Frelinghuysen Township School District

Science Curriculum

Frelinghuysen Township School District
Science Curriculum

Frelinghuysen Township School District Mission Statement

Frelinghuysen Township School District is a small and caring community. Its mission is:

- **To provide all students a superior individualized education**
- **To create strategic partnerships with parents and the community to meet students' needs**
- **To provide a compassionate, safe and supportive environment**
- **To support innovative practices by effectively leveraging technology**
- **To develop confident students who will be productive, contributing members of a constantly changing global society**

Curricular Overview

The Science Curriculum was created for Frelinghuysen School District using resources from past curriculum, the New Jersey Student Learning Standards and an analysis of the needs of our students.

The curriculum is based on the Understanding by Design (UbD) philosophy which emphasizes using a backwards design that uses goals to drive the learning plan. This ensures that instruction is focused and driven by specific learning outcomes. Units are organized into themes and learning goals, with pacing guides and suggested resources for teachers to use to guide daily instruction.

Frelinghuysen Township School seeks to provide our students with a well-rounded curriculum supported by best practices in education to guide our students throughout their entire educational journey. This curriculum was created with the intention of keeping with our mission of developing productive students through a superior, individualized education that effectively leverages technology in a safe and supportive school community.

Written/Edited by:

Stephanie Bonaparte
Kim Allen
Tracy Smolen
Jennifer Guida
Christine Wagner
Kate Lorenzo
Diana Puzio

Board of Education adoption: November 17, 2021

Frelinghuysen Township School District
Science Curriculum

Grade K

Unit 1: Motion and Stability: Forces and Interaction	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards **K-PS2-1** Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. [Clarification Statement: Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.] [Assessment Boundary: Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include non-contact pushes or pulls such as those produced by magnets.] **K-PS2-2** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull. [Clarification Statement: Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.] [Assessment Boundary: Assessment does not include friction as a mechanism for change in speed.]	**Technology Standards** (K-2) 8.1.2.A.4-Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums). 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.2.E.1-Use digital tools and online resources to explore a problem or issue. (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. **21st Century Life and Career Standards** 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.
Learning Outcomes	
Students will understand…. ● Nonliving things need help to move and move in different ways ● Pushes and pulls Force on an object affects how it moves and the direction it moves ● Force and direction ● How gravity affects motion ● Simple machines ● How magnets are used to move things	*Students will be able to answer….* ● How can things move? ● How do living and nonliving things move differently? ● What does it mean to push or pull? ● What is force? ● How does force affect the way things move? ● What is gravity? ● What is a simple machine? ● How can magnets make things move?

ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Weekly Tests/Balanced Tests • Unit Assessments • Alternate Assessments • Performance Tasks • Projects • Choice Boards • Benchmark Assessments
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments

LEARNING PLAN

Pacing Guide: 6 – 8 Weeks

Recommended Learning Activities

- Share nonliving items and demonstrate how to make them move. Make a chart "How can we make something move?"
- Push or Pull Game - Stand Up/ Sit down
- Force Activity using a ball with students in a circle
- Force and Direction Investigation
- Gravity Investigation
- Ramp Experiment
- Simple Machine Activity and create a Simple Machines Anchor Chart
- Simple Machines Stations
- Magnet Investigation
- Force and Motion Review Game
- Force and Motion Marble Painting
- Complete Mystery Science Force Olympics
  Read and discuss the following mystery's
  - What's the biggest excavator?
  - Why do builders need so many big machines? – Read Along
  - How can you knock down a wall made of concrete?
  - How can you knock down the most bowling pins? – Read Along
  - How can we protect a mountain town from falling rocks?
  - How could you invent a trap?
- Participate in force and motion activities
  - Bowling with different bowling balls and types of pins (Cups, Dice, blocks)
  - Acting out Machines and jobs
  - Act out work words
- Ski Jump Science

- Apple Drop Science
- Soda Bottle Bowling
- Sorting Push and Pull

Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • ELA, Math, Science, Social Studies • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications

Instructional and Supplemental Materials

- Mystery Science
- Little Science Thinkers – Karen Jones – Teacher Pay Teachers (TPT)
- Materials
  - Workbook from Little Science Thinkers on TPT
  - Prompts and Picture cards from Little Science Thinkers on TPT
  - Small toy that can be pushed/pulled/rolled
  - Small ball
  - Balloons
  - Paper clip
  - Foil
  - Paper cups
  - Marble
  - Pool noodle
  - Wooden block
  - Books
  - Felt
  - Tape measure
  - Eraser
  - Popsicle stick
  - Playdoh

- Coins
- Post-it notes
- Buttons
- Straws
- Cotton balls
- Cardboard
- Small garden shovel
- Nails
- Sandwich bags
- Rulers
- Yarn
- Jars and bottles
- Magnets
- Metal objects
- paint
- Tissue Paper
- Pencils
- Crayons
- Markers
- Glue
- Tape
- Anchor Charts
- Scissors
- Blocks
- Cups
- Paper

- Websites
  - https://mysteryscience.com (exploration, activity, books, and extras)
  - www.discoveryeducation.com
  - https://jr.brainpop.com/
  - https://www.youtube.com/
  - https://www.raz-kids.com/
  - https://www.getepic.com/
  - https://www.timeforkids.com/k1
- Videos
  - https://safeyoutube.net/w/3v5 world's biggest excavator
  - https://safeyoutube.net/w/ofR excavator song
  - https://safeyoutube.net/w/h8Cb trucks
  - https://safeyoutube.net/w/f8Cb cranes
  - https://safeyoutube.net/w/d8Cb bulldozer
  - https://safeyoutube.net/w/i8Cb digger excavator
  - https://safeyoutube.net/w/j8Cb cement mixer
  - https://www.youtube.com/channel/UChMDpjtiuRhBcY55PzOZBaQ things that go
  - https://www.readworks.org/article/Will-You-Push-or-Pull/cfb9c500-233c-4bc6-8d5e-f9ee703614e3#!articleTab:content/
  - https://safeyoutube.net/w/1vBb - controlled avalanches - preventice avalanches
  - https://safeyoutube.net/w/f3Bb - Avalanche Control

- https://safeyoutube.net/w/g3Bb falling rock prevention
- https://www.bing.com/videos/search?q=kindergarten+motion+video&view=detail&mid=5FD9D68040781E1D4DC25FD9D68040781E1D4DC2&FORM=VIRE force and motion
- https://www.youtube.com/watch?v=E-SnC_WKsCg
- https://www.youtube.com/watch?v=Vg4m-xNmygU

- Texts
  - Books by Karen Jones
    - Move it!
    - Pushes and Pulls
    - Force
    - Gravity
    - Simple Machines
    - Push and Pull with Magnets

Leveled Texts

- Advanced: How Do They Move by Kira Freed – Raz kids (Level F)
- Intermediate: How Things Move by Veronica Angel – Raz kids (Level C)
- Beginner: Move it! By Adrienne Mason – Raz kids (Level A)

Unit 2: Energy	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards **K-PS3-1** Make observations to determine the effect of sunlight on Earth's surface. [Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.] **K-PS3-2** Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]	**Technology Standards** (K-2) 8.1.2.A.4-Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums). 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.2.E.1-Use digital tools and online resources to explore a problem or issue. (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.

	21st Century Life and Career Standards 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.
Learning Outcomes	
Students will understand…. ● How the sun affects the Earth ● Direct sunlight causes surfaces to heat up ● Shade reduces warming effects of the Sun	*Students will be able to answer….* ● How does the sun affect the Earth? ● What does the sun do?
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Interactive online games ● Open-ended response questions & comprehension questions ● Running records ● Teacher observation ● Classwork Practice ● Discussion Trifolds ● Video logs	● Weekly Tests/Balanced Tests ● Unit Assessments ● Alternate Assessments ● Performance Tasks ● Projects ● Choice Boards ● Benchmark Assessments
Benchmark	Alternative
● Unit pre and post assessments that align to text series	● Portfolio ● Performance assessments
LEARNING PLAN	
Pacing Guide: 3 - 6 Weeks	
Recommended Learning Activities	
● The Sun's Warmth Investigation ● Sun and Shade Experiment and Anchor chart ● Shadow drawings ● Sun Screen Science ● Complete the mystery science mysteries for Sunny Skies ○ How could you walk barefoot across hot pavement without burning your feet? – Read Aloud ○ How could you warm up a frozen playground? ○ Why Does it get cold in winter?	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 ● Repeat/modify directions ● Visual models ● Assistive technology ● Extended time	Gifted and Talented ● Flexible grouping ● Differentiated activities (centers) ● Games ● Assistive technology

<table>
<tr>
<td>

- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

</td>
<td>

- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

</td>
</tr>
<tr><td colspan="2">Connections</td></tr>
<tr>
<td>

Interdisciplinary Connections

- ELA, Math, Science, Social Studies
- Technology
- Character education
- Career Education

</td>
<td>

21st Century Skills and Career Education

- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

</td>
</tr>
<tr><td colspan="2">Instructional and Supplemental Materials</td></tr>
<tr>
<td colspan="2">

- Mystery Science
- Little Science Thinkers – Karen Jones – Teacher Pay Teachers (TPT)
- Materials
  - Workbook from Little Science Thinkers on TPT
  - Prompts and Picture cards from Little Science Thinkers on TPT
  - Tissue Paper
  - Pencils
  - Crayons
  - Markers
  - Glue
  - Tape
  - Anchor Charts
  - Scissors
  - Blocks
  - Cups
  - Paper
  - Water
  - Ice
  - Paper plates
  - Construction paper
  - Popsicle sticks
  - Sunscreen
  - Pipe cleaners
  - Coffee filters
- Websites
  - https://mysteryscience.com (exploration, activity, books, and extras)
  - www.discoveryeducation.com
  - https://jr.brainpop.com/
  - https://www.youtube.com/
  - https://www.raz-kids.com/

</td>
</tr>
</table>

- https://www.getepic.com/
- https://www.timeforkids.com/k1

- Texts
  - A Book of Seasons by Alice and Martin Provensen
  - Four Seasons Male a Year by Anne Rockwell
  - Watching the Seasons by Edana Eckart
  - Sunshine makes the Seasons
  - Books by Karen Jones
    - The Sun
    - The Sun Warms Us

Leveled Texts

- Advanced: Our Sun by Hannah Gramson – Raz Kids (Level H)
- Intermediate: Too Hot! By Anthony Curran – Raz Kids (Level C)
- Beginner: Hot and Cold by Annette Carruthers – Raz Kids (Level A)

Unit 3: Plants and Animals
From Molecules to Organisms: Structures and Processes & Earth and Human Activity

DESIRED RESULTS

Standards

New Jersey Student Learning Standards
From Molecules to Organisms: Structures and Processes
K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and, that all living things need water.]
Earth and Human Activity
K-ESS3-1 Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. [Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight, so they often grow in meadows. Plants, animals, and their surroundings make up a system.]
K-ESS3-2 Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. [Clarification Statement: Emphasis is on local forms of severe weather.]
K-ESS3-3 Communicate solutions that will reduce the impact of climate change and humans on the

Technology Standards
(K-2) 8.1.2.A.4-Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.
8.1.2.E.1-Use digital tools and online resources to explore a problem or issue.
(3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.
8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks.
(6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools.
8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.
8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.

