

Long Beach Island Consolidated School District Curriculum Guide

Grade: 5	Content Area: Science
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Introduction

In fifth grade Science, students explore concepts and phenomena involving matter, energy in ecosystems, interactions with space system objects, Earth's systems interactions and human impacts on the environment. Units of study involve science and engineering practices such as developing and using models, and obtaining, evaluating, and communicating information. Crosscutting concepts include scale, proportion, quantity and systems, and systems models. Students use these practices and crosscutting concepts to demonstrate understanding of the scientific ideas.

Original Adoption: October 23, 2019
Revised on: April 1, 2019
Revised by: C. McBride
Revised on: August 16, 2022
Revised by: C. McBride

Recommended Pacing Guide	
Unit 1: Properties of Matter	25 Days
Unit 2: Changes in Matter	25 Days
Unit 3: Earth's Systems	25 Days
Unit 4: Earth's Water	25 Days
Unit 5: Human Impacts on Earth's Systems	25 Days
Unit 6: Patterns in Space	25 Days
Unit 7: Matter and Energy in Ecosystems	25 Days

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Unit 1: Properties of Matter	Duration: 25 days
Science Standards 5-PS1-1, 5-PS1-3, 3-5-ETS1-1	
Disciplinary Core Ideas PS1.A Structure and Properties of Matter Measurements of a variety of properties can be used to identify materials.	
Science and Engineering Practices SEP.3 Planning and Carrying Out Investigation Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. SEP.6 Constructing Explanations Construct an explanation of observed relationships	
Crosscutting Concepts CCC.3 Scale, Proportion, and Quantity Using models of various scales to study phenomena in systems that are too large or too small to observe	
Connections to Nature of Science Science is a Human Endeavor Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (5-PS1-1)	
Computer Science and Design Thinking Standards 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.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task. (3-5-ETS1-1, 5-PS-1).	
Interdisciplinary Standards ELA/Literacy Ri.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowingly. MP.2 Reason abstractly and quantitatively MP.5 Use appropriate tools strategically	

Enduring Understandings
Everything is made of matter. Matter is made of molecules.

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Matter is a term that applies to all of the stuff around us and it is made of particles that are too small to see.

Matter exists as particles that are too small to see, and so matter is always conserve even if it seems to disappear

Substances can be identified based on observable and measurable properties.

Scientists and engineers use their understanding of properties of matter to create products/design solutions to problems.

Gasses are made from matter particles that are too small to be seen. (Ex: an inflated balloon)

Essential Questions

What is matter and what is it made up of?

How do scientists observe and measure properties of matter?

What happens to matter when matter changes (as it goes through its different forms)?

How can we identify and compare matter based on its properties? (What are the identifiable properties of a substance?)

Career Readiness, Life Literacies, and Key Skills Practices

The following skills are encouraged and taught:

Demonstrate creativity and innovation.

Utilize critical thinking to make sense of problems and persevere in solving them.

Use technology to enhance productivity increase collaboration and communicate effectively

Work productively in teams while using cultural/global competence.

Career Readiness, Life Literacies, and Key Skills Standards

9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries (5-PS1-1)

LGBT and Disabilities Law N.J.S.A 18A:35-4.35 Instruction on the political, economic, and social integration of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum

Amistad Law: N.J.S.A 18A:52:16A-88-4.35 Instruction regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of secondary school students.

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

Instruction on the Holocaust and genocides in an appropriate place in the curriculum with an emphasis on the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

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Student Learning Goals/Objectives	
<p><i>Students will know:</i></p> <p>What makes up matter Examples of properties of matter How to observe and classify matter How to measure matter How properties of matter are used to create new products/design solutions to problems.</p>	<p><i>Students will be able to:</i></p> <p>Develop a model to describe that matter is made of particles too small to be seen. (5-PS1-1) Make observations and measurements to identify materials based on their properties. (5-PS1-3)</p>
Assessment Evidence	
<p>Performance Tasks</p> <p>Plan and conduct investigation to use senses to describe and identify objects Observe and measure matter using tools to describe and identify objects Compare and contrast materials based on physical properties Use evidence to explain that matter is made of particles Identify materials based on properties Identify differences among states of matter Design new playground equipment using properties of matter</p>	<p>Other Assessments</p> <p>Formative:</p> <ul style="list-style-type: none"> ● Lesson quizzes, and reviews ● Student investigations and models ● Language Arts writing activities ● Graphic Organizers & Guided Note Taking ● Directed Reading ● Cooperative Group Learning ● Homework ● Journal Entries ● Exit Tickets ● Polls/ Surveys with self evaluation component ● Jigsaw ● Think, Pair, Share ● Quizzes <p>Alternative:</p> <ul style="list-style-type: none"> ● Modified tests and quizzes ● Group work ● Peer assessments ● Labs ● Projects ● Portfolio Assessments <p>Summative</p> <ul style="list-style-type: none"> ● Unit Test/Topic Test ● Unit Project

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	<ul style="list-style-type: none"> ● Performance Assessment/Tasks ● Engineering projects <p>Benchmark Assessments:</p> <ul style="list-style-type: none"> ● Unit pre-test ● Beginning of the year, mid year, and end of the year SGO
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Core Instructional & Supplemental Materials	
<p>Suggested Activities/Resources:</p> <ul style="list-style-type: none"> ● Savvas Realize “Elevate Science” <ul style="list-style-type: none"> ○ Lesson explorations ○ Hands-on activities ○ Virtual Labs ○ Video based projects ○ Performance tasks ○ Engineering projects ○ Student investigationsMatter simulations- Phet Interactive ○ Concord Consortium Molecular Workbench ○ http://betterlesson.com/lesson/644582/the-particles-of-matter ○ -Matter and Its Interactions Unit New Jersey Center for Teaching and Learning ○ -What is an Atom -Basics for Kids 	<p>Varied Levels of Text:</p> <ul style="list-style-type: none"> ● leveled readers ● Newsela ● Storyworks ● <i>Made of Matter</i> ● <i>Break it Down</i> ● <i>Solving Dissolving</i> ● <i>Science You Can't See</i> ● <i>Food Scientist's Handbook</i> ● <i>Mason, A. (2006). Change it! Solids, liquids, gases and you</i> ● <i>Stille, D. (2004). Matter: See it, touch it, taste it, smell it</i> ● <i>Slade, S. (2014). Splat! Wile E. Coyote experiments with states of matter</i> ● <i>Walliman, D. (2016). Professor Astrocat's atomic adventure</i> ● <i>Kelsey, E. (2012). You are stardust.</i> ● <i>Berne, J. (2016). On a beam of light: A story of Albert Einstein</i> ● <i>Wells, R. (1995). What's smaller than a pygmy shrew?</i> ● <i>Braun, E. (2012). Joe-Joe the wizard brews up solids, liquids and gases</i> ● <i>Green, D. (2008). Physics: Why matter matters.</i> ● <i>Yorifuji, B. (2012). Wonderful life with the elements: The periodic table personified</i>

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- *Munroe, R. (2015). Thing explainer: Complicated stuff in simple words.*

Modifications and Accommodations

English Language Learners:

- Provide pictures and well labeled models
- Speak slowly and gesture when necessary
- Pre-teach vocabulary words
- Extended time on assessments
- Small group for assessment
- Review Vocabulary
- Allow for alternate responses during activities and assessments
- Literacy and language support strategies including discourse
- Use a poster, slide, or picture to support student listening in science such as GLAD pictorial input chart
- Preview science texts with students, discussing salient text features such as tables, graphs, and photographs before they read it.
- Provide summaries and include native language texts.
- Provide sentence stems for all students to use, especially to support complex verbal practices like argumentation, explanation, and communication.
- Engage ELs in authentic vocabulary exploration as they try to make their thoughts meaningful to others through writing. Provide dictionaries or [Google Translate](#). Look beyond grammar and spelling to understand student ideas.
- Home culture connections

Special Education/504 Plans/Students with Disabilities:

- Follow specific IEP/504 accommodations and modifications
- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Allow alternate assignments and assessments
- Differentiated Instruction

Students at Risk of Failure:

- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Incorporate social/emotional discussions
- Encourage and monitor positive peer collaboration
- Provide academic resources for both home and school use

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- Provide incentives to increase motivation and collaboration

Economically Disadvantaged:

- Provide clear, achievable expectations, do not lower academic requirements for them.
- Build a safe and nurturing atmosphere
- Be flexible with assignments
- Offer several alternatives from which all students can choose.
- Allow students to finish assignments independently, or give them the opportunity to complete tasks at their own pace.
- Use real-world examples and create mental models for abstract idea
- Provide increased knowledge base and vocabulary use about real world experiences.
- Share the decision making in class.
- Maintain expectations while offering choice and soliciting input
- Connect concepts to students' sense of "place" as physical, historical, and sociocultural dimensions
- Ask questions that elicit students' funds of knowledge
- Use cultural artifacts that are meaningful
- Use project-based learning as a form of connected science
- Provide resources for science instruction

Culturally Diverse:

- Involve families in student learning
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Teach study skills
- Provide students with necessary academic resources and materials
- Allow for alternative assignments
- Provide visuals
- Assign peer tutor
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students
- Use cultural artifacts that are meaningful relevant
- Integrate community involvement
- Include role models and mentors of similar racial or ethnic backgrounds

Gifted and Talented

- Peer mediated strategies
- Cooperative learning groups
- Differentiated instruction

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Presentation accommodations allow a student to:

- Vary the method of presentation: lecture, small groups, large group, demonstration, individual experimentation
- Explore real world connections
- Use technology tools to enhance content

Response accommodations allow a student to:

- Turn and Talk
- Reward risk taking while encouraging students to think “outside of the box”

Setting accommodations allow a student to:

- Use flexible seating
- Have choice in seating/grouping

Timing accommodations allow a student to:

- Have flexible pacing in terms of content, assignments, and assessments
- Explore extended activities

Scheduling accommodations allow a student to:

- Establish a timeline for completing a project
- Have rigorous Pacing

Organization skills accommodations allow a student to:

- Model executive functioning
- Utilize independent skills practices

Assignment modifications allow a student to:

- Complete enrichment tasks
- Write longer passages on essays and open ended responses including academic vocabulary
- Answer higher order thinking questions
- Cite text evidence
- Create alternate projects or assignments, student developed rubrics, student choice when completing a project or alternate labs

Curriculum modifications provide:

- Topics of interest to the student and/or relevant to how the world works
- Students access to supplemental reading materials matched to individual student lexiles
- Opportunities for open-ended, self-directed activities
- Opportunities to get graded or assessed using a different standard than the one for others

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Unit 2: Changes in Matter	Duration: 25 days
Science Standards 5-PS1-2, 5-PS1-4	
Disciplinary Core Ideas PS1.A Structure and Properties of Matter Matter is conserved when it changes form PS1.B Chemical Reactions When substances are mixed a new substance with different properties may form	
Science and Engineering Practices SEP.2 Developing and Using Models Develop a model to describe phenomena SEP.3 Planning and Carrying Out Investigation Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. SEP.5 Using Mathematics and Computational Thinking Measuring and graphing quantities to address questions and problems	
Crosscutting Concepts CCC.2 Cause and Effect Identifying and testing causal relationships using these relationships to explain change CCC.3 Scale, Proportion, and Quantity Using standard units to measure and describe physical quantities such as weight, time, temperature and volume.	
Connections to Nature of Science Science is a Human Endeavor Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (5-PS1-2)	
Computer Science and Design Thinking Standards 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.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task. (5-PS1-2).	
Interdisciplinary Standards ELA/Literacy RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowingly. W.5.9 Draw evidence from literary or informational texts to support analysis, reflection and research	

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MP.2 Reason abstractly and quantitatively
MP.5 Use appropriate tools strategically

Enduring Understandings

Recognize that matter exists as particles that are too small to see, so matter is always conserved even if it seems to disappear.
Sometimes when two substances are mixed, each of the substances keeps its original properties and sometimes a new substance is formed.
Determine whether the mixing of two substances always results in the formation of new substances or not and provide examples.
Differences between soluble and insoluble solutions.

Essential Questions

What is conservation of matter?
What happens when matter changes?
How can we use properties of matter to design new materials?
When two substances are mixed together, is something completely new and different always made?

Career Readiness, Life Literacies, and Key Skills Practices

The following skills are encouraged and taught:
Demonstrate creativity and innovation.
Utilize critical thinking to make sense of problems and persevere in solving them.
Use technology to enhance productivity increase collaboration and communicate effectively
Work productively in teams while using cultural/global competence.

Career Readiness, Life Literacies, and Key Skills Standards

9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries (5-PS1-2)

LGBT and Disabilities Law N.J.S.A 18A:35-4.35 Instruction on the political, economic, and social integration of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum

Amistad Law: N.J.S.A 18A:52:16A-88-4.35 Instruction regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of secondary school students.

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Holocaust Law N.J.S.A 18A:35-28
 Instruction on the Holocaust and genocides in an appropriate place in the curriculum with an emphasis on the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

Student Learning Goals/Objectives	
<p><i>Students will know:</i> That matter is conserved during a physical change Temperature can affect a physical change Differences between the states of matter</p>	<p><i>Students will be able to:</i> 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-PS1-2) Conduct an investigation to determine whether the mixing of two or more substances results in new substances (5-PS1-4) Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of a problem (3-5 ETS1-2)</p>
Assessment Evidence	
<p>Performance Tasks Use evidence to show that matter is conserved during a physical and chemical change Measure and graph quantities to provide evidence of conservation of matter Compare and contrast states of matter Identify how improvement in the understanding of materials science impacts technologies</p>	<p>Other Assessments Formative:</p> <ul style="list-style-type: none"> ● Lesson quizzes, and reviews ● Student investigations and models ● Language Arts writing activities ● Graphic Organizers & Guided Note Taking ● Directed Reading ● Cooperative Group Learning ● Homework ● Journal Entries ● Exit Tickets ● Polls/ Surveys with self evaluation component

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	<ul style="list-style-type: none"> ● Jigsaw ● Think, Pair, Share ● Quizzes <p>Alternative:</p> <ul style="list-style-type: none"> ● Modified tests and quizzes ● Group work ● Peer assessments ● Labs ● Projects ● Portfolio Assessments <p>Summative</p> <ul style="list-style-type: none"> ● Unit Test/Topic Test ● Unit Project ● Performance Assessment/Tasks ● Engineering projects <p>Benchmark Assessments:</p> <ul style="list-style-type: none"> ● Unit pre-test ● Beginning of the year, mid year, and end of the year SGO
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Core Instructional & Supplemental Materials	
<p>Suggested Activities/Resources:</p> <ul style="list-style-type: none"> ● Savvas Realize “Elevate Science” <ul style="list-style-type: none"> ○ Lesson explorations ○ Hands-on activities ○ Virtual Labs ○ Video based projects ○ Performance tasks ○ Engineering projects ○ Student investigationsMatter simulations- Phet Interactive ○ Concord Consortium Molecular Workbench ○ http://betterlesson.com/lesson/644582/the-particles-of-matter-Matter-and-Its-Interactions-Unit New Jersey Center for Teaching and Learning 	<p>Varied Levels of Text:</p> <ul style="list-style-type: none"> ● leveled readers ● Newsela ● Storyworks ● <i>Made of Matter</i> ● <i>Break it Down</i> ● <i>Solving Dissolving</i> ● <i>Science You Can’t See</i> ● <i>Food Scientist’s Handbook</i> ● <i>Mason, A. (2006). Change it! Solids, liquids, gases and you</i> ● <i>Stille, D. (2004). Matter: See it, touch it, taste it, smell it</i> ● <i>Slade, S. (2014). Splat! Wile E. Coyote experiments with states of matter</i>

