

Englewood on the Palisades Charter School

Science Curriculum

Grade Five

Aligned With the 2026 New Jersey Student Learning Standards

The Vision for Science Education in New Jersey

2026 New Jersey Student Learning Standards for Science

The New Jersey Student Learning Standards for Science (NJSLS-S) describe the expectations for what students should know and be able to do as well as promote three-dimensional science instruction across the three science domains (i.e., physical sciences, life science, Earth and space sciences). From the earliest grades, the expectation is that students will engage in learning experiences that enable them to investigate phenomena, design solutions to problems, make sense of evidence to construct arguments, and critique and discuss those arguments (in appropriate ways relative to their grade level).

The foundation of the NJSLS-S reflects three dimensions — science and engineering practices, disciplinary core ideas, and crosscutting concepts. The performance expectations are derived from the interplay of these three dimensions. It is essential that these three components are integrated into all learning experiences. Within each standard document, the three dimensions are intentionally presented as integrated components to foster sensemaking and designing solutions to problems. Because the NJSLS-S is built on the notions of coherence and contextuality, each of the science and engineering practices and crosscutting concepts appear multiple times across topics and at every grade level. Additionally, the three dimensions should be an integral part of every curriculum unit and should not be taught in isolation.

Mission

All students will possess an understanding of scientific concepts and processes required for personal decision-making, participation in civic life, and preparation for careers in STEM fields (for those that chose).

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.

(NJ DOE, 2022)

New Jersey Legislative Statutes and Administrative Code

Science

Amistad Law: *N.J.S.A. 18A 52:16A-88*

[African Americans in Science](#)
[8 Amazing Black Scientists and How They Changed History](#)
[African American Scientists and Inventors](#)

Holocaust Law: *N.J.S.A. 18A:35-28*

[Georg Bredig: Scientist, Humanist, and Holocaust Survivor](#)

LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*

<https://prideinstem.org/>
[LGBTQ+ Scientists Through History](#)
[Celebrating Scientists With Disabilities](#)

Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*

Ada Twist, Scientist by Andrea Beaty [Ada Twist, Scientist Activities](#)
How Many Stars in the Sky by Lenny Hort [How Many Stars in the Sky? | RIF.org](#)
Mae Among the Stars by Roda Amhed [Mae Among the Stars STEM Activity](#)
The Outdoor Scientist by Temple Grandin

5th Grade Science Curriculum

A 5th-grade science curriculum aligns with the New Jersey Student Learning Standards (NJSLS) and provides students with advanced scientific inquiry skills and a deeper understanding of living systems, energy, forces, geological processes, environmental change, and the importance of conservation and sustainability. This curriculum continues to build upon the foundational science skills and knowledge developed in earlier grades while introducing more advanced concepts and scientific inquiry skills.

Throughout the year, the curriculum should incorporate hands-on activities, experiments, real-world observations, and technology-based investigations to engage 5th-grade students and make learning science interactive and meaningful. Formative assessments, observations, and ongoing progress monitoring should be used to ensure that students are meeting the learning objectives. The curriculum should be flexible and adaptable to meet the individual needs and learning styles of the students.

Grade Fifth Units and Pacing	
Unit 1 - Properties of Matter	9 weeks
Unit 2 - Energy, Organisms, and Ecosystems	9 weeks
Unit 3 - Earth Systems	9 weeks
Unit 4 - Space Systems	9 weeks
Total Number of Weeks:	36 weeks

Unit 1: Properties of Matter

Duration: 9 weeks

Unit Goals:

This unit will focus on matter and its characteristics. Learners will be able to identify the structure of each state of matter and be able to define and describe matter based on physical traits. Additionally, students will experiment with various materials to decide whether matter can be created and/ or destroyed.

Duration: 9 weeks

Essential Questions:

- How can understanding the properties of matter impact our lives?
- How can we prove that matter is neither created nor destroyed?
- What is matter made up of?

Enduring Understandings:

- Matter is a term that applies to all of the things around us and it is made of particles that are too small to see.
- When substances are heated, cooled, or mixed the total weight before and after is always the same.
- Substances can be identified based on observable and measurable properties.
- Sometimes when two substances are mixed, each of the substances keeps its original properties and sometimes a new substance is formed.
- Matter can neither be created nor destroyed.

