

GREEN TOWNSHIP SCHOOL DISTRICT



Content Area: Science
Course/Grade Level: 4th Grade

Curriculum Committee Members:

Principal:
Jon Paul Bollette

Board Approval Date:
10/21/26



4th Grade

Mission:

All students will develop an understanding of scientific concepts and processes essential for informed decision-making, meaningful participation in civic life, and readiness for postsecondary opportunities, including careers in STEM fields.

Vision:

Prepare students to become scientifically literate individuals who can effectively:

- Apply scientific thinking, skills, and understanding to real-world phenomena and problems;
- Engage in systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned;
- Conduct investigations, solve problems, and engage in discussions;
- Discuss open-ended questions that focus on the strength of the evidence used to generate claims;
- Read and evaluate multiple sources, including science-related magazine and journal articles and web-based resources to gain knowledge about current and past science problems and solutions and develop well-reasoned claims; and
- Communicate ideas through journal articles, reports, posters, and media presentations that explain and argue.



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Key Performance and Benchmark Tasks/Assessments

Formative assessments:

- Used to gauge student understanding and progress throughout the unit.
- Not necessarily graded
- Provide feedback for students to use to reflect, revise and refine their work.

Summative Assessments:

- Final projects or assessments to determine what students have learned over the course of the project or unit.

Benchmark Assessments:

- Teacher-created benchmark assessments to be given periodically during the year.

Alternative Assessments:

- Teacher modifies assignments and activities based on student needs.
- Oral assessments administered in place of written when necessary.
- Accommodation and modification ideas may be found here:
 - [Modifications & Accommodations Menu](#)
 - *Assessments other than paper & pencil tests See link for more info:*
http://education.qmu.edu/assets/docs/forms/mirs/assessment_brochure.pdf

Integrated Accommodations & Modifications

Please utilize the link below for ideas and strategies to use with ***ELL, Students with IEPs & 504s, At-Risk Students and Gifted & Talented Students***.

The attached worksheets can be printed ahead of each unit during the planning phase to help the teacher plan for the needs of particular students in each class, allowing for differentiation per unit and per year. The worksheets contain suggested accommodations and modifications for Content & Material, Student



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Organization, Instructional Strategies, Assessments, Attention/Focus, Written Language, and Social/Behavioral.
[Modifications & Accommodations Menu](#)



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Unit 1

<i>Energy</i>	Pacing: 12 instructional periods
Unit Summary: In this unit, students investigate how motion is measured using distance, time, and position while exploring how forces transfer and transform energy to produce movement. They also examine how electrical energy is generated from a variety of energy sources and communicate their understanding through research, engineering projects, and collaborative presentations.	
Essential Questions: - How can we measure and describe the motion of an object? - How do forces and energy affect the motion of objects? - How is energy transferred and transformed from one form to another?	Enduring Understandings: - The motion of an object can be described by measuring its position, the distance it travels, and the time it takes to move. - Energy is transferred and transformed through forces. Balanced forces store energy, while unbalanced forces cause objects to move. - Energy exists in many forms and can be transferred or transformed to meet human needs, with electricity serving as one of the most useful forms of energy.

New Jersey Student Learning Standards	Student Learning Objectives	Practices
4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object. [Assessment Boundary: Assessment does not include quantitative measures of changes in the speed of an object or on any precise or quantitative definition of energy.] 4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide. [Clarification Statement: Emphasis is on the change in the energy due to the change in speed, not on the forces, as objects	- Explain that distance is the separation between two objects - Measure the distance between two objects - Identify an object's initial and final positions - Measure the distance an object travels in two dimensions - Measure in seconds how long it takes an object to travel a specified distance	- Planning and Carrying Out Investigations - Analyzing and Interpreting Data - Using Mathematics and Computational Thinking - Developing and Using Models



