Lower Cape May Regional School District
Physical & Earth Science
7th Grade

Interdisciplinary Connections

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

RL.8.1. Cite the textual evidence and make relevant connections that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.

Integration of Technology

9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.
9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).
9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
9.4.8.TL.4: Synthesize and publish information about a local or global issue or event (e.g., MSLS4-5, 6.1.8.CivicsPI.3).
9.4.8.TL.5: Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration. •
9.4.8.TL.6: Collaborate to develop and publish work that provides perspectives on a real-world problem.

21st Century Skills

9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).
9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
9.4.8.CI.3: Examine challenges that may exist in the adoption of new ideas (e.g., 2.1.8.SSH, 6.1.8.CivicsPD.2).
9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries.
9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).

9.4.8.CT.3: Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.
9.4.8.DC.1: Analyze the resource citations in online materials for proper use.
9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).
9.4.8.DC.3: Describe tradeoffs between allowing information to be public (e.g., within online games) versus keeping information private and secure.
9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences.
9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure. •
9.4.8.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation.
9.4.8.DC.7: Collaborate within a digital community to create a digital artifact using strategies such as crowdsourcing or digital surveys.
9.4.8.DC.8: Explain how communities use data and technology to develop measures to respond to effects of climate change (e.g., smart cities).
9.4.8.GCA.1: Model how to navigate cultural differences with sensitivity and respect (e.g., 1.5.8.C1a). •
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal.
9.4.8.IML.1: Critically curate multiple resources to assess the credibility of sources when searching for information.
9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.
9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations. •
9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.
9.4.8.IML.6: Identify subtle and overt messages based on the method of communication.
9.4.8.IML.7: Use information from a variety of sources, contexts, disciplines, and cultures for a specific purpose (e.g., 1.2.8.C2a, 1.4.8.CR2a, 2.1.8.CHSS/IV.8.AI.1, W.5.8, 6.1.8.GeoSV.3.a, 6.1.8.CivicsDP.4.b, 7.1.NH.IPRET.8).
9.4.8.IML.8: Apply deliberate and thoughtful search strategies to access high-quality information on climate change (e.g., 1.1.8.C1b).
9.4.8.IML.9: Distinguish between ethical and unethical uses of information and media (e.g., 1.5.8.CR3b, 8.2.8.EC.2).
9.4.8.IML.10: Examine the consequences of the uses of media (e.g., RI.8.7).
9.4.8.IML.11: Predict the personal and community impact of online and social media activities.
9.4.8.IML.12: Use relevant tools to produce, publish, and deliver information supported with evidence for an authentic audience.
9.4.8.IML.13: Identify the impact of the creator on the content, production, and delivery of information (e.g., 8.2.8.ED.1).
9.4.8.IML.14: Analyze the role of media in delivering cultural, political, and other societal messages. •
9.4.8.IML.15: Explain ways that individuals may experience the same media message differently.

Career Education

9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest.
9.2.8.CAP.2: Develop a plan that includes information about career areas of interest.
9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.

9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement.
9.2.8.CAP.5: Develop a personal plan with the assistance of an adult mentor that includes information about career areas of interest, goals and an educational plan.
9.2.8.CAP.6: Compare the costs of postsecondary education with the potential increase in income from a career of choice.
9.2.8.CAP.7: Devise a strategy to minimize costs of postsecondary education.
9.2.8.CAP.8: Compare education and training requirements, income potential, and primary duties of at least two jobs of interest.
9.2.8.CAP.9: Analyze how a variety of activities related to career preparation (e.g., volunteering, apprenticeships, structured learning experiences, dual enrollment, job search, scholarships) impacts postsecondary options.
9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally.
9.2.8.CAP.11: Analyze potential career opportunities by considering different types of resources, including occupation databases, and state and national labor market statistics.
9.2.8.CAP.12: Assess personal strengths, talents, values, and interests to appropriate jobs and careers to maximize career potential.
9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances.
9.2.8.CAP.14: Evaluate sources of income and alternative resources to accurately compare employment options.
9.2.8.CAP.15: Present how the demand for certain skills, the job market, and credentials can determine an individual's earning power.
9.2.8.CAP.16: Research different ways workers/ employees improve their earning power through education and the acquisition of new knowledge and skills.
9.2.8.CAP.17: Prepare a sample resume and cover letter as part of an application process.
9.2.8.CAP.18: Explain how personal behavior, appearance, attitudes, and other choices may impact the job application process.
9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level
9.2.8.CAP.20: Identify the items to consider when estimating the cost of funding a business.