Key NJSLS Strands:

- 5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.
- 5-PS1-2. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
- 5-PS1-3. Make observations and measurements to identify materials based on their properties.
- 5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

Science & Engineering Practices

Disciplinary Core Ideas

Cross-cutting Concepts

Developing and Using Models Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. • Develop a model to describe phenomena. (5-PS1-1) Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. • Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (5-PS1-4) • Make observations and measurements to produce data to serve as the basis for evidence for	PS1.A: Structure and Properties of Matter: Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gasses are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects. (5-PS1-1) The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (5-PS1-2) Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) (5-PS1-3) PS1.B: Chemical Reactions: When two or more different substances are mixed, a	Cause and Effect Cause and effect relationships are routinely identified, tested, and used to explain change. (5-PS1-4) Scale, Proportion, and Quantity Natural objects exist from the very small to the immensely large. (5-PS1-1) Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. (5-PS1- 2), (5-PS1-3)
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an explanation of a phenomenon. (5-PS1-3) Using Mathematics and Computational Thinking Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions. • Measure and graph quantities such as weight to address scientific and engineering questions and problems. (5-PS1-2)	new substance with different properties may be formed. (5-PS1-4) No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) (5-PS1-2)	
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Interdisciplinary Connections	
English Language Arts • RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-PS1- 1) • W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (5-PS1-2),(5-PS1-3),(5-PS1-4) • W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-PS1-2),(5-PS1-3),(5-PS1-4)	

- W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research (5-PS1-2), (5-PS1-3), (5-PS1-4)

Math

- 5.NBT.A.1 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (5-PS1-1)
- 5.NF.B.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (5-PS1-1)
- 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real-world problems. (5-PS1-2)
- 5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement. (5-PS1-1)
- 5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. (5-PS1-1)

21st-Century 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.CI.4: Research the development process of a product and identify the role of failure as a part of the creative process.
- 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue.

Career Ready Practices

- CRP 8: Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP 11: Use technology to enhance productivity by accessing online resources.

Technology Integration

- 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.
- 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Determine the different states of matter and how they change. Measure the mass, volume, and length of various objects. Make observations and measurements to identify materials based on their properties. Compare substances based on their physical properties. Recognize factors affecting properties of matter. Identify mixtures and solutions and relate the properties of mixtures with the properties of the starting materials.	What is Matter? What are the Properties of Matter? How Does Matter Change?	Formative Assessments: Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments	Materials: Measuring tools (scales, graduated cylinders, rulers) Various materials for observation (solids, liquids, gasses) Thermometers Containers for mixtures and solutions Substances for creating mixtures and solutions (salt, water, sand, oil) Observation journals Safety equipment (goggles, gloves) Experiment supplies (vinegar, baking soda, candles, ice)	Compress Conduction Detect Dissolve Mineral Relative Solubility Substance Atom Accuracy Alternative Conserve Kelvin React Substance

Identify which changes in properties represent physical changes and which represent chemical changes. Recognize that both kinds of changes are consistent with the law of conservation of matter.		Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Reference charts for physical and chemical properties Conservation of matter demonstration materials (sealed containers, balance scales) Vocabulary foldables Activities: Observe and describe the different states of matter and how they change Measure the mass, volume, and length of various objects Make observations and measurements to identify materials based on their properties Compare substances based on their physical properties	
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			Investigate factors affecting the properties of matter Identify mixtures and solutions and relate their properties to the properties of the starting materials Distinguish between physical and chemical changes in properties Demonstrate that both physical and chemical changes are consistent with the law of conservation of matter Dissolving Salt Lab: dissolving DOES NOT create something new Investigating changes of state with ice cubes Students make glue balls, lava lamps, origami dogs, and more	
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			things to help them differentiate between physical and chemical changes. Bubble Bomb- baking soda, vinegar, plastic bag reaction Links: BrainPop-States of Matter BrainPop-Matter Changing States Bill Nye-3 Phases of Matter Prezi: Science Structures and Properties of Matter Mentor Texts: <i>What Is the World Made Of?</i> by Kathleen Weidner Zoehfeld	
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			<i>Solids, Liquids, and Gasses</i> by Ginger Garrett <i>Periodic Table</i> by Scholastic <i>What's the Matter in Mr. Whiskers' Room?</i> by Michael Elsohn Ross <i>Mixtures and Solutions</i> by Natalie Hyde <i>Properties of Matter</i> by Rebecca Hirsch <i>Physical and Chemical Changes</i> by Dorothy Hinshaw Patent <i>Experiments with Mixtures, Compounds, and Elements</i> by Salvatore Tocci <i>The Everything Kids' Science Experiments Book</i> by Tom Robinson	
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			<i>Science Matters</i> by Robert M. Hazen and James Trefil	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson ● Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) ● Intensive instruction ● Practice fact retrieval ● Lesson taught again using a differentiated approach ● Allow answers to be given orally or dictated ● Use visuals / Anchor Charts
Students with IEPs and 504 Plans	● Follow all the IEP/504 plan modifications ● Allow extra time to complete assignments or tests ● Guided notes and/or scaffold outline for written assignments ● Work in a small group ● Solidify and refine concepts through repetition ● Allow answers to be given orally or dictated ● Use multi-sensory teaching approaches ● Utilize assistive technology and materials

	● Use large print books, Braille, or books on CD (digital text) ● Text to speech/audio recorded selections ● Amplification system as needed ● Leveled texts according to ability ● Fine motor skill stations embedded in rotation as needed ● Modified or constrained spelling word lists ● Provide anchor charts with high frequency words and phonemic patterns ● Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. ● Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. ● Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	● Work toward longer passages as skills in English increase ● Use visuals ● Introduce/highlight key vocabulary before lesson ● Teacher models reading aloud daily ● Provide peer tutoring ● Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers ● Guided notes and/or scaffold outline for written assignments ● Provide students with English Learner leveled readers ● Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts ● As students share ideas, include a drawing or annotation to illustrate connections. ● Invite students to use gestures as they count.

