/ Differentiated Instruction	Assessment	Values Integration	Resources
<i>Nature of Waves</i>	S7LT-IIIc-4 MELC Infer that waves carry energy	Critical Thinking Making observations, predictions, and explanations on the activity involving coins and basin of water	<ul style="list-style-type: none"> • Read-alouds • Direct instruction using lecture and discussion methods 	Diagnostic Determining students' prior knowledge on the topics at hand	Being sensitive on the needs of others	<ul style="list-style-type: none"> • three coins • basin with water
<i>Classification of Waves</i>	S7LT-IIIc-5 Differentiate transverse from longitudinal waves, and mechanical from electromagnetic waves	Collaboration Working on an activity in a group Critical Thinking <ul style="list-style-type: none"> • Presenting observations on the demonstration shown by the teacher on the kinds of waves • Analysis of a given situation Literacy Writing and reading aloud observations	<ul style="list-style-type: none"> • Demonstration of the kinds of waves using a slinky • Direct instruction using lecture and discussion methods • Group work • Analysis of a given situation 	Formative Writing observations on the demonstration of the kinds of waves	<ul style="list-style-type: none"> • Building friendships • Living in peace with others 	<ul style="list-style-type: none"> • slinky • yarn or thread • small clay balls
<i>Characteristics of Waves</i>	S7LT-IIIc-6 Relate the characteristics of waves	Critical Thinking <ul style="list-style-type: none"> • Distinguishing the characteristics and parts of a wave using the diagram of a wave train • Reviewing the chapter activities done and describing how one fare in them and formulating conclusions and recommendations as well • Doing a research about tsunamis, focusing on 	<ul style="list-style-type: none"> • Word Hunt activity • Direct instruction using lecture and discussion methods • Use of a wave train diagram • Experiential learning through small group activities • Independent study in coming up with required outputs 	Formative <ul style="list-style-type: none"> • Seatwork • Group activities Summative <ul style="list-style-type: none"> • Essential questions • Chapter test • Performance task 	<ul style="list-style-type: none"> • Working cooperatively and harmoniously with others • Giving appreciation for how the concepts learned will affect or change one's own disposition in life • Taking concrete actions to be able to apply the concepts 	<ul style="list-style-type: none"> • diagram of wave train • activity or experiment materials • a 1-inch wide garter • barbecue sticks • identical beads • visual aids of several devices that have been developed for the benefit of the human

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		<p>their nature and the devastating effects of the big waves they generate</p> <ul style="list-style-type: none"> • Generating waves in water together with group mates <p>Communication</p> <ul style="list-style-type: none"> • Presenting to the class the results or findings of the activity or task • Writing a summary of the concepts learned in the chapter <p>Creativity and Critical Thinking Producing outputs related to the topics discussed (wave generator, and concept map and jingle on waves)</p>	<ul style="list-style-type: none"> • Enrichment exercises about the topics discussed 		<p>learned in real life</p> <ul style="list-style-type: none"> • Being aware of the precautionary and safety measures in the event of the occurrence of a disaster (e.g., typhoon surge) 	<p>race (e.g., x-ray machines, ECG machines, cell phones)</p>
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Chapter 9: Energy