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interact.] [Assessment Boundary: Assessment does not include quantitative measurements of energy.] 4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. [Assessment Boundary: Assessment does not include quantitative measurements of energy.] 4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.* [Clarification Statement: Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound; and, a passive solar heater that converts light into heat. Examples of constraints could include the materials, cost, or time to design the device.] [Assessment Boundary: Devices should be limited to those that convert motion energy to electric energy or use stored energy to cause motion or produce light or sound.] 4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. [Clarification Statement: Examples of renewable energy resources could include wind energy, water behind dams, and sunlight; nonrenewable energy resources are fossil fuels and fissile materials. Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning of fossil fuels.]	- Explain that the faster an object moves over a specified distance, the less time it takes - Explain that energy can be transferred from one object to another - Argue from evidence that the more massive an object, the more energy required to move it - Construct an argument, using evidence, to show that when forces are balanced, energy is store - Construct an argument, using evidence, to show that when forces are unbalanced, energy is transformed into motion - Explain how mechanical energy is converted into electrical energy - Explain that electricity is our most prominent form of energy because it can be stored and transferred easily and over long distances - Construct projects related to the production or use of electrical energy - Collect information on one of six types of energy sources - Collaborate to create an oral presentation on one of six types of energy sources	- Constructing Explanations and Designing Solutions - Engaging in Argument from Evidence - Obtaining, Evaluating, and Communicating Information
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Interdisciplinary Connections

2020 Career Readiness, Life Literacies, and Key Skills

- 9.4.5.Cl.3 – Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity.
- 9.4.5.Cl.4 – Research and explore the impact of a design solution on the environment and society.
- 9.4.5.CT.1 – Identify and gather relevant data that will aid in the problem-solving process.
- 9.4.5.CT.2 – Identify a problem and list the types of individuals and resources that can aid in solving the problem.
- 9.4.5.CT.3 – Describe how digital tools and technology can be used to solve problems and improve processes.
- 9.4.5.IML.1 – Evaluate digital sources for accuracy, perspective, credibility, and relevance.



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9.4.5.IML.6 – Use appropriate sources of information from diverse sources, contexts, disciplines, and cultures to answer questions.

9.4.5.TL.5 – Collaborate digitally to produce an artifact.

9.4.5.TL.6 – Adapt and use digital tools to design and develop a product.

Unit 1: Core Unit Content

Key Concepts

- ☐ Review of distance, motion, and time
- ☐ Energy and motion
- ☐ Energy and forces
- ☐ Producing electrical energy

Instructional Materials & Resources

Instructional Materials:

- Reading materials
- Online resources
- Online videos
- Hands-on activities

Resources:

- Knowing science teacher manual
- Generation genius
- Bill Nye the Science guy
- youtube



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Unit 1: Assessments

Formative assessments:

- Exit tickets
- Classroom polls
- Short quizzes
- KWL charts
- Class discussions

Summative Assessments:

- End of unit projects
- End of unit tests
- Writing pieces
- experiments

Alternative Assessments:

- Tests read aloud
- Hands-on experiments
- assistance/scribe for tests/projects

Unit 1: Accommodations & Modifications

Please utilize the link below for ideas and strategies to use with ELL, Students with IEPs & 504s, At-Risk Students and Gifted & Talented Students. Note possible accommodations or modifications for this unit below.

[Modifications & Accommodations Menu](#)

Unit 2



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Structure and Function

Pacing: 31 instructional periods

Unit Summary: In this unit, students classify living organisms based on their observable characteristics and investigate how the structures and behaviors of plants and animals help them meet their basic needs and survive. Through guided investigations, engineering design challenges, and nonfiction texts, students explore how organisms function as systems and adapt to seasonal changes in their environments.

Essential Questions:

- How do scientists classify living things?
- How do the structures of plants and animals help them survive?
- How do the parts of plants and animals work together as systems?

Enduring Understandings:

- Living things share common characteristics and can be classified based on their observable structures and traits.
- The structures and behaviors of plants and animals work together to meet their basic needs, respond to environmental changes, and ensure survival.
- Plants and animals are systems whose specialized structures work together to perform essential functions, and engineers can design solutions by learning from these natural systems.

