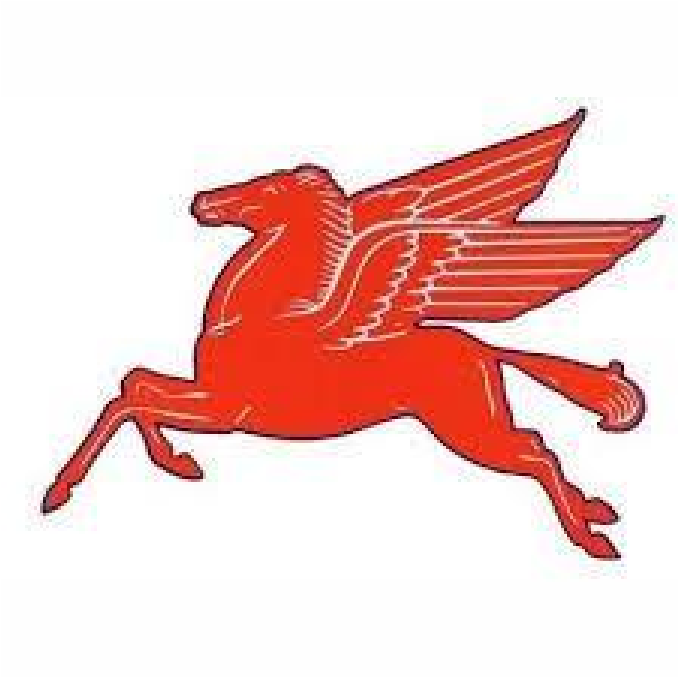
Curriculum Management System

PAULSBORO PUBLIC SCHOOLS



Science Grade 6

UPDATED 2022

For adoption by all regular education programs as specified and for adoption or adaptation by all Special Education Programs in accordance with Board of Education Policy.

Board Approved: 2022

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Paulsboro Public Schools

Mission Statement

The mission of the Paulsboro School District is to work with students, parents, educators, and community to develop excellence in education while preparing each student to be viable and productive citizens in society. Our goal is to develop the unique potential of the whole student by creating a challenging and diverse learning climate that prepares students for the 21st Century and is rich in tradition and pride.

PACING CHART

TOPIC	# OF DAYS	DATES	COMMENTS
Unit 1 – Life Structure and Function	*6 days*	*Quarter 1 / MP 1*	*Focus On Understanding Cells and Life- Lesson 1: Exploring Life Choose 1 Lab to complete out of the lesson or Divide Class in Half – each half does a lab and present observations to assist on time.*
Unit 1 – Life Structure and Function	*3 days*	*Quarter 1 / MP 1*	*Focus On Understanding Cells and Life- Lesson 2: Cell Structure and Function – Includes two Labs –Powering the Cell Lab can be completed as a group to assist with time.*
Unit 1 – Life Structure and Function	*4 days*	*Quarter 1 / MP 1*	*Focus on Body Systems- Lesson 1: Levels of Organization – with 3 investigations and a lab*
Unit 1 – Life Structure and Function	*4 days*	*Quarter 1 / MP 1*	*Focus on Body Systems- Lesson 2: Structure and Support- with 2 investigations and 3 labs*
Unit 1 – Life Structure and Function	*4 days*	*Quarter 1 / MP 1*	*Focus on Body Systems- Lesson 3: Obtaining Energy and Removing Waste – with 3 investigations and 2 labs*
Unit 1 – Life Structure and Function	*4 days*	*Quarter 1 / MP 1*	*Focus on Body Systems- Lesson 4: Moving Materials – with 3 investigations and 1 lab*
Unit 1 – Life Structure and Function	*4 days*	*Quarter 1 / MP 1*	*Focus on Body Systems- Lesson 5: Control and Information Processing Complete Engineering Investigation and 2 labs*
Unit 2 – Reproduction of Organisms	*4 days*	*Quarter 1 / MP 1*	*Focus on Reproduction of Organisms- Lesson 1: Inheritance – with 4 investigations and 1 lab*