Essential Questions	<ul style="list-style-type: none"> • How is sound produced and transmitted? • How can you distinguish the source of sound? • How is sound perceived by man? • How is music differentiated from noise? • What is the nature of light? • How is light transmitted? • How can heat be transferred? • What gives a material its electrical nature? • How can electrons be transferred? 	Enduring Understandings	<p>Sound, light, heat, and electricity are important forms of energy. They can be beneficial, but in some instances, they can be harmful to both living and nonliving things.</p>
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Content	K to 12 Learning Competencies (MELCs included)	21st-Century Skills	Teaching Strategies/ Differentiated Instruction	Assessment	Values Integration	Resources
<p><i>Sound Energy</i></p>	<p>S7LT-IIIId-7 MELC Describe the characteristics of sound using the concepts of wavelength, velocity, and amplitude</p> <p>S7LT-IIIe-8 Explain sound production in the human voice box, and how pitch, loudness, and quality of sound vary from one person to another</p> <p>S7LT-IIIe-9 Describe how organisms produce, transmit, and receive sound of various frequencies (infrasonic, audible, and ultrasonic sound)</p>	<p>Critical Thinking</p> <ul style="list-style-type: none"> • Making observations • Ranking the given materials based on ability of sound transmission • Classifying recorded sounds into pleasant and unpleasant sounds, and musical sounds or noises • Tracing the path of sound from the source to the receiver <p>Collaboration</p> <ul style="list-style-type: none"> • Doing pair work in labeling parts of the ear with its corresponding functions • Tracing the path of sound as it travels from its source to an observer • Performing the group activity on characteristics of sound and sharing observations to the class • Demonstrating how wire length, thickness, and tightness affect pitch and presenting the activity results in class <p>Communication</p> <ul style="list-style-type: none"> • Answering questions about the simple activities done on the 	<ul style="list-style-type: none"> • Investigative activities on the production of sounds • Direct instruction using lecture and discussion methods • Representing musical sounds and noises by graphs • Experiential learning through small group activities/ laboratory methods • Reflection 	<p>Diagnostic Determining students' prior knowledge on the chapter topics to be discussed</p> <p>Formative</p> <ul style="list-style-type: none"> • Seatwork • Teacher-made test on concepts on sound energy <p>Summative</p> <ul style="list-style-type: none"> • Pencil-and-paper test 	<ul style="list-style-type: none"> • Displaying sincerity in the sound of one's voice to show love and respect to others • Being obedient • Expressing kindness in words • Showing respect by observing silence in areas such as libraries, hospitals, and places of worship 	<ul style="list-style-type: none"> • ruler • book • tuning fork • rubber ball • diagram of a vibrating tuning fork • diagrams of molecular structures of solid, liquid, and gas; and of vacuum • diagram of human ear (to be labeled) parts and functions of human ear • wind chimes of different lengths and with metal tubes of different diameters • rubber band • plastic cup • three boxes with different objects inside them • recorded sounds (e.g., horn blowing during traffic, guitar being played by a musician, roosters crowing in the early morning; birds chirping; glass, spoon, and fork falling on the floor; piano being played; and hard rock being

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		<p>production and transmission of sound</p> <ul style="list-style-type: none"> • Explaining the results of activities • Naming situations where immediate obedience is required • Explaining what to do when asked to try prohibited drugs for fun 				<p>dropped on the ground)</p> <ul style="list-style-type: none"> • activity or experiment materials
<p><i>Light Energy</i></p>	<p>S7LT-III-f-10 Relate characteristics of light such as color and intensity to frequency and wavelength</p> <p>MELC Explain color and intensity of light in terms of its wave characteristics</p> <p>S7LT-III-g-11 Infer that light travels in a straight line</p>	<p>ICT Literacy Doing a research on the contributions of scientists on the study of light</p> <p>Collaboration</p> <ul style="list-style-type: none"> • Participating in a debate with group mates based on assigned task (taking the side of particle or wave theory, or evaluating the debate arguments) • Working with others in the activity on transmission of light on different kinds of materials and presenting the results in class • Working with a classmate in summarizing the concepts learned on the characteristics of light 	<ul style="list-style-type: none"> • Direct instruction using lecture and discussion methods • Experiential learning through small group activities/ laboratory methods • Interactive instructions 	<p>Formative</p> <ul style="list-style-type: none"> • Seatwork • Teacher-made test on concepts on light energy • Group activities <p>Summative</p> <ul style="list-style-type: none"> • Pencil-and-paper test 	<ul style="list-style-type: none"> • Being open-minded • Being open to criticisms • Showing honesty and sincerity • Being sensitive to the needs of others 	<ul style="list-style-type: none"> • a piece of plastic cover • empty bottles of mineral water, fermented milk drink, and soft drink • a piece of cellophane • plastic cup • small wooden block • drinking glass • flashlight with batteries. • activity or experiment materials