Accelerating Students	● Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) ● Provide options, alternatives and choices to differentiate and broaden the curriculum ● Organize and offer flexible small group learning activities ● Provide whole group enrichment explorations ● Teach cognitive and methodological skills ● Use center, stations, or contracts ● Organize integrated problem-solving simulations ● Propose interest-based extension activities ● Expose students to beyond level texts.
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Unit 2: Energy, Organisms, and Ecosystems

Unit Goals:

This unit will focus on ways that organisms find and make energy. Students will learn about the balance between plants and animals within an ecosystem. Finally, students will create chains and webs that show how the sun impacts entire ecosystems.

This unit places an emphasis on the idea that organisms are related in food webs in which some animals eat plants for food, and other animals eat the animals that eat the plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plant parts and animals) and therefore act as “decomposers”. Decomposition eventually restores some materials back to the soil. Organisms can only survive in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of organisms are able to meet their needs in a relatively stable web of life and all organisms meet these needs through the transfer of the sun’s energy through matter.

Duration: 9 weeks

Essential Questions:

- How is the sun important to our lives?
- How is the sun important to all organisms on earth?

- In what ways is the sun related to the flow of energy?
- How is the sun important to all organisms on earth?
- How does the sun impact the roles of producers, consumers and decomposers in an ecosystem?
- How can an organism maintain its population in an ecosystem? What factors can threaten a species?

Enduring Understandings:

- Everything gets its energy from the sun.
- Plants, animals, and humans rely on each other for energy.
- An ecosystem is a community of independent organisms along with the inorganic components (chiefly soil, water, air, and rocks) that make up their environment.
- A biome is a large ecosystem, characterized by its dominant life-forms—for example, the Amazonian rainforest.
- The organisms in a biological community are linked in their need to obtain energy from food, which derives from the Sun through plant life. (There are, however, some communities, in areas such as deep-ocean rifts, that are not dependent on sunlight at all.)
- The organisms in the food web can be viewed in three groups: producers (plants), consumers (primary-and secondary-consuming animals, whether herbivores, carnivores, or omnivores), and decomposers (that is, both detritivores and true decomposers).
- Food webs/ chains are made up of primary, secondary, and tertiary consumers.

Key NJSLS Strands:

- 5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water.
- 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- 5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
- 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-ETS1-2 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.

Science & Engineering Practices

Disciplinary Core Ideas

Cross-cutting Concepts

Developing and Using Models Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. • Use models to describe phenomena. (5-PS3-1)	PS3.D: Energy in Chemical Processes and Everyday Life The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1) LS1.C: Organization for Matter and Energy Flow in Organisms Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1). LS2.A: Interdependent Relationships in Ecosystems The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular	Energy and Matter Energy can be transferred in various ways and between objects. (5-PS3-1) Systems and System Models A system can be described in terms of its components and their interactions. (5-LS2- 1)
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	needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1) LS2.B: Cycles of Matter and Energy Transfer in Ecosystems Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gasses, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)	
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Interdisciplinary Connections	
English Language Arts	● RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-LS1-1) ● RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-LS2-1), (5-PS3-1) ● RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-LS1-1) ● W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-LS1-1)

- SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5-LS2-1), (5-PS3-1)

Math

- MP.2 Reason abstractly and quantitatively. (5-LS1-1), (5-LS2-1)
- MP.4 Model with mathematics. (5-LS1-1), (5-LS2-1)
- MP.5 Use appropriate tools strategically. (5-LS1-1)
- 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. (5-LS1-1)

21st-Century Skills

- 9.2.5.CAP.1 Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
- 9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process.
- 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.
- 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue.

Career Ready Practices

- CRP 8: Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP 11: Use technology to enhance productivity by accessing the following online resources.