Unit 2 – Reproduction of Organisms	*2 days*	*Quarter 1 / MP 1*	*Focus on Reproduction of Organisms- Lesson 2: Types of Reproduction – with 2 investigations and a lab*
Unit 2 – Reproduction of Organisms	*8 days*	*Quarter 1 / MP 1*	*Focus on Reproduction of Organisms- Lesson 3: Reproduction and Growth of Animals – with 4 investigations and an Engineering lab*
Unit 2 – Reproduction of Organisms	*2 days*	*Quarter 1 / MP 1*	*Focus on Reproduction of Organisms- Lesson 4: Reproduction and Growth of Plants – with 2 investigation and complete the "Seeds of Thought" Lab*
Unit 3 – Energy in the Atmosphere	*3 days*	*Quarter 3 / MP 3*	*Focus on Energy and Matter- Lesson 1: Particles in Motion – with 4 investigations and 2 labs*
Unit 3 – Energy in the Atmosphere	*5 days*	*Quarter 3 / MP 3*	*Focus on Energy and Matter - Lesson 2: States of Matter – with 4 investigations and 1 lab*
Unit 3 – Energy in the Atmosphere	*2 days*	*Quarter 3 / MP 3*	*Focus on Energy and Matter - Lesson 3: Thermal Energy Transfers – with 1 investigation and 3 labs*
Unit 3 – Energy in the Atmosphere	*3 days*	*Quarter 3 / MP 3*	*Focus on Energy and Matter – Lesson 4: Thermal Energy Conductivity – with 1 investigation and complete the Engineering lab*
Unit 3 – Energy in the Atmosphere	*3 days*	*Quarter 3 / MP 3*	*Focus on The Water Cycle – Lesson 1: Water in the Atmosphere – with 2 labs*
Unit 3 – Energy in the Atmosphere	*3 days*	*Quarter 3 / MP 3*	*Focus on The Water Cycle – Lesson 2: Water on Earth's Surface – with 2 investigations and 1 lab*
Unit 3 – Energy in the Atmosphere	*3 days*	*Quarter 3 / MP 3*	*Focus on Weather and Climate – Lesson 1: Solar Energy and Earth – with 1 investigation and 4 labs*
Unit 3 – Energy in the Atmosphere	*3 days*	*Quarter 3 / MP 3*	*Focus on Weather and Climate –*

			Lesson 2: Atmospheric and Oceanic Circulation – with 5 investigations and 3 labs
Unit 3 – Energy in the Atmosphere	*3 days*	*Quarter 3 / MP 3*	*Focus on Weather and Climate – Lesson 3: Weather Patterns – with 7 investigations and 2 labs*
Unit 3 – Energy in the Atmosphere	*3 days*	*Quarter 3 / MP 3*	*Focus on Weather and Climate – Lesson 4: Climates on Earth – with 5 investigations*
Unit 4 – Human Impact on the Environment	*3 days*	*Quarter 3 / MP 3*	*Focus on Human Impact on the Environment – Lesson 1: Impact on Land – with 4 investigations and 3 labs*
Unit 4 – Human Impact on the Environment	*3 days*	*Quarter 3 / MP 3*	*Focus on Human Impact on the Environment – Lesson 2: Impact on Water – with 3 investigations and complete the Engineering investigation with 1 lab*
Unit 4 – Human Impact on the Environment	*3 days*	*Quarter 3 / MP 3*	*Focus on Human Impact on the Environment – Lesson 3: Impact on the Atmosphere- with 6 investigations and 1 lab*
Unit 4 – Human Impact on the Environment	*5 days*	*Quarter 3 / MP 3*	*Focus on Human Impact on the Environment – Lesson 4: Impact on Climate- with 1 lab and must complete at least 2 investigations*