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		<p>Communication</p> <ul style="list-style-type: none"> Presenting to the class research results about the contributions of certain scientists to the study of light Describing the path of light Identifying different sources of light Explaining own reaction when others argue upon one's ideas <p>Critical Thinking</p> <ul style="list-style-type: none"> Giving answers to questions to facilitate discussion Designing and executing a simple activity to investigate how the distance from a source affects the brightness of light. 				
Heat Energy	<p>S7LT-IIIh-i-1 MELC Infer the conditions necessary for heat transfer to occur</p>	<p>Collaboration Working with a group on an activity</p> <p>Critical Thinking</p> <ul style="list-style-type: none"> Determining the difference and relationship between temperature and heat Demonstrating modes of heat transfer Determining whether a material is a conductor or insulator of heat. 	<ul style="list-style-type: none"> Direct instruction using lecture and discussion methods Experiential learning through small group activities/ laboratory methods 	<p>Formative</p> <ul style="list-style-type: none"> Seatwork Group activities <p>Summative</p> <ul style="list-style-type: none"> Output for application tasks in activity 	Showing patience and honesty in doing work	activity or experiment materials

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		<p>Communication</p> <ul style="list-style-type: none"> Tell the conditions for heat transfer to occur Presenting activity results to class 				
Electrical Energy	<p>S7LT-IIIj-13 MELC Describe the different types of charging processes</p> <p>S7LT-IIIj-14 Explain the importance of earthing or grounding</p>	<p>Scientific and ICT Literacies Doing a research on biographies of given scientists</p> <p>Critical Thinking</p> <ul style="list-style-type: none"> Inferring that electricity has become a necessity in modern living Tracing the history of development of the concepts and principles of electricity using the researched findings on the pioneer scientists <p>Critical Thinking</p> <ul style="list-style-type: none"> Identifying particles that carry charges Determining the number of electrons, protons, and neutrons of a sample atom Forming inferences on about the law of charges Examining how a body can be charged by induction, grounding, or conduction Formulating conclusions and recommendations 	<ul style="list-style-type: none"> Direct instruction using lecture and discussion methods Experiential learning through small group activities/ laboratory methods Enrichment activity Research work 	<p>Formative</p> <ul style="list-style-type: none"> Seatwork Teacher-made test on concepts on electrical energy Homework Group activities Self-assessment <p>Summative</p> <ul style="list-style-type: none"> Short test Essential questions Chapter test Performance task 	<ul style="list-style-type: none"> Having a sense of gratitude Recognizing one's role in minimizing the impact of global warming Being aware of current environment issues Giving appreciation of how the concepts learned will affect or change one's own disposition in life Taking concrete actions to be able to apply concepts learned in real life 	<ul style="list-style-type: none"> pictures of given scientists world map diagrams of an electroscope

		<p>Collaboration Making a balloon map of the scientists and their contributions to the development of knowledge and applications of electricity</p> <p>Communication</p> <ul style="list-style-type: none"> • Explaining how moving charges affect the lighting of a bulb • Determining the amount of charge that flows in a circuit • Presenting activity results in class • Writing a summary of the concepts learned in the chapter • Reporting 			
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4th Quarter

Unit 4: <i>The Philippines, Earth, and Space</i>		Time Frame: 50 hours	
Content Standards*	<p>The learners demonstrate an understanding of:</p> <ul style="list-style-type: none"> • the relation of geographical location of the Philippines to its environment; • the different phenomena that occur in the atmosphere; • the relationship of the seasons and the position of the Sun in the sky; and • the occurrence of eclipses. 	Performance Standards*	<p>The learners shall be able to analyze the advantage of the location of the Philippines in relation to the climate, weather, and seasons</p>

* *Italicized text for Content Standards and Performance Standards are add-on ones from the TG. This is applied throughout the CM.*

Chapter 10: The Philippine Archipelago

Essential Questions**	<ul style="list-style-type: none"> How can the specific location of a place be identified on a globe? What is the difference between latitude and longitude? What makes the Philippines' landforms and water forms important? How important is Earth's natural resources to humans? How can Earth's resources be protected from further damage and depletion? What are the possible ways of conserving Earth's resources? 	Enduring Understandings**	<p>The Philippine archipelago has a strategic geographical location on Earth with different landforms and water forms wherein rich biodiversity and abundant natural resources abound.</p>
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** Contents for **Essential Questions (EQ)** and **Enduring Understandings (EU)** are set per unit in the textbook and by chapter in the teachers guide. The text under *Big Ideas* in the TG were considered for EU. Hence, these were integrated in the table above and not within each lesson in the CM. Furthermore, some EQs and EUs have come from the WT or are author-provided; these were considered as long as they are developed in the WT/TG content.