Technology Integration

- 8.1.5.DA.3: Organize and present collected data visually to communicate insights gained from different views of the data.
- 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Identify the different structures of a plant	How energy gets	Formative Assessments:	Materials:	Convert

and explain their role in acquiring resources for survival. Identify that the sun is the original source of energy for all organisms. Explain that food provides organisms with the energy they need for body repair, growth, motion and all life processes. Identify the roles of living and nonliving things in an ecosystem. Determine that an organism's environment must have everything an organism needs to survive.	transformed by plants? How organisms use matter and energy? How organisms interact?	Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments Alternate and Benchmark Assessments: Progress Monitoring Assessments	Plant specimens or diagrams Magnifying glasses Sunlight exposure tools (lamps, timers) Food samples and nutritional information Ecosystem model materials (soil, water, plants, small animals or replicas) Energy flow charts and diagrams Materials for plant growth experiments (seeds, pots, soil, water) Observation journals Materials for constructing ecosystem models (craft supplies, natural materials)	Indicator Energy flow Flow chart Potential energy Kinetic energy Solar energy Photosynthesis Cellular respiration Reproduce Conserve Cycle Decompose Transfer
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		Cumulative/Benchmark Assessments	Visual aids for food chains and webs (posters, cards) Vocabulary foldables Links: Brain Pop Photosynthesis Brain Pop Food Chains Brain Pop Energy Pyramid Photosynthesis Intro Video Plants: Who Needs Dirt? Bill Nye (food chains) Food Chains Food Webs Energy Flow in an Ecosystem Matter and Energy Flow in Organisms Activities: Go on a plant scavenger	
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			hunt to find and identify different plant structures Create a sun-to-plant energy flow chart and present it to the class Make a food diary and discuss how different foods provide energy for the body Build a mini-ecosystem in a jar to observe the roles of living and nonliving things Design a habitat diorama showing what an organism needs to survive Conduct an experiment to demonstrate photosynthesis using leaf disks and water Photosynthesis + Cellular Respiration: Students create a teaching tool (FlipGrid, poster, Google Slides) that	
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			shows the connection between photosynthesis and cellular respiration. Food Web/Food Chain: Students create a food chain on a sentence strip or a food web on a piece of paper with yarn. Play a game where students act out different roles in a food web Use recycled materials to build a model showing how organisms use matter and energy Perform a skit to show interactions within an ecosystem, such as predator-prey relationships Grow bean plants and document their growth, noting how different structures help them survive Mentor Texts: <i>The Magic School Bus</i> <i>Plants Seeds: A Book</i>	
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			<i>About How Living Things Grow</i> by Joanna Cole <i>Energy from the Sun</i> by Allan Fowler <i>What Happens to Our Food?</i> by Jacqui Bailey <i>Who Eats What? Food Chains and Food Webs</i> by Patricia Lauber <i>A Drop of Water: A Book of Science and Wonder</i> by Walter Wick <i>Living Sunlight: How Plants Bring the Earth to Life</i> by Molly Bang and Penny Chisholm <i>Energy Makes Things Happen</i> by Kimberly Brubaker Bradley <i>Nature's Patchwork Quilt: Understanding Habitats</i> by Mary Miche	
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			<i>How Ecosystems Work</i> by Julie K. Lundgren <i>The Web at Dragonfly Pond</i> by Brian "Fox" Ellis	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson ● Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) ● Intensive instruction ● Practice fact retrieval ● Lesson taught again using a differentiated approach ● Allow answers to be given orally or dictated ● Use visuals / Anchor Charts
Students with IEPs and 504 Plans	● Follow all the IEP/504 plan modifications ● Allow extra time to complete assignments or tests ● Guided notes and/or scaffold outline for written assignments ● Work in a small group ● Solidify and refine concepts through repetition

	● Allow answers to be given orally or dictated ● Use multi-sensory teaching approaches ● Utilize assistive technology and materials ● Use large print books, Braille, or books on CD (digital text) ● Text to speech/audio recorded selections ● Amplification system as needed ● Leveled texts according to ability ● Fine motor skill stations embedded in rotation as needed ● Modified or constrained spelling word lists ● Provide anchor charts with high frequency words and phonemic patterns ● Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. ● Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. ● Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	● Work toward longer passages as skills in English increase ● Use visuals ● Introduce/highlight key vocabulary before lesson ● Teacher models reading aloud daily ● Provide peer tutoring ● Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers ● Guided notes and/or scaffold outline for written assignments ● Provide students with English Learner leveled readers ● Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts

	● As students share ideas, include a drawing or annotation to illustrate connections. ● Invite students to use gestures as they count.
Accelerating Students	● Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) ● Provide options, alternatives and choices to differentiate and broaden the curriculum ● Organize and offer flexible small group learning activities ● Provide whole group enrichment explorations ● Teach cognitive and methodological skills ● Use center, stations, or contracts ● Organize integrated problem-solving simulations ● Propose interest-based extension activities ● Expose students to beyond level texts.

Unit 3: Earth Systems

Unit Goals:

This unit will focus on how the earth is a nonliving object that is made up of four major systems. The Earth's geosphere is everything that makes up the nonliving surface of the earth and its layers. The hydrosphere consists of all the water on the earth. This includes water in oceans, lakes, streams, ponds, groundwater, glaciers and other ice forms. It can be made up of liquid or frozen water and freshwater or saltwater. The atmosphere consists of the layer of gas (air), which is made up of mostly nitrogen and oxygen, that surrounds the Earth. This gives plants and animals the air it needs to breathe and survive. The biosphere is the Earth's outer shell that is made up of land, air, and water where all living things exist. Each system is dependent on one another.