MODIFICATIONS

Special Education:

Accommodations will be made in accordance with students' IEPs and 504 plans. The following provides examples and are not limited:

- Shorten assignments to focus on the mastery of key concepts – classroom/homework.
- Alternatives for written assignments in a hands-on activity assignment such as clay models, posters, panoramas, collections – visual, auditory or kinetics assignments.
- Modified textbooks.
- Organize workspaces in a clear environment from unrelated materials.
- Provide technology in lieu of written work.
- Provide verbal/visual aids to assist with comprehension.
- Have students repeat/paraphrase directions and understandings of concepts during/after lessons are taught.
- Number and sequence the steps in task.
- Provide directions in small steps and in few direct words.
- Maintain adequate space for students – preferential seating.
- Provide an unobstructed view of boards, teacher and screens so students are not distracted and can follow along easily.
- Have seating in classroom in optimal proximity to positive role models or teachers to assist during the day.
- Provide differentiated assessments that coincides with a students' learning style to aid in analyzing the comprehension and mastery of skills including verbal test such as an independent project.
- Show a model of the end product of directions.
- Extended time on tests assignments.
- Mark correct answers rather than incorrect answers.
- Use a pass-fail or an alternative grading system when the student is assessed on his or her own growth.
- Frequent breaks.
- Excused lateness, absence, or missed work.
- Pre-approved nurse's visits and accompaniment to visits.

English Language Learners:
Accommodations include, but not limited to:

- Alternative responses for comprehension – gestures, drawings.
- Extended time on assignments and assessments.
- Teacher modeling – Hands - on activities and explanations.
- Simplified written and verbal instructions.
- Use reduced text so print is not so dense.
- Use translation to locate words in the native language.
- Use English Learners resources such as study guides, assessments and a visual glossary.
- Google Translate.

At-Risk Students:
Accommodations include, but not limited to:

- Have student restate information.
- Provisions of notes or outlines.
- Concrete examples.
- Assistance in maintaining uncluttered space.
- Weekly home-school communication tools -notebook, daily log, phone calls or email messages.
- Peer or scribe note-taking.
- Use of manipulatives.
- No penalty for spelling errors or sloppy handwriting.
- Follow a routine/schedule.
- Teach time management skills – Self-management.
- Verbal and visual cues regarding directions and staying on task.
- Adjusted assignment timelines.
- Visual daily schedule.
- Immediate feedback.
- Work-in-progress check.
- Pace long-term projects.
- Preview test procedures.
- Film or video supplements in place of reading text.
- Pass/no pass option.
- Cue/model expected behavior.
- Use peer supports and mentoring.

- Have parent sign homework/behavior chart.

Gifted and Talented Students:
Accommodations include, but not limited to:

- Offer choice.
- Speak to student interests.
- Allow G/T students to work together.
- Tiered learning.
- Focus on effort and practice.
- Encourage risk taking.
- Utilize Pre-AP Resources such as the pacing, assignment and best practices guide.

Unit 1

Big Idea: Life Structure and Function

Topic: Cells and Life

Body Systems

Standards: NGSS- Life Science

MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.

MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of
groups of cells

MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how
characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction
of animals and plants respectively

MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

GOAL

Concept(s): Students will use data and conceptual models to understand how the environment and genetic factors determine the growth of an individual organism. Student will know the characteristics of living things, and how do the parts of a cell work together in order to function. Students will know how body systems in organisms organize and how they interact in order to perform life functions. They connect this idea to the role of animal behaviors in animal reproduction and to the dependence of some plants on animal behaviors for their reproduction.