Content	K to 12 Learning Competencies (MELCs included)***	21st-Century Skills	Teaching Strategies/ Differentiated Instruction	Assessment	Values Integration	Resources
<i>The Philippines' Geographical Location</i>	<p>S7ES-IVa-1 MELC Demonstrate how places on Earth may be located using a coordinate system</p> <p>S7ES-IVa-2 Describe the location of the Philippines with respect to the continents and oceans of the world</p>	<p>Critical Thinking</p> <ul style="list-style-type: none"> Interpreting the lines in a globe Identifying the parts of the globe from given descriptions Locating a selected country and identifying its latitude-longitude coordinates, including that of the Philippines Differentiating a globe from a world map, and using them to locate 	<ul style="list-style-type: none"> Read-alouds Jigsaw puzzle of a globe as motivational activity Direct instruction using lecture and discussion methods Exercises on identifying the latitude-longitude coordinates of a country 	<p>Diagnostic Determining prior knowledge</p> <p>Formative</p> <ul style="list-style-type: none"> Seatwork Homework <p>Summative</p> <ul style="list-style-type: none"> Teacher-made test 	Being observant	<ul style="list-style-type: none"> jigsaw puzzle of a globe globe world map diagram of a globe to be labeled map with coordinates and landmarks activity or experiment materials

		<p>continents, countries, and bodies of water in relation to the Philippines</p> <p>Collaboration Working with a group in making maps of the Philippines</p> <p>Communication</p> <ul style="list-style-type: none"> Identifying the trademark products of each region in the Philippines Citing the geographical factors involved in the manufacture of these products 				
<i>Landforms in the Philippines</i>	<p>S7ES-IVb-3 Recognize that soil, water, rocks, coal, and other fossil fuels are Earth materials that people use as resources</p> <p>S7ES-IVc-4 Describe ways of using Earth's resources sustainably</p> <p>MELC Cite and explain ways of using Earth's resources sustainably</p>	<p>Collaboration Working on activities with a group</p> <p>Critical Thinking</p> <ul style="list-style-type: none"> Determining the suitability of the soil for growing plants and presenting the activity output in class Doing research on the type/s of soil that can be found in each landform in the Philippines and is best for growing different kinds of 	<ul style="list-style-type: none"> Activity on identifying the location of the given places in the Philippines and then directing them to name the different landforms and other distinct features of the place Direct instruction using lecture and discussion methods Experiential learning Group activities Concept mapping to summarize the lesson 	<p>Formative</p> <ul style="list-style-type: none"> Homework Seatwork Peer assessment of students' presentation of output <p>Summative</p> <ul style="list-style-type: none"> Teacher-made test 	Recognizing the value of protecting and conserving Philippine landforms	<ul style="list-style-type: none"> pictures of different places in the Philippines activity or experiment materials

		<p>plants</p> <ul style="list-style-type: none"> • Comparing landforms in the Philippines • Creating a concept map to summarize the lesson on landforms • Assessing outputs (own group and other groups') <p>Communication</p> <ul style="list-style-type: none"> • Identifying the landforms in different places in the Philippines and their corresponding features • Presenting activity outputs to the class 				
<i>Water Forms in the Philippines</i>	<p>S7ES-IVb-3 Recognize that soil, water, rocks, coal, and other fossil fuels are Earth materials that people use as resources</p> <p>S7ES-IVc-4 Describe ways of using Earth's resources sustainably</p> <p>MELC Cite and explain ways of using Earth's resources sustainably</p>	<p>Collaboration</p> <ul style="list-style-type: none"> • Working on activities with a group • Doing a peer-assessment <p>Critical Thinking and Social and Environmental Awareness</p> <ul style="list-style-type: none"> • Distinguishing polluted from unpolluted water • Giving opinions on the given questions regarding the present condition of any water form • Predicting the 	<ul style="list-style-type: none"> • Word Hunt Activity for motivation • Direct instruction using lecture and discussion methods • Experiential learning through group activities 	<p>Formative</p> <ul style="list-style-type: none"> • Seatwork • Enrichment activity or homework on a written report about a river system in own locality <p>Summative Teacher-made test</p>	Recognizing individual responsibility or contribution in maintaining the life of water forms in the country	<ul style="list-style-type: none"> • diagrams, pictures, or videos of stages of development of a river and a lake • activity or experiment materials • laboratory equipment