21st Century Life and Career Standards
9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.

land, water, air, and/or other living things in the local environment. [Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]	
Learning Outcomes	
Students will understand…. ● Living and nonliving things ● Parts of a plant ● Plants are affects by their environment ● Plant needs ● Plants make their own food ● Plants reproduce ● The life cycle of a plant ● How to compare and sort leaves and plants ● How plants adapt ● Animals are living things ● Ways that animals are different ● That there are six main groups of animals ● Animals change over time ● Animal groups are different ● Reptiles ● Birds ● Fish ● Amphibians ● Mammals ● Invertebrates ● Animals life cycles	*Students will be able to answer….* ● How are plants affects by the environment? ● How can we tell if something is living or nonliving? ● What are the parts of a plant? ● What does a plant need to grow? ● How do plants get food? ● How do plants make more plants? ● What are the stages in the life cycle of a plant? ● How are plants different? ● What does it mean to adapt? ● ● How can we compare and contrast different kinds of animals? ● How do we know if animals are living things? ● What are the six main groups of animals? ● What are reptiles? ● What are birds? ● What are fish? ● What are amphibians? ● What are mammals? ● What are invertebrates? ● How are animal life cycles different? ●
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Interactive online games ● Open-ended response questions & comprehension questions	● Weekly Tests/Balanced Tests ● Unit Assessments ● Alternate Assessments ● Performance Tasks ● Projects ● Choice Boards ● Benchmark Assessments

• Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 12 – 16 Weeks	
Recommended Learning Activities	

- Living and Nonliving Investigation
- Plant Diagramming
- Plant Dissection
- Plants and their Environment Experiment
- Plant Needs Discussion Cards
- What Plants Need Mini-Books
- Plants make Food Anchor Chart
- Seed Observations
- Pollination Craftivity
- Life Cycle Activity
- I Spy Plants Game
- Leaf Investigation
- Adapt or not game
- Properties of Matter Stations
- Thumbs Up/Thumbs Down Review Game
- Animal Investigation
- Experiment - How does an animal grow and change?
- Animal group sort
- Reptile or not? Game
- Comparing Birds and Reptiles Venn Diagram
- Fish, Bird, or Reptile? Activity
- Amphibians vs. Fish
- Amphibians Booklet
- Which Mammal Activity
- Invertebrates that Swim Crawl and Fly – Activity
- Super Simple Caterpillar Reading Buddy Craft
- Create Simple Life Cycles
- Create a metamorphosis Anchor Chart
- Animal Stations
- Animal Groups – Four Corners Game
- Nature Walks and Observations
- Complete the mystery science mysteries for Plant & Animal Secrets
    - Why do woodpeckers peck wood?
    - Where do animals live? – Read Along
    - How can you find animals in the woods?
    - How do animals make their home in the forest? – Read Along

- How do plants and trees grow?
- Why would you want an old log in your backyard? – Read Along

Integrated Accommodations and Modifications

Special Education, ELL and 504

- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

Gifted and Talented

- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

Connections

Interdisciplinary Connections

- ELA, Math, Science, Social Studies
- Technology
- Character education
- Career Education

21st Century Skills and Career Education

- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

Instructional and Supplemental Materials

- Mystery Science
- Little Science Thinkers – Karen Jones – Teacher Pay Teachers (TPT)
- Materials
  - Workbook from Little Science Thinkers on TPT
  - Prompts and Picture cards from Little Science Thinkers on TPT
  - Tissue Paper
  - Pencils
  - Crayons
  - Markers
  - Glue
  - Tape
  - Anchor Charts
  - Scissors
  - Insect toys
  - Craft feathers
  - Construction paper
  - Animal kit
  - Small flow
  - Magnifying glasses

- Plastic bowls
- Seeds
- Sandwich bags
- Paper towls
- Soil
- Rocks or stones
- Sand
- Tray
- Popsicle sick
- Cotton balls
- Cornstarch
- Leaves
- Carrots, celery, lettuce, pumpkin seed
- Food coloring

- Videos
  - https://safeshare.tv/x/n1Pnzy8n_FE
  - https://safeshare.tv/x/fQHt1W2togc
  - https://safeshare.tv/x/ss587d44dfedd06
  - https://safeshare.tv/x/ss587d4623ab83e
  - https://safeshare.tv/x/PqJx46nA0pE
  - https://safeshare.tv/x/eydEl8Oe5No
  - https://safeshare.tv/x/ss587d5b1ded074
  - https://safeshare.tv/x/ss587d5ddf3fb43
  - https://safeshare.tv/x/ss5980c265d8670
  - https://www.youtube.com/watch?v=tzN299RpJHA
  - https://www.youtube.com/watch?v=4AzGCJzlAEw
- Websites
  - https://mysteryscience.com (exploration, activity, books, and extras)
  - www.discoveryeducation.com
  - https://jr.brainpop.com/
  - https://www.youtube.com/
  - https://www.raz-kids.com/
  - https://www.getepic.com/
  - https://www.timeforkids.com/k1
  - https://www.sciencekids.co.nz/plants.html
  - https://switchzoo.com/games/buildabiome.htm
  - https://animals.sandiegozoo.org/live-cams
  - https://explore.org/livecams/zen-den/chipmunk-log
  - https://kids.nationalgeographic.com/
  - https://pbskids.org/wildkratts
- Texts
  - Caterpillar to Butterfly – National Geographic
  - Penguins – National Geographic
  - Polar Bears – National Geographic
  - Pumpkin Jack – Will Hubbell
  - Stellaluna – Janell Cannon

- Seed to plant – National Geographic
- Bat Loves the Night – Nicola Davies
- Tops and Bottoms – Janet Stevens
- Chickens aren't the only ones – Ruth Heller
- The Very Impatient Caterpillar – Ross Burach
- Give Bees a Chance – Bethany Barton
- Books by Karen Jones
  - Animals Alive
  - Animal Groups
  - Sneaky, Scaly Reptiles
  - Feathers and Flocks
  - Fish Underwater
  - Croak, Crawl, Amphibians!
  - Mammals
  - Interesting Invertebrates
  - Animal Life Cycles
  - Is it alive?
  - Plant Parts
  - What Plants Need
  - How Plants Make Food
  - Plants make Plants
  - Life Cycle: Plant
  - Different Plants, Different Places
  - Plants Adapt

Leveled Texts

- Advanced: Where Plants Grow by Vic Moors – Raz Kids (Level D)
- Intermediate: The New Forest Path by Maribeth Boelts – Raz Kids (Level B)
- Beginner: The Plant by Kataline Page – Raz Kids (Level AA)

Unit 4: Weather & Seasons; Earth Systems	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards **K-ESS2-1** Use and share observations of local weather conditions to describe patterns over time. [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [Assessment Boundary: Assessment of quantitative observations limited to whole numbers and	**Technology Standards** (K-2) 8.1.2.A.4-Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums). 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.2.E.1-Use digital tools and online resources to explore a problem or issue. (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate

relative measures such as warmer/cooler.] **K-ESS2-2** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.]	the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real-world problem. **21st Century Life and Career Standards** 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.
Learning Outcomes	
Students will understand…. ● What weather is ● Different kinds of weather ● How weather affects our lives ● Severe weather ● How to stay safe during severe weather ● Seasons	*Students will be able to answer….* ● How do the weather and seasons affect us? ● What do you think weather is? ● What are some different kinds of weather? ● How can we observe and measure weather? ● How does weather affect us? ● What is severe weather? ● What happens during different seasons? ● How do the weather and seasons affect us?
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Interactive online games ● Open-ended response questions & comprehension questions ● Running records ● Teacher observation ● Classwork Practice ● Discussion Trifolds ● Video logs	● Weekly Tests/Balanced Tests ● Unit Assessments ● Alternate Assessments ● Performance Tasks ● Projects ● Choice Boards ● Benchmark Assessments
Benchmark	Alternative
● Unit pre and post assessments that align	● Portfolio

<table>
<tr><td>to text series</td><td>● Performance assessments</td></tr>
<tr><td colspan="2">LEARNING PLAN</td></tr>
<tr><td colspan="2">Pacing Guide: 6 - 8 Weeks</td></tr>
<tr><td colspan="2">Recommended Learning Activities</td></tr>
<tr><td colspan="2">
● Weather Words Activity and create an anchor chart
● Weather or not? game
● Rain Investigation
● Making a weather Journal & Observe and measure weather chart
● Weather Investigation bags
● Sorting Out Severe Weather Facts
● What Season Am I? – game
● Design, Build, and create a tree for each season
● Season and weather stations
● The Sun, Weather, and Me! Booklet
● Seasons 4-Corners
● Complete the mystery science mysteries for Wild Weather
  ○ How can you get ready for a big storm? – Read Along
  ○ Have you ever watched a storm?
  ○ How many different kinds of weather are there?
● Complete the mystery science mysteries for Circle of Seasons
  ○ How do you know what to wear for the weather? – Read Along
  ○ What will the weather be like on your birthday?
  ○ Why do birds lay eggs in the Spring?
● Participate in Weather Activities
  ○ Observe weather
  ○ Record weather
  ○ Make predictions about weather
  ○ Report the weather
</td></tr>
<tr><td colspan="2">Integrated Accommodations and Modifications</td></tr>
<tr><td>Special Education, ELL and 504
● Repeat/modify directions
● Visual models
● Assistive technology
● Extended time
● Preferred/flexible seating
● Differentiated activities (centers)
● Shortened assignments
● Sensory integration activities
● Flexible grouping
● Games
● Kinesthetic Activity
● Role Play</td><td>Gifted and Talented
● Flexible grouping
● Differentiated activities (centers)
● Games
● Assistive technology
● Problem solving strategies
● Tiered choice activities
● Kinesthetic Activities
● Role Play
● Critical thinking strategies
● Accelerated learning
● Independent study</td></tr>
<tr><td colspan="2">Connections</td></tr>
<tr><td>Interdisciplinary Connections
● ELA, Math, Science, Social Studies</td><td>21st Century Skills and Career Education
● Problem Solving</td></tr>
</table>

• Technology • Character education • Career Education	• Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications

Instructional and Supplemental Materials

- Mystery Science
- Little Science Thinkers – Karen Jones – Teacher Pay Teachers (TPT)
- Materials
  - Workbook from Little Science Thinkers on TPT
  - Prompts and Picture cards from Little Science Thinkers on TPT
  - Tissue Paper
  - Pencils
  - Crayons
  - Markers
  - Glue
  - Tape
  - Anchor Charts
  - Scissors
  - Blocks
  - Cups
  - Paper
  - Pan
  - Water,
  - Dry sponge
  - Ice
  - Cups
  - Paper plates
  - Construction paper
  - Stick
  - Brown paper bags
  - Mini flashlights
  - Legos
  - Blocks
  - Playdoh
  - Magazines
  -
- Websites
  - https://mysteryscience.com (exploration, activity, books, and extras)
  - www.discoveryeducation.com
  - https://jr.brainpop.com/
  - https://www.youtube.com/
  - https://www.raz-kids.com/
  - https://www.getepic.com/
  - https://www.timeforkids.com/k1
  - https://www.billnye.com/home-demos/twistin-tornado
  - http://www.weatherwizkids.com/weather-wind.htm

- https://www.sciencekids.co.nz/videos/weather.html
- Texts
  - Shapes in the Sky by Josepha Sherman
  - The Little raindrop by Joanna Gray
  - What Will the Weather Be? By Lynda DeWitt
  - Weather words and What They Mean by Gail Gibbons
  - A Book of Seasons by Alice and Martin Provensen
  - Four Seasons Male a Year by Anne Rockwell
  - Watching the Seasons by Edana Eckart
  - Weather by National Geographic Kids
  - Storms by National Geographic Kids
  - The Snowy Day by Ezra Jack Keats
  - Books by Karen Jones
    - What is Weather?
    - Weather all Around
    - Observing Weather
    - Weather and Me
    - Severe Weather Ahead!
    - The Changing Seasons

Leveled Texts

- Advanced: Snow Falls by Nigel Pepperhouse – Raz kids (Level C)
- Intermediate: A Cold Day by Anthony Curran – Raz Kids (Level B)
- Beginner: Winter by Vic Moors – Raz Kids (Level AA)

Unit 5: Engineering Design	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool. **K-2-ETS1-2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. **K-2-ETS1-3** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	**Technology Standards** (K-2) 8.1.2.A.4-Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums). 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.2.E.1-Use digital tools and online resources to explore a problem or issue. (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in

	interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.
	21st Century Life and Career Standards 9.1.2.CR.1: Recognize ways to volunteer in the classroom, school and community.
Learning Outcomes	
Students will understand…. • Engineers design solutions to solve problems • Explore simple problems and how we could work together to form a plan and solve it • Explain why it is necessary to find solutions for problems • Explore problems; observations, research, multimedia resources • Illustrate designs to "fix" problems • Examine how each part of a model is necessary to solve a problem and what the functions are used for • Compare two solutions for a problem, explore what worked well, what could be improved, and which was better	*Students will be able to answer….* • How do Engineers solve problems? • What process do engineers do? • What is the first step in the engineering process? • Why is it necessary to find solutions for a problem? • How can you solve a problem? • What steps do you take to solve a problem? • Why should you list possible solutions for a problem? • Why should you analyze data from tests of two objects designed to solve the same problem? • What are the strengths and weaknesses of two test solutions?
ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Weekly Tests/Balanced Tests • Unit Assessments • Alternate Assessments • Performance Tasks • Projects • Choice Boards • Benchmark Assessments
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: Over the course of the year	

Recommended Learning Activities

• Force
  ○ Bowling
  ○ Design and Build a skier/ snowboarder and slope
  ○ Design and Build a machine to move an object across
  ○ Design and Build a marshmallow launcher
  ○ Design and Build a ramp
  ○ Design and Build an obstacle to protect a house from a falling rock
• Weather
  ○ Design and Build a structure to block the sun using given supplies
  ○ Design and Build an object to keep an animal dry
• Plants & Animals
  ○ Design and Build a habitat for a given animal
  ○ Design and Build fence to keep animals out of the garden
• Seasonal
  ○ Design and Build a sleigh
  ○ Design and Build a boat
  ○ Design and Build a hot air balloon
  ○ Design and Build an object to keep an egg safe when landing
  ○ Design and build a paper airplane
  ○ Design and build a submarine
  ○ Deign and make a broom for the witch
  ○ Design and make snowflakes and then compare the different solutions
  ○ Design and Create dot structures using toothpicks
  ○ Design and create a road that keeps a marble on the track
  ○ Design and create train tracks
  ○ Design and build a car
  ○ Design and build three different houses
  ○ Design and build a bridge
  ○ Design and build a pinwheel
• Building a trap to catch animals and people (How to catch…)
• Drawing possible inventions
• Work with an engineer
• Complete the engineering process