Students are able to understand:	**Learning Goals:**
- The characteristics of living things. - The parts of a cell and their functions. - The process of how the parts of a cell contribute to the function of the cell as a whole. - The embryological development of different species reveals relationships not evident in the fully-formed anatomy. - That all living things are made up of cells, which is the smallest unit that can be alive. - That an organism may consist of one single cell (unicellular) or many cells (multicellular). - That within cells, different structures are responsible for different functions; the cell membrane forms	- Students will learn the relationship between cells and life. They will distinguish between living and nonliving things. - Students will gather evidence and acknowledge that all living things are made up of cells. - Students will describe the function of a cell as a whole and explore ways parts of a cell contribute to the function by utilizing models. - Students will understand the body system and understand the concept that the body is made of interacting

MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. **MS-LS1-7.** Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism **MS-LS1-8.** Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. **<u>Related Interdisciplinary Standards:</u>** **MA.6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. **LA.W.6.1**. Write arguments to support claims with clear reasons and relevant evidence. **LA.RI.6.1.** Cite textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text. **LA.SL.6.5.** Include multimedia components (e.g., graphics, images, music sound) and visual displays in	the boundary that controls what materials enter and leave the cell. - That these subsystems are groups of cells working together to form tissues and organs that are specialized for particular body functions. - That new cells are made from old cells, which use food as building blocks, to make more cell parts.	subsystems. - Students will understand how cells are organized into tissues, organs, and organ systems to work together to carry out specific tasks in multicellular organisms. - Students will explore how different systems interact to enable structural and supportive body functions. They learn how these interacting systems enable movement, and support or refute that the body could not function without the support of the skeletal system. - Students will explore the structure and function of the digestive system and how it interacts with other systems, including the excretory system. Students also will explore how plants obtain energy and is it the same as animals. - Students will explore the vascular system of plants and the respiratory and circulatory systems of animals. Students will understand the interaction of subsystems to move materials and understand the blood's role in breathing. - Students will explore the nervous system and sense receptors and how stimuli cause a response in plants.

presentations to clarify information. **Career Ready Practices** **CRP2** Apply appropriate academic and technical skill. **CRP4** Communicate clearly and effectively and with reason. **CRP5.** Consider the environmental, social and economic impacts of decisions. **CRP6.** Demonstrate creativity and innovation. **CRP7.** Employ valid and reliable research strategies. **CRP11.** Use technology to enhance productivity. **CRP12**. Work productively in teams while using cultural global competence. **Technology Standards** **TECH.8.1.8** Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.		
	Formative/Summative Assessments	**Primary & Supplementary Resources**
	Including, but not limited to: **Formative:** participation in team activities, research, verbal communication, observations, experiments, initial models, Google reflection forms/exit tickets **Summative/Topic:** Interactive Science assessments, formal lab sheets**,** experiments, final model and final Scientific Explanation (CER)	- Interactive Science Series - Trade Books/ Classroom Library - Manipulatives - NJ DOE Model Curriculum - NGSS www.nextgenscience.org/ - NSTA www.nsta.org/ - Student Chromebook use - Microscopes, prepared slides - The Science Spot - Game On: Online Science Games - Education.com activities and experiences - Numerous internet sites, references, digital media, Discovery Education Streaming Plus - ITunesU

Unit 2

Big Idea: Reproduction of Organisms

Topic: Inheritance

Reproduction

Standards: Molecules to Organisms: Structures and Processes

MS LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.

MS LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

MS LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

Standards: Heredity: Inheritance and Variation of Traits

Goal

Concept(s): Students will understand how living things reproduce, and which factors affect their growth. Students will apply the concepts they learn throughout the module to develop and test a game that models the difference in offspring produced through asexual and sexual reproduction.