New Jersey Student Learning Standards	Student Learning Objectives	Practices
• 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] [Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.] • 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. • 3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved	• Compare and review traits of living and nonliving things • Compare traits of vertebrates and invertebrates • Explain how animals' physical structures and body coverings may be used to classify them • Identify and compare observable characteristics of each major vertebrate group • Associate the physical structures of animals with basic needs • Associate animal senses with survival behaviors	• Developing and Using Models • Planning and Carrying Out Investigations • Analyzing and Interpreting Data • Obtaining, Evaluating, and Communicating Information • Constructing Explanations and Designing Solutions • Engaging in Argument



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• 3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. • 3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved	• Identify, describe, and associate the physical structures and behaviors of crayfish their basic needs • Design and construct a ‘prosthetic device’ to replace a lost crayfish physical structure • Associate the physical structure of plants (roots, stems, leaves, flowers, and fruits) with the basic needs of the plants • Associate the physical structures of plants with their specific functions and explain how these structures work together as s system in the plant • Observe and compare characteristics of plant structures in a variety of plants • Comprehend and respond to nonfiction texts • Describe how adaptations of plants allow them to respond to seasonal changes • Carry out a guided inquiry about the effects of temperature on plants • Describe how adaptations of animals allow them to respond to seasonal changes • Compare seasonal behaviors of migration, hibernation, and staying active • Carry out a guided inquiry about the effects of temperature on animals • Recognize and understand that conducting science investigations requires safe practices • Comprehend and respond to nonfiction texts	from Evidence • Using Mathematics and Computational Thinking
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Interdisciplinary Connections

2020 Career Readiness, Life Literacies, and Key Skills

9.4.5.Cl.3 – Participate in a brainstorming session with individuals with diverse perspectives to expand one’s thinking about a topic of curiosity.



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- 9.4.5.CT.1 – Identify and gather relevant data that will aid in the problem-solving process.
9.4.5.CT.2 – Identify a problem and list the types of individuals and resources that can aid in solving the problem.
9.4.5.CT.4 – Apply critical thinking and problem-solving strategies to develop solutions to real-world problems.
9.4.5.IML.1 – Evaluate digital sources for accuracy, perspective, credibility, and relevance.
9.4.5.TL.5 – Collaborate digitally to produce an artifact.
9.4.5.TL.6 – Adapt and use digital tools to design and develop a product.

Unit 2: Core Unit Content

Key Concepts

- ☐ Animal classification
- ☐ Animal structure and survival
- ☐ Plant structure and survival
- ☐ Plant and animal seasonal responses

Instructional Materials & Resources

Instructional Materials:

- Reading materials
- Online resources
- Online videos
- Hands-on activities

Resources:

- Knowing science teacher manual
- Generation genius
- Bill Nye the Science guy
- youtube



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Unit 2: Assessments

Formative assessments:

- Exit tickets
- Classroom polls
- Short quizzes
- KWL charts
- Class discussions

Summative Assessments:

- End of unit projects
- End of unit tests
- Writing pieces
- Experiments

Alternative Assessments:

- Tests read aloud
- Hands-on experiments
- assistance/scribe for tests/projects

Unit 2: Accommodations & Modifications

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[Modifications & Accommodations Menu](#)



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Unit 3

Earth's Surface Processes

Pacing: 30 instructional periods

Unit Summary: In this unit, students investigate Earth's structure, landforms, fossils, soils, and maps to understand how scientists study the planet and its history. They explore how weathering, erosion, and plate tectonics shape Earth's surface, create natural hazards, and influence the ways people prepare for and reduce the impacts of these events.

Essential Questions:

- **What can Earth's layers tell us about our planet?**
- **How do scientists use evidence to learn about Earth's past?**
- **How do Earth's natural processes affect people and the environment?**

Enduring Understandings:

- Earth is made of interconnected layers and systems that shape its surface through processes occurring both inside and outside the planet.
- Scientists use fossils, rock layers, soil, maps, and models to investigate Earth's history and explain how environments have changed over time.
- The movement of tectonic plates and surface processes, such as weathering and erosion, continually reshape Earth and can create natural hazards that people prepare for and respond to.