Integrated Accommodations and Modifications	
Special Education, ELL and 504	Gifted and Talented
• Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games	• Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning

• Kinesthetic Activity • Role Play	• Independent study
Connections	
Interdisciplinary Connections • ELA, Math, Science, Social Studies • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• Materials o Pencil o Tape o Glue o Pipe cleaners o Popsicle sticks o Toilet paper rolls o Paper towel rolls o Play-doh o Pom-poms o Markers o Crayons o Straws o Toothpicks o Dots o Candy corn o Marshmallows o Aluminum foil o Cardboard o Spray bottle o Water o Airzooka o Buckets o Baking soda o Paper clips o Plastic bottles o Ping pong balls o Tennis balls o Bags o Jelly beans o Gummy worms/bears o Cardstock o Chalk o Marbles	

- Pumpkin
- Apple
- Clothespin
- Beakers
- Cups
- Flashlights
- Post-its
- Envelopes
- Index cards
- Pasta
- Paper towels
- Plates
- Rubber bands
- Skewers
- Sting
- Tissue paper
- Scissors
- Rulers

- Videos
  - https://www.youtube.com/watch?v=owHF9iLyxic
  - https://www.youtube.com/watch?v=fxJWin195kU
  - https://www.youtube.com/watch?v=D9I35Rqo04E
  - https://www.youtube.com/watch?v=wE-z_TJyziI
  - https://www.youtube.com/watch?v=ptADSmJCVwQ
- Websites
  - www.mysteryscience.com (exploration, activity, books, extras)
  - https://www.raz-plus.com/
  - https://safeyoutube.net/w/SxVb - inventors and inventions
  - https://ngss.wonderville.org/resources
  - http://www.discovere.org/
  - http://www.sciencekids.co.nz/
  - http://teachers.egfi-k12.org/category/web_resources/
  - https://studio.code.org/s/coursea-2019
  - https://www.nasa.gov/kidsclub/index.html#.VIWzXzHF-So
  - http://www.kineticcity.com/
- Books
  - Rosie Revere, Engineer – Andrea Beaty
  - Iggy Peck, Architect – Andrea Beaty
  - Ada Twist, Scientist – Andrea Beaty
  - The girl who thought in pictures – Finley Mosca
  - The girl with a Mind for Math – Finely Mosca
  - After the Fall – Dan Santat
  - How to Catch a Unicorn – Adam Wallace
  - How to Catch a Mermaid – Adam Wallace
  - How to Catch a Dinosaur –Adam Wallace
  - How to Catch a Monster – Adam Wallace
  - How to Catch a Turkey – Adam Wallace

- How to Catch an Elf – Adam Wallace
- How to Catch the Tooth Fairy – Adam Wallace
- How to catch the Easter Bunny – Adam Wallace
- How to Catch a Leprechaun – Adam Wallace
- How to Catch Santa – Jean Reagan
- The 12 Sleighs of Christmas – Sherri Duskey Rinker
- The True Story of the Three Little Pigs – Jon Scieszka
- The Three Little Pigs – RH Disney
- She Persisted Around the World – Chelsea Clinton
- Talkin' About Bessie – Nikki Grimes
- The Boy Who Harnessed the Wind – William Kamkwamba
- I am Jane Goodall – Brad Meltzer
- The Easter Bunny's Assistant – Jan Thomas
- If I Built a House – Chris Van Dusen
- If I Built a Car – Chris Van Dusen
- Koala Lou – Mem Fox
- Horton Hatches the Egg – Dr. Seuss
- The Polar Express – Chris Van Allsburg
- The Dot – Peter Reynolds
- How I Became A Pirate – David Shannon
- Room on the Broom – Julia Donaldson
- The Runaway Pumpkin – Kevin Lewis
- Pumpkin Jack – will Hubbell
- How to Code a Sandcastle – Josh Funk
- Snowflake Bentley – Jacqueline Briggs Martin
- Balloons over Broadway – Melissa Sweet
- Turkey Trouble – Wendi Silvano
- The Lorax – Dr. Seuss

Leveled Texts

- Advanced: Let's Build a Fairy Bridge by Rachel Rice – Raz Kids (Level G)
- Intermediate: Bridges by Elizabeth Jane Pustilnik – Raz Kids (Level B)
- Beginner: We Build by Katie Knight – Raz Kids (Level AA)

Grade 1

Unit 1: Waves and their Applications in Technology for Information Transfer	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards 1-PS4-1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. 1-PS4-2 Make observations to construct an evidence-based account that objects can only be seen when illuminated. 1-PS4-3 Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. 1-PS4-4 Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.	Technology Standards (K-2) 8.1.2.A.4-Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums). 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.2.E.1-Use digital tools and online resources to explore a problem or issue. 21st Century Life and Career Standards CRP1. Act as a responsible and contributing citizen and employee CRP2. Apply appropriate academic and technical skills CRP4. Communicate clearly and effectively and with reason CRP6. Demonstrate creativity and innovation. CRP7. Employ valid and reliable research strategies. CRP8. Utilize critical thinking to make sense of problems and preserve in solving them. CRP11. Use technology to enhance productivity
Learning Outcomes	
Students will understand…. ● Vibrating materials make sounds as they vibrate ● Sound waves make some materials vibrate ● How to develop a guiding research question ● How to develop a hypothesis and experiment to prove/disprove it ● The difference between natural and artificial light	*Students will be able to answer….* ● Why vibrating matter makes sound? ● Why sound can make items vibrate? ● How can objects be seen given a specific amount of light? ● What effect light has on different types of surfaces?
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading	● Weekly Tests/Balanced Tests ● Unit Assessments ● Alternate Assessments • Performance Tasks • Projects

• Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Choice Boards • Benchmark Assessments
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: (9) Weeks	
Recommended Learning Activities	
• Make sounds (hand/feet ~sounds of rain, vibrate a ruler) • Create sound makers • Sort materials as transparent, translucent, and opaque • Create a stained glass window using tissue paper • Use a mystery box (dark to gradual light) to view objects • Build a device to communicate information across the room using light and colored markers • Play red light/green light using sound • Analyze sounds with their eyes	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • ELA, Math, Science, Social Studies • Technology • Character education • Career Education • Science and Engineering Practices (SEP): Planning and Carrying Out Investigations	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications

Constructing Explanations and Designing Solutions ● Disciplinary Core Ideas (DCI): PS4.A: Wave Properties PS4.B: Electromagnetic Radiation PS4.C: Information Technologies and Instrumentation ● Crosscutting Concepts (CC): Cause and Effect *Connections to Engineering, Technology, and Applications of Science* Influence of Engineering, Technology, and Science on Society and the Natural World *Connections to Nature of Science* Scientific Investigations Use a Variety of Methods	

Instructional and Supplemental Materials

- Scholastic News
- www.scholastic/sn1
- www.mysteryscience.com (exploration, activity, extras)
  How do they make silly sounds in cartoons?
  Where do sounds come from?
  What if there were no windows?
  Can you see in the dark?
  How could you send a secret message to someone far away?
  How do boats find their way in the fog?
- www.mysteryscience.com (books: The Secret of the Sounds, Light Up the Dark, Gabrielle and the Tugboat)
- Ruler, foil cookie sheet
- Thin string
- Assortment of materials that are transparent, translucent, and opaque, Colored tissue paper, glad press and seal
- Crayons, scissors, black cardstock, smooth paper clips
- Markers, LED flashlights
- www.sciencekids.co.nz/
- https://kids.nationalgeographic.com/
- https://www.raz-plus.com/

Leveled Texts

- Advanced: Raz-kids Rainbows (Level J)
- Intermediate: Raz-kids Shadows (Level C)
- Beginner: Raz-kids What Do I Hear? (Level A)

Grade 1

Unit 2: Earth's Place in the Universe	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards	Technology Standards (K-2) 8.1.2.A.4-Demonstrate developmentally

<table>
<tr><td rowspan="2">1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted.

1-ESS1-2 Make observations at different times of year to relate the amount of daylight to the time of year.</td><td>appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.
8.1.2.E.1-Use digital tools and online resources to explore a problem or issue.</td></tr>
<tr><td>21st Century Life and Career Standards

CRP1. Act as a responsible and contributing citizen and employee
CRP2. Apply appropriate academic and technical skills
CRP4. Communicate clearly and effectively and with reason
CRP6. Demonstrate creativity and innovation.
CRP7. Employ valid and reliable research strategies.
CRP8. Utilize critical thinking to make sense of problems and preserve in solving them.
CRP11. Use technology to enhance productivity</td></tr>
<tr><td colspan="2">Learning Outcomes</td></tr>
<tr><td>Students will understand….
Patterns of the sun during the day
Patterns of the moon
Phases of the moon and why they occur
Patterns of the stars
How to record sunrise/sunset throughout the seasons
Why we have less daylight hours during the winter than summer</td><td>Students will be able to answer….
Why does the sun appear to move across the sky (rise in morning, set in evening)?
Why does the moon appear in the evening and set in the morning?
What are the phases of the moon and why do they occur?
Why are stars only seen at night?</td></tr>
<tr><td colspan="2">ASSESSMENT</td></tr>
<tr><td>Formative</td><td>Summative</td></tr>
<tr><td>Exit Slips
Journals
Oral reading
Graphic Organizers
Class discussion
Response to reading
Interactive online games
Open-ended response questions & comprehension questions
Running records
Teacher observation
Classwork Practice
Discussion Trifolds</td><td>Weekly Tests/Balanced Tests
Unit Assessments
Alternate Assessments
Performance Tasks
Projects
Choice Boards
Benchmark Assessments</td></tr>
</table>

<table>
<tr><td colspan="2">

- Video logs

</td></tr>
<tr><td>Benchmark</td><td>Alternative</td></tr>
<tr><td>

- Unit pre and post assessments that align to text series

</td><td>

- Portfolio
- Performance assessments

</td></tr>
<tr><td colspan="2">LEARNING PLAN</td></tr>
<tr><td colspan="2">Pacing Guide: (9) Weeks</td></tr>
<tr><td colspan="2">Recommended Learning Activities</td></tr>
<tr><td colspan="2">

- Trace an object's shadow and observe how the shadow changes over time (use object to analyze how to move a light source to change the length and shape of the shadow
- Students to trace their shadows in the morning and afternoon and identify differences
- Make sun finders (model of sun's movement across the sky) to reason how sun can help guide them during the day
- Chart seasonal patterns of sunrise and sunset
- Develop and use a model of the Big Dipper to determine why stars are only visible in the night sky
- Make phases of the moon using cookies
- Have students sit around a shaded ball and illustrate what they see depending on where they are seated (moon phases)

</td></tr>
<tr><td colspan="2">Integrated Accommodations and Modifications</td></tr>
<tr><td>Special Education, ELL and 504

- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

</td><td>Gifted and Talented

- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

</td></tr>
<tr><td colspan="2">Connections</td></tr>
<tr><td>Interdisciplinary Connections

- ELA, Math, Science, Social Studies
- Technology
- Character education
- Career Education
- Science and Engineering Practices (SEP):
  Planning and Carrying Out Investigations
  Analyzing and Interpreting Data
- Disciplinary Core Ideas (DCI):
  ESS1.A: The Universe and its Stars
  ESS1.B: Earth and the Solar System
- Crosscutting Concepts (CC)
  Patterns /Structure and Function
  Connections to Nature of Science

</td><td>21st Century Skills and Career Education

- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

</td></tr>
</table>

Scientific Knowledge Assumes an Order and Consistency in Natural Systems	

Instructional and Supplemental Materials

- Scholastic News
- www.scholastic/sn1
- www.mysteryscience.com (exploration, activity, extras)
  Can a statue's shadow move?
  What does your shadow do when you are not looking?
  How can the sun help you if you're lost?
  Why do you have to go to bed early in the summer?
  Why do the stars come out at night?
  How can stars help you if you get lost?
- www.mysteryscience.com (books: Shadow Play, Time for Bed?, Follow the North Star)
- Blank paper (8.5 by 11), markers, tape, led flashlights, paper gnomes, shadow patterns
- Colored chalk
- Scissors, three hole punch, paper fasteners, sun finder print out
- Dot stickers, paper cups 8oz, push pins, big dipper star pictures printout, sky sheet printout
- Large sugar cookies, vanilla/chocolate icing, small plastic cups, popsicle sticks
- www.sciencekids.co.nz/
- https://kids.nationalgeographic.com/
- https://www.raz-plus.com/

Leveled Texts

- Advanced: Raz-kids On the Moon (Level F)
- Intermediate: Raz-kids Space (Level C)
- Beginner: Raz-kids The Moon (Level C)

Grade 1

Unit 3: From Molecules to Organisms: Structure & Processes
Heredity: Inheritance & Variation of Traits

DESIRED RESULTS

Standards

New Jersey Student Learning Standards

1-LS1-1 - Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

1-LS1-2 - Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.

1-LS3 - Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Technology Standards
(K-2) 8.1.2.A.4-Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.
8.1.2.E.1-Use digital tools and online resources to explore a problem or issue.