Duration: 9 weeks

Essential Questions:

- What are the four major systems of the Earth?

• How do Earth’s systems interact to affect Earth’s surface materials and processes? • How can the actions of humankind impact and affect the Earth’s systems?		
Enduring Understandings: • Explain the four major systems of the Earth. • Differentiate between the different layers of the Earth based on distinct characteristics. • Describe how life on Earth would be different if the ozone layer continues to be depleted. • Interpret and create graphs that represent the location of both salt and fresh water on Earth. • Analyze lab results that suggest that areas near water will see milder temperature fluctuations		
Key NJSLS Strands: • 5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. • 5-ESS2-2: Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. • 5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment. • 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-ETS1-2 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.		
Science & Engineering Practices	Disciplinary Core Ideas	Cross-cutting Concepts
Analyzing and Interpreting Data Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.	ESS1.A: The Universe and its Stars The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth. (5-ESS1-1) ESS1.B: Earth and the Solar System	Patterns Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena. (5- ESS1-2)

• Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships. (5-ESS1-2) Engaging in Argument from Evidence Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). • Support an argument with evidence, data, or a model. (5-ESS1-1) Developing and Using Models Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. • Develop a model using an example to describe a scientific principle. (5-ESS2-1) Using Mathematics and Computational Thinking	The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year. (5-ESS1-2) ESS2.A: Earth Materials and Systems Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth’s surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1) ESS2.C: The Roles of Water in Earth’s Surface Processes Nearly all of Earth’s available water is in the ocean. Most freshwater is in glaciers	Scale, Proportion, and Quantity Standard units are used to measure and describe physical quantities such as weight and volume. (5-ESS2-2) Systems and System Models A system can be described in terms of its components and their interactions. (5-ESS2-1)
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Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions. - Describe and graph quantities such as area and volume to address scientific questions. (5-ESS2-2) Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in 3– 5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods. - Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem. (5-ESS3-1)	or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5- ESS2-2) Human Impacts on Earth Systems: Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environments. (5-ESS3-1)	
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Interdisciplinary Connections

English Language Arts

- RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-LS2-1)
- SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5-LS2-1)
- RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.
- W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
- W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.
- W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work.
- W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

Math

- MP.2 Reason abstractly and quantitatively. (5-ESS2-1), (5-ESS2-2), (5-ESS3-1), (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3)
- MP.4 Model with mathematics. (5-LS2-1)
- MP.5 Use appropriate tools strategically. (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3)
- 5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5-ESS2-1)

21st-Century Skills

- 9.2.5.CAP.1 Evaluate personal likes and dislikes and identify careers that might be suited to personal likes.
- 9.4.5.CI.1 Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions.
- 9.4.5.CI.2 Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue.
- 9.4.5.CT.1 Identify and gather relevant data that will aid in the problem-solving process.

Career Ready Practices

- CRP 8: Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP 11: Use technology to enhance productivity by accessing online resources.

Technology Integration

- 8.2.5.ED.1 Explain the functions of a system and its subsystems.
- 8.2.5.ED.2 Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.
- 8.2.5.ED.5 Describe how specifications and limitations impact the engineering design process. Using the constraints and tradeoffs identified in the design.
- 8.2.5.ETW.1 Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems.
- 8.2.5.ETW.2 Describe ways that various technologies are used to reduce improper use of resources.
- 8.2.5.ETW.5 Identify the impact of a specific technology on the environment and determine what can be done to increase positive effects and to reduce any negative effects, such as climate change.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Identify and describe Earth's major systems ● the geosphere ● the hydrosphere ● the atmosphere ● the biosphere Explain the cycles that exist in each Earth system (i.e. water cycle) Develop a model to	Earth's major systems How Earth's major systems interact The role of the oceans in Earth's systems Resource use and its effects on the Earth Protecting the environment	Formative Assessments: Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form	Materials: Modeling clay Clear containers for water cycle experiments Art supplies (paper, markers, paint) Maps and globes	Geosphere Hydrosphere Atmosphere Biosphere Water cycle Evaporation Condensation