Lower Cape May Regional School District (Physical Science) Curriculum	
Content Area: Science	
Course Title: Physical Science	**Grade level: 7th**
Unit 1: Foundations **● Nature of Science Inquiry** **● Observations and Measurement** **● Experiments and Communicating Results**	**Dates for Units: 25 days and year-long application**
Unit 2: Earth and Space Sciences **● Earth's Place in the Universe** **● Earth's Systems** **● Earth and Human Activity** **● How Matter Changes**	**Dates for Units: 60 days**
Unit 3: Chemistry **● Properties of Matter** **● Structure of Matter** **● Classifying Elements** **● Compounds**	**Dates for Unit: 55 days**
Unit 4: Physics **● Motion, Forces, and Energy** **● Wave Properties and Electromagnetic Radiation**	**Dates for Unit: 40 days**

Lower Cape May Regional School District (7th grade Science) Curriculum Unit 1 Overview
Content Area: Science
Unit Title: Foundations of Science
Target Course/Grade Level: Physical/Earth 7th
Unit Summary: **● This unit explores the nature of science and the scientific method of discovery.** **● This unit also describes how scientists use models and mathematics to describe the world around them.** **● Science skills, mathematics, and units of measurement focusing on The Standard International Units of Measurement and the use of the Metric system.** **● The different ways data is organized and presented to others is covered.**

● **The knowledge and skills gained in this chapter will serve as a foundation for the study of science throughout the year.**		
Learning Targets		
CPI #	**Cumulative Progress Indicators (CPI) for Unit**	
MS-ETS1-1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	
MS-ETS1-2	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	
MS-ETS1-3	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	
MS-ETS1-4	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Analyzing and Interpreting Data Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. Analyze and interpret data to determine similarities and differences in findings. (MS-PS1-2)	**ETS1.B: Developing Possible Solutions** A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (secondary to MS-PS1-6) **ETS1.C: Optimizing the Design Solution** Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of the characteristics may be incorporated into the new	**Patterns** Macroscopic patterns are related to the nature of microscopic and atomic-level structure. (MS-PS1-2) Cause and Effect **Cause and effect** relationships may be used to predict phenomena in natural or designed systems. (MS-PS1-4) **Scale, Proportion, and Quantity** Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-PS1-1) ***Connections to Engineering, Technology, and Applications of***

	design. (secondary to MS-PS1-6) The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (secondary to MS-PS1-6) **ETS1.A: Defining and Delimiting Engineering Problems** The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions. (secondary to MS-PS3-3) **ETS1.B: Developing Possible Solutions** A solution needs to be tested, and then modified on the basis of the test results in order to improve it. There are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem. (secondary to MS-PS3-3)	***Science*** **Interdependence of Science, Engineering, and Technology** Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-PS1-3) Connections to Nature of Science Scientific Knowledge is Based on Empirical Evidence Science knowledge is based upon logical and conceptual connections between evidence and explanations. (MS-PS1-2)
Unit Enduring Questions: ● What are the branches of Physical and Earth Science? ● How does science take place? ● Differentiate between scientific theory and scientific law. ● How do we use scientific method? ● What are science skills? ● Why do scientists use scientific notation and SI units.		**Unit Enduring Understandings:** ● Science takes place through observation, descriptions, and experimentation. ● Scientific methods guides our thinking and actions when learning about natural

● Why is the metric system used as international units of measurement?	phenomena. ● The metric system is a base ten system of measurement used by scientists all around the world.
Unit Objectives: ***Students will know….*** ● How many branches of science is organized. ● Students will know that science takes a systematic and an interdisciplinary approach to learning about the world around them. ● Science skills include ability to observe, make measurements, infer connections, and present information in a universal manner.	**Unit Objectives:** ***Students will be able to…...*** ● Describe how science takes place. ● Identify and classify the main branches of science and explain the interdisciplinary nature of science. ● Design experiments to solve hypothetical problems. Confirm results by designing and repeating experiments. ● Interpret data from graphs; determine trends and draw predictions, hypotheses, and draw conclusions. ● Organize and display data in tables, graphs, and charts.

Lower Cape May Regional School District (7th grade Science) Curriculum Unit 2 Overview	
Content Area: Science	
Unit Title: Earth and Space Sciences	
Target Course/Grade Level: Physical/Earth 7th	
Unit Summary: ● **Explores Earth's plance in the universe, Earth's systems, and our Earth and human activity.** ● **Explain how models are used to describe Earth-sun-moon relationships as it relates to season, phases, eclipse, gravity and motion, and scale properties of object s with in our solar system.** ● **Describes how Earth's geoscience processes (flow of energy, cycling of materials) have shaped our Earth.**	
Learning Targets	
CPI #	**Cumulative Progress Indicators (CPI) for Unit**
MS-ESS1-1	Develop and use a model of the Earth-sun-moon system to describe

	the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
MS-ESS1-2	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
MS-ESS1-3	Analyze and interpret data to determine scale properties of objects in the solar system.
MS-ESS1-4	Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.
MS-ESS2-1	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
MS-ESS2-2	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
MS-ESS2-3	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
MS-ESS2-4	Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
MS-ESS2-5	Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.
MS-ESS2-6	Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
MS-ESS3-1	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
MS-ESS3-2	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
MS-ESS3-3	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
MS-ESS3-4	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