21st Century Life and Career Standards

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively

	and with reason. • CRP6. Demonstrate creativity and innovation. • CRP8. Utilize critical thinking to make sense of problems and persevere in solving them. • CRP11. Use technology to enhance productivity.
Learning Outcomes	
Students will understand…. • The needs of living things • Plants needs • The needs of a plant • The parts of a plant • How water moves through a plant • Recognize objects and organisms as living and nonliving • Explore habitats of animals • Explore what animals need to live and grow • Explore patterns between parents and their offspring's • Explore the relationship between a tree's and flowers roots and leaves • Explore the patterns of animals and the structures that help them accomplish functions • Explore patterns in behaviors of parents and their offspring that help them survive • Explore how animals structures help them survive	*Students will be able to answer….* • What do living things need to survive? • How do you know something is living? • What do plants need to live and grow? • Do all animals live in the same place? • What types of animals live in a given place? • What do animals need to live and grow? • What helps animals survive? • How are parents and offspring alike? • How does the structure and function of a tree and plant work together?
ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds	• Weekly Tests/Balanced Tests • Unit Assessments • Alternate Assessments • Performance Tasks • Projects • Choice Boards • Benchmark Assessments

<table>
<tr><td colspan="2">

- Video logs

</td></tr>
<tr><td>Benchmark</td><td>Alternative</td></tr>
<tr><td>

- Unit pre and post assessments that align to text series

</td><td>

- Portfolio
- Performance assessments

</td></tr>
<tr><td colspan="2">LEARNING PLAN</td></tr>
<tr><td colspan="2">Pacing Guide: (6-9) Weeks</td></tr>
<tr><td colspan="2">Recommended Learning Activities</td></tr>
<tr><td colspan="2">

- Complete the mystery science mysteries for Plant and Animal Superpowers
  - Why do birds have beaks?
    - Bird beaks and food experiment
  - Who do baby ducks follow their mothers – Read Along
  - Why are polar bears white?
    - Camouflage game
  - Why do family members look alike? – Read Along
    - Animal Match up game Variation
  - Why don’t trees blow down in the wind?
    - Windproof Umbrella Activity
  - What do sunflowers do when you’re not looking? – Read Along
    - Plants on the Move Activity
- Life cycle
  - Butterflies
  - Chickens
  - Pumpkin
  - Sunflowers
- Living vs. Nonliving
  - Plants
    - Sort living and non-living objects
    - Label parts of a tree and sunflower
    - Illustrate the needs of a plant
    - Dissect a lima bean
  - Animals
    - Sort animals into their habitats

Illustrate how animals grow from offsprings to parents

</td></tr>
<tr><td colspan="2">Integrated Accommodations and Modifications</td></tr>
<tr><td>

Special Education, ELL and 504

- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

</td><td>

Gifted and Talented

- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

</td></tr>
</table>

<table>
<tr><td></td><td></td></tr>
<tr><td colspan="2">Connections</td></tr>
<tr><td>Interdisciplinary Connections
● ELA, Math, Science, Social Studies
● Technology
● Character education
● Career Education
● Science and Engineering Practices (SEP):
Constructing Explanations and Designing Solutions
Obtaining, Evaluating, and Communicating Information
● Disciplinary Core Ideas (DCI):
LS1.A: Structure and Function
LS1.B: Growth and Development of Organisms
LS1.D: Information Processing
LS3.A: Inheritance of Traits
LS3.B: Variation of Traits
● Crosscutting Concepts (CC)
Patterns /Structure and Function
Connections to Engineering, Technology, and Applications of Science
Influence of Engineering, Technology, and Science on Society and the Natural World
Connections to Nature of Science
Scientific Knowledge is Based on Empirical Knowledge</td><td>21st Century Skills and Career Education
● Problem Solving
● Critical Thinking
● Communication
● Collaborative learning
● Productivity
● Real-world applications</td></tr>
<tr><td colspan="2">Instructional and Supplemental Materials</td></tr>
<tr><td colspan="2">● Materials
○ Pencil
○ Crayons
○ Straws
○ Journals
○ Rubber bands
○ Pasta
○ Marbles
○ Pennies
○ Aluminum foil
○ Beans
○ Spoon
○ Chopstick
○ Tweezers
○ Toothpicks
○ Construction paper</td></tr>
</table>

  - Cardstock
  - Scissors
  - Markers
  - Pipe cleaners
  - Stickers
  - Cups
  - Soil
  - Seeds
  - Ziploc bags
  - Celery
  - Carnation
  - Food coloring
  - Cups
  - Seeds
  - Lima beans
  - Data sheets
- Videos
  - https://www.wildscreen.org/arkive-closure/
  - https://safeyoutube.net/w/Sgcb
  - https://safeyoutube.net/w/ibY
  - https://safeyoutube.net/w/sbY
  - https://safeyoutube.net/w/lvCb
  - https://safeyoutube.net/w/2vCb
  - https://safeyoutube.net/w/8vCb
  - https://safeyoutube.net/w/DHDb
  - http://plantsinmotion.bio.indiana.edu/plantmotion/movements/tropism/phototropism/corn/cornworship.html
  - https://safeyoutube.net/w/FlRb
- Websites
  - https://animalandplant.weebly.com/websites.html
  - www.mysteryscience.com (exploration, activity, books, extras)
  - https://www.raz-plus.com/
  - http://www.sciencekids.co.nz/gamesactivities.html
  - https://kids.nationalgeographic.com/
  - https://ngss.wonderville.org/resources
  - http://www.sciencekids.co.nz/plants.html
  - https://switchzoo.com/games/buildabiome.htm
  - https://animals.sandiegozoo.org/live-cams
  - https://nj.pbslearningmedia.org/re source/nuggets.el.sci.homes/nature-nuggets-animal-homes/
  - https://explore.org/livecams/zen-den/chipmunk-log
- Books
  - Tops and Bottoms – Janet Stevens
  - Stellaluna – Janell Cannon
  - Caterpillar to Butterfly – National Geographic
  - Penguins – National Geographic
  - Polar Bears – National Geographic

- Seed to plant – National Geographic
- Bat Loves the Night – Nicola Davies
- What if you you Animal Hair – Sandra Markle
- What if you had Animal Teeth – Sandra Markle
- What if you had Animal Ears – Sandra Markle
- What if you had Animals Nose – Sandra Markle
- What if you had Animal Feet - Sandra Markle

Leveled Texts

- Advanced: Wonders of Nature – Cheryl Ryan – Raz kids (level J)
- Intermediate: Animals, Animals –Cheryl Ryan - Raz kids (Level E)
- Beginner: Where Animals Live – Robert Charles - Raz kids (Level D)

Grade 1

Unit 4: Engineering Design

DESIRED RESULTS

Standards

New Jersey Student Learning Standards

K-2-ETS1-1 - Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2-ETS1-2 - Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

K-2-ETS1-3 - Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Technology Standards

(K-2) 8.1.2.A.4-Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.
8.1.2.E.1-Use digital tools and online resources to explore a problem or issue.

21st Century Life and Career Standards

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP11. Use technology to enhance productivity.

Learning Outcomes

Students will understand….

- Engineers design solutions to solve problems
- Explore simple problems and how we could work together to form a plan and

Students will be able to answer….

- How do Engineers solve problems?
- What process do engineers do?
- What is the first step in the engineering process?

solve it • Explain why it is necessary to find solutions for problems • Explore problems; observations, research, multimedia resources • Illustrate designs to "fix" problems • Examine how each part of a model is necessary to solve a problem and what the functions are used for • Compare two solutions for a problem, explore what worked well, what could be improved, and which was better	• Why is it necessary to find solutions for a problem? • How can you solve a problem? • What steps do you take to solve a problem? • Why should you list possible solutions for a problem? • Why should you analyze data from tests of two objects designed to solve the same problem? • What are the strengths and weaknesses of two test solutions?
ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Weekly Tests/Balanced Tests • Unit Assessments • Alternate Assessments • Performance Tasks • Projects • Choice Boards • Benchmark Assessments
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: Over the Course of a Year	
Recommended Learning Activities	

• Wave, light, & Sound
  ○ Make your own traffic light
• Earth's Place in Universe
  ○ Space lander mission
  ○ Space rocket
  ○ Astronaut docking challenge
• Plants and Animals
  ○ Curios George – blow, wind, blow
  ○ Paper Bag Kite
  ○ Fly a Leaf
• STEAM & Seasonal
  ○ Design and Build a sleigh	

- Design and Build a boat
- Design and Build a hot air balloon
- Design and Build an object to keep an egg safe when landing
- Design and build a paper airplane
- Design and build a submarine
- Deign and make a broom for the witch
- Design and make snowflakes and then compare the different solutions
- Design and Create dot structures using toothpicks
- Design and create a road that keeps a marble on the track
- Design and create train tracks
- Design and build a car
- Design and build three different houses
- Design and build a bridge
- Design and build a paper column
- Design and build a conveyor belt
- Design and build a straw roller coaster
- Design and build a shoe box marble run
- Design and build a catapult
- Design and build a pinwheel
- Design and build traps that go along with the (How to catch…books)

Integrated Accommodations and Modifications

Special Education, ELL and 504

- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

Gifted and Talented

- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

Connections

Interdisciplinary Connections

- ELA, Math, Science, Social Studies
- Technology
- Character education
- Career Education
- (SEP) Science and Engineering Practices:
  Asking Questions and Defining Problems
  Developing and Using models
  Analyzing and Interpreting Data
- (DCI) Disciplinary Core Ideas:
  ETS1.A: Defining and Delimiting

21st Century Skills and Career Education

- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

Engineering Problems ETS1.B: Develop Possible Solutions ETS1.C: Optimizing the Design Solution • (CCC) Crosscutting concepts: Structure and Function	

Instructional and Supplemental Materials

- Materials
  - Brown paper bag
  - Streamers
  - Tape
  - Light string
  - Plastic straw
  - Fishing line
  - Cardboard
  - Wooden poles Pencil
  - Glue
  - Pipe cleaners
  - Popsicle sticks
  - Toilet paper rolls
  - Paper towel rolls
  - Play-doh
  - Pom-poms
  - Markers
  - Crayons
  - Straws
  - Toothpicks
  - Dots
  - Candycorn
  - Marshmallows
  - Aluminum foil
  - Spray bottle
  - Water
  - Airzooka
  - Buckets
  - Baking soda
  - Paper clips
  - Plastic bottles
  - Ping pong balls
  - Tennis balls
  - Bags
  - Jelly beans
  - Gummy worms/bears
  - Cardstock
  - Chalk
  - Marbles
  - Pumpkin
  - Apple

  - Clothespin
  - Beakers
  - Cups
  - Flashlights
  - Post-its
  - Envelopes
  - Index cards
  - Pasta
  - Paper towels
  - Plates
  - Rubber bands
  - Skewers
  - Sting
  - Tissue paper
  - Scissors
  - Rulers
- Videos
  - https://safeyoutube.net/w/h2Bb
  - https://www.youtube.com/watch?v=owHF9iLyxic
  - https://www.youtube.com/watch?v=fxJWin195kU
  - https://www.youtube.com/watch?v=D9I35Rqo04E
- Websites
  - www.mysteryscience.com (exploration, activity, books, extras)
  - https://www.raz-plus.com/
  - http://www.lawrencehallofscience.org/sites/default/files/pdfs/Lawrence_Hall_of_Science_Easter_Science_Card.pdf
  - http://www.outdoorbiology.com/files/resources/activities/FlyALeaf.pdf
  - https://studio.code.org/s/coursea-2019
  - https://www.nasa.gov/kidsclub/index.html#.VIWzXzHF-So
  - http://www.kineticcity.com/
  - https://safeyoutube.net/w/SxVb - inventors and inventions
  - https://ngss.wonderville.org/resources
  - http://www.discovere.org/
  - http://www.sciencekids.co.nz/
- Books
  - The Most Magnificent Thing – Ashley Spires
  - Rosie Revere, Engineer – Andrea Beaty
  - Iggy Peck, Architect – Andrea Beaty
  - Ada Twist, Scientist – Andrea Beaty
  - The girl who thought in pictures – Finley Mosca
  - The girl with a Mind for Math – Finely Mosca
  - After the Fall – Dan Santat
  - How to Catch a Unicorn – Adam Wallace
  - How to Catch a Mermaid – Adam Wallace
  - How to Catch a Dinosaur –Adam Wallace
  - How to Catch a Monster – Adam Wallace
  - How to Catch a Turkey – Adam Wallace