show how at least two systems interact Identify agents of change and how they affect Earth's systems by studying images. Explain the way oceans affect the different systems on Earth. Identify renewable and nonrenewable resources. Describe how human activities impact Earth's systems Use images and data to explain how the increase in human populations have impacted Earth's resources. Research and communicate ways to protect the Earth from both natural processes and human		Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Images of natural events (volcanoes, hurricanes, earthquakes) Materials for building terrariums (soil, plants, containers) Water cycle diagram materials (poster board, markers) Erosion experiment supplies (sand, water, trays) Reference books on Earth systems Presentation materials (poster boards, markers, slides) Vocabulary foldables Case study materials (articles, reports) Images and data charts showing population growth and resource use	Precipitation Erosion Agents of change Ocean currents Climate Interaction Model Ecosystem Terrarium Natural events Global climate System Earth systems Renewable Nonrenewable Resources Sustainability
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impact.			Art supplies (poster boards, markers, paints) Gardening supplies (seeds, soil, pots) Recycling bins and materials Video recording equipment Local environmental survey forms Reference books on renewable and nonrenewable resources Internet access for research Cleanup event supplies (gloves, trash bags) Activities: Climate Change Activity Create a layered model of Earth's major systems	Human impact Earth's systems Population growth Conservation Recycling Natural processes Case study Data analysis Environmental issues Mitigation Renewable energy Fossil fuels Ecosystem Pollution Sustainable practices Community involvement
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			(geosphere, hydrosphere, atmosphere, biosphere) Illustrate the water cycle with a detailed diagram Develop a model demonstrating the interaction between the hydrosphere and atmosphere Analyze images of natural events to identify agents of change in Earth's systems Conduct a classroom discussion/debate on the impact of oceans on Earth's systems Create a 3D model of the water cycle and explain each stage Build a terrarium to observe interactions within the biosphere	
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			Use a map to trace how ocean currents affect global climates Investigate the effects of erosion on the geosphere through experiments Create and present a report on how the hydrosphere supports the biosphere Classify various resources as renewable or nonrenewable Investigate the impact of human activities on Earth's systems through case studies Analyze images and data to explain the effects of increasing human populations on Earth's resources Create posters or presentations on ways to	
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			protect Earth from natural processes and human impact Conduct a survey on local environmental issues and propose solutions Develop a recycling program for the classroom or school Organize a debate on the pros and cons of renewable and nonrenewable resources Plant a garden to learn about sustainable practices Create a video documentary on human impact and ways to mitigate it Participate in a community clean-up event and reflect on the experience	
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			Links: Earth's Materials and Systems Role of Water Human Impact on Earth's Systems Four Spheres Part 1 (Geosphere and Biosphere) Four Spheres Part 2 (Hydrosphere and Atmosphere) What on Earth? (Interaction of Spheres) H2O- No! Fresh Water Problems Bill Nye The Science Guy on Wind Bill Nye The Science Guy on the Atmosphere BrainPop- Entire Earth's Systems collection	
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			Mentor Texts: <i>The Magic School Bus Inside the Earth</i> by Joanna Cole <i>A Drop Around the World</i> by Barbara McKinney <i>The Everything Kids' Science Experiments Book</i> by Tom Robinson <i>The Water Cycle</i> by Rebecca Olien <i>Earth's Systems</i> by Conrad J. Storad <i>Oceans: An Illustrated Reference</i> by Fabio Moretti <i>National Geographic Kids Everything Oceans</i> by Elizabeth Carney <i>Erosion: Changing Earth's Surface</i> by Robin Koontz <i>How Mountains Are Made</i> by Kathleen Weidner Zoehfeld <i>The Ocean Book: Aquarium and Seaside Activities and Ideas for</i>	
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			<i>All Ages</i> by Center for Marine Conservation <i>The Lorax</i> by Dr. Seuss <i>One Well: The Story of Water on Earth</i> by Rochelle Strauss <i>Energy Island: How One Community Harnessed the Wind and Changed Their World</i> by Allan Drummond <i>The Wump World</i> by Bill Peet <i>Our House Is Round: A Kid's Book About Why Protecting Our Earth Matters</i> by Yolanda Kondonassis <i>Trash Magic: A Book About Recycling</i> by Loreen Leedy <i>Heroes of the Environment: True Stories of People Who Are Helping to Protect Our Planet</i> by Harriet Rohmer <i>The New 50 Simple Things Kids Can Do to</i>	
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			<i>Save the Earth</i> by EarthWorks Group <i>What a Waste: Trash, Recycling, and Protecting our Planet</i> by Jess French <i>The Down-to-Earth Guide to Global Warming</i> by Laurie David and Cambria Gordon	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) ● Explicit instruction ● Schema-based instruction ● Use visuals ● Use manipulatives ● Use a multi-sensory approach ● Guided notes and/or scaffold outline for written assignments ● Introduce key vocabulary before lesson ● Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) ● Intensive instruction ● Practice fact retrieval ● Lesson taught again using a differentiated approach ● Allow answers to be given orally or dictated ● Use visuals / Anchor Charts