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<ul style="list-style-type: none">○ -What is an Atom -Basics for Kids	<ul style="list-style-type: none">● <i>Walliman, D. (2016). Professor Astrocat's atomic adventure</i>● <i>Kelsey, E. (2012). You are stardust.</i>● <i>Berne, J. (2016). On a beam of light: A story of Albert Einstein</i>● <i>Wells, R. (1995). What's smaller than a pygmy shrew?</i>● <i>Braun, E. (2012). Joe-Joe the wizard brews up solids, liquids and gases</i>● <i>Green, D. (2008). Physics: Why matter matters.</i>● <i>Yorifuji, B. (2012). Wonderful life with the elements: The periodic table personified</i>
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Modifications and Accommodations

English Language Learners:

- Provide pictures and well labeled models
- Speak slowly and gesture when necessary
- Pre-teach vocabulary words
- Extended time on assessments
- Small group for assessment
- Review Vocabulary
- Allow for alternate responses during activities and assessments
- Literacy and language support strategies including discourse
- Use a poster, slide, or picture to support student listening in science such as GLAD pictorial input chart
- Preview science texts with students, discussing salient text features such as tables, graphs, and photographs before they read it.
- Provide summaries and include native language texts.
- Provide sentence stems for all students to use, especially to support complex verbal practices like argumentation, explanation, and communication.
- Engage ELs in authentic vocabulary exploration as they try to make their thoughts meaningful to others through writing. Provide dictionaries or [Google Translate](#). Look beyond grammar and spelling to understand student ideas.
- Home culture connections

Special Education/504 Plans/Students with Disabilities:

- Follow specific IEP/504 accommodations and modifications
- Strategic grouping
- Pre-teach concepts
- Small group for assessments

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- Check in's during experiments to help refocus
- Allow alternate assignments and assessments
- Differentiated Instruction

Students at Risk of Failure:

- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Incorporate social/emotional discussions
- Encourage and monitor positive peer collaboration
- Provide academic resources for both home and school use
- Provide incentives to increase motivation and collaboration

Economically Disadvantaged:

- Provide clear, achievable expectations, do not lower academic requirements for them.
- Build a safe and nurturing atmosphere
- Be flexible with assignments
- Offer several alternatives from which all students can choose.
- Allow students to finish assignments independently, or give them the opportunity to complete tasks at their own pace.
- Use real-world examples and create mental models for abstract idea
- Provide increased knowledge base and vocabulary use about real world experiences.
- Share the decision making in class.
- Maintain expectations while offering choice and soliciting input
- Connect concepts to students' sense of "place" as physical, historical, and sociocultural dimensions
- Ask questions that elicit students' funds of knowledge
- Use cultural artifacts that are meaningful
- Use project-based learning as a form of connected science
- Provide resources for science instruction

Culturally Diverse:

- Involve families in student learning
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Teach study skills
- Provide students with necessary academic resources and materials
- Allow for alternative assignments
- Provide visuals
- Assign peer tutor
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps

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- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students
- Use cultural artifacts that are meaningful relevant
- Integrate community involvement
- Include role models and mentors of similar racial or ethnic backgrounds

Gifted and Talented

- Peer mediated strategies
- Cooperative learning groups
- Differentiated instruction

Presentation accommodations allow a student to:

- Vary the method of presentation: lecture, small groups, large group, demonstration, individual experimentation
- Explore real world connections
- Use technology tools to enhance content

Response accommodations allow a student to:

- Turn and Talk
- Reward risk taking while encouraging students to think “outside of the box”

Setting accommodations allow a student to:

- Use flexible seating
- Have choice in seating/grouping

Timing accommodations allow a student to:

- Have flexible pacing in terms of content, assignments, and assessments
- Explore extended activities

Scheduling accommodations allow a student to:

- Establish a timeline for completing a project
- Have rigorous Pacing

Organization skills accommodations allow a student to:

- Model executive functioning
- Utilize independent skills practices

Assignment modifications allow a student to:

- Complete enrichment tasks
- Write longer passages on essays and open ended responses including academic vocabulary
- Answer higher order thinking questions

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- Cite text evidence
- Create alternate projects or assignments, student developed rubrics, student choice when completing a project or alternate labs

Curriculum modifications provide:

- Topics of interest to the student and/or relevant to how the world works
- Students access to supplemental reading materials matched to individual student lexiles
- Opportunities for open-ended, self-directed activities
- Opportunities to get graded or assessed using a different standard than the one for others

Unit 3: Earth's Systems	Duration: 25 days
Science Standards 5-ESS2-1, 5-ESS2-2	
Disciplinary Core Ideas 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)	
Science and Engineering Practices SEP.2 Developing and Using Models Develop a model to describe phenomena SEP.6 Constructing Explanations Construct explanations of observed relationships	
Crosscutting Concepts CCC.4 Systems and System Models Understanding that a system is a group of related parts that make up a whole and can carry out functions its individual parts cannot.	
Connections to Nature of Science Science is a Human Endeavor Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (5-ESS2-1)	
Computer Science and Design Thinking Standards 8.2.5.NT.2: Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies.	

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8.2.5.NT.3: Redesign an existing product for a different purpose in a collaborative team.
8.2.5.NT.4: Identify how improvement in the understanding of materials science impacts technologies (5-ESS2-1).

Interdisciplinary Standards ELA/Literacy
RI.5.3 Explain the relationships or interactions between two or more individuals, events, ideas or concepts in a historical, scientific, or technical text based on specific information in the text.
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

Enduring Understandings

Earth is a nonliving object that is made up of four major systems (geosphere, atmosphere, hydrosphere, and biosphere).
{Geosphere (solid/molten rock, soil, sediments. Hydrosphere (water and ice). Biosphere (living things, including humans). Atmosphere (air).}
Earth’s systems interact in multiple ways to affect Earth’s surface materials and processes

Essential Questions

What are the four major systems that make up our Earth and how do they interact?
What are the components of the atmosphere, biosphere, hydrosphere, and geosphere?
How does the ocean affect other systems?
What effect does ocean water have on the nearby land?
How does the interaction of winds/clouds and mountains determine weather patterns?
How can the engineering process be used to solve real world problems?

Career Readiness, Life Literacies, and Key Skills Practices

The following skills are encouraged and taught:
Demonstrate creativity and innovation.
Utilize critical thinking to make sense of problems and persevere in solving them.
Use technology to enhance productivity increase collaboration and communicate effectively
Work productively in teams while using cultural/global competence.

Career Readiness, Life Literacies, and Key Skills Standards

9.4.5.CT.2: Identify a problem and list the types of individuals and resources (e.g., school, community agencies, governmental, online) that can aid in solving the problem (e.g., 2.1.5.CHSS.1, 4-ESS3-1).
9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.

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<p>9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (5-ESS2-1, 6.1.5.CivicsCM.3).</p>
<p>LGBT and Disabilities Law N.J.S.A 18A:35-4.35 Instruction on the political, economic, and social integration of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum</p>
<p>Amistad Law: N.J.S.A 18A:52:16A-88-4.35 Instruction regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of secondary school students.</p>
<p>Holocaust Law N.J.S.A 18A:35-28 Instruction on the Holocaust and genocides in an appropriate place in the curriculum with an emphasis on the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.</p>

Student Learning Goals/Objectives	
<p><i>Students will know:</i> The components of Earth’s systems The interactions of Earth’s systems The effect of the ocean on Earth’s systems How to analyze and interpret data to explain the interconnectedness of two systems interactions How to define problems and develop solutions</p>	<p><i>Students will be able to:</i> Develop a model using an example to describe ways the geosphere, hydrosphere, biosphere and/or atmosphere interact (5-ESS2-1)</p>
Assessment Evidence	
<p>Performance Tasks Develop models of Earth’s systems interactions Interpret bar graphs of rainfall data Research the career of air pollution analyst Create terrarium to demonstrate interaction of spheres Identify how improvement in the understanding of materials science impacts technologies</p>	<p>Other Assessments Formative:</p> <ul style="list-style-type: none"> ● Lesson quizzes, and reviews ● Student investigations and models ● Language Arts writing activities ● Graphic Organizers & Guided Note Taking ● Directed Reading ● Cooperative Group Learning