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		<p>condition of a water system in own locality based on the existing practices of the community and the environmental programs of both government and nongovernment organizations</p> <p>Communication</p> <ul style="list-style-type: none"> Identifying and comparing water forms in the Philippines Presenting activity outputs to the class Writing a report about a river system in own locality, including naming factors that contributed to its present condition and the local government unit's program for it (may be supported by pictures as evidence) 				
<i>Materials from Earth</i>	S7ES-IVb-3 Recognize that soil, water, rocks, coal, and other fossil fuels are Earth materials that people use as resources	<p>Collaboration</p> <ul style="list-style-type: none"> Working on an activity in groups Working with a partner on a list of things they can do to spread awareness of the conservation and protection of natural 	<ul style="list-style-type: none"> Direct instruction using lecture and discussion methods Use of charts, pictures, or videos in discussing the concepts on minerals Presentation of different sceneries showing 	<p>Formative</p> <ul style="list-style-type: none"> Seatwork Homework <p>Summative Teacher-made tests</p>	<ul style="list-style-type: none"> Being responsible and wise on the use of natural resources Showing care for and conservation of natural resources Being accurate on the data outputs Making wise and 	<ul style="list-style-type: none"> mineral samples (or pictures or videos of them) charts, pictures, or a video presentation showing the types, properties, uses, and sources of minerals that are

	<p>S7ES-IVc-4 Describe ways of using Earth's resources sustainably</p> <p>MELC Cite and explain ways of using Earth's resources sustainably</p>	<p>resources and the immediate need to address the depletion of natural resources</p> <p>Critical Thinking</p> <ul style="list-style-type: none"> • Doing a research on the minerals that are found in great quantities in some regions of the Philippines • Testing the hardness of minerals • Drawing a mineral map of the Philippines and including a legend for reference for the identification of minerals on the map • Identifying the different kinds of rocks • Classifying rocks according to type • Doing a research on the varied uses of rocks to determine why there are considered important resources • Identifying products that are formed from raw Earth materials 	<p>various rock formations in the Philippines</p> <ul style="list-style-type: none"> • Experiential learning through small group activities • Pair work on listing things that one can do to spread awareness on the conservation and protection of the Philippines' natural resources. 		<p>informed decisions</p>	<p>available in the Philippines</p> <ul style="list-style-type: none"> • activity or experiment materials • long bond paper • pictures or videos of different sceneries showing various rock formations in the Philippines • rock samples
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		<p>Initiative Spearheading the campaign for the protection and conservation of safe water in the community</p> <p>Critical Thinking</p> <ul style="list-style-type: none"> • Identifying different kinds of rocks and inferring that they are important resources on earth that need to be conserved • Presenting own data and comparing them with that of others while still observing accuracy <p>Communication Preparing and sharing activity outputs and reports with the class</p> <p>Creativity Preparing a chart or any creative presentation about the materials on Earth</p> <p>Work Ethic Analyzing situations and weighing benefits over harm or personal advantage</p>			