Students with IEPs and 504 Plans	● Follow all the IEP/504 plan modifications ● Allow extra time to complete assignments or tests ● Guided notes and/or scaffold outline for written assignments ● Work in a small group ● Solidify and refine concepts through repetition ● Allow answers to be given orally or dictated ● Use multi-sensory teaching approaches ● Utilize assistive technology and materials ● Use large print books, Braille, or books on CD (digital text) ● Text to speech/audio recorded selections ● Amplification system as needed ● Leveled texts according to ability ● Fine motor skill stations embedded in rotation as needed ● Modified or constrained spelling word lists ● Provide anchor charts with high frequency words and phonemic patterns ● Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. ● Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. ● Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	● Work toward longer passages as skills in English increase ● Use visuals ● Introduce/highlight key vocabulary before lesson ● Teacher models reading aloud daily ● Provide peer tutoring

	● Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers ● Guided notes and/or scaffold outline for written assignments ● Provide students with English Learner leveled readers ● Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts ● As students share ideas, include a drawing or annotation to illustrate connections. ● Invite students to use gestures as they count.
Accelerating Students	● Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) ● Provide options, alternatives and choices to differentiate and broaden the curriculum ● Organize and offer flexible small group learning activities ● Provide whole group enrichment explorations ● Teach cognitive and methodological skills ● Use center, stations, or contracts ● Organize integrated problem-solving simulations ● Propose interest-based extension activities ● Expose students to beyond level texts.

Unit 4: Space Systems

Unit Goals:

Through the development and use of models, students will use evidence to explain that Earth is a sphere and that gravity causes objects to move toward Earth’s center. Students develop an understanding of daily patterns in our sky such as day and night. They will understand the cause for the changing seasons, length of shadows and stars in the night sky. They will learn about the sun as a star and how distance from Earth can change how an object appears. Students will be able to explain which patterns occur due to the rotation of the Earth and which patterns are due to Earth’s revolution around the sun.

Duration: 9 weeks		
Essential Questions: • How does weight and mass affect the gravitational force on various objects? • Why is it important to understand gravity? • How would life be different on Earth with no gravitational force on objects? • What daily patterns can be observed in our sky? • How does Earth's revolution cause seasonal differences in the appearance of stars? • How does distance affect the size of objects?		
Enduring Understandings: • The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center. • Many patterns on Earth are caused by the interactions between Earth, the sun, and stars. • Seasons occur because of the combination of Earth's tilt and Earth's revolution. Over the course of a year, the positions of stars appear to change and certain stars are visible only in certain months. • The appearance of objects in the sky, such as the sun and stars, are based on their distance from you.		
Key NJSL Strands: • 5-ESS1-1: Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth. • 5-ESS1-2: Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. • 5-PS2-1: Support an argument that the gravitational force exerted by Earth on objects is directed down.		
Science & Engineering Practices	Disciplinary Core Ideas	Cross-cutting Concepts
Engaging in Argument from Evidence Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by	PS2.B Types of Interactions The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center. (5-PS2-1)	Cause and Effect Cause and effect relationships are routinely identified and used to explain change. (5-PS2-1) Patterns

peers by citing relevant evidence about the natural and designed world(s). - Support an argument with evidence, data, or a model. (5-PS2-1) Analyzing and Interpreting Data Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. - Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships. (5-ESS1-2)	ESS1.B Earth and the Solar System The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South Poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of day, month, and year. (5-ESS1-2) ESS1.A The Universe and its Stars The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth. (5-ESS1-1)	Similarities and differences in patterns can be used to sort, classify, communicate, and analyze simple rates of change for natural phenomena. (5-ESS1-2)
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Interdisciplinary Connections
English Language Arts - RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-PS2-1), (5-ESS1-1) - RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-ESS1-1) - RI.5.8 Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s). (5-ESS1-1)

- RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-PS2-1), (5-ESS1-1)
- W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5- PS2-1), (5-ESS1-1)
- SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5-ESS1-2)

Math

- MP.2 Reason abstractly and quantitatively. (5-ESS1-1),(5-ESS1-2)
- MP.4 Model with mathematics. (5-ESS1-1),(5-ESS1-2)
- 5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (5-ESS1-1)
- 5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5-ESS1-2)

21st-Century Skills

- 9.2.5.CAP.4: Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements
- 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.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data.

Career Ready Practices

- CRP 8: Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP 11: Use technology to enhance productivity by accessing online resources.

Technology Integration

- 8.1.5.IC.1: Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.

- 8.1.5.IC.2: Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.
- 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Skills	Instructional Topics	Assessment	Resources	Vocabulary
Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. Use models to explain that gravity pulls objects toward the center of the Earth. Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of constellations, sun and moon. Observe the position of the sun at different	Gravitational Force Earth's Rotation and Daily Patterns Earth's Revolution and Yearly Patterns The Sun and Other Stars	Formative Assessments: Lesson Quizzes Lesson Self-assessment Teacher Observations Class Discussions Classwork/ Homework Exit Slips/Google Form Summative Assessments: Topic/Unit Assessments Constructed Response Questions Projects Cumulative Tests Performance Assessments	Materials: Craft materials (paper, cardboard, glue, scissors) for model building Marbles or small balls for gravity models Foam balls or balloons for Earth-sun-moon models Images of constellations for observation Graph paper and calculators for daylight hours graphing Data sets or access to online resources for seasonal patterns investigation	Gravitational Force Rotation Revolution Constellations Orbit Seasons Apparent Size Brightness Attractive Interactions