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	<ul style="list-style-type: none">• Homework• Journal Entries• Exit Tickets• Polls/ Surveys with self evaluation component• Jigsaw• Think, Pair, Share• Quizzes <p>Alternative:</p> <ul style="list-style-type: none">• Modified tests and quizzes• Group work• Peer assessments• Labs• Projects• Portfolio Assessments <p>Summative</p> <ul style="list-style-type: none">• Unit Test/Topic Test• Unit Project• Performance Assessment/Tasks• Engineering projects <p>Benchmark Assessments:</p> <ul style="list-style-type: none">• Unit pre-test• Beginning of the year, mid year, and end of the year SGO
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Core Instructional & Supplemental Materials	
<p>Suggested Activities/Resources:</p> <ul style="list-style-type: none">• Savvas Realize “Elevate Science”<ul style="list-style-type: none">○ Lesson explorations○ Hands-on activities○ Virtual Labs○ Video based projects○ Performance tasks○ Engineering projects• www.Betterlesson.com• www.teachengineering.org• sciencing.com	<p>Varied Levels of Text:</p> <ul style="list-style-type: none">• leveled readers• Newsela• Storyworks• Cole, J. The magic school bus and the climate challenge. (2010).• Bang, M. & Chisholm, P. (2014) Buried sunlight: How fossil fuels have changed the earth

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	<ul style="list-style-type: none">• Rockwell, A. (2006). Why are the ice caps melting? The dangers of global warming.• Chambers, C. (2016). Stickmen's guide to Earth's atmosphere in layers• Strauss, R. (2007). One well: The story of water on earth• Bang, M. (2014) Common ground: The water, earth and air we share.• Mulder, M. (2014). Every last drop: Bringing clean water home.
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Modifications and Accommodations

English Language Learners:

- Provide pictures and well labeled models
- Speak slowly and gesture when necessary
- Pre-teach vocabulary words
- Extended time on assessments
- Small group for assessment
- Review Vocabulary
- Allow for alternate responses during activities and assessments
- Literacy and language support strategies including discourse
- Use a poster, slide, or picture to support student listening in science such as GLAD pictorial input chart
- Preview science texts with students, discussing salient text features such as tables, graphs, and photographs before they read it.
- Provide summaries and include native language texts.
- Provide sentence stems for all students to use, especially to support complex verbal practices like argumentation, explanation, and communication.
- Engage ELs in authentic vocabulary exploration as they try to make their thoughts meaningful to others through writing. Provide dictionaries or [Google Translate](#). Look beyond grammar and spelling to understand student ideas.
- Home culture connections

Special Education/504 Plans/Students with Disabilities:

- Follow specific IEP/504 accommodations and modifications
- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus

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- Allow alternate assignments and assessments
- Differentiated Instruction

Students at Risk of Failure:

- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Incorporate social/emotional discussions
- Encourage and monitor positive peer collaboration
- Provide academic resources for both home and school use
- Provide incentives to increase motivation and collaboration

Economically Disadvantaged:

- Provide clear, achievable expectations, do not lower academic requirements for them.
- Build a safe and nurturing atmosphere
- Be flexible with assignments
- Offer several alternatives from which all students can choose.
- Allow students to finish assignments independently, or give them the opportunity to complete tasks at their own pace.
- Use real-world examples and create mental models for abstract idea
- Provide increased knowledge base and vocabulary use about real world experiences.
- Share the decision making in class.
- Maintain expectations while offering choice and soliciting input
- Connect concepts to students' sense of "place" as physical, historical, and sociocultural dimensions
- Ask questions that elicit students' funds of knowledge
- Use cultural artifacts that are meaningful
- Use project-based learning as a form of connected science
- Provide resources for science instruction

Culturally Diverse:

- Involve families in student learning
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Teach study skills
- Provide students with necessary academic resources and materials
- Allow for alternative assignments
- Provide visuals
- Assign peer tutor
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation

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- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students
- Use cultural artifacts that are meaningful relevant
- Integrate community involvement
- Include role models and mentors of similar racial or ethnic backgrounds

Gifted and Talented

- Peer mediated strategies
- Cooperative learning groups
- Differentiated instruction

Presentation accommodations allow a student to:

- Vary the method of presentation: lecture, small groups, large group, demonstration, individual experimentation
- Explore real world connections
- Use technology tools to enhance content

Response accommodations allow a student to:

- Turn and Talk
- Reward risk taking while encouraging students to think “outside of the box”

Setting accommodations allow a student to:

- Use flexible seating
- Have choice in seating/grouping

Timing accommodations allow a student to:

- Have flexible pacing in terms of content, assignments, and assessments
- Explore extended activities

Scheduling accommodations allow a student to:

- Establish a timeline for completing a project
- Have rigorous pacing

Organization skills accommodations allow a student to:

- Model executive functioning
- Utilize independent skills practices

Assignment modifications allow a student to:

- Complete enrichment tasks
- Write longer passages on essays and open ended responses including academic vocabulary
- Answer higher order thinking questions
- Cite text evidence

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- Create alternate projects or assignments, student developed rubrics, student choice when completing a project or alternate labs

Curriculum modifications provide:

- Topics of interest to the student and/or relevant to how the world works
- Students access to supplemental reading materials matched to individual student lexiles
- Opportunities for open-ended, self-directed activities
- Opportunities to get graded or assessed using a different standard than the one for others

Unit 4: Earth’s Water	Duration: 25 days
Science Standards 5-ESS2-2	
Disciplinary Core Ideas 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 or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2)	
Science and Engineering Practices SEP.2 Developing and Using Models Develop a model to describe phenomena SEP.6 Constructing Explanations and Designing Solutions Use evidence to construct or support an explanation or design a solution to a problem	
Crosscutting Concepts CCC.3 Scale, Proportion, and Quantity Using standard units to measure and describe physical quantities such as weight, time, temperature and volume.	
Connections to Nature of Science Science is a Human Endeavor Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (5-ESS2-2)	
Computer Science and Design Thinking Standards 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.3: Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task. (5-ESS2-2)	

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Interdisciplinary Standards ELA/Literacy

RI.5.9.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

MP.2 Reason abstractly and quantitatively

MP.4 Model with mathematics

Enduring Understandings

Nearly all of Earth's available water is in the ocean - freshwater in glaciers or underground; a tiny fraction in streams, lakes, wetlands, and atmosphere.

Essential Questions

Where is the water on Earth located? Where and how much of this water is usable by humans?

How is water distributed on Earth? (percentage)

What is the effect of melting ice on Earth's systems?

How can we design a solution to a local problem related to climate change?

Career Readiness, Life Literacies, and Key Skills Practices

The following skills are encouraged and taught:

Demonstrate creativity and innovation.

Utilize critical thinking to make sense of problems and persevere in solving them.

Use technology to enhance productivity increase collaboration and communicate effectively

Work productively in teams while using cultural/global competence.

Career Readiness, Life Literacies, and Key Skills Standards

9.4.8.Cl.4: Explore the role of creativity and innovation in career pathways and industries (5-PS1-2)

9.4.5.Cl.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 (5-PS1-2, W.4.6, 3.MD.B.3,7.1.NM.IPERS.6).

9.4.5.Cl.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 (6.3.5.CivicsPD.3, W.5.7).

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 (8.2.5.ED.2, 1.5.5.CR1a).

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (2.1.5.EH.4, 5-PS1-2, 6.3.5.CivicsPD.2).

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LGBT and Disabilities Law N.J.S.A 18A:35-4.35 Instruction on the political, economic, and social integration of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum

Amistad Law: N.J.S.A 18A:52:16A-88-4.35 Instruction regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of secondary school students.