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<p><i>Energy Sources</i></p>	<p>S7ES-IVb-3 Recognize that soil, water, rocks, coal, and other fossil fuels are Earth materials that people use as resources</p> <p>S7ES-IVc-4 Describe ways of using Earth's resources sustainably</p> <p>MELC Cite and explain ways of using Earth's resources sustainably</p>	<p>Collaboration</p> <ul style="list-style-type: none"> • Group reading and discussion of a given selection • Identifying the current energy problems of the country <p>Literacy Preparing a short written and oral report</p> <p>Critical Thinking and Social Awareness and Environmental Awareness</p> <ul style="list-style-type: none"> • Analyzing situations that will show the value of supporting online and on-the-job campaigns related to resource conservation • Producing an innovative source of light <p>Communication</p> <ul style="list-style-type: none"> • Summarizing reports on the advantages and disadvantages of energy sources • Presenting written and oral reports on the advantages and disadvantages of energy sources 	<ul style="list-style-type: none"> • Crossword puzzle activity for motivation • Direct instruction using lecture and discussion method • Independent study • Using reading in science content area (reading selections are provided) • Experiential learning through group activities 	<p>Formative</p> <ul style="list-style-type: none"> • Seatwork • Homework <p>Summative</p> <ul style="list-style-type: none"> • Test on classifying energy sources as conventional or nonconventional, identifying the energy source described • Test on naming ways to conserve energy sources 	<p>Recognizing the importance of supporting online or on-the-job campaigns related to resource conservation</p>	<ul style="list-style-type: none"> • crossword puzzle containing vocabulary words on energy sources • copies of reading selections on energy sources • activity or experiment materials
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<p><i>Conserving Resources</i></p>	<p>S7ES-IVc-4 Describe ways of using Earth's resources sustainably</p> <p>MELC Cite and explain ways of using Earth's resources sustainably</p>	<p>Collaboration</p> <ul style="list-style-type: none"> • Doing research and discussing findings with a group • Presenting the results of the group discussion to the class <p>Environmental Awareness and Communication</p> <ul style="list-style-type: none"> • Naming the biodegradable waste that own household generates and the action steps taken to manage such waste • Sharing own opinions on the effects of not using the resources wisely and own ways to conserve resources • Identifying existing environmental problems, proposing possible solutions to them, and spreading awareness for taking positive steps toward protecting the environment <p>Critical Thinking and Communication</p> <ul style="list-style-type: none"> • Citing reasons for the necessity of making laws that address the 	<ul style="list-style-type: none"> • Word Hunt and Picture Analysis activities for motivation • Direct instruction using lecture and discussion methods • Group activity • Review of chapter activities 	<p>Formative</p> <ul style="list-style-type: none"> • Seatwork • Homework <p>Summative</p> <ul style="list-style-type: none"> • Answering essential questions • Chapter test • Performance task 	<ul style="list-style-type: none"> • Realizing the need for waste management • Recognizing the value of promoting environmental awareness, protection, and conservation of resources • Giving appreciation for how the concepts learned will affect or change one's own disposition in life • Taking concrete actions to be able to apply concepts learned in real life • Showing determination and strong will in adopting a healthy lifestyle that considers the use of natural, biodegradable, and ecologically friendly materials 	<ul style="list-style-type: none"> • different kinds of solid wastes • crossword puzzle containing vocabulary words on energy sources, including the words <i>plastic bottle, tin cans, PVC pipe, empty toothpaste tube, broken glass, paper,</i> • pictures of a landslide, a towering dumpsite, a waterway clogged by solid wastes, a fish kill, and an oil price hike • activity or experiment materials
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		<p>conservation and protection of Earth's resources.</p> <ul style="list-style-type: none"> • Naming initiatives that address the conservation of Earth's resources. • Writing a reflection paper of the important concepts learned in the chapter • Describing how one performed in the activities • Formulating conclusions and recommendations 			
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****Italicized texts under K to 12 Learning Competencies column are add-ons. Such marking is applied throughout the CM.*