New Jersey Student Learning Standards	Student Learning Objectives	Practices
• 4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features. [Clarification Statement: Maps can include topographic maps of Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes.] • 4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. [Clarification Statement: Examples	• Identify Earth's layers and the characteristics of each • Create models of Earth's internal structure • Understand how and why geologists use core sampling • Comprehend and respond to nonfiction texts	• Developing and Using Models • Obtaining, Evaluating, and Communicating Information • Planning and Carrying Out Investigations



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of evidence from patterns could include rock layers with marine shell fossils above rock layers with plant fossils and no shells, indicating a change from land to water over time; and, a canyon with different rock layers in the walls and a river in the bottom, indicating that over time a river cut through the rock.]

[Assessment Boundary: Assessment does not include specific knowledge of the mechanism of rock formation or memorization of specific rock formations and layers.

Assessment is limited to relative time.]

- 4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.*

[Clarification Statement: Examples of solutions could include designing an earthquake resistant building and improving monitoring of volcanic activity.] [Assessment Boundary: Assessment is limited to earthquakes, floods, tsunamis, and volcanic eruptions.]

- Recognize that fossils provide evidence about organisms that lived long ago
- Explain how fossils provide evidence about the nature of the environment at any time in history
- Create models to better understand plate tectonics and fossil records
- Comprehend and respond to nonfiction texts
- Identify and describe soil layers
- Observe properties of soil samples
- Comprehend and respond to nonfiction texts
- Compare the process of weathering and erosion
- Create models to represent and understand various types of weathering and erosion
- Understand the impact of weathering and erosion on humans
- Comprehend and respond to nonfiction texts
- Give examples of Earth's continental and oceanic landforms
- Compare types of maps that show Earth's features
- Explain how topographic maps represent contour and elevation
- Comprehend and respond to nonfiction texts
- Understand the ways in which tectonic plates move
- Explain how volcanoes, earthquakes, and tsunamis form and describe their relationship to each other
- Give examples of preventive measures humans take to reduce the impacts of these natural hazards
- Comprehend and respond to nonfiction text

- Analyzing and Interpreting Data
- Constructing Explanations and Designing Solutions
- Engaging in Argument from Evidence
- Using Mathematics and Computational Thinking

Interdisciplinary Connections



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2020 Career Readiness, Life Literacies, and Key Skills

- 9.4.5.CI.3 – Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity.
- 9.4.5.CT.1 – Identify and gather relevant data that will aid in the problem-solving process.
- 9.4.5.CT.2 – Identify a problem and list the types of individuals and resources that can aid in solving the problem.
- 9.4.5.CT.4 – Apply critical thinking and problem-solving strategies to develop solutions to real-world problems.
- 9.4.5.IML.1 – Evaluate digital sources for accuracy, perspective, credibility, and relevance.
- 9.4.5.IML.6 – Use appropriate sources of information from diverse sources, contexts, disciplines, and cultures to answer questions.
- 9.4.5.TL.5 – Collaborate digitally to produce an artifact.
- 9.4.5.TL.6 – Adapt and use digital tools to design and develop a product.
- 9.4.5.TL.7 – Collaborate digitally to produce a product or solve a problem.

Unit 3: Core Unit Content

Key Concepts

- ☐ Earth's internal structure
- ☐ Using rocks and fossils to learn about Earth's history
- ☐ Soil Structure
- ☐ Weathering and erosion
- ☐ Maps and patterns in Earth's surface
- ☐ Volcanoes, Tsunamis, and Earthquakes, and their effects on humans

Instructional Materials & Resources

Instructional Materials:

- Reading materials
- Online resources
- Online videos
- Hands-on activities

Resources:

- Knowing science teacher manual



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- Generation genius
- Bill Nye the Science guy
- youtube

Unit 3: Assessments

Formative assessments:

- Exit tickets
- Classroom polls
- Short quizzes
- KWL charts
- Class discussions

Summative Assessments:

- End of unit projects
- End of unit tests
- Writing pieces
- Experiments

Alternative Assessments:

- Tests read aloud
- Hands-on experiments
- assistance/scribe for tests/projects

Unit 3: Accommodations & Modifications

Please utilize the link below for ideas and strategies to use with ELL, Students with IEPs & 504s, At-Risk Students and Gifted & Talented Students. Note possible accommodations or modifications for this unit below.