- How to Catch an Elf – Adam Wallace
- How to Catch the Tooth Fairy – Adam Wallace
- How to catch the Easter Bunny – Adam Wallace
- How to Catch a Leprechaun – Adam Wallace
- How to Catch Santa – Jean Reagan
- The 12 Sleighs of Christmas – Sherri Duskey Rinker
- The True Story of the Three Little Pigs – Jon Scieszka
- The Three Little Pigs – RH Disney
- She Persisted Around the World – Chelsea Clinton
- Talkin' About Bessie – Nikki Grimes
- The Boy Who Harnessed the Wind – William Kamkwamba
- I am Jane Goodall – Brad Meltzer
- The Easter Bunny's Assistant – Jan Thomas
- If I Built a House – Chris Van Dusen
- If I Built a Car – Chris Van Dusen
- Koala Lou – Mem Fox
- Horton Hatches the Egg – Dr. Seuss
- The Polar Express – Chris Van Allsburg
- The Dot – Peter Reynolds
- How I Became A Pirate – David Shannon
- Room on the Broom – Julia Donaldson
- The Runaway Pumpkin – Kevin Lewis
- Pumpkin Jack – will Hubbell
- How to Code a Sandcastle – Josh Funk
- Snowflake Bentley – Jacqueline Briggs Martin
- Balloons over Broadway – Melissa Sweet
- Turkey Trouble – Wendi Silvano

The Lorax – Dr. Seuss

Leveled Texts

- Advanced: Advanced: Building a Bridge –Ned Jensen - Raz kids – (Level I)
- Intermediate: Building a House – Anthony Curran - Raz kids – (Level G)
- Beginner: Building a Road – D.G. Chelsea - Raz kids – (Level C)

Grade 2

Unit 1: Matter and It's Interactions	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards 2-PS1-1 Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. 2-PS1-2 Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. 2-PS1-3 Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. 2-PS1-4 Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot	Technology Standards (K-2) 8.1.2.A.4-Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums). 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.2.E.1-Use digital tools and online resources to explore a problem or issue. (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.
	21st Century Life and Career Standards CRP1. Act as a responsible and contributing citizen and employee CRP2. Apply appropriate academic and technical skills CRP4. Communicate clearly and effectively and with reason CRP6. Demonstrate creativity and innovation. CRP8. Utilize critical thinking to make sense of problems and preserve in solving them. CRP11. Use technology to enhance productivity
Learning Outcomes	
Students will understand…. ● Describing and classifying materials by their observable properties. ● How to select and use materials based on these properties. ● Using evidence to describe how heating and cooling cause changes to matter.	*Students will be able to answer….* ● What are properties of matter? ● How are objects put together? ● How do heating and cooling change matter? ● How does matter change?

• Use evidence to describe reversible and irreversible changes to matter. • Explore how an object can be taken apart and its pieces used to make another object.	
ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Weekly Tests/Balanced Tests • Unit Assessments • Alternate Assessments • Performance Tasks • Projects • Choice Boards • Benchmark Assessments
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 10 Weeks	
Recommended Learning Activities	
• Complete Lessons 1-4 in HMH Science Dimension series: What are properties of matter?, How • are object put together?, How do heating and cooling change matter?, How does matter change? • View “Can You Explain It?” videos and discuss and respond to questions • Complete Hands On Activities: Explore Properties of Matter, Build Objects from Smaller, Explore Cooling, Explore Changes to Matter • Take it further: Careers and People in Science and Engineering, How Foods Change • You solve it (online interactive activity) • Unit Project: Explore Melting: What is the fastest way to change ice to water? • Unit Performance Task: Build a Model Boat: Design tests and analyze data to determine which materials have properties best suited to their model boat • Vocabulary Games: Guess the Word	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers)	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities

• Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	• Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study

Connections	
Interdisciplinary Connections • ELA, Math, Science, Social Studies • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications

Instructional and Supplemental Materials

- HMH Science Dimension Student Edition
- HMH Science Dimension Teacher Edition
- HMH online resources https://www.hmhco.com
- Scholastic News
- Mystery Science – Material Magic (online)
- Magic School Bus Meets Molly Clue
- Bill Nye: Phases of Matter
- www.sciencekids.co.nz/
- https://kids.nationalgeographic.com/
  Cotton
- Foam
- Feathers
- Tissues
- Zippered pillow case
- Flower
- Orange juice
- Ice cube tray
- Paper plate
- Microwave and container
- Uncooked food (popcorn kernels)
- Measuring cup
- Ice cubes
- Bowls
- Tin can
- Stopwatch
- Plastic bottle, fabric, clay, straw, tape, scissors

Leveled Texts

- Advanced: Making Coins, Matter First Science
- Intermediate: What Can We Learn about Matter?, Melting Matter

- Beginner: What Can We Learn About Matter? (simplified version of above) Matter: Physical Science for Kids

Grade 2

Unit 2: Ecosystems: Interactions, Energy, and Dynamics

DESIRED RESULTS

Standards

New Jersey Student Learning Standards

2-LS2-1 Plan and conduct an investigation to determine if plants need sunlight and water to grow.

2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats

Technology Standards

(K-2) 8.1.2.A.4-Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).

8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.

8.1.2.E.1-Use digital tools and online resources to explore a problem or issue.

(3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.

8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.

8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks.

(6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools.

8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.

8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.

21st Century Life and Career Standards

Learning Outcomes

Students will understand….

- What plants need in order to live and grow.
- Plants depend on animals for their pollination or to move their seeds around.
- A simple model may be designed to mimic the function of an animal in dispersing seeds or pollinating plants.
- Explore environments to identify observable patterns by exploring the environment
- Observe plants and animals to compare

Students will be able to answer….

- What do plants need?
- How do plants depend on animals?
- How can I design a simple model based on evidence to represent how animals help plants pollinate or disperse seeds?
- What plants and animals live in water habitats?
- What plants and animals live in land habitats?

<table>
<tr><td colspan="2">diversity of life in water habitats.
• Observe plants and animals to compare diversity of life in land habitats.</td></tr>
<tr><td colspan="2">ASSESSMENT</td></tr>
<tr><td>Formative</td><td>Summative</td></tr>
<tr><td>• Exit Slips
• Journals
• Oral reading
• Graphic Organizers
• Class discussion
• Response to reading
• Interactive online games
• Open-ended response questions & comprehension questions
• Running records
• Teacher observation
• Classwork Practice
• Discussion Trifolds
• Video logs</td><td>• Weekly Tests/Balanced Tests
• Unit Assessments
• Alternate Assessments
• Performance Tasks
• Projects
• Choice Boards
• Benchmark Assessments</td></tr>
<tr><td>Benchmark</td><td>Alternative</td></tr>
<tr><td>• Unit pre and post assessments that align to text series</td><td>• Portfolio
• Performance assessments</td></tr>
<tr><td colspan="2">LEARNING PLAN</td></tr>
<tr><td colspan="2">Pacing Guide: 8 Weeks</td></tr>
<tr><td colspan="2">Recommended Learning Activities</td></tr>
<tr><td colspan="2">• Complete Lessons 1-4 in HMH Science Dimension series: What do plants need?, How do plants depend on animals?, What plants and animals live in water habitats?, What plants and animals live in land habitats?
• View “Can You Explain It?” videos and discuss and respond to questions
• Complete Hands On Activities: Explore What a Plant Needs, Plan and Build a Model Tool, Make Model Habitats, Make a Habitat Exhibit
• Take it further: Careers and People in Science and Engineering, How Foods Change
• You solve it (interactive activity) City Habitats: Children identify and observe how plants and animals get what they need within a variety of habitats within a city
• Unit Project: Explore Habitats: Why do plants and animals live where they do?
• Unit Performance Task: Observe an Ant Farm: Compare lives of ants within an ant farm and identify how its shape and stability relate to its function
• Vocabulary Games: Show the Word!
• Make a Model! Design a model that mimics the function of an animal in dispersing seeds or pollinating plants using the design process.</td></tr>
<tr><td colspan="2">Integrated Accommodations and Modifications</td></tr>
<tr><td>Special Education, ELL and 504
• Repeat/modify directions
• Visual models
• Assistive technology
• Extended time
• Preferred/flexible seating</td><td>Gifted and Talented
• Flexible grouping
• Differentiated activities (centers)
• Games
• Assistive technology
• Problem solving strategies</td></tr>
</table>

• Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	• Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • ELA, Math, Science, Social Studies • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• HMH Science Dimension Student Edition • HMH online resources https://www.hmhco.com • www.sciencekids.co.nz/ • https://kids.nationalgeographic.com/ • https://www.ngssphenomena.com/new-gallery-1/azwktehoyb5223vnt3iyp08zsw78qg seed pod dispersing seeds • Mystery Science – Plant and Animal Adventures • Magic School Bus Gets Planted • Bill Nye: Plants • Large clear plastic containers, measuring cup, water, food coloring, celery stalks, red crayons • 3 kinds of seeds, drinking straws, toothpicks, craft sticks, masking tape, string • Transparent plastic container, rocks, markers, rubber sea creatures, water • Books and fact cards about animals, pencils, poster board, markers • Notebook, hand lens, camera • Ant farm kit, ants, hand lens, dropper, plastic gloves, food crumbs, water	
Leveled Texts	
• Advanced: Meet The Amazing Monarch Butterfly, Strange Plants (Level Q) • Intermediate: How Do Living Things Survive in their Environment?, Strange Plants (Level N) • Beginner: How Living Things Survive in their Environment?, Strange Plants (Level K)	

Grade 2

Unit 3: Earth's Place In the Universe	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards 2-ESS1-1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly. 2-ESS2-1 Compare multiple solutions designed to slow or prevent wind or water from changing the	Technology Standards (K-2) 8.1.2.A.4-Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums). 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.

<table>
<tr><td rowspan="2">shape of the land.
2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area.
2-ESS2-3 Obtain information to identify where water is found on Earth and that it can be solid or liquid</td><td>8.1.2.E.1-Use digital tools and online resources to explore a problem or issue.
(3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.
8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks.
(6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools.
8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.
8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.</td></tr>
<tr><td>21st Century Life and Career Standards
CRP1. Act as a responsible and contributing citizen and employee
CRP2. Apply appropriate academic and technical skills
CRP4. Communicate clearly and effectively and with reason
CRP6. Demonstrate creativity and innovation.
CRP8. Utilize critical thinking to make sense of problems and preserve in solving them.
CRP11. Use technology to enhance productivity</td></tr>
<tr><td colspan="2">Learning Outcomes</td></tr>
<tr><td>Students will understand….
Water is found in ponds, lakes, rivers, and oceans on Earth
How to develop a map to identify where land and water are located
Using evidence to explain that some changes to Earth happen slowly
Using evidence to explain that some changes to Earth happen quickly
How to find solutions to prevent wind from changing the land
How to find solutions to prevent water from changing the land
Water exists on Earth as solid and liquid form.</td><td>Students will be able to answer….
Where is water found on Earth?
How can we map land and water?
What changes on Earth happen slowly?
What changes on Earth happen quickly?
How can we prevent wind and water from changing the land?
Compare and contrast bodies of water by creating a model of where they are found on Earth.</td></tr>
</table>

<table>
<tr><th colspan="2">ASSESSMENT</th></tr>
<tr><td>Formative</td><td>Summative</td></tr>
<tr><td>Exit Slips
Journals
Oral reading
Graphic Organizers
Class discussion
Response to reading
Interactive online games
Open-ended response questions & comprehension questions
Running records
Teacher observation
Classwork Practice
Discussion Trifolds
Video logs</td><td>Weekly Tests/Balanced Tests
Unit Assessments
Alternate Assessments
Performance Tasks
Projects
Choice Boards
Benchmark Assessments</td></tr>
<tr><td>Benchmark</td><td>Alternative</td></tr>
<tr><td>Unit pre and post assessments that align to text series</td><td>Portfolio
Performance assessments</td></tr>
<tr><th colspan="2">LEARNING PLAN</th></tr>
<tr><td colspan="2">Pacing Guide: 11 Weeks</td></tr>
<tr><td colspan="2">Recommended Learning Activities</td></tr>
<tr><td colspan="2">Complete Units 4 & 5 in HMH Science dimension Series: Where is Water Found on Earth?, How
Can We Map Land and Water?, What Changes on Earth/Happen Slowly?, What Changes on
Earth Happen Quickly?, How Can we Prevent water from Changing Land?
View “Can You Explain It?” videos and discuss and respond to questions
Complete Hands On Activities: Locate Bodies of Water, Make a Map, Model Erosion, Model
Quick Changes on Earth, Prevent Water from Changing Land
Take it further: Careers and People in Science and Engineering, How Foods Change
You solve it (interactive activity): Mapping Water, Preventing Wind Erosion
Unit Project: Explore Ocean Water: Why doesn’t an ocean freeze?, Make a Windbreak: How can you stop wind from changing the land?
Unit Performance Task: Map an Island: Develop a model to show where land and water are located and to represent models in the natural world, Build an Earthquake Proof Structure:
Compare and contrast earthquake proof structures
Vocabulary Games: Guess the Word, Make a Match</td></tr>
<tr><td colspan="2">Integrated Accommodations and Modifications</td></tr>
<tr><td>Special Education, ELL and 504
Repeat/modify directions
Visual models
Assistive technology
Extended time
Preferred/flexible seating
Differentiated activities (centers)
Shortened assignments
Sensory integration activities</td><td>Gifted and Talented
Flexible grouping
Differentiated activities (centers)
Games
Assistive technology
Problem solving strategies
Tiered choice activities
Kinesthetic Activities
Role Play</td></tr>
</table>