Chapter 11: Interactions in the Atmosphere			
Essential Questions	<ul style="list-style-type: none"> • What distinguishes the different layers of the atmosphere from one another? • How important is the atmosphere to the living organisms on Earth? • How do human activities affect the atmosphere? • How do weather systems change and develop? • How important is weather forecasting and reporting? • What makes the climate in the Philippines different from that of other countries? 	Essential Understandings	<ul style="list-style-type: none"> • The atmosphere plays a vital role in sustaining life on Earth. • The atmosphere protects Earth from the sun's harmful radiation, which can cause absolute danger to living organisms. • The atmosphere, among other factors, also determines the weather conditions on Earth.

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Content	K to 12 Learning Competencies (MELCs included)	21st-Century Skills	Teaching Strategies/ Differentiated Instruction	Assessment	Values Integration	Resources
<p><i>The Composition of the Atmosphere</i></p> <p><i>Layers of the Atmosphere</i></p> <p><i>Importance of the Atmosphere</i></p> <p><i>Effects of Human Activities on the Atmosphere</i></p>	<p>S7ES-IVd-5 MELC Discuss how energy from the Sun interacts with the layers of the atmosphere</p>	<p>Collaboration</p> <ul style="list-style-type: none"> Working on activities as a group Presenting outputs from the activities done <p>Critical Thinking and Communication</p> <ul style="list-style-type: none"> Identifying some components of air Describing how rust forms Concept mapping of the lessons learned about the layers of the atmosphere and composition of air Doing peer assessment of other groups' work 	<ul style="list-style-type: none"> Word Hunt activity for motivation Read-alouds Direct instruction using lecture and discussion methods Experiential learning through group activities 	<p>Diagnostic Determining prior knowledge on the topics to be discussed</p> <p>Formative</p> <ul style="list-style-type: none"> Seatwork Peer assessment 	<p>Realizing the value of building strong friendships through mutual respect, honesty and trust</p>	<ul style="list-style-type: none"> a puzzle that includes words related to atmosphere such as <i>storm, ITCZ, clouds, ozone, airplane</i>, etc. activity or experiment materials
<p><i>Weather Systems</i></p>	<p>S7ES-IVe-6 Explain how some human activities affect the atmosphere</p> <p>S7ES-IVf-7 MELC Account for the occurrence of land and sea breezes, monsoons, and intertropical convergence zone (ITCZ)</p>	<p>Collaboration</p> <ul style="list-style-type: none"> Working on activities as a group Presenting activity outputs to the class Engaging in constructive critiquing of others' outputs <p>Critical Thinking, Communication, and Collaboration</p> <ul style="list-style-type: none"> Explaining how air exerts pressure 	<ul style="list-style-type: none"> Direct instruction using lecture and discussion methods Experiential learning through group activities 	<p>Formative</p> <ul style="list-style-type: none"> Seatwork 	<p>Realizing the importance of knowing the daily atmospheric pressure in own locality</p>	<p>activity or experiment materials</p>

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		<ul style="list-style-type: none"> Constructing an improvised aneroid barometer Demonstrating the relationship of air temperature and surfaces Making a weather forecast 				
<i>The Philippine Climate</i>	S7ES-IVg-8 Describe the effects of certain weather systems in the Philippines	<p>Critical Thinking</p> <ul style="list-style-type: none"> Comparing scenes common during different seasons and classifying them based on time of occurrence Determining the climate of some countries Analyzing the types of climate over different regions in the Philippines Constructing a climate map of the Philippines <p>Communication</p> <ul style="list-style-type: none"> Describing how one performed in the activities Formulating conclusions and recommendations 	<ul style="list-style-type: none"> Direct instruction using lecture discussion and method Picture analysis of the different types of climate in the Philippines Enrichment activity using reflective discussions by presentation of different scenes during different seasons that the students have created Review of the chapter activities done 	<p>Formative</p> <ul style="list-style-type: none"> Homework Seatwork Constructing a climate map of the Philippines as an enrichment activity <p>Summative</p> <ul style="list-style-type: none"> Essential questions Chapter test Performance task 	<ul style="list-style-type: none"> Practicing wise spending and economy in times of crisis Appreciating how the concepts learned will affect or change one's own disposition in life Taking concrete actions to be able to apply concepts learned in real life Learning about environmental awareness on helping reduce air pollution Participating in a campaign for cleanliness in the community 	<ul style="list-style-type: none"> Philippine map sheets of colored paper of different colors paste or glue pair of scissors pictures of scenes that are common during different seasons world map

Chapter 12: Seasons and Eclipses

Essential Questions	<ul style="list-style-type: none"> How do the varying angles of the sun's rays change the intensity of radiation? How does Earth's tilt affect the changes in seasons? 	Essential Understandings	<ul style="list-style-type: none"> Earth's tilt and its position relative to the sun, among other factors, affect the changes in seasons. When sunlight is blocked by either Earth or the moon, a shadow is cast and eclipses occur.
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CURRICULUM MAP