[Modifications & Accommodations Menu](#)



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Unit 4

Waves

Pacing: 7 instructional periods

Unit Summary: In this unit, students investigate the properties of waves and light by creating models, building devices, and exploring how waves transfer energy and information. They examine how light travels, bends, and reflects, discover how the human eye detects light, and use codes to understand how information can be sent and received through waves.

Essential Questions:

- What are waves, and how do they move energy?
- How does light behave when it travels?
- How do models help us understand scientific concepts?

Enduring Understandings:

- Waves are repeating patterns of motion that transfer energy and can be used to carry information from one place to another.
- Light travels in predictable ways, including traveling in straight lines, bending, and reflecting, allowing us to see and communicate.
- Scientists and engineers use models and codes to explain wave behavior, represent how the eye works, and communicate information efficiently.

New Jersey Student Learning Standards	Student Learning Objectives	Practices
• 4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move. [Clarification Statement: Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves.] [Assessment Boundary: Assessment does not include interference effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength.]	• Describe waves using scientific vocabulary • Model waves graphically • Explain that waves are caused by repetitive motion • Construct a wave generator • Explain that light travels in a straight line • Explain that light bends	• Developing and Using Models • Planning and Carrying Out Investigations • Analyzing and Interpreting Data • Constructing Explanations



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• 3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost • 4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. [Assessment Boundary: Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works.] • 3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. • 4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.* [Clarification Statement: Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, and using Morse code to send text.]	• Explain that light reflects off objects • Construct a simple model of the human eye • Explain what a code is • Create a code to send information to a recipient • Decode a coded message from a sender • Observer the role of waves in transmitting information	and Designing Solutions • Obtaining, Evaluating, and Communicating Information • Using Mathematics and Computational Thinking • Engaging in Argument from Evidence
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Interdisciplinary Connections

2020 Career Readiness, Life Literacies, and Key Skills

- 9.4.5.Cl.3 – Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity.
- 9.4.5.Cl.4 – Research and explore the impact of a design solution on the environment and society.
- 9.4.5.CT.1 – Identify and gather relevant data that will aid in the problem-solving process.
- 9.4.5.CT.2 – Identify a problem and list the types of individuals and resources that can aid in solving the problem.
- 9.4.5.CT.4 – Apply critical thinking and problem-solving strategies to develop solutions to real-world problems.
- 9.4.5.IML.1 – Evaluate digital sources for accuracy, perspective, credibility, and relevance.
- 9.4.5.IML.6 – Use appropriate sources of information from diverse sources, contexts, disciplines, and cultures to answer questions.
- 9.4.5.TL.1 – Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each.
- 9.4.5.TL.5 – Collaborate digitally to produce an artifact.
- 9.4.5.TL.6 – Adapt and use digital tools to design and develop a product.



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Unit 4: Core Unit Content

Key Concepts

- ☐ Properties of waves
- ☐ Light and how humans see
- ☐ Using waves to transfer information

Instructional Materials & Resources

Instructional Materials:

- Reading materials
- Online resources
- Online videos
- Hands-on activities

Resources:

- Knowing science teacher manual
- Generation genius
- Bill Nye the Science guy
- youtube

Unit 4: Assessments

Formative assessments:

- Exit tickets
- Classroom polls
- Short quizzes
- KWL charts
- Class discussions



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Summative Assessments:

- End of unit projects
- End of unit tests
- Writing pieces
- Experiments

Alternative Assessments:

- Tests read aloud
- Hands-on experiments
- assistance/scribe for tests/projects

Unit 4: Accommodations & Modifications

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[Modifications & Accommodations Menu](#)