Students are able to understand:	Learning Goals:
• How traits pass from one generation to the next. • How multicellular organisms reproduce. • How do genetic and environmental factors affect reproduction and growth in animals.	• Students will learn about the reproduction and growth of organisms, and model the reproduction of an organisms, including factors that affect its successful reproduction and growth. • Students will explore how organisms transfer genetic information to their offspring. They will come to understand that genetic differences in the alleles of the genes inherited traits between parent and offspring. Student will develop and use models, specifically Punnett squares and pedigrees, to predict patterns of inheritance. • Students will explore how organisms reproduce, either sexually or asexually, and transfer their genetic

MS LS3-2. Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. **Related Interdisciplinary Standards:** **RST.6-8.1.** Cite specific textual evidence to support analysis of science and technical texts. **RI.6.8.** Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not. **WHST.6-8.1.** Write arguments focused on discipline content. **6.SP.A.2.** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. **6.SP.B.4.** Summarize numerical data sets in relation to their context. **Career Ready Practices** **CRP2.** Apply appropriate academic and technical skill. **CRP4.** Communicate clearly and effectively and with reason. **Technology Standards**		information to their offspring. Students will model and interpret data to enhance their understanding of how sexual reproduction results in offspring with genetic variation. ● Students will explore how animals engage in characteristic behaviors, which often involve gathering and responding to sensory stimuli, to increase the odds of sexual reproduction and their survival of their young, Students will also explain how environmental and genetic factors affect the growth of an animal. ● Students will explore how plants reproduce, both sexually and asexually, and what factors affect the probability of their successful reproduction and growth. They will engage in arguments and construct explanations about how specialized features, genetic factors, and local conditions affect plant reproduction and growth.
	Formative/Summative Assessments	**Primary & Supplementary Resources**
	Including, but not limited to: **Formative:** participation in team activities, research, verbal communication, observations, experiments, initial models, Google reflection forms/exit tickets	- Interactive Science Series - Trade Books/ Classroom Library - Manipulatives - NJ DOE Model Curriculum - NGSS www.nextgenscience.org/ - NSTA www.nsta.org/

TECH.8.1.8. Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.	**Summative/Topic:** Interactive Science assessments, formal lab sheets**,** experiments, final model and final Scientific Explanation (CER)	- Student Chromebook use - Microscopes, prepared slides - The Science Spot - Game On: Online Science Games - Education.com activities and experiences - Numerous internet sites, references, digital media, Discovery Education Streaming Plus - ITunesU

Unit 3

Big Idea: Energy in the Atmosphere

Topic: Energy and Matter

The Water Cycle

Weather and Climate

Standards: Energy (Energy and Matter Module)

MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. [Clarification Statement: Examples of devices could

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.

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

GOAL

Concept(s): Matter and energy take many forms. Investigations explore the relationships between matter and energy, and encourage the students to observe the changes that take place through interaction of chemicals and the transfer of energy. Properties of each determine how they are used in the real world. All students will understand that physical science principles, including fundamental ideas about matter, energy and motion are powerful tools for making sense of phenomena in physical, living, and Earth Systems science. This unit will also cover weather, climate, and climate change. Key topics include how the uneven heating of the surface of the Earth causes the movement of air masses and weather; how temperature and convection affect ocean currents, evaporation, and condensation; and how weather and climate differ and how each is classified, studied and predicted.

Students are able to understand:

Learning Goals:

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. **<u>Standards: Earth's Systems (The Weather Cycle Module – MS-ESS2-4) (Weather and Cycle Module – MS-ESS2-5 and MS-ESS2—6)</u>** **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. **<u>Interdisciplinary Connections:</u>** **RST.6-8.1.** Cite specific textual evidence to support analysis of science and technical texts. (MS-ETS1-1), (MS-ETS1-2), (MS-ETS1-3)	**During the Energy and Matter Module -** ● What happens to matter when its energy level changes. ● What temperature is, and how it is measured. ● Whether or not energy determines the state of matter of a substance through investigations (hands-on activities). ● Which direction the heat flows from one object to another. ● Which properties of materials affect the way energy in transferred. **During the Water Cycle Module –** ● What drives the cycling of water among the oceans, atmosphere, and organisms. ● How does water cycle into and through the atmosphere. ● How does water cycle on the Earth's surface. **During the Weather and Climate Module –** ● How do patterns of atmospheric and oceanic circulation impact weather and climate. ● How does energy transfer from the Sun to Earth and the atmosphere. ● What cause air and water to flow. ● How do the interactions of air	**During the Energy and Matter Module -** ● Students investigate methods of thermal energy transfer, the factors that affect these transfers, and how matter is affected; and design, construct, and test a solar cooker. ● Students will carry out investigations to determine the relationships among the energy transferred, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. They will develop and use models to enhance their understanding of these relationships. ● Students will carry out investigations to determine the relationships among the energy transferred, the type of matter and it's mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. They will construct explanations of these relationships for a variety of substances. ● Students will explore how energy moves when objects are at different temperatures. They will develop and use models to enhance their understanding of the process. ● Student will plan and carry out investigations to understand factors, such as the nature of the matter and the size of the sample, that affect the amount of energy transfer needed to change the temperature of a sample of matter; and come to understand the difference between directly proportional and inversely proportional relationships between energy, mass, and temperature.