• Flexible grouping • Games • Kinesthetic Activity • Role Play	• Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • ELA, Math, Science, Social Studies • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• HMH Science Dimensions Student Edition • HMH Science Dimensions Teacher Edition • HMH online resources https://www.hmhco.com • Mystery Science – Works of Water • Bill Nye: Earth Science • www.sciencekids.co.nz/ • https://kids.nationalgeographic.com/ • Online/print resources about where you live, poster board, art materials • Paper, pencils, crayons, markers, examples of island maps • Small cups, medium sized bowls, salt/fresh water, stopwatch, freezer • Plastic gloves, soil, small container, foil tray, pitcher with water, tooth picks, craft sticks, straws, chenille sticks, small rocks, glue/tape, clay, safety goggles, small book • Flat boxes, sand/loose soil, fan/hair dryer	
Leveled Texts	
• Advanced: Raz-kids: All About Rocks, Earth's Water (Level N) • Intermediate: Raz-kids: Why Are Resources Important?, Earth's Water (Level K) • Beginner: Raz-kids: Why Are Resources Important? (simplified version of above), Earth's Water	

Grade 2

Unit 4: Engineering Design	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool. K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare	Technology Standards (K-2) 8.1.2.A.4-Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums). 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.2.E.1-Use digital tools and online resources to explore a problem or issue. (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in

the strengths and	interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.
	21st Century Life and Career Standards CRP1. Act as a responsible and contributing citizen and employee CRP2. Apply appropriate academic and technical skills CRP4. Communicate clearly and effectively and with reason CRP6. Demonstrate creativity and innovation. CRP8. Utilize critical thinking to make sense of problems and preserve in solving them. CRP11. Use technology to enhance productivity
Learning Outcomes	
Students will understand…. ● Ask questions, make observations, and gather information to define a problem to be solved through the design process ● Analyze and compare multiple design solutions.	*Students will be able to answer….* • Ask questions, make observations, and gather information to define a problem to be solved through the design process • Analyze and compare multiple design solutions.
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Interactive online games ● Open-ended response questions & comprehension questions ● Running records ● Teacher observation ● Classwork Practice ● Discussion Trifolds	• Weekly Tests/Balanced Tests • Unit Assessments • Alternate Assessments • Performance Tasks • Projects • Choice Boards • Benchmark Assessments

• Video logs	
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 5 Weeks	
Recommended Learning Activities	
• Complete Unit 1 Lessons 1 & 2 in HMH Science dimension Series : What is a Design Process?, • How Can We Compare Design Solutions? • View “Can You Solve It?” videos and discuss and respond to questions • Complete Hands On Activities: Build a Better Lunchbox, Compare Strengths and Weaknesses of Design Solutions • Complete Apply what You Know Activities: What Engineers Do, Steps 1-5 of Design Process, • One Problem, Many Solutions, Build and Test a Solution, Compare Design Solutions • Take it further: Make Your Lunchbox Better, Careers and People in Science and Engineering • You solve it (online interactive activity) • Unit Project: Runaway Wagon: How can you stop a wagon from rolling away? • Unit Performance Task: Build a Water Bottle Holder: Define a problem and develop a solution that take into consideration the structure and function of a water bottle holder • Vocabulary Games: Guess the Word	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • ELA, Math, Science, Social Studies • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• HMH Science Dimensions Student Edition • HMH Science Dimensions Teacher Edition	

- HMH online resources https://www.hmhco.com
- www.sciencekids.co.nz/
- https://kids.nationalgeographic.com/
- You Tube: Crash Course for Kids Engineering
- STEM bins
- "Once Upon A Stem" (tpt)
- Rosie Revere, Engineer Activities and STEM (tpt)
- Lunch box
- Water bottle
- Foil
- Waxed paper
- Paper towels
- Cotton batting
- Uncooked spaghetti
- Marshmallows
- Making tape
- Scissors
- String
- Water bottle, ribbon, fabric, string, straw, tape, rubber bands, scissors, chenille sticks, glue

Leveled Texts

- Advanced: Raz-kids: Ben's Engineering Project, Fantastic Flying Machines (Level P)
- ● Intermediate: Raz-kids: How Do Engineers Solve Problems, Fantastic Flying Machines (Level L)
- ● Beginner: Raz-kids: How Do Engineers Solve Problems (simplified version of above), Fantastic Flying Machines (Level I)

Grade 3

Unit 1: Engineering Design	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards 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. 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. 8.2.5.ITH.2: Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have. 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.	Technology Standards (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. 21st Century Life and Career Standards 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 (e.g., 8.2.5.ED.2, 1.5.5.CR1a). 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 (e.g., W.4.7, 8.2.5.ED.6). 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, 4-ESS3-1, 6.3.5.CivicsPD.2). 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. 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).
Learning Outcomes	
Students will understand…. ● to explore real-world examples of new and old technology and the needs that they fulfill ● how to define the work that engineers do to develop technology with available materials and resources ● how to identify limits and the role they play in problem solving and determining constraints	*Students will be able to answer….* ● How do we define a problem? ● How do we design a solution? ● How do we test and improve a solution?

• to develop an understanding of the role of research and criteria and constraints when developing a design solution • to develop an understanding of the importance of researching detailed information related to design solutions • to explore the importance of testing a design • to plan and carry out investigations to analyze systems used as design solutions in order to optimize a design solution • to develop an understanding of potential failure points or difficulties with a design	
ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Weekly Tests/Balanced Tests • Unit Assessments • Alternate Assessments • Performance Tasks • Projects • Choice Boards • Benchmark Assessments
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 5 Weeks	
Recommended Learning Activities	
• Complete Lessons 1-3 in HMH Science Dimensions - How Do We Define a Problem?, How Can We Design a Solution?, and How Do We Test and Improve a Solution? activities in Student Edition Unit 1 • Vocabulary Games: Guess The Word • View Can You Solve It? videos and discuss and respond to questions • Complete Hands On Activities: What's in the Way?, Modeling Irrigation, Looking it Over • Complete Apply What You Know Activities: Meet the Need, Brainstorming Ideas, Clipped!, Plan a Test • Read Take it Further Texts: Phoning Home, Solve Your Own Problem, Less Water, Consumer Test Lab, Tell Everybody, Model Work • Complete Unit Project - Building a Better Backpack • Complete You Solve It - Egg Drop Challenge	

- Complete Unit Performance Task
- Complete Unit Review
- Read *Marvelous Mattie* by Emily Arnold McCully
- Play online games about engineering at: https://pbskids.org/games/engineering/

Integrated Accommodations and Modifications

Special Education, ELL and 504

- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

Gifted and Talented

- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

Connections

Interdisciplinary Connections

- ELA, Math, Science, Social Studies
- Technology
- Character education
- Career Education

21st Century Skills and Career Education

- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

Instructional and Supplemental Materials

- http://ngss-k-5-ausd.weebly.com/3engineering-design---third-grade.html
- Engineering Crash Course for Kids https://www.youtube.com/watch?v=qDcMq1SjR_I
- classroom objects
- scrap paper
- paper clips
- safety goggles
- plastic cups
- small, empty plastic milk jugs
- plastic tubing
- water
- balloons
- large and small containers for water
- tape
- tent stakes
- rubber bands
- aquarium pumps
- graduated cylinder

Leveled Texts
• Advanced: Designing Amusement Park Rides (Green) • Intermediate: How Does the Design Process Help Us? (Blue) • Beginner: How Does the Design Process Help Us? (Red)

Grade 3

Unit 2: Forces and Motion	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards 3-PS2-1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. 3-PS2-2 Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion. 3-PS2-3 Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other. 3-PS2-4 Define a simple design problem that can be solved by applying scientific ideas about magnets.	Technology Standards (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. 21st Century Life and Career Standards 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 (e.g., 8.2.5.ED.2, 1.5.5.CR1a). 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 (e.g., W.4.7, 8.2.5.ED.6). 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, 4-ESS3-1, 6.3.5.CivicsPD.2). 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. 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3). 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources)

Learning Outcomes	
Students will understand…. ● how to plan investigations about how a force will have an effect on motion and explore how those relationships inform the engineering and design process to improve technologies ● to explore how the strength of a force is related to the amount of weight that can be moved ● to obtain and evaluate information from familiar examples about how the strength of a force can be changed ● to identify the cause and effect relationship between forces and motion ● to plan an investigation about how the strength and direction of a force can be changed ● to identify the cause and effect relationship between the speed and direction of an object and the strength and direction of the force applied to it ● the difference between balanced and unbalanced forces ● the causes and effects of friction and gravity on forces and motion ● the cause and effect relationship between magnets and some metals ● to examine the ways electrical forces operate as well as how they can create magnetism ● to develop an understanding of how to use a change in position to determine the motion of a person or object ● to investigate the nature of speed and its relation to forces and motion ● to identify regular patterns of motion and future motion to predict the motion of a pendulum	*Students will be able to answer….* ● What are forces? ● What are some types of forces? ● What forces act from a distance? ● What is motion? ● What are some patterns of motion?
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading	● Weekly Tests/Balanced Tests ● Unit Assessments ● Alternate Assessments ● Performance Tasks ● Projects ● Choice Boards

• Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Benchmark Assessments
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 9 Weeks	
Recommended Learning Activities	
• Complete Lessons 1-3 in HMH Science Dimensions - What Are Forces?, What Are Some Types of Forces?, and What Forces Act From a Distance? activities in Student Edition Unit 2 • Vocabulary Games: Concentration • View Can You Solve It? videos and discuss and respond to questions • Complete Hands On Activities: Demonstrating How Forces Affect Motion, Exploring Forces, Build an Electromagnet • Complete Apply What You Know Activities: Playground Pushes and Pulls, Sliding Along, Compass • Complete Unit Project - Balanced Forces • Complete You Solve It - Launch a Roller Coaster! • Complete Unit 2 Performance Task - Moved without Touching • Complete Unit 2 Review • Complete Lessons 1-2 in HMH Science Dimensions - What Is Motion? and What Are Some Patterns in Motion? activities in Student Edition Unit 3 • Vocabulary Games: Bingo • View Can You Solve It? videos and discuss and respond to questions • Complete Hands On Activities: Slow Walk, Fast Walk, Tick Tock • Complete Apply What You Know Activities: Frame of Reference Flipbook, Engineering Motion • Read Take it Further Texts: Predicting Motion: Golf, Safety Engineer, Extreme Sports, Birds of a Feather, Maglev Train, Make a Compass, Movie Making, Robots Race, Where Does Earth Go Every Year?, Well-Oiled Machines • Complete Unit Project - Motion Detectives • Complete You Solve It - Patterns of Motion • Complete Unit 3 Performance Task - Hunting for Treasure! • Complete Unit 3 Review • Read *Forces Make Things Move* by Kimberly Brubaker Bradley • Read *Motion: Push and Pull Fast* by Darlene R. Stille • Read *Waking Upside Down* by Philip Heckman • Play online games about forces at: http://www.sciencekids.co.nz/gamesactivities/forcesinaction.html	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models	Gifted and Talented • Flexible grouping • Differentiated activities (centers)

• Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	• Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • ELA, Math, Science, Social Studies • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• http://ngss-k-5-ausd.weebly.com/3forces-and-interaction-part-1.html • http://ngss-k-5-ausd.weebly.com/3forces-and-interaction-part-2.html • Bill Nye Video Motion https://www.youtube.com/watch?v=eT4n3dzkG3w • pencil • paper • graph paper • toy truck • masking tape • meter stick • stopwatch • objects to push like rulers, erasers • two different battery-powered cars • two different spring scales • compass • bar magnet • electrical meter • calculator • 90 cm of thin insulated wire • battery holder • 2 D-cell batteries • large nail or bolt • tape • paper clips • 5-10 sheets of paper cut into quarters • stapler • cardboard tubes • old water hoses • scissors	

• string • small metal washer • large metal washer • timer
Leveled Texts
• Advanced: Building With Machines (Green) • Intermediate: How Do We Use Machines? (Blue) • Beginner: How Do We Use Machines? (Red)

Grade 3

Unit 3: Life Cycles, Inherited Traits, Living Organisms and Fossils	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards 3-LS1-1 Develop models to describe that organisms have unique and diverse life cycles, but all have in common birth, growth, reproduction, and death. 3-LS2-1 Construct an argument that some animals form groups that help members survive. 3-LS3-1 Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. 3-LS3-2 Use evidence to support the explanation that traits can be influenced by the environment. 3-LS4-1 Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. 3-LS4-2 Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. 3-LS4-3 Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. 3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.	Technology Standards (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. 21st Century Life and Career Standards 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 (e.g., 8.2.5.ED.2, 1.5.5.CR1a). 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 (e.g., W.4.7, 8.2.5.ED.6). 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, 4-ESS3-1, 6.3.5.CivicsPD.2). 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. 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3). 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating

	Sources)
Learning Outcomes	
Students will understand…. • to identify and recognize common patterns in various life cycles of plants • that a given plant's life cycle always happens in the same order, and can be disrupted • to identify patterns and stages in the life cycles of animals • to develop and use models to represent the stages in the life cycles of different animals • to compare and contrast the unique and diverse life cycles of animals • to develop and use models to illustrate what happens when the unique life cycle patterns of animals are interrupted or changed in some way, thereby affecting reproduction • to identify similarities and differences in leaves, flowers, shape, height, and other traits of plants from photos • to identify similarities and differences in color and other traits of animals from photos • to examine and identify examples of cause-and-effect relationships to construct explanations about characteristics and variation of traits of plants that are affected by the environment • to examine and identify examples of cause-and-effect relationships to construct explanations about characteristics and traits of animals that are affected by the environment • to identify adaptations that help organisms to survive • to explore how physical and behavioral adaptations help organisms survive • to examine and identify examples of cause-and-effect relationships to construct explanations about characteristics and traits that help living things survive • to examine and identify examples of cause-and-effect relationships to construct	*Students will be able to answer….* • What are some plant life cycles? • What are some animal life cycles? • What are inherited plant and animal traits? • How does the environment affect traits? • What are adaptations? • How can organisms succeed in their environments? • How do some animals form groups that help them survive? • What happens when environments change? • What is a fossil? • What do fossils tell us about the past?

relationships to construct explanations about the advantages of animals living in groups • to recognize ways in which an environment can change, and that changes in habitats affect both living and nonliving things • to develop an understanding that organisms need to react to environmental changes in order to survive • to explore the cause-and-effect relationship between human activities and the environment, and how environmental changes affect plants and animals • to analyze and interpret evidence or organisms that lived long ago and look for patterns in their fossils • to analyze and interpret fossil evidence of organisms that lived long ago that shows patterns of life in the past • to analyze terrestrial and aquatic animals in their natural habitat • to study fossils and analyze and interpret the pictures looking for consistent patterns in the organisms • to compare fossils to current-era organisms	
ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Weekly Tests/Balanced Tests • Unit Assessments • Alternate Assessments • Performance Tasks • Projects • Choice Boards • Benchmark Assessments
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	

Pacing Guide: 12 Weeks
Recommended Learning Activities

- Complete Lessons 1-3 in HMH Science Dimensions - What Are Some Plant Life Cycles?, What Are Some Animal Life Cycles?, What Are Inherited Plant and Animal Traits? activities in Student Edition Unit 4
- Vocabulary Games: Guess the Word
- View Can You Solve It? videos and discuss and respond to questions
- Complete Hands On Activities: How Do Plants Grow?, Observing Mealworm Metamorphosis, Monster Traits
- Complete Apply What You Know Activities: In Full Bloom Flipbook, Design a Nest, Pick a Hand
- Read Take it Further Texts: The Germinators, Careers in Science & Engineering, Embryology, Comparing Plant Life Cycles to Animal Life Cycles, Scavenger Hunt, Hot Diggity Dog, Can Animal Growth be Tracked?, Human Traits and the Environment, Build a Sugar Organism, Hide and Seek, Dinosaur Parts, Build a Fossil Museum, That's a Long Time Ago, How a Fossil Forms
- Complete Unit Project - Life Cycle Model
- Complete You Solve It - Insect Life Cycles
- Complete Unit 4 Performance Task - Cool Beans! (And Warm and Hot Ones, Too!)
- Complete Unit 4 Review
- Complete Lessons 1-4 in HMH Science Dimensions - How Does the Environment Affect Traits?, What Are Adaptations?, How Can Organisms Succeed in their Environments?, What Happens When Environments Change? activities in Student Edition Unit 5
- Vocabulary Games: Picture It!
- View Can You Solve It? videos and discuss and respond to questions
- Complete Hands On Activities: How Much Water Do Plants Need?, BIrd Beaks, Battle of the Beans, How Can It Cross the Road?
- Complete Apply What You Know Activities: Plan a Garden, Match It!, Identify It!, Environmental Changes and You
- Complete Unit Project - Lucky Layers
- Complete You Solve It - Survival!
- Complete Unit 5 Performance Task - Change It Up
- Complete Unit 5 Review
- Complete Lessons 1-2 in HMH Science Dimensions - What Is a Fossil?, What Do Fossils Tell Us about the Past? activities in Student Edition Unit 6
- Vocabulary Games: Bingo
- View Can You Solve It? videos and discuss and respond to questions
- Complete Hands On Activities: Walk This Way!, What Can You Learn from Studying a Fossil?
- Complete Apply What You Know Activities: Modeling Fossils, Look-Alikes
- Complete Unit Project - A Window to the Past
- Complete You Solve It - Fossil Hunt
- Complete Unit 6 Performance Task - Past or Present?
- Complete Unit 6 Review
- Make models of fossils with three different colors of playdoh and seashells.
- Read *Cam Jansen and the Mystery of the Dinosaur Bones* by David A. Adler
- Remember to study dinosaur bones in Alberta, Canada during our study of North America (Social Studies). Review the types of land and environment the dinosaurs once lived in
- Research the first type of dinosaur bone that was dug up in our state, New Jersey. Discuss how the environment in New Jersey was during the dinosaur age

Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • ELA, Math, Science, Social Studies • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• http://ngss-k-5-ausd.weebly.com/3inheritance-and-variation-of-traits-life-cycles-and-traits.html • http://ngss-k-5-ausd.weebly.com/3interdependent-relationships-in-ecosystems.html • Bill Nye Video Life Cycles https://www.youtube.com/watch?v=MREKmC1NvrU • construction paper • scissors • colored markers • staples or paper clips • clear plastic cups • 3 seeds • soil • water • gloves • mealworms • clear container with lid • uncooked oatmeal • baby carrot or slice of raw potato • magnifying glass • camera • coin • monster parent traits table • crayons or colored pencils • 3 plants of same type and height • tape • permanent marker	

- metric ruler
- measuring cup
- plastic cups
- index cards
- pencils, pens
- drawing paper
- straws
- plastic spoons
- chopsticks
- clothespins
- toothpicks
- bowl of water
- paper plate
- marbles
- foam packing
- noodles
- cup of colored water
- timer
- specimens (images or real)
- paper
- 30 dry white beans
- 30 dry black beans
- 5 dry red beans
- large sheet of white paper
- large sheet of black paper
- cup
- clock with second hand or timer
- computer
- poster board
- craft sticks
- glue
- cardboard
- chenille sticks
- wood
- clay
- student's shoe
- rolling pin
- chopstick holder
- fossil kit
- hand lens

Leveled Texts

- Advanced: Surprising Adaptations (green)
- Intermediate: How Do Living Things Change and Grow? (blue)
- Beginner: How Do Living Things Change and Grow? (red)
- Advanced: Rain Forest Adventure (green)
- Intermediate: How Are Living Things Connected to Their Ecosystem? (blue)
- Beginner: How Are Living Things Connected to their Ecosystem? (red)

Grade 3

Unit 4: Weather and Patterns	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards 3-ESS2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. 3-ESS2-2 Obtain and combine information to describe climates in different regions of the world. 3-ESS3-1 Make a claim about the merit of a design solution that reduces the impacts of climate change and/or a weather-related hazard. 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.4: Organize and present climate change data visually to highlight relationships or support a claim. 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data. 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. 8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment. 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.	Technology Standards (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. 21st Century Life and Career Standards 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim. 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 (e.g., 8.2.5.ED.2, 1.5.5.CR1a). 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 (e.g., W.4.7, 8.2.5.ED.6). 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, 4-ESS3-1, 6.3.5.CivicsPD.2). 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. 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3). 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources) 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3). 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data.

Learning Outcomes	
Students will understand…. ● to analyze aspects of weather that can be observed and recorded, including temperature, rain or snow, wind, and clouds ● that weather follows patterns ● to use instruments to record weather conditions in a table ● that satellites record weather conditions ● to analyze and interpret data about weather patterns to understand and identify patterns of change ● to analyze and interpret data about seasonal weather changes ● to identify patterns of typical weather conditions to make predictions about the weather ● to explore natural hazards and recognize their cause-and-effect relationship with people and the environment ● to explore how meteorologists collect data to track weather across different times and areas, identify patterns, and use patterns to make predictions about future weather ● that although people cannot eliminate natural hazards, they can take steps to reduce their impacts by researching previous techniques and plans ● to develop and understanding of climate types and animals that thrive in particular climates ● to apply their understanding of climate types and native plants to identify and evaluate patterns necessary for life to thrive using artificial climate and weather patterns ● to identify characteristics of climate change ● to brainstorm and design solutions to reduce the impacts of climate change	*Students will be able to answer….* ● How is the weather measured? ● How can we predict weather? ● What are some severe weather impacts? ● What are some types of climates? ● What is climate change? ● What are some design solutions that reduce the impacts of climate change?
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading	● Weekly Tests/Balanced Tests ● Unit Assessments ● Alternate Assessments

• Graphic Organizers • Class discussion • Response to reading • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Performance Tasks • Projects • Choice Boards • Benchmark Assessments
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 6 Weeks	
Recommended Learning Activities	
• Complete Lessons 1-4 in HMH Science Dimensions - How Is Weather Measured?, How Can We Predict the Weather?, What Are Some Severe Weather Impacts?, What Are Some Types of Climates? activities in Student Edition Unit 7 • Vocabulary Games: Concentration • View Can You Solve It? videos and discuss and respond to questions • Complete Hands On Activities: Analyzing Weather Data, Weather Here and There, Smashing Floods, Looking For a New Home • Complete Apply What You Know Activities: Wind Pictures, Averages in Your Town, The Answer Is Blowing in the Wind, Explain the Zones • Read Take it Further Texts: How Windy Is it?, Put It All Together, Weather Outside of the United States, National Weather Patterns, Reporting Severe Weather, Historical Weather Patterns, Migrating Monarchs, Other Factors • Complete Unit Project - Safety Plan • Complete You Solve It - Run a Weather Station • Complete Unit 7 Performance Task - A New Job? • Complete Unit 7 Review • Read *A Drop Around the World* by Barbara Shaw McKinney • Read Seymour Simon – Smithsonian Weather titles such as: Lightning, Hurricanes, Weather, Tornadoes, and Storms. • Read *Outside Your Window: A First Book of Nature* by Nicola Davies • Read *Weather Forecasting* by Gail Gibbons • Play online games about weather at: https://www.learninggamesforkids.com/weather-games.html • Climate Change - We ARE the Problem & the Solution https://www.youtube.com/watch?v=-D_Np-3dVBQ • Climate Change for Kids https://www.youtube.com/watch?v=WkvPdUtYhX8 • I'm only a Kid...I can't do anything about Climate Change...right? https://www.youtube.com/watch?v=PslL9WC-2cQ	
Integrated Accommodations and Modifications	

Special Education, ELL and 504	Gifted and Talented
• Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	• Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study

Connections	
Interdisciplinary Connections • ELA, Math, Science, Social Studies • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications

Instructional and Supplemental Materials

- http://ngss-k-5-ausd.weebly.com/3weather-and-climate.html
- Weather vs. Climate Crash Course for Kids https://www.youtube.com/watch?v=YbAWny7FV3w
- Bill Nye Video Climates https://www.youtube.com/watch?v=Fr29YJ7TswA
- http://www.sciencekids.co.nz/weather.html
- drawing paper
- drawing utensils
- computer
- rain gauge
- wind vane
- thermometer
- data table
- class map of United States
- group map of United States
- newspapers or internet
- graph paper
- colored pencils
- self-stick notes in a variety of colors
- sheets of paper
- 9x12 pan
- sand
- water
- containers for pouring water
- model house

• small stones • plastic straws • strips of fabric • beach ball • marker • notepaper • hair dryer • world map • access to weather data
Leveled Texts
• Advanced: Double Danger: Thunderstorms and Tornadoes (green) • Intermediate: How Can We Describe Weather? (blue) • Beginner: How Can We Describe Weather? (red)

4th Grade

Unit 1: Engineering	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards ● 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. ● 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.1: Collect, organize, and display data in order to highlight relationships or support a claim. ● 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.	Technology Standards 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. 21st Century Life and Career Standards • 9.1.5.PB.2: Describe choices consumers have with money (e.g., save, spend, donate). • 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 (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6). • 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 (e.g., 8.2.5.ED.2, 1.5.5.CR1a). • 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 (e.g., W.4.7, 8.2.5.ED.6). • 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, 4-ESS3-1, 6.3.5.CivicsPD.2). • 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. • 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).