MS-ESS3-5	Ask questions to clarify evidence of the factors that have caused climate change over the past century.	
Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Analyzing and Interpreting Data Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. Analyze and interpret data to determine similarities and differences in findings. (MS-PS1-2) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-ESS1-4) **Developing and Using Models** Modeling in in 6–8 builds on K–5 experiences and progresses to developing, using, and	**ESS1.A: The Universe and Its Stars** Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models. (MS-ESS1-1) Patterns Patterns can be used to identify cause and effect relationships. (MS-ESS1-1) Scale, Proportion, and Quantity New Jersey Department of Education Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe. (MS-ESS1-2) **ESS1.B: Earth and the Solar System** The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them. (MS-ESS1-2), (MSESS1-3) This model of the solar system can explain eclipses of the sun and the moon. Earth's spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year. (MS-ESS1-1) The solar system appears to have formed from a disk of dust and gas, drawn together by	**Patterns** Macroscopic patterns are related to the nature of microscopic and atomic-level structure. (MS-PS1-2) Cause and Effect **Cause and effect** relationships may be used to predict phenomena in natural or designed systems. (MS-PS1-4) **Systems and System Models Models** can be used to represent systems and their interactions. (MS-ESS1-2) **Scale, Proportion, and Quantity** Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-PS1-1) **Energy and Matter** Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter. (MS-ESS2-4) **Stability and Change** Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale. (MS-ESS2-1) ***Connections to Engineering, Technology, and Applications of***

revising models to describe, test, and predict more abstract phenomena and design systems. Develop and use a model to describe phenomena. (MS-ESS2-1), (MS-ESS2-6) Develop a model to describe unobservable mechanisms. (MS-ESS2-4) **Planning and Carrying Out Investigations** Planning and carrying out investigations in in 6–8 builds on K–5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions. Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions. (MS-ESS2-5) **Asking Questions and Defining Problems** Asking questions and defining problems in grades 6–8 builds on grades K–5 experiences and progresses to specifying relationships between variables and clarifying arguments and models. Ask questions to identify and clarify evidence of an argument. (MS-ESS3-5)	gravity. (MS-ESS1-2) **ESS1.C: The History of Planet Earth** The geologic time scale interpreted from rock strata provides a way to organize Earth's history. Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale. (MS-ESS1-4) **ESS1.C: The History of Planet Earth** Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. (HS.ESS1.C GBE) (secondary to MS-ESS2-3) ESS2.A: Earth's Materials and Systems All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. (MS-ESS2-1) The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future. (MS-ESS2-2) **ESS2.B: Plate Tectonics and LargeScale System Interactions** Maps of ancient land and water patterns, based on investigations of rocks and	***Science*** **Interdependence of Science, Engineering, and Technology** Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-PS1-3) **Influence of Science, Engineering, and Technology on Society and the Natural World** All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ESS3-1), (MS-ESS3-4) The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus, technology use varies from regionto region and over time. (MS-ESS3-2), (MS-ESS3-3) ***Connections to Nature of Science*** **Scientific Knowledge is Based on Empirical Evidence** Science knowledge is based upon logical and conceptual connections between evidence and explanations. (MS-PS1-2)

	fossils, make clear how Earth's plates have moved great distances, collided, and spread apart. (MS-ESS2-3) **ESS2.C: The Roles of Water in Earth's Surface Processes** Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land. (MS-ESS2-4) The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns. (MS-ESS2-5) Global movements of water and its changes in form are propelled by sunlight and gravity. (MS-ESS2-4) Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents. (MS-ESS2-6) Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations. (MS-ESS2-2) **ESS3.A: Natural Resources** Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not	**Scientific Knowledge is Open to Revision in Light of New Evidence** Science findings are frequently revised and/or reinterpreted based on new evidence. (MS-ESS2-3) **Science Addresses Questions About the Natural and Material World** Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes. (MS-ESS3-4)

	renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS3-1) ESS3.B: Natural Hazards Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events. (MS-ESS3-2) **ESS3.C: Human Impacts on Earth Systems** Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3) Typically, as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3), (MS-ESS3-4) **ESS3.D: Global Climate Change** Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever	

	climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. (MS-ESS3-5)	
Unit Enduring Questions: ● How do cyclic patterns of our Earth-sun-moon systems create lunar phase, eclipses, and seasons? ● What is the role of gravity in the motions within galaxies and the solar system? ● How does evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history? ● What are the geoscience processes that shape our Earth? ● What evidence is used to explain past plate motions? ● Explain how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determines regional climates. ● Describe how human impact effects Earth's geoscience processes.		**Unit Enduring Understandings:** ● Earth-sun-moon relationships create lunar phases, eclipses and seasons. ● Evidence within rock strata help identify the age of each layer. ● Geoscience processes are natural forces that shape Earth's surface. ● Convection currents move Earth's lithospheric plates. ● Convection currents within the Earth's atmosphere and oceans help determine regional climates.
Unit Objectives: ***Students will know….*** ● how the Earth moves through Space and what the outcomes due to this movement (seasons/day/night)? ● how gravity and motion related. ● How are phases and eclipses occur? ● what causes the tides on Earth. ● the Big Bang Theory - how the solar system formed. ● the major types of Galaxies. ● how scientist recognized the makeup of our solar system and the objects within it. ● the characteristics of the inner and outer planets. ● how to identify the characteristics of each type of rock: igneous, sedimentary, metamorphic. ● how to identify each type of rock and the subgroups within each type of rock.\ ● the ways in which each type of rock can be used.		**Unit Objectives:** ***Students will be able to…...*** ● Demonstrate how Earth moves in Space. ● Explain what causes the cycle of Seasons on Earth. ● Explain what causes the Cycle of Day and Night on Earth. ● Identify what determines the strength of the force of gravity between two objects. ● Describe two factors that keep the moon and Earth in Orbit. ● Explain what caused the Phases of the Moon. Describe Lunar and Solar Eclipses. ● Identify what causes the tides.

● how each type of rock is formed by way of the rock cycle. ● the layers of the Earth (crust, mantle, core) and the characteris that make each layer unique. ● the process of convection and how these currents transfer heat within the mantle of the Earth. ● the theories behind plate tectonics and seafloor spreading. ● the process of plate tectonics and how the plates move over the crust of the Earth. ● the processes of seafloor spreading. ● the three types of plate boundaries. ● the forces that change the Earth's surface and features that result due to these forces. ● that energy of an earthquake travels through the Earth and can be measured. ● How volcanoes and plate tectonics are related. ● The physical and chemical properties of magma.	● State the Big Bang Theory. ● Compare and contrast the major types of Galaxies. ● Explain how astronomers describe the scale of the Universe. ● Illustrate and defined the objects that make up the solar system. ● Compare and contrast the inner and outer planets. ● Identify what characteristics make the inner planets unique. ● Identify what characteristics make the outer planets unique. ● list the characteristics used to identify rocks. ● identify and describe the three major groups of rocks. ● Compare and contrast each rock group: igneous, sedimentary and metamorphic. ● describe ways in which each type of rock can be used. ● identify the subgroups of each type of rock. ● illustrate the rock cycle. ● describe how the Rock Cycle does not need to follow in one particular order for each type of rock to form. ● explain how Geologists learn about Earth's Inner Structures. ● identify the characteristic of Earth's Crust, Mantle, and Core. ● Explain how heat is transferred by means of convection currents found within the mantle. I ● describe and use evidence to show how scientist proved that continents are drifting apart.

	• list the Evidence for Sea-Floor Spreading. • explain the process of Sea-Floor Spreading. • describe the process of subduction. • explain the Theory of Plate Tectonics. • Compare and contrast each type of Plate Bound. • explain how stress in the Earth's Crust changes Earth's surface. • describe where faults are usually found and why they form. • identify the land features that result from Plate Movement. • describe how energy of an Earthquake travels through Earth. • identify the scales used to measure the strength of an Earthquake. • explain how scientists locate the epicenter of an Earthquake. • identify where Earth's Volcanic regions are located and explain why they are found there. • Explain how Hot Spot Volcanoes form. • identify Physical and Chemical Properties of Matter. • define and explain what factors determine the viscosity of Magma.

Unit 3 Overview
Content Area: Science
Unit Title: Chemistry
Target Course/Grade Level: Physical/Earth Science 7th
Unit Summary: ● **The Properties of Matter -** Chemical and physical properties are investigated. The concept of density and calculations involving density are introduced. Difference between mass and weight explained and examples given. Measuring the mass and volume of a liquid, and volume of solid objects and using the data to identify unknown objects. ● **The Structure of Matter -** Atoms, elements, molecules and compounds are investigated. The development of atomic history is examined. Identifying elements based on sub-atomic structures is shown and practiced. ● **Classifying Matter** - Using the Periodic Table to organize matter into groups in order to recognize patterns between the elements and properties. Metals, Non-metals, and Noble Gases will be investigated. ● **Compounds** - Characteristics of Compounds will be investigated. How compounds form along recognizing and writing chemical formulas will be presented and practiced. Acids and Bases will also be investigated and properties between each will be identified. ● **Changes in Matter** - Types of chemical reactions will be investigated. Using Chemical Equations will be taught to show reactions. Nuclear Process are introduced.