Holocaust Law N.J.S.A 18A:35-28
Instruction on the Holocaust and genocides in an appropriate place in the curriculum with an emphasis on the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

Student Learning Goals/Objectives	
<p><i>Students will know:</i></p> <p>Where freshwater is located on Earth.</p> <p>How to construct a graph to represent and analyze the distribution of water on Earth.</p> <p>The percentage of freshwater on earth that is available for human use.</p> <p>Why it is important to preserve the water we currently have available for human use</p>	<p><i>Students will be able to:</i></p> <p>Describe and graph the amounts and percentages of water and freshwater in various reservoirs to provide evidence about the distribution of water on Earth (ESS2-2)</p>
Assessment Evidence	
<p>Performance Tasks</p> <p>Explain parts of the water cycle</p> <p>Recognize that the ocean is an important part of the water cycle.</p> <p>Identify where most freshwater is found</p> <p>Explain other freshwater sources</p> <p>Develop a prototype to convey proposed object, tool or process</p> <p>Apply scientific ideas to solve design problems</p>	<p>Other Assessments</p> <p>Formative:</p> <ul style="list-style-type: none"> ● Lesson quizzes, and reviews ● Student investigations and models ● Language Arts writing activities ● Graphic Organizers & Guided Note Taking ● Directed Reading ● Cooperative Group Learning ● Homework

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	<ul style="list-style-type: none"> ● Journal Entries ● Exit Tickets ● Polls/ Surveys with self evaluation component ● Jigsaw ● Think, Pair, Share ● Quizzes <p>Alternative:</p> <ul style="list-style-type: none"> ● Modified tests and quizzes ● Group work ● Peer assessments ● Labs ● Projects ● Portfolio Assessments <p>Summative</p> <ul style="list-style-type: none"> ● Unit Test/Topic Test ● Unit Project ● Performance Assessment/Tasks ● Engineering projects <p>Benchmark Assessments:</p> <ul style="list-style-type: none"> ● Unit pre-test ● Beginning of the year, mid year, and end of the year SGO
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Core Instructional & Supplemental Materials	
<p>Suggested Activities/Resources:</p> <ul style="list-style-type: none"> ● Savvas Realize “Elevate Science” <ul style="list-style-type: none"> ○ Lesson explorations ○ Hands-on activities ○ Virtual Labs ○ Video based projects ○ Performance tasks ○ Engineering projects <p>“How Can You Find Water Underground?” p.155 “How do we filter water?” p.160 “It’s Melting” p.152 Engineering Design</p>	<p>Varied Levels of Text:</p> <ul style="list-style-type: none"> ● leveled readers ● Newsela ● Storyworks ● Strauss, R. (2007). One well: The story of water on earth ● Bang, M. (2014) Common ground: The water, earth and air we share. ● Mulder, M. (2014). Every last drop: Bringing clean water home.

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Modifications and Accommodations

English Language Learners:

- Provide pictures and well labeled models
- Speak slowly and gesture when necessary
- Pre-teach vocabulary words
- Extended time on assessments
- Small group for assessment
- Review Vocabulary
- Allow for alternate responses during activities and assessments
- Literacy and language support strategies including discourse
- Use a poster, slide, or picture to support student listening in science such as GLAD pictorial input chart
- Preview science texts with students, discussing salient text features such as tables, graphs, and photographs before they read it.
- Provide summaries and include native language texts.
- Provide sentence stems for all students to use, especially to support complex verbal practices like argumentation, explanation, and communication.
- Engage ELs in authentic vocabulary exploration as they try to make their thoughts meaningful to others through writing. Provide dictionaries or [Google Translate](#). Look beyond grammar and spelling to understand student ideas.
- Home culture connections

Special Education/504 Plans/Students with Disabilities:

- Follow specific IEP/504 accommodations and modifications
- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Allow alternate assignments and assessments
- Differentiated Instruction

Students at Risk of Failure:

- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Incorporate social/emotional discussions
- Encourage and monitor positive peer collaboration
- Provide academic resources for both home and school use
- Provide incentives to increase motivation and collaboration

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Economically Disadvantaged:

- Provide clear, achievable expectations, do not lower academic requirements for them.
- Build a safe and nurturing atmosphere
- Be flexible with assignments
- Offer several alternatives from which all students can choose.
- Allow students to finish assignments independently, or give them the opportunity to complete tasks at their own pace.
- Use real-world examples and create mental models for abstract idea
- Provide increased knowledge base and vocabulary use about real world experiences.
- Share the decision making in class.
- Maintain expectations while offering choice and soliciting input
- Connect concepts to students' sense of "place" as physical, historical, and sociocultural dimensions
- Ask questions that elicit students' funds of knowledge
- Use cultural artifacts that are meaningful
- Use project-based learning as a form of connected science
- Provide resources for science instruction

Culturally Diverse:

- Involve families in student learning
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Teach study skills
- Provide students with necessary academic resources and materials
- Allow for alternative assignments
- Provide visuals
- Assign peer tutor
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students
- Use cultural artifacts that are meaningful relevant
- Integrate community involvement
- Include role models and mentors of similar racial or ethnic backgrounds

Gifted and Talented

- Peer mediated strategies
- Cooperative learning groups
- Differentiated instruction

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Presentation accommodations allow a student to:

- Vary the method of presentation: lecture, small groups, large group, demonstration, individual experimentation
- Explore real world connections
- Use technology tools to enhance content

Response accommodations allow a student to:

- Turn and Talk
- Reward risk taking while encouraging students to think “outside of the box”

Setting accommodations allow a student to:

- Use flexible seating
- Have choice in seating/grouping

Timing accommodations allow a student to:

- Have flexible pacing in terms of content, assignments, and assessments
- Explore extended activities

Scheduling accommodations allow a student to:

- Establish a timeline for completing a project
- Have rigorous Pacing

Organization skills accommodations allow a student to:

- Model executive functioning
- Utilize independent skills practices

Assignment modifications allow a student to:

- Complete enrichment tasks
- Write longer passages on essays and open ended responses including academic vocabulary
- Answer higher order thinking questions
- Cite text evidence
- Create alternate projects or assignments, student developed rubrics, student choice when completing a project or alternate labs

Curriculum modifications provide:

- Topics of interest to the student and/or relevant to how the world works
- Students access to supplemental reading materials matched to individual student lexiles
- Opportunities for open-ended, self-directed activities
- Opportunities to get graded or assessed using a different standard than the one for others

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Unit 5: Human Impact on Earth's Systems	Duration: 25 days
Science Standards 5-ESS3-1	
Disciplinary Core Ideas ESS3.C 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.	
Science and Engineering Practices SEP.1 Asking questions and Defining Problems Define a simple design problem that can be solved through the development of an object, tool or process. SEP.6 Constructing Explanations and Designing Solutions Use evidence to construct or support an explanation or design a solution to a problem SEP.8 Obtaining, Evaluating, and Communicating Information Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem	
Crosscutting Concepts CCC.4 Systems and System Models A system can be described in terms of its components and their interactions	
Connections to Nature of Science Science is a Human Endeavor Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (5-ESS3-1)	
Computer Science and Design Thinking Standards 8.2.5.ETW.1: Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems. (5-ESS3-1) 8.2.5.ETW.2: Describe ways that various technologies are used to reduce improper use of resources. 8.2.5.ITH.1: Explain how societal needs and wants influence the development and function of a product and a system. 8.2.5.ED.4: Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints). 8.2.5.ED.5: Describe how specifications and limitations impact the engineering design process. 8.2.5.ED.6: Evaluate and test alternative solutions to a problem using the constraints and tradeoffs identified in the design process.	

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Interdisciplinary Standards ELA/Literacy

RI.5.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

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

MP.2 Reason abstractly and quantitatively

Enduring Understandings

Human activities have had major effects on the Earth's resources.

Individuals and communities can help protect Earth's resources and environments

Conservation of resources is necessary for providing resources for Earth's inhabitants

Essential Questions

What are natural resources, where are they found, and how are they used?

How can we classify and differentiate between renewable and nonrenewable resources?

Where does energy come from?

How do human activities affect earth's systems?

How do building materials affect energy efficiency?

How can we protect and conserve resources?

Why is it important to conserve resources?

Career Readiness, Life Literacies, and Key Skills Practices

The following skills are encouraged and taught:

Demonstrate creativity and innovation.

Utilize critical thinking to make sense of problems and persevere in solving them.

Use technology to enhance productivity increase collaboration and communicate effectively

Work productively in teams while using cultural/global competence.

Career Readiness, Life Literacies, and Key Skills Standards

9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries (5-PS1-2)

LGBT and Disabilities Law N.J.S.A 18A:35-4.35 Instruction on the political, economic, and social integration of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum

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Amistad Law: N.J.S.A 18A:52:16A-88-4.35 Instruction regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of secondary school students.