RST.6-8.7. Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-ETS1-3) **RST.6-8.9.** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (MS-ETS1-2), (MS-ETS1-3) **WHST.6-8.7.** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-ETS1-2) **WHST.6-8.8.** Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-ETS1-1) **WHST.6-8.9.** Draw evidence from informational texts to support analysis, reflection, and research. (MS-ETS1-2) **SL.8.5.** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-ETS1-4) **MP.2.** Reason abstractly and quantitatively. (MS-ESS2-2), (MS-ESS2-3), (MS-ESS2-5) **6.NS.C.5.** used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent	masses cause changes in weather conditions. ● What factors determine regional climates.	**During the Water Cycle Module –** ● Students will explore how water cycles among Earth's system and the energy and force that drive this cycling, and develop/use models of the water cycle. ● Students will explore how the transfer of thermal energy drives processes of the water cycle, including evaporation, condensation, and crystallization, and develop/use models to enhance their understanding of these processes. ● Students will continue their exploration of the motion and cycling of water among Earth's subsystems, focusing on precipitation, runoff, and the role of gravity in moving water downhill. They will recognize various water reservoirs and will develop/use models about these concepts. **During the Weather and Climate Module -** ● Students will investigate weather and climate, and develop models that explain the causes of global circulation and how it affects weather and climate. ● Students will explore atmospheric and oceanic circulation. They will develop and use models to describe how unequal beating and rotation of Earth cause global

quantities in real-world contexts, explaining the meaning of 0 in each situation. (MS-ESS2-5) **6.EE.B.6.** Understand that positive and negative numbers are Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-ESS2-2), (MS-ESS2-3) **9.2.8.B.3.** Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career. **<u>Career Ready Practices:</u>** **CRP1.** Act as a responsible and contributing citizen and employee. **CRP2.** Apply appropriate academic and technical skills. **CRP4.** Communicate clearly and effectively and with reason. **CRP5.** Consider the environmental, social and economic impacts of decisions. **CRP6.** Demonstrate creativity and innovation. **CRP7.** Employ valid and reliable research strategies. **CRP11.** Use technology to enhance productivity. **CRP12.** Work productively in teams while using cultural global competence.		patterns of winds and ocean currents. ● Students will look for patterns in the weather and explore how and why weather changes. They will collect data to provide evidence for how the interactions of air masses result in changes in weather conditions. ● Students will explore climate and factors that determine regional climates. They will develop and use models to enhance their understanding of how factors including unequal heating by the Sun, latitude altitude, and patters atmospheric and oceanic circulation determine regional climates.
	Formative/Summative Assessments	**Primary & Supplementary Resources**
	Including, but not limited to: **Formative:** participation in team activities, research, verbal communication, observations, experiments, initial models, Google reflection forms/exit tickets **Summative/Topic:** Interactive Science assessments, formal lab sheets**,** experiments, final model and final Scientific Explanation (CER)	- Interactive Science Series - Trade Books/ Classroom Library - Manipulatives - NJ DOE Model Curriculum - NGSS www.nextgenscience.org/ - NSTA www.nsta.org/ - Student Chromebook use - Microscopes, prepared slides - The Science Spot - Game On: Online Science Games - Education.com activities and