Learning Targets	
CPI #	**Cumulative Progress Indicators (CPI) for Unit**
MS-PS1-1	Develop models to describe the atomic composition of simple molecules and extended structures.
MS-PS1-2	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
MS-PS1-3	Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.
MS-PS1-4	Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
MS-PS1-5	Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
MS-PS1-6	Undertake a design project to construct, test, and modify a device that

	either releases or absorbs thermal energy by chemical processes.
MS-PS3-1	Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.
MS-PS3-2	Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.
MS-PS3-3	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.
MS-PS3-4	Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample.
MS-PS3-5	Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems. **Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 6–8 builds on K–5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or design solutions.	**PS1.A: Structure and Properties of Matter** Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms. (MS-PS1-1) Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (MS-PS1-2), (MS-PS1-3) Gases and liquids are made of molecules or inert atoms that are moving about relative to each other. (MS-PS1-4) In a liquid, the	**Patterns** Macroscopic patterns are related to the nature of microscopic and atomic-level structure. (MS-PS1-2) **Cause and Effect** Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS1-4) **Systems and System Models** Models can be used to represent systems and their interactions such as inputs, processes, and outputs – and energy and matter flows within systems. (MS-PS3-2) **Scale, Proportion, and Quantity** Time, space, and energy phenomena

Analyzing and Interpreting Data Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis.

Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.

Engaging in Argument from Evidence Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed worlds.

Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 6–8 builds on K–5 experiences and progresses to evaluating the merit and validity of ideas and methods.

molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations. (MS-PS1-4) Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals). (MS-PS1-1) The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter. (MS-PS1-4)

PS1.B: Chemical Reactions Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants. (MS-PS1-2), (MS-PS1-3), (MS-PS1-5) The total number of each type of atom is conserved, and thus the mass does not change. (MS-PS1-5) Some chemical reactions release energy, others store energy. (MS-PS1-6)

PS3.A: Definitions of Energy The term “heat” as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one

can be observed at various scales using models to study systems that are too large or too small. (MS-PS1-1)

Energy and Matter Matter is conserved because atoms are conserved in physical and chemical processes. (MS-PS1-5) The transfer of energy can be tracked as energy flows through a designed or natural system. (MS-PS1-6)

Structure and Function Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. (MS-PS1-3)

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-PS1-3)

Influence of Science, Engineering and Technology on Society and the Natural World The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as

	object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. (secondary to MS-PS1-4) The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule (whichever is the appropriate building block for the system's material). The details of that relationship depend on the type of atom or molecule and the interactions among the atoms in the material. Temperature is not a direct measure of a system's total thermal energy. The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the system, and the state of the material. (secondary to MS-PS1-4) **PS3.B: Conservation of Energy and Energy Transfer** When the motion energy of an object changes, there is inevitably some other change in energy at the same time. (MS-PS3-5) The amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment. (MS-PS3-4) Energy is spontaneously transferred out of hotter regions or objects	climate, natural resources, and economic conditions. Thus, technology use varies from region to region and over time. (MS-PS1-3) ***Connections to Nature of Science*** **Scientific Knowledge is Based on Empirical Evidence** Science knowledge is based upon logical and conceptual connections between evidence and explanations. (MS-PS1-2) **Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena** Laws are regularities or mathematical descriptions of natural phenomena. (MS-PS1-5)

	and into colder ones. (MS-PS3-3) **PS3.C: Relationship Between Energy and Forces** When two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object. (MS-PS3-2) **ETS1.A: Defining and Delimiting Engineering Problems** The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions. (secondary to MS-PS3-3) **ETS1.B: Developing Possible Solutions** A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (secondary to MS-PS1-6) **ETS1.C: Optimizing the Design Solution** Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of the characteristics may be incorporated into the new design. (secondary to	

	MS-PS1-6) The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (secondary to MS-PS1-6)	
Unit Enduring Questions: ● How is the periodic table arranged? ● What are the parts of an atom and how do they bond? ● What are covalent and ionic bonds? ● How do covalent and ionic bonds differ? ● How is matter conserved in a reaction? ● How is a chemical equation written to shown conservation of mass/matter? ● What makes substances different from one another? ● How to use a substances physical and chemical properties to identify a substance? ● How to determine if a chemical reaction has occurred based on the substances properties? ● What happens to a pure substance when thermal energy is added or removed? ● When atoms get close to each other how do their valence electrons react to form a covalent or ionic bond? ● How are simple (ionic) compounds named? ● How are simple (covalent) molecules named? ● How have atomic models changed throughout history with the introduction of new evidence? ● How is thermal energy transferred from one object to another? ● How energy is transformed from one type to another? ● How is energy released or stored in a chemical reaction?		**Unit Enduring Understandings:** ● Matter is neither created nor destroyed in a chemical reaction, the atoms simply rearrange. ● Chemical reactions change the identity of a substance and can be recognized by four signs. ● All matter is composed of atom. ● Atoms are divisible onto 3 subatomic particles. ● The periodic table is a working arrangement of elements; known and unknown. ● The position of an element on the periodic table determines its properties. ● In nature, atoms bond by gaining, losing or sharing electrons to attain a state of highest stability. ● Chemical equations are balanced by applying the law of conservation of mass. ● Chemical reactions can be recognized by four signs. ● The products of a chemical reaction can be predicted by applying a set of rules. ● Every chemical or physical changes involves a change in energy.
Unit Objectives:		**Unit Objectives:**