Holocaust Law N.J.S.A 18A:35-28
 Instruction on the Holocaust and genocides in an appropriate place in the curriculum with an emphasis on the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

Student Learning Goals/Objectives	
<p><i>Students will know:</i></p> <p>How a given human activity (e.g., in agriculture, industry, everyday life) affects the Earth's resources and environments.</p> <p>How a given community uses scientific ideas to protect a given natural resource and the environment in which the resource is found.</p> <p>The positive and negative effects on the environment as a result of human activities.</p> <p>How individual communities can use scientific ideas and a scientific understanding of interactions between components of environmental systems to protect a natural resource and the environment in which the resource is found.</p> <p>Environmental Science careers</p>	<p><i>Students will be able to:</i></p> <p>5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment</p>
Assessment Evidence	
<p>Performance Tasks</p> <p>Describe Earth's resources</p> <p>Compare and contrast types of resources</p> <p>Develop solutions to a design problem</p>	<p>Other Assessments</p> <p>Formative:</p> <ul style="list-style-type: none"> ● Lesson quizzes, and reviews ● Student investigations and models

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<p>Identify where energy comes from</p>	<ul style="list-style-type: none"> ● Language Arts writing activities ● Graphic Organizers & Guided Note Taking ● Directed Reading ● Cooperative Group Learning ● Homework ● Journal Entries ● Exit Tickets ● Polls/ Surveys with self evaluation component ● Jigsaw ● Think, Pair, Share ● Quizzes <p>Alternative:</p> <ul style="list-style-type: none"> ● Modified tests and quizzes ● Group work ● Peer assessments ● Labs ● Projects ● Portfolio Assessments <p>Summative</p> <ul style="list-style-type: none"> ● Unit Test/Topic Test ● Unit Project ● Performance Assessment/Tasks ● Engineering projects <p>Benchmark Assessments:</p> <ul style="list-style-type: none"> ● Unit pre-test ● Beginning of the year, mid year, and end of the year SGO
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Core Instructional & Supplemental Materials	
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<ul style="list-style-type: none">○ Performance tasks○ Engineering projects	<ul style="list-style-type: none">● Paul, M. (2015) One plastic bag: Isatou Ceesay and the recycling women of the Gambia.● Schuch, S. (2002). A symphony of whales.● Bouler, O. (2011). Olivia's birds: Saving the gulf● Drummond, A. (2015). Energy island: How one community harnessed the wind and changed their world.
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Modifications and Accommodations

English Language Learners:

- Provide pictures and well labeled models
- Speak slowly and gesture when necessary
- Pre-teach vocabulary words
- Extended time on assessments
- Small group for assessment
- Review Vocabulary
- Allow for alternate responses during activities and assessments
- Literacy and language support strategies including discourse
- Use a poster, slide, or picture to support student listening in science such as GLAD pictorial input chart
- Preview science texts with students, discussing salient text features such as tables, graphs, and photographs before they read it.
- Provide summaries and include native language texts.
- Provide sentence stems for all students to use, especially to support complex verbal practices like argumentation, explanation, and communication.
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- Home culture connections

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- Follow specific IEP/504 accommodations and modifications
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- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Allow alternate assignments and assessments

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- Differentiated Instruction

Students at Risk of Failure:

- Strategic grouping
- Pre-teach concepts
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- Check in's during experiments to help refocus
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- Encourage and monitor positive peer collaboration
- Provide academic resources for both home and school use
- Provide incentives to increase motivation and collaboration

Economically Disadvantaged:

- Provide clear, achievable expectations, do not lower academic requirements for them.
- Build a safe and nurturing atmosphere
- Be flexible with assignments
- Offer several alternatives from which all students can choose.
- Allow students to finish assignments independently, or give them the opportunity to complete tasks at their own pace.
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- Ask questions that elicit students' funds of knowledge
- Use cultural artifacts that are meaningful
- Use project-based learning as a form of connected science
- Provide resources for science instruction

Culturally Diverse:

- Involve families in student learning
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Teach study skills
- Provide students with necessary academic resources and materials
- Allow for alternative assignments
- Provide visuals
- Assign peer tutor
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education

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- Communicate high expectations for the success of all students
- Use cultural artifacts that are meaningful relevant
- Integrate community involvement
- Include role models and mentors of similar racial or ethnic backgrounds

Gifted and Talented

- Peer mediated strategies
- Cooperative learning groups
- Differentiated instruction

Presentation accommodations allow a student to:

- Vary the method of presentation: lecture, small groups, large group, demonstration, individual experimentation
- Explore real world connections
- Use technology tools to enhance content

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- Turn and Talk
- Reward risk taking while encouraging students to think “outside of the box”

Setting accommodations allow a student to:

- Use flexible seating
- Have choice in seating/grouping

Timing accommodations allow a student to:

- Have flexible pacing in terms of content, assignments, and assessments
- Explore extended activities

Scheduling accommodations allow a student to:

- Establish a timeline for completing a project
- Have rigorous Pacing

Organization skills accommodations allow a student to:

- Model executive functioning
- Utilize independent skills practices

Assignment modifications allow a student to:

- Complete enrichment tasks
- Write longer passages on essays and open ended responses including academic vocabulary
- Answer higher order thinking questions
- Cite text evidence
- Create alternate projects or assignments, student developed rubrics, student choice when

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completing a project or alternate labs

Curriculum modifications provide:

- Topics of interest to the student and/or relevant to how the world works
- Students access to supplemental reading materials matched to individual student lexiles
- Opportunities for open-ended, self-directed activities
- Opportunities to get graded or assessed using a different standard than the one for others

Unit 6: Solar System and Patterns in Space	Duration: 25 days
Science Standards 5-ESS1-1, 3-5 ETS1-1, 5-ESS1-2, 5-PS2-1	
<p>Disciplinary Core Ideas</p> <p>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.</p> <p>PS2.B Types of Interactions The gravitational force exerted by Earth acting on an object near Earth’s surface pulls that object toward the planet’s center..</p> <p>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</p>	
<p>Science and Engineering Practices</p> <p>SEP.2 Developing and Using Models Develop a model to describe phenomena</p> <p>SEP.3 Planning and Carrying Out Investigation Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon.</p> <p>SEP.4 Analyzing and Interpreting Data Represent data in graphical displays to reveal patterns that indicate relationships</p> <p>SEP.6 Constructing Explanations and Designing Solutions Use evidence to construct or support an explanation or design a solution to a problem</p>	
<p>Crosscutting Concepts</p> <p>CCC.1 Patterns Classifying and sorting natural objects and designed products to observe patterns</p> <p>CCC.2 Cause and Effect Identifying and testing causal relationships and using these relationships to explain change</p> <p>CCC.3 Scale, Proportion, and Quantity Natural objects exist from the very small to the immensely large</p>	

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Connections to Nature of Science Science is a Human Endeavor

Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (5-ESS1--2)

Computer Science and Design Thinking Standards

8.2.5.ITH.2: Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have. (5-ESS1-2, 3-5 ETS1-1)

8.2.5.ITH.3: Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use.

8.2.5.ITH.4: Describe a technology/tool that has made the way people live easier or has led to a new business or career..

Interdisciplinary Standards ELA/Literacy

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 points.

W.5.3.C Use a variety of transitional words, phrases, and clauses to manage the sequence of events

5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multistep, real-world problems

Enduring Understandings

Many stars are as big and bright as the sun.

The brightness of stars is related to their distances from Earth.

Changes in length and directions of shadows occur over time

Changes in day and night occur over time

Seasonal appearance of stars change over time

Gravity is the pull from Earth that keeps objects from floating into space.

Gravitational force pulls from each object's center of gravity (center of its mass)

Essential Questions

How does the sun compare in size and brightness to other stars?

What factors affect the brightness of stars? (What factors make certain stars appear brighter than others?)

How are distance and brightness of stars related? (How does the relative distance affect the brightness of a star?)

What causes night and day?