times during the day and use evidence to explain daily patterns on Earth (i.e. night and day, shadows) Observe images of constellations to identify patterns. Calculate and graph the hours of daylight Use evidence to explain that Earth's orbit and the moon's orbit cause predictable patterns such as seasons. Identify that the reason the sun appears larger and brighter than other stars is due to its distance from Earth. Explain the sun's importance to Earth. Explain how the distance of a star from Earth impacts		Alternate and Benchmark Assessments: Progress Monitoring Assessments Cumulative/Benchmark Assessments	Scale models or images of the sun and other stars Telescopes or binoculars for star observation (if available) Presentation materials (poster boards, markers, slides) Reference books or online resources for research and evidence gathering Vocabulary foldables Activities: Gravitational Interactions Debate Gravity Models Earth-Sun-Moon Model Building Daily Sun Position Observations	
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the brightness and apparent size from Earth.			Constellation Exploration Daylight Hours Graphing Orbit and Seasonal Patterns Investigation Sun vs. Star Comparison Star Distance Brightness Experiment Argument Presentation Links: Brainpop: Gravity Lunar Olympics Earth's Rotation and Revolution Sun and the Seasons Following the Sun (shadows) Gravity	
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			What are Stars? Prezi: Seasonal Appearance of Stars in the Sky Mentor Texts: <i>The Magic School Bus Lost in Space</i> by Joanna Cole <i>Gravity Is a Mystery</i> by Franklyn M. Branley <i>The Sun: Our Nearest Star</i> by Franklyn M. Branley <i>The Moon Seems to Change</i> by Franklyn M. Branley <i>Stars</i> by Seymour Simon <i>Astronomy: Out of This World!</i> by Dan Green	
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			<i>The Solar System</i> by Melvin Berger <i>Why the Sun and the Moon Live in the Sky</i> by Elphinstone Dayrell <i>What Are Stars?</i> by Kathryn Smithyman <i>The Reasons for Seasons</i> by Gail Gibbons	
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Modifications and Accommodations	
Tier II and III Strategies	Small group instruction (Tier II) • Explicit instruction • Schema-based instruction • Use visuals • Use manipulatives • Use a multi-sensory approach • Guided notes and/or scaffold outline for written assignments • Introduce key vocabulary before lesson • Lesson taught again using a differentiated approach Small group or Individual instruction (Tier III) • Intensive instruction • Practice fact retrieval • Lesson taught again using a differentiated approach

	● Allow answers to be given orally or dictated ● Use visuals / Anchor Charts
Students with IEPs and 504 Plans	● Follow all the IEP/504 plan modifications ● Allow extra time to complete assignments or tests ● Guided notes and/or scaffold outline for written assignments ● Work in a small group ● Solidify and refine concepts through repetition ● Allow answers to be given orally or dictated ● Use multi-sensory teaching approaches ● Utilize assistive technology and materials ● Use large print books, Braille, or books on CD (digital text) ● Text to speech/audio recorded selections ● Amplification system as needed ● Leveled texts according to ability ● Fine motor skill stations embedded in rotation as needed ● Modified or constrained spelling word lists ● Provide anchor charts with high frequency words and phonemic patterns ● Students might need guidance as to what actions happen during partner work time. Invite students to discuss what it looks like when they are working with their partner while exploring the connecting cubes. Generate a list of shared expectations for partner work. ● Invite students to plan a strategy before they begin working. If time allows, invite students to share their plan with a partner. ● Some students may benefit from feedback that emphasizes effort and time on task. For example, moving counters in the squares of the 5-frame or filling the 5-frame with one counter in each square.
Multi-language Learners	● Work toward longer passages as skills in English increase ● Use visuals ● Introduce/highlight key vocabulary before lesson

	● Teacher models reading aloud daily ● Provide peer tutoring ● Utilize translation supports including bilingual dictionary, translation device, assistive technology, and peers ● Guided notes and/or scaffold outline for written assignments ● Provide students with English Learner leveled readers ● Support recommended by the grade specific “can do” list outlined by WIDA, including Key Uses Edition and Descriptor Name Charts ● As students share ideas, include a drawing or annotation to illustrate connections. ● Invite students to use gestures as they count.
Accelerating Students	● Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles) ● Provide options, alternatives and choices to differentiate and broaden the curriculum ● Organize and offer flexible small group learning activities ● Provide whole group enrichment explorations ● Teach cognitive and methodological skills ● Use center, stations, or contracts ● Organize integrated problem-solving simulations ● Propose interest-based extension activities ● Expose students to beyond level texts.

Prepared by Julie Lang, MA

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