Students will know….	***Students will be able to…...***
● Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants. The total number of each type of atom is conserved, and thus the mass does not change. ● Chemical processes, their rates, and whether or not energy is stored or released can be understood in terms of the collisions of molecules and rearrangements of atoms into new molecules, with consequent changes in total binding energy (i.e., the sum of all bond energies in the set of molecules) that are matched by changes in kinetic energy. In many situations, a dynamic and condition-dependent balance between a reaction and the reverse reaction determines the numbers of all types of molecules present. ● The fact that atoms are conserved, together with knowledge of the chemical properties of the elements involved, can be used to describe, and predict chemical reactions. Chemical processes and properties of materials underlie many important biological and geophysical phenomena.	● Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms ● Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. ● Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles. ● Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy. Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs ● Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium.

Lower Cape May Regional School District (7th grade Science) Curriculum
Unit 4 Overview

Content Area: Science

Unit Title: Physics

Target Course/Grade Level: Physical/Earth Science 7th

Unit Summary:

- Describing Motion – Kinematics - Differences between distance and displacement are investigated and various graphs, distance-time graphs and positions time graphs are used to represent motion. Students will participate in the 40m dash and use their data to for distance, displacement, and speed calculations.
- Speed and Acceleration - Differences in constant speed, instantaneous, and average speed are examined. Students will make calculations determining positive and negative acceleration using real time data and computer simulations.
- Representing Forces - Students will examine different type of contact forces, (applied, spring, elastic, and chemical) and field forces (electrical and magnetic forces) and how they originate from the four fundamental forces; Strong Nuclear, Weak Nuclear, Electromagnetic, and Gravitational forces.
- Forces and Motion - Students will plan an investigation to show how an object's motion depends on the sum of the forces on the objects and mass of the object. Balanced and unbalanced forces can change or maintain the motion of an object. Newton's Laws of Motion are examined through actual real time investigations and using computer simulations.
- Forms of Energy - The different forms of energy will be identified and investigated and will include mechanical and non-mechanical forms. Students will investigate the transfer and transformation from one kind of energy to another using the roller coaster to investigate mechanical forms of energy. Students will also design and build a basic still to evaporate and collect freshwater from salt water.
- Conservation of Energy - The question, "Why doesn't a roller coaster go forever and why a ball doesn't bounce to its original height will drive the student investigation why energy doesn't last forever, or at least not in the form it originated from.

Wave/EMS

- Describing Mechanical Waves - Students will investigate the difference between mechanical wave by comparing ocean waves with sound waves. How sounds are produced and how they are measured will be identified.
- Properties of Waves - Students will investigate the physical properties of waves by learning how sound waves are used to discover oil and used to diagnose and heal the body. Investigating other uses of waves in our world.
- Electromagnetic Waves - Students will investigate how new discoveries are made in space using

the different types of electromagnetic waves. The various uses of all the different types of electromagnetic waves used in our everyday world be be recognized. How radar is used to predict weather, keep track of airplanes in the air and ships at sea will be compared.

- Waves and Magnetism - Understanding how electromagnetic waves are a more reliable way to encode and transmit information than analog signals will drive learning. Investigating how data is stored and transmitted will be highlighted.
- Dual Nature of Light - Through learning about renewable energy resources such as solar power, students will investigate the photoelectric effect and the dual nature of electromagnetic radiation. The students will also look to see how electromagnetic radiation is used in the medical profession, in addition to different career paths there in associated with radiation.

Learning Targets	
CPI #	**Cumulative Progress Indicators (CPI) for Unit**
MS-PS2-1	Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
MS-PS2-2	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
MS-PS2-3	Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
MS-PS2-4	Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.
MS-PS2-5	Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.
MS-PS4-1	Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.
MS-PS4-2	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
MS-PS4-3	Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.