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Why are some constellations only visible during certain times of the year?
 Why do shadows appear larger at certain times of the day, and shorter at other times?
 How does gravity affect objects on Earth? (What role does gravity play as it pertains to objects on Earth?)
 How do shadows change over time?
 What seasonal changes can be observed in patterns of stars over time?
 How do patterns of day and night change over time?

Career Readiness, Life Literacies, and Key Skills Practices

The following skills are encouraged and taught:
 Demonstrate creativity and innovation.
 Utilize critical thinking to make sense of problems and persevere in solving them.
 Use technology to enhance productivity increase collaboration and communicate effectively
 Work productively in teams while using cultural/global competence.

Career Readiness, Life Literacies, and Key Skills Standards

9.4.8.Cl.4: Explore the role of creativity and innovation in career pathways and industries (5-ESS1-2)

LGBT and Disabilities Law N.J.S.A 18A:35-4.35 Instruction on the political, economic, and social integration of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum

Amistad Law: N.J.S.A 18A:52:16A-88-4.35 Instruction regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of secondary school students.

Holocaust Law N.J.S.A 18A:35-28
 Instruction on the Holocaust and genocides in an appropriate place in the curriculum with an emphasis on the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

Student Learning Goals/Objectives	
<p><i>Students will know:</i> Earth's gravity is directed down toward the center of Earth. Day and night are caused by Earth's rotation</p>	<p><i>Students will be able to:</i> Support an argument that the gravitational force exerted by Earth on objects is directed down. (5-PS2-1)</p>

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<p>Why the sun casts different sized shadows How the tilt of the Earth’s axis affects the angle at which the Sun’s rays hit the Earth. Earth revolves around the sun about once a year The length of shadows decreases during the day until they reach a certain point, then the shadows gradually start to get larger The location of constellations in the night sky appear in different locations due to the rotation and revolution of Earth Why the amount of daylight is different depending on the time of year The relative brightness of the Sun compared to other stars is a function of the distance to those stars. How to use graphical displays (e.g., bar graphs, pictographs) to organize data pertaining to daily and seasonal changes caused by the Earth’s rotation and orbit around the sun.</p> <ul style="list-style-type: none"> ● Students use the organized data to find and describe relationships within the datasets. 	<p>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-ESS1-2)</p>
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Assessment Evidence

<p>Performance Tasks Demonstrate that Earth’s gravity pulls objects toward the center of Earth. Demonstrate that day and night are caused by Earth’s rotation Construct explanation for the effects of Earth’s movements around the sun Create an argument that the relative brightness of the Sun compared to other stars is a function of the distance to those stars. Explain how day turns into night. Explain why the sun casts different sized shadows. Explain that the location of constellations in the night sky appear in different locations due to the rotation and revolution of Earth.</p>	<p>Other Assessments Formative:</p> <ul style="list-style-type: none"> ● Lesson quizzes, and reviews ● Student investigations and models ● Language Arts writing activities ● Graphic Organizers & Guided Note Taking ● Directed Reading ● Cooperative Group Learning ● Homework ● Journal Entries ● Exit Tickets ● Polls/ Surveys with self evaluation component ● Jigsaw
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<p>Explain that the length of shadows decreases during the day until they reach a certain point, then the shadows gradually start to get larger.</p> <p>Describe why daylight differs throughout the year</p> <p>Model how shadows change</p> <p>Use graphical displays (e.g., bar graphs, pictographs) to organize data pertaining to daily and seasonal changes caused by the Earth's rotation and orbit around the sun.</p>	<ul style="list-style-type: none"> ● Think, Pair, Share ● Quizzes <p>Alternative:</p> <ul style="list-style-type: none"> ● Modified tests and quizzes ● Group work ● Peer assessments ● Labs ● Projects ● Portfolio Assessments <p>Summative</p> <ul style="list-style-type: none"> ● Unit Test/Topic Test ● Unit Project ● Performance Assessment/Tasks ● Engineering projects <p>Benchmark Assessments:</p> <ul style="list-style-type: none"> ● Unit pre-test ● Beginning of the year, mid year, and end of the year SGO
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Core Instructional & Supplemental Materials	
<p>Suggested Activities/Resources:</p> <ul style="list-style-type: none"> ● Savvas Realize "Elevate Science" <ul style="list-style-type: none"> ○ Lesson explorations ○ Hands-on activities ○ Virtual Labs ○ Video based projects ○ Performance tasks ○ Engineering projects 	<p>Varied Levels of Text:</p> <ul style="list-style-type: none"> ● leveled readers ● Newsela ● Storyworks ● <i>Gravity</i> ● <i>How Big Is Big? How Far Is Far?</i> ● <i>Which Way is Up?</i> ● <i>Dog Days of Summer</i> ● <i>Handbook of Stars and Constellations</i> ● <i>Star Scientist</i> ● <i>Lowe, S. (2015). Cosmos: The infographic book of space</i> ● <i>Sisson, S. (2014). Star stuff: Carl Sagan and the mysteries of the cosmos</i> ● <i>Simon, S. (1989). The sun</i> ● <i>Gibbons, G. (1995) The reason for seasons</i>

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- Bailey, J. (2004). *Sun up, sun down: The story of day and night.*
- Zopfi, G. (2014). *Shadowman.*

Modifications and Accommodations

English Language Learners:

- Provide pictures and well labeled models
- Speak slowly and gesture when necessary
- Pre-teach vocabulary words
- Extended time on assessments
- Small group for assessment
- Review Vocabulary
- Allow for alternate responses during activities and assessments
- Literacy and language support strategies including discourse
- Use a poster, slide, or picture to support student listening in science such as GLAD pictorial input chart
- Preview science texts with students, discussing salient text features such as tables, graphs, and photographs before they read it.
- Provide summaries and include native language texts.
- Provide sentence stems for all students to use, especially to support complex verbal practices like argumentation, explanation, and communication.
- Engage ELs in authentic vocabulary exploration as they try to make their thoughts meaningful to others through writing. Provide dictionaries or [Google Translate](#). Look beyond grammar and spelling to understand student ideas.
- Home culture connections

Special Education/504 Plans/Students with Disabilities:

- Follow specific IEP/504 accommodations and modifications
- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Allow alternate assignments and assessments
- Differentiated Instruction

Students at Risk of Failure:

- Strategic grouping
- Pre-teach concepts
- Small group for assessments
- Check in's during experiments to help refocus
- Incorporate social/emotional discussions

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- Encourage and monitor positive peer collaboration
- Provide academic resources for both home and school use
- Provide incentives to increase motivation and collaboration

Economically Disadvantaged:

- Provide clear, achievable expectations, do not lower academic requirements for them.
- Build a safe and nurturing atmosphere
- Be flexible with assignments
- Offer several alternatives from which all students can choose.
- Allow students to finish assignments independently, or give them the opportunity to complete tasks at their own pace.
- Use real-world examples and create mental models for abstract idea
- Provide increased knowledge base and vocabulary use about real world experiences.
- Share the decision making in class.
- Maintain expectations while offering choice and soliciting input
- Connect concepts to students' sense of "place" as physical, historical, and sociocultural dimensions
- Ask questions that elicit students' funds of knowledge
- Use cultural artifacts that are meaningful
- Use project-based learning as a form of connected science
- Provide resources for science instruction

Culturally Diverse:

- Involve families in student learning
- Provide social/emotional support
- Respect cultural traditions
- Build in more group work to encourage interaction with peers
- Show photos, videos, and definitions when possible for culturally unique vocabulary
- Teach study skills
- Provide students with necessary academic resources and materials
- Allow for alternative assignments
- Provide visuals
- Assign peer tutor
- Support verbal explanations with non verbal cues: Gestures/ facial expressions Props, realia, manipulatives, concrete materials Visuals, graphs, pictures, maps
- Provide positive praise to increase motivation
- Provide real world connections and emphasize the value of education
- Communicate high expectations for the success of all students
- Use cultural artifacts that are meaningful relevant
- Integrate community involvement
- Include role models and mentors of similar racial or ethnic backgrounds

Gifted and Talented

- Peer mediated strategies

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- Cooperative learning groups
- Differentiated instruction