● *Astronomer* ● *Diver* ● *Electrician* ● *Film and Video Editor* ● *Meteorologist* ● *Park Ranger* ● *Physics Teacher* ● *Pilot* ● *Ship and Boat Captain* ● *Zoologist* **<u>Technology Standards</u>** TECH.8.1.8 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.		experiences - Numerous internet sites, references, digital media, Discovery Education Streaming Plus - ITunesU - NASA, NOAA websites - TigTag - Twig - Mystery Science - NewsELA Articles related to topic - Read Works Articles related to topic - Wonders Anthology/Leveled Readers

Unit 4

Big Idea: Human Impact on the Environment
Topic: Impact on Land, Water, Atmosphere and Climate

Standards: Earth's Systems

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-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.

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

GOAL

Concept(s): In this unit, students will understand how activities impact Earth's land, water, atmosphere and climate. They will learn about gradual processes and catastrophic events; and how they contribute to changes on the earth's surface. Student apply the concepts they learn throughout the unit to design plans for monitoring and minimizing environmental impacts.

Students will understand:	**Learning Goals:**
• How humans can minimize their impact on land. • How humans can monitor and minimize their impact on water. • Why humans must minimize their impact on the atmosphere. • How humans' activities caused the rise in global temperature and what is the environmental impact of global warming.	• Students will explore how human activities impact Earth's land, water, atmosphere, and climate. • Students will explore the impact of human activities on the land. They will analyze data, develop and use models and design solutions to enhance their understanding of how humans cause changes to Earth's land environments. • Students will explore the impact of human activities on water. They will construct explanations and use models to enhance their understanding of how humans cause and can minimize changes to Earth's water environments. • Student will explore the impact of human activities on the atmosphere. They will

iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. **<u>Related Interdisciplinary Standards:</u>** **RST.6-8.1**. Cite specific textual evidence to support analysis of science and technical texts. (MS-ESS2-2), (MS-ESS2-3), (MS-ESS2-5) **RST.6-8.7.** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-ESS2-3) **RST.6-8.9.** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (MS-ESS2-3), (MS-ESS2-5) **WHST.6-8.8.** Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-ESS2-5) **MP.2.** Reason abstractly and quantitatively. (MS-ESS2-2), (MS-ESS2-3), (MS-ESS2-5) **6.NS.C.5**. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in		construct explanations to enhance their understanding on how humans cause and can minimize air pollution. ● Students will explore the impact of human activities on climate. They will ask questions and construct explanations to enhance their understanding of how humans cause changes to Earth's climate.
	Formative/Summative Assessments	**Primary & Supplementary Resources**
	Including, but not limited to: **Formative:** participation in team activities, research, verbal communication, observations, experiments, initial models, Google reflection forms/exit tickets **Summative/Topic:** Interactive Science assessments, formal lab sheets**,** experiments, final model and final Scientific Explanation (CER)	- Interactive Science Series - Trade Books/ Classroom Library - Manipulatives - NJ DOE Model Curriculum - NGSS www.nextgenscience.org/ - NSTA www.nsta.org/ - Student Chromebook use - Microscopes, prepared slides - The Science Spot - Game On: Online Science Games - Education.com activities and experiences - Numerous internet sites, references, digital media, Discovery Education Streaming Plus - ITunesU - NASA, NOAA websites - TigTag - Twig - Mystery Science - NewsELA Articles related to topic - Read Works Articles related to

each situation. (MS-ESS2-5) **6.EE.B.6.** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-ESS2-2), (MS-ESS2-3 **7.EE.B.4.** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (MS-ESS2-2), (MS-ESS2-3)		topic - Wonders Anthology/Leveled Readers