Science and Engineering Practices	**Disciplinary Core Ideas**	**Crosscutting Concepts**

Asking Questions and Defining Problems Asking questions and defining problems in grades 6–8 builds from grades K–5 experiences and progresses to specifying relationships between variables and clarifying arguments and models. **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 6–8 builds from grades K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. **Engaging in Argument from Evidence** Engaging in argument from evidence in 6–8 builds from grades K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world.	**PS2.A: Forces and Motion** For any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction (Newton's third law). (MS-PS2-1) The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change. The greater the mass of the object, the greater the force needed to achieve the same change in motion. For any given object, a larger force causes a larger change in motion. (MS-PS2-2) All positions of objects and the directions of forces and motions must be described in an arbitrarily chosen reference frame and arbitrarily chosen units of size. In order to share information with other people, these choices must also be shared. (MS-PS2-2) **PS2.B: Types of Interactions** Electric and magnetic (electromagnetic) forces can be attractive or repulsive, and their sizes depend on the magnitudes of the charges, currents, or magnetic strengths involved and on the distances between the interacting objects. (MS-PS2-3) Gravitational forces are always attractive. There is a gravitational force between	**Cause and Effect** Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS2-3), (MS-PS2-5) **Systems and System Models** Models can be used to represent systems and their interactions— such as inputs, processes and outputs—and energy and matter flows within systems. (MS-PS2-1), (MS-PS2-4), **Stability and Change** Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and forces at different scales. (MS-PS2-2) **Patterns** Graphs and charts can be used to identify patterns in data. (MS-PS4-1) **Structure and Function** Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. (MS-PS4-2) Structures can be designed to serve particular functions. (MS-PS4-3) ***Connections to Nature of Science*** **Scientific Knowledge is Based on Empirical Evidence** Science knowledge is based upon logical and conceptual connections between evidence and explanations. (MS-PS2-2), (MS-PS2-4)

	any two masses, but it is very small except when one or both of the objects have large mass—e.g., Earth and the sun. (MS-PS2-4) Forces that act at a distance (electric, magnetic, and gravitational) can be explained by fields that extend through space and can be mapped by their effect on a test object (a charged object, or a ball, respectively). (MS-PS2-5) **PS4.A: Wave Properties** A simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude. (MS-PS4-1) A sound wave needs a medium through which it is transmitted. (MS-PS4-2) **PS4.B: Electromagnetic Radiation** When light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light. (MS-PS4-2) The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends. (MS-PS4-2) A wave model of light is useful for explaining brightness, color, and the frequency-dependent bending of light at a surface between	**Influence of Science, Engineering, and Technology on Society and the Natural World** Technologies extend the measurement, exploration, modeling, and computational capacity of scientific investigations. (MS-PS4-3)

	media. (MS-PS4-2) However, because light can travel through space, it cannot be a matter wave, like sound or water waves. (MS-PS4-2) **PS4.C: Information Technologies and Instrumentation** Digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information. (MS-PS4-3)	
Unit Enduring Questions: ● How can one explain and predict interactions between objects and within systems of objects? ● How do Newton's Laws explain the nature of physics? ● How can one predict an object's continued motion, changes in motion, or stability? ● How do the laws of physics apply to a rollercoaster? ● How does energy change form? ● How can energy be transferred from one material to another? ● How are different kinds of mechanical waves different from each other? ● How are waves used to transfer energy and send and store information? ● What is electromagnetic radiation? ● What are the different uses of the different types of waves in the electromagnetic spectrum?		**Unit Enduring Understandings:** ● Motion can be modeled, explained, predicted, and described through their components. ● Balanced forces keep motion unchanged, unbalanced forces create acceleration. ● Every force has an equal and opposite force. ● Kinetic energy and several types of potential energy has the ability to do work. ● Energy is conserved- all energy transfers are governed by the law of conservation of energy. ● Momentum is conserved during collisions. ● Mechanical waves are a type of energy which use matter as a medium. ● Sound is formed through vibrations and travel as mechanical waves. ● Energy can come in various forms and it can be transferred from one form to another when work is done. ● The amount of energy before a transformation is equal to the amount of energy after the transformation.

Unit Objectives: ***Students will know….***	**Unit Objectives:** ***Students will be able to…...***
● For any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first but in the opposite direction (Newton's third law). ● The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change. The greater the mass of the object, the greater the force needed to achieve the same change in motion. For any given object, a larger force causes a larger change in motion. Forces on an object can also change its shape or orientation. All positions of objects and the directions of forces and motions must be described in an arbitrarily chosen reference frame and arbitrarily chosen units of size. ● Energy is a quantitative property of a system that depends on the motion and interactions of matter and radiation within that system. That there is a single quantity called energy is due to the fact that a system's total energy is conserved, even as, within the system, energy is continually transferred from one object to another and between its various possible forms. ● Momentum is defined for a particular frame of reference; it is the mass times the velocity of the object. In any system, total momentum is always conserved. If a system interacts with objects outside itself, the total momentum of the system can change; however, any such change is balanced by changes in the momentum of objects outside the system. ● The wavelength and frequency of a wave are related to one another by the speed of travel of the wave, which depends on the type of wave and the medium through which it is passing. ● Information can be digitized (e.g., a picture stored as the values of an array of pixels); in this form, it can be stored reliably in computer memory and sent over long distances as a series of wave pulses. ● Electromagnetic radiation (e.g., radio, microwaves, light) can be modeled as a wave of changing electric and magnetic fields or as particles called photons. The wave model is useful for explaining many features of electromagnetic radiation, and the particle model explains other features. ● When light or longer wavelength electromagnetic	● Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media. ● Evaluate questions about the advantages of using a digital transmission and storage of information. ● Evaluate the claims, evidence, and the reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other. ● Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter ● Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