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	<ul style="list-style-type: none"> How is a solstice different from an equinox? How does the geographical location of the Philippines affect its seasons? What is the difference between a lunar eclipse and a solar eclipse? 		
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Content	K to 12 Learning Competencies (MELCs included)	21st-Century Skills	Teaching Strategies/ Differentiated Instruction	Assessment	Values Integration	Resources
Seasons	<p>S7ES-IVh-9 Using models, relate:</p> <p>9.1 the tilt of the Earth to the length of daytime</p> <p>9.2 the length of daytime to the amount of energy received;</p> <p>9.3 the position of the Earth in its orbit to the height of the Sun in the sky</p> <p>9.4 the height of the Sun in the sky to the amount of energy received</p> <p>9.5 the latitude of an area to the amount of energy the area receives</p> <p>S7ES-IVh-9 MELC Using models, relate:</p>	<p>Critical Thinking, Collaboration, and Communication</p> <ul style="list-style-type: none"> Explaining the effect of Earth's tilt on seasonal changes Describing the occurrence of seasons as Earth revolves around the sun Explaining why days are longer during summer and shorter during winter Describing the intensity of solar radiation when the sun is at various angles Discussing the findings with group mates and presenting the results of the activities to class 	<ul style="list-style-type: none"> Observing the globe as the model of Earth Picture analysis as motivational activity Direct instruction using lecture and discussion methods Experiential learning through group activities 	<p>Diagnostic Determining prior knowledge on the chapter topics to be discussed</p> <p>Formative Seatwork</p> <p>Summative Teacher-made tests</p>	<ul style="list-style-type: none"> Promoting close family ties Showing affection to others Practicing self-preservation against the harmful effects of intense sunlight 	<ul style="list-style-type: none"> globe activity or experiment materials pictures of a person's shadow at different times of the day model or diagram that illustrates the intensity of heat on the surface of Earth over different regions

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	<ul style="list-style-type: none"> - the tilt of the Earth to the length of daytime; - the length of daytime to the amount of energy received; - the position of the Earth in its orbit to the height of the Sun in the sky; - the height of the Sun in the sky to the amount of energy received; - the latitude of an area to the amount of energy the area receives; and - the tilt of the Earth and the seasons 					
<i>Seasons in the Philippines</i>	<p>S7ES-IVi-10 Show what causes change in the seasons in the Philippines using models</p>	<p>Critical Thinking</p> <ul style="list-style-type: none"> • Describing the geographical location of the Philippines • Inferring the relationship between geographical location and seasons in the Philippines <p>Numeracy, Critical Thinking, Collaboration, and Communication</p> <ul style="list-style-type: none"> • Preparing a graph on the average rainfall per month in some Philippine cities and interpreting the graph 	<ul style="list-style-type: none"> • Review of concepts related to the relationship between Earth's tilt and seasons • Lecture and discussion methods • Experiential learning through group activities /laboratory methods 	<p>Formative</p> <ul style="list-style-type: none"> • Seatwork <p>Summative</p> <ul style="list-style-type: none"> • Teacher-made test 	Recognizing the values of perseverance and not giving up	<ul style="list-style-type: none"> • globe • activity or experiment materials

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		<ul style="list-style-type: none"> Explaining rainfall as a basis of seasonal changes in the Philippines Presenting activity data and results to the class 				
<i>Eclipses</i>	<p>S7ES-IVj-11 Explain how solar and lunar eclipses occur</p> <p>S7ES-IVj-11 MELC Explain how solar and lunar eclipses occur using models</p> <p>S7ES-IVj-12 Collect, record, and report data on the beliefs and practices of the community in relation to eclipses</p>	<p>Critical Thinking, Collaboration, and Communication</p> <ul style="list-style-type: none"> Demonstrating how eclipses occur using prototype models of Earth, the sun, and the moon Identifying the positions of Earth, the sun, and the moon during solar and lunar eclipses Writing a reflection paper on the important lessons or concepts they learned in the chapter. <p>Cultural Awareness and Communication Interviewing old folks about traditional beliefs and practices in relation to eclipse, and presenting these in class</p>	<ul style="list-style-type: none"> Motivational activity Direct instruction using lecture and discussion methods Experiential learning through group activities Independent study in doing the Performance Task Review of chapter activities done and describing how one fared in them and formulating conclusions and recommendations as well 	<p>Formative</p> <ul style="list-style-type: none"> Seatwork Homework <p>Summative</p> <ul style="list-style-type: none"> Essential questions Teacher-made test Chapter test Reflection paper Performance task 	<ul style="list-style-type: none"> Practicing self-discipline in every situation in life Appreciating how the concepts learned will affect or change one's own disposition in life Taking concrete actions to be able to apply concepts learned in real life Appreciating a scientific mind and attitude to enlighten people on the myths on eclipses 	<ul style="list-style-type: none"> letters <i>E, E, S, I, P, C,</i> and <i>L</i> for the Unscrambling Letters activity activity or experiment materials