Presentation accommodations allow a student to:

- Vary the method of presentation: lecture, small groups, large group, demonstration, individual experimentation
- Explore real world connections
- Use technology tools to enhance content

Response accommodations allow a student to:

- Turn and Talk
- Reward risk taking while encouraging students to think “outside of the box”

Setting accommodations allow a student to:

- Use flexible seating
- Have choice in seating/grouping

Timing accommodations allow a student to:

- Have flexible pacing in terms of content, assignments, and assessments
- Explore extended activities

Scheduling accommodations allow a student to:

- Establish a timeline for completing a project
- Have rigorous Pacing

Organization skills accommodations allow a student to:

- Model executive functioning
- Utilize independent skills practices

Assignment modifications allow a student to:

- Complete enrichment tasks
- Write longer passages on essays and open ended responses including academic vocabulary
- Answer higher order thinking questions
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- Create alternate projects or assignments, student developed rubrics, student choice when completing a project or alternate labs

Curriculum modifications provide:

- Topics of interest to the student and/or relevant to how the world works
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Unit 7: Energy and Food	Duration: 25 days
Science Standards 5-LS1-1, 5-LS2-1, 5-PS3-1	
Disciplinary Core Ideas 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) Plants acquire their material for growth chiefly from air and water. 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)	
Science and Engineering Practices SEP.2 Developing and Using Models Develop a model to describe phenomena SEP.3 Planning and Carrying Out Investigation Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. SEP.5 Using Mathematics and Computational Thinking Measuring and graphing quantities to address questions and problems	
Crosscutting Concepts CCC.2 Cause and Effect Identifying and testing causal relationships using these relationships to explain change CCC.3 Scale, Proportion, and Quantity Using standard units to measure and describe physical quantities such as weight, time, temperature and volume. CCC.5 Energy and Matter Matter is transported into, out of, and within systems. CCC.8 Systems and System Models- A system can be described in terms of its components and their interactions	
Connections to Nature of Science Science is a Human Endeavor Scientists and engineers are guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas. (5-LS2-1)	
Computer Science and Design Thinking Standards 8.2.5.ITH.1: Explain how societal needs and wants influence the development and function of a product and a system. (5-LS2-1) 8.2.5.ETW.1: Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems.	

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Interdisciplinary Standards ELA/Literacy

RI.5.5 Compare and contrast the overall structure of events, ideas, concepts or information in two or more texts

RI.5.1 Quote accurately from the text when explaining what the text says explicitly and when drawing inferences from the text

MP.2 Reason abstractly and quantitatively

MP.5 Use appropriate tools strategically

Enduring Understandings

- Everything is made of matter. Matter is made of molecules.
- Animals grow by changing food molecules into body molecules that can build their bodies.
- Animals use some food molecules to release energy for movement and growth.
- Food molecules in an ecosystem can always be traced back to plants.
- Plants use water molecules, carbon dioxide molecules from the air, and energy from the sun to make food.
- Animals and plants grow by changing food molecules into body molecules that can build their bodies.
- Animals and plants use some food molecules to release energy for movement and growth.
- Energy in an ecosystem can always be traced back to the sun.
- Scientists convince others that their claims are correct by using data and ideas as evidence.
- Decomposers release nutrients from dead plants and animals into the soil.
- Animals, plants, and decomposers grow by changing food molecules into body molecules that can build their bodies.
- Animals, plants, and decomposers use some food molecules to release energy for movement and growth.
- Plants need nutrients to help make food molecules for energy and body matter
- Scientists convince others that their claims are correct by using data and ideas as evidence.

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Essential Questions

- How do animals grow?
- Where do food molecules in an ecosystem come from?
- Where do food molecules for plants come from?
- Where does energy in an ecosystem come from?
- Why is the matter that makes up soil different in different places?
- How do nutrients in the soil help plants grow?
- How do scientists convince others that their claims are correct?

Career Readiness, Life Literacies, and Key Skills Practices

The following skills are encouraged and taught:

Demonstrate creativity and innovation.

Utilize critical thinking to make sense of problems and persevere in solving them.

Use technology to enhance productivity increase collaboration and communicate effectively

Work productively in teams while using cultural/global competence.

Career Readiness, Life Literacies, and Key Skills Standards

9.4.5.CT.1: Identify and gather relevant data that will aid in the problem-solving process (e.g., 2.1.5.EH.4, 5-PS3-1, 6.3.5.CivicsPD.2).

LGBT and Disabilities Law N.J.S.A 18A:35-4.35 Instruction on the political, economic, and social integration of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum

Amistad Law: N.J.S.A 18A:52:16A-88-4.35 Instruction regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of secondary school students.

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

Instruction on the Holocaust and genocides in an appropriate place in the curriculum with an emphasis on the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

Student Learning Goals/Objectives

Students will know:

How to identify a given claim to be supported

Students will be able to:

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<p>about a given phenomenon. The claim includes the idea that plants acquire the materials they need for growth chiefly from air and water.</p> <ul style="list-style-type: none"> • Students describe the given evidence, data, and/or models that support the claim. • Students determine whether the evidence supports the claim. • Students use reasoning to connect the evidence to support the claim with argumentation. Students describe a chain of reasoning. <p>Students use models to describe a phenomenon that includes the idea that energy in animals’ food was once energy from the sun. Students identify and describe the components of the model that are relevant for describing the phenomenon.</p> <ul style="list-style-type: none"> • Students identify and describe the relevant relationships between components. • Students use the models to describe causal accounts of the relationships between energy from the sun and animals’ needs for energy. 	<p>5-PS3-1- Use or develop a model to describe how energy in animals’ food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. [Clarification Statement: Examples of models could include diagrams, and flowcharts.]</p> <p>5-LS1-1- Support an argument that plants get the materials they need for growth chiefly from air and water. [Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.]</p> <p>5-LS2-1- Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.[Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.]</p>
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Assessment Evidence

<p>Performance Tasks</p> <p>Construct models to describe how energy in animal’s food was once energy from the sun (food chains, energy pyramids)</p> <p>Describe process of photosynthesis</p> <p>Explain how animals get energy from food</p> <p>Demonstrate how matter moves through ecosystems</p> <p>Explain environmental and other effects of meeting our needs and wants through food production/trade (“What is the real cost of bananas?”)</p>	<p>Other Assessments</p> <p>Formative:</p> <ul style="list-style-type: none"> • Lesson quizzes, and reviews • Student investigations and models • Language Arts writing activities • Graphic Organizers & Guided Note Taking • Directed Reading • Cooperative Group Learning • Homework • Journal Entries • Exit Tickets
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	<ul style="list-style-type: none"> ● Polls/ Surveys with self evaluation component ● Jigsaw ● Think, Pair, Share ● Quizzes <p>Alternative:</p> <ul style="list-style-type: none"> ● Modified tests and quizzes ● Group work ● Peer assessments ● Labs ● Projects ● Portfolio Assessments <p>Summative</p> <ul style="list-style-type: none"> ● Unit Test/Topic Test ● Unit Project ● Performance Assessment/Tasks ● Engineering projects <p>Benchmark Assessments:</p> <ul style="list-style-type: none"> ● Unit pre-test ● Beginning of the year, mid year, and end of the year SGO
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- Heinz, B. (2006). Butternut hollow pond
- Lauber, P. (2016). Who eats what? Food chains and food webs
- Slade, S. (2010). What if there were no gray wolves?
- Bial, R. (2001). A handful of dirt.

Modifications and Accommodations

English Language Learners:

- Provide pictures and well labeled models
- Speak slowly and gesture when necessary
- Pre-teach vocabulary words
- Extended time on assessments
- Small group for assessment
- Review Vocabulary
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- Use a poster, slide, or picture to support student listening in science such as GLAD pictorial input chart
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Students at Risk of Failure:

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Gifted and Talented

- Peer mediated strategies
- Cooperative learning groups
- Differentiated instruction

Presentation accommodations allow a student to:

- Vary the method of presentation: lecture, small groups, large group, demonstration, individual experimentation
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Assignment modifications allow a student to:

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