radiation is absorbed in matter, it is generally converted into thermal energy (heat). Shorter wavelength electromagnetic radiation (ultraviolet, X-rays, gamma rays) can ionize atoms and cause damage to living cells. ● Multiple technologies based on the understanding of waves and their interactions with matter are part of everyday experiences in the modern world (e.g., medical imaging, communications, scanners) and in scientific research. They are essential tools for producing, transmitting, and capturing signals and for storing and interpreting the information contained in them.	

<u>Assessments</u>

Summative Assessment

- Mid/End of unit test: may include, but not limited to: consists of multiple choice, matching, fill in the blank, open-ended questions, reading and interpreting data
- Final projects: Research project, poster display

Formative Assessments

- Review Warm Ups
- Labs
- Quizzes
- Homework
- Classwork

Benchmark Assessments

- Quarterly exams

Alternative Assessments

- Self-assessments, peer review, optional retakes/test corrections,problem based learning, modified lab reports, oral presentations

Modifications for ELL's

Speak slowly, clearly, and use gestures
Simplify language; avoid idioms, slang, and sarcasm
Pair student with a buddy
Give preferential seating
Maintain routines with consistent signals
Write clearly and legibly
Provide a graphic organizer in advance of a new topic/vocabulary/chapter
Present information in a variety of ways (pictures, videos, manipulatives)
Rephrase questions, directions, and explanations
Have tests read orally
Highlight or bold key words in classwork, homework, and tests
Allow extra time for assignments

Modifications for Special Education

Provide a lab partner.
Allow extra time for set up and completion of lab work.
Use a combination of written, verbal, and pictorial instructions with scaffolding.
Demonstrate procedures and allow students to practice. (modeling)
Build-in frequent brief breaks.
Give preferential seating to avoid distractions.
Written and verbal instructions
Highlighr or bold key words in classwork, homework, and tests
Provide graphic organizers
Chunk larger assignments

Modifications for 504

Provide a lab partner.
Allow extra time for set up and completion of lab work.
Use a combination of written, verbal, and pictorial instructions with scaffolding.
Demonstrate procedures and allow students to practice. (modeling)
Build-in frequent brief breaks.

Modifications for Gifted and Talented Students:

- Teacher tutoring
- Peer tutoring
- Cooperative Learning Groups

Gifted And Talented

- Provide advance reading level books
- Provide opportunities for Project-based learning
- Extended learning opportunities when classroom assignments are finished early

At Risk of Failure

- Opportunity to make up missing work
- Opportunity to retest
- Parent/Teacher Log

Project-based Learning Tasks:

- A debate, speech, social media campaign, or multimedia presentation on a current science topic

Vocabulary:

- In-text vocabulary should be incorporated into every unit. Word journals, vocabulary walls, and/or various other activities should be utilized by the instructor to teach vocabulary.

The Research Process:

- The research process must be integrated within each course curriculum. Students will be provided

with opportunities to investigate issues from thematic units of study.

Technology:

- Students must engage in technology applications integrated throughout the curriculum. Applicable technology utilized in this curricula are included below:
  - Books online
  - Laptops/Chromebooks
  - Ipads/Ipods as per IEP
  - Mimio/Smartboard
  - Internet
  - Brain Pop
  - National Geographic
  - YouTube/Netflix/Hulu
  - Google Classroom/Zoom/Google Meet
  - Additional resources will be utilized as needed
  - Google Earth
  - Gizmos
  - Science World

Resources:

- Ancillary resources and materials used to deliver instruction are included below:
  - Teacher created materials
  - Media Center resources (books/videos)
  - Various internet sites for informational text, online museums, webquests, pictures, maps, and videos
  - Teachers Pay Teachers
  - School/Teacher owned activity books

Curriculum development Resources/Supplemental Instructional Materials:

List or Link Ancillary Resources and Curriculum Materials Here:

- You Tube, BrainPop
- Gizmos
- Lab materials
- Text-support materials (tests, quizzes …)
- Teacher Generated Materials (worksheets, tests, projects, activities (independent & group, internet research, note taking, and scavenger hunts).
- Current Events and online resources as needed within curriculum topics
- Science World

Board of Education Approved Text(s)/Core Material

RMT Physical Earth Science Text (digital version)
Science Explorer Pearson