Learning Outcomes	
Students will understand…. • that possible solutions to a problem are limited by available materials and resources (constraints) • the success of a designed solution is determined by considering the desired features of a solution (criteria) • different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each one meets the specified criteria for success or how well each takes the constraints into account. • that research on a problem should be carried out before beginning to design a solution • testing a solution involves investigating how well it performs under a range of likely conditions • communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. • tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved	Students will be able to answer…. • How do engineers define problems and solutions? • What is the importance of prototypes? • How are prototypes tested and improved using models?
ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Apply What You Know responses • Can You Solve It? responses • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Preassessments • Lesson Check • Lesson Round Up • Unit Assessments • Alternate Assessments • Performance Tasks • Unit Projects • Choice Boards

Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 4 Weeks	
Recommended Learning Activities	

• Complete Lesson 1-3 How Do Engineers Define Problems?, How do Engineers Design Solutions?, and How Do Engineers Test and Improve Prototypes? activities in student edition
• Vocabulary Games: Guess The Word
• View Can You Solve It videos and discuss and respond to questions
• Complete Hands On Activities: Menu Planning , Design It, Things Fail and Improve,
• Complete Apply What You Know Activities: Engineered?, What is the Problem?, Paper Building, Hear Here, Class Collaboration (worksheet), Tissue Rope, Cakes Done Right!
• Magazine Hunt: students search through magazines to find both engineered and not engineered products. For engineered products, Ss record the problem that it solves.
• Fair Test Contest: https://thesciencepenguin.com/2015/07/scientificmethod.html Hold several different contests to model the importance of conducting fair tests with only one different variable
• Limits in Nature: groups carry out research about the types of technologies and tools that are available to address limits in nature
• Hearing Enhancing Device: construct a wearable hearing enhancing device within a series of criteria and constraints
• Read Take it Further Texts: People in Science: Improving Hearing, Careers in Science and Engineering, Sense Extenders for Science
• You Solve It: Keeping It Warm and Cool: students explore what keeps a home cool in a hot humid climate and warm in a cold climate
• Unit Project: Extend a Sense: design a device to improve one human sense
• Unit Performance Task: Designing a Portable Chair: develop models for a more comfortable portable chair
• Innovative Prototypes Research Project: research the top engineered prototypes of the current year; select one device to profile in a research project
• Video Based Project: It's a Bird! It's a Plane!: Students explore the forces involved in flight by building and testing paper airplanes that can navigate a simple obstacle course
• Google Expeditions:
  ○ Engineering in the Everglades: Students should be able to explain that criteria and constraints of a proposed new structure in Shark Valley.
  ○ From Assembly to Launch: A Rocket's Journey: Students will explain how NASA's design solutions to engineering problems relate to the assembly and launch of space vehicles	

Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities

• Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	• Role Play • Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • (ELA, Math, Science, Social Studies) • Technology • Character education • Career Education • (SEP) Science and Engineering infusions • (CCC) Crosscutting concepts: patterns, cause and effect, systems and system models, stability and change, structure and function, scale, proportion and quantity	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04 • DOGONews - www.dogonews.com • Future of Food video: https://www.youtube.com/watch?v=mnoCy0j7DNs • Targeting Sounds: Who Am I video: https://www.youtube.com/watch?v=yxjXZnWrPrY • Engineering Process for Kids: https://www.youtube.com/watch?v=fxJWin195kU • Fair Test Contest: https://thesciencepenguin.com/2015/07/scientificmethod.html • Bill Nye - Simple Machines video • Interactive Notebook: Engineering Process • Index cards • magazines • tissue paper/toilet paper • recipe cards • cloth scraps • duct tape • masking tape • wire clothes hangers • string • rubber tubing • plastic headband • scissors • baseball/painter's hat • plastic/paper cups	
Leveled Texts	
• Advanced: Enrichment: City Water Tunnel 3 • Intermediate: On-Level Reader: What is the Engineering Process? • Beginner: Extra Support: What is the Engineering Process?	

4th Grade

Unit 2: Energy, Waves, and Information Transfer

DESIRED RESULTS

Standards

New Jersey Student Learning Standards

- 4-PS3-1 Use evidence to construct an explanation relating the speed of an object to the energy of that object
- 4-PS3-2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. [
- 4-PS3-3 Ask questions and predict outcomes about the changes in energy that occur when objects collide.
- 4-PS3-4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.
- 4-PS4-1 Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
- 4-PS4-2 Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
- 4-PS4-3 Generate and compare multiple solutions that use patterns to transfer information.
- 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.

Technology Standards

8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.
8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks.

21st Century Life and Career Standards

• 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 (e.g., 8.2.5.ED.2, 1.5.5.CR1a).
• 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 (e.g., W.4.7, 8.2.5.ED.6).
• 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, 4-ESS3-1, 6.3.5.CivicsPD.2).
• 9.4.5.CT.3: Describe how digital tools and technology may be used to solve problems.
• 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).
• 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings.

Learning Outcomes

Students will understand….

- the faster a given object is moving, the more energy it possesses
- energy can be moved from place to place by moving objects or through sound, light, or electric currents
- when objects collide, energy can be transferred from one object to another, thereby changing their motion
- the expression "produce energy" typically refers to the conversion of stored energy into a desired form for practical use

Students will be able to answer….

- What is energy and how is it transferred?
- How do collisions show energy?
- What are the different parts of waves?
- How can light can be reflected?
- How can information be transferred from place to place?

• waves, which are regular patterns of motion, can be made in water by disturbing the surface • an object can be seen when light reflected from its surface enters the eyes • digitized information can be transmitted over long distances without significant degradation	
ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Apply What You Know responses • Can You Solve It? responses • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Preassessments • Lesson Check • Lesson Round Up • Unit Assessments • Alternate Assessments • Performance Tasks • Unit Projects • Choice Boards
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 8 Weeks	
Recommended Learning Activities	
• Complete Energy Lesson 1-3, What is Energy?, How is Energy Transferred?, How Do Collisions Show Energy? activities in student edition • Complete Waves and Information Transfer Lesson 1-3, What Are Waves?, How Does Light Reflect?, and How is Information Transferred from Place to Place? activities in student edition • Vocabulary Games: Guess The Word, Picture It • View Can You Solve It videos and discuss and respond to questions • Complete Hands On Activities: Light the Bulb, Bang a Gong, Flour Power, Rebounce, Test It! Stored Energy in a Spring, Let's Make Waves, Disappearing Coins, Reflecting on Angles, PIxels to Pictures • Complete Apply What You Know Activities: Energy Near You, Testing Testing, Make Vibrations, Tune In, Bobbing and Waving, Seeing Color, Read This, Make a Scytale, Make your Own Code, Make a Wave • Complete Engineer it Activities: Energy from Algae, Thermal Imaging, Shocking, Designed for	

Safety

- Read Take it Further Texts: Mayra Artiles, Car Engineer; Career in Science: HVAC Tech; People in Science: Amanda Steffy; People in Science: Christian Doppler and Debra Fischer; Optics Engineers; Elephant Communication
- Pizza Box Solar Cooker: build and test a Solar Cooker
- Explore transfer of energy through circuits by playing Circuit Construction Kit https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc_en.html
- Mystery Science: Energizing Everything: Energy, Motion and Electricity
- Mystery Science: Waves of Sound: Sound, Waves and Communication
- You Solve It Unit 2: Crash Course: Make observations and record data about the relationship between the speed of a car and the energy that is transferred when the car collides with other objects
- You Solve It Unit 3: Build a Wave Pool: test the settings on a wave pool to create different heights and lengths of waves
- Video Based Project: No Gas Needed: Students design and assemble a model vehicle powered by a solar panel
- Unit 2 Project: Truck Pull: learn how energy transfers from one object to another by designing a model to transfer spring or elastic energy
- Unit 3 Project: Reflecting Light: design a project for bringing more light into a poorly lit section of their school
- Unit 2 Performance Task: Energy Transfers All Around: Create a multimedia presentation to report on how energy is transferred from objects
- Unit 3 Performance Task: Rainbow Show: Create a three part educational presentation about rainbows
- Google Expeditions:
  - Frontiers of Flight: identify the forces that act on an airplane and explain how these forces enabled each type of aircraft to fly
  - University of Central Florida Photonics Lab: students will be able to explain how optical fibers are made and evaluated

Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study

Connections	
Interdisciplinary Connections	21st Century Skills and Career Education

• (ELA, Math, Science, Social Studies) • Technology • Character education • Career Education • (SEP) Science and Engineering infusions • (CCC) Crosscutting concepts: patterns, cause and effect, systems and system models, stability and change, energy and matter	• Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications

Instructional and Supplemental Materials

- HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
- DOGONews - www.dogonews.com
- YouTube Videos: The Dr. Bionics Show; FreeSchool videos; Crash Course Kids videos, AumSum Time videos, SciShow Kids videos
- Algae as Biofuel website: http://kinooze.com/algae-biofuel/
- Circuit Construction Kit: https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc_en.html
- Coding website: https://www.tynker.com/; https://code.org/; https://scratch.mit.edu/educators/
- gong
- tuning fork and metal or wooden rails
- D sized batteries
- light bulb
- three lengths of wire
- switch
- wax paper
- empty container
- rubber bands
- grains of sand, rice, or confetti
- pizza boxes
- tin foil and plastic wrap
- tape
- tennis balls
- baking dish with flour
- giant rubber bands
- toy car/truck
- buckets and water
- corks
- yarn
- slinkys
- flashlight
- transparent wrapping paper
- lens set (concave and convex)
- pennies
- cardboard and cardboard tubes
- small mirror
- modeling clay

Leveled Texts
• Advanced: Enrichment: Energy on Demand: Making Electricity; What Happens Under the Hood? • Intermediate: On-Level Reader: How Do We Generate and Use Electricity?; How Do We Use Forms of Energy? • Beginner: Extra Support: How Do We Generate and Use Electricity; How Do We Use Forms of Energy?

4th Grade

Unit 3: From Molecules to Organisms: Structures and Processes	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards • 4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. • 4-LS1-2 Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. • 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.	Technology Standards 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. 21st Century Life and Career Standards • 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 (e.g., 6.3.5.CivicsPD.3, W.5.7). • 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 (e.g., 8.2.5.ED.2, 1.5.5.CR1a). • 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 (e.g., W.4.7, 8.2.5.ED.6). • 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, 4-ESS3-1, 6.3.5.CivicsPD.2). • 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).
Learning Outcomes	
Students will understand…. • that plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction	*Students will be able to answer….* • How do functions of internal and external plant structures aid in growth, survival, behavior, and reproduction? • How do different plant structures work

• that different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain • that animals are able to use their perceptions and memories to guide their actions	together as a system? • How do internal and external structures of animals function? • How do different animal senses work?
ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Apply What You Know responses • Can You Solve It? responses • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Preassessments • Lesson Check • Lesson Round Up • Unit Assessments • Alternate Assessments • Performance Tasks • Unit Projects • Choice Boards
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 7 Weeks	
Recommended Learning Activities	
• Complete Plant Structure and Function Lesson 1-2, What Are Some Plant Parts and How Do They Function? and How Do Plants Grow and Reproduce? activities in student edition • Complete Animal Structure and Function Lesson 1-3, What Are Some External Structures of Animals?, What Are Some Internal Structures of Animals?, and How Do Senses Work? activities in student edition • Vocabulary Games: Concentration • View Can You Solve It videos and discuss and respond to questions • Complete Hands On Activities: Hold the Soil, Flying High, Staying Warm, Pump It Up, Touch Test • Complete Apply What You Know Activities: Modeling Water Flow in Plants, Plant Response, Pollination Models, Pinecone Parts, Design to Survive, Find the Inspiration, All Systems Go, Name That Scent, No See, No Smell, No Taste?, Test It! • Complete Engineer it Activities: Green Roofs, Biomimicry • Read Take it Further Texts: People in Science & Engineering: Clayton Anderson; Careers in Science & Engineering: Pomologist; Careers in Science & Engineering: Biomimetic Engineering; People in Science: Henry Gray and Vanessa Ruiz; Take It Further: Extreme Senses • View animal adaptation Wild Krats Videos on PBS	

- View Planet Earth series
- Create a Plant Profile Poster highlighting a unique plant, its region, its habitat, its life cycle, and how it reproduces
- Dissect seedless vs. seeded plants to explore reproduction of plants
- Build a Biome: https://switchzoo.com/games/buildabiome.htm
- Research and present on one of Earth's Biomes: https://earthobservatory.nasa.gov/experiments/biome
- Play Carnivore, Omnivore, and Herbivore Hunt (Game from Fairview Lake) to show how the effect of changes in numbers of a population
- Visit Fairview Lake YMCA camp
- You Solve It Unit 4: Growing Plants in Different Environments: determine the characteristics of different biomes and interpret data to decide what plants grow best in certain biomes
- You Solve It Unit 5: Break It Down: students construct and support an argument that all animals' internal structures help them digest food and that these structures relate to the types of food the animals eat.
- Video Based Project: Tent-Making Bats: students learn about the different physical characteristics of bats, bat behavior, and the roles bats play in their ecosystems
- Unit 4 Project: Plant and Animal Partnerships: students will investigate how the structure and function of plants and animals work together for pollination, and present their findings to the class.
- Unit 5 Project: Chew Clue: students will perform an investigation to determine which teeth belong to which animal.
- Unit 4 Performance Task: Flower Parts: students make an educational illustration of a specific flower by dissecting the flower and identifying its individual parts.
- Unit 5 Performance Task: Breathing In and Out: students gather data on the lung capacity of fourth-grade students in order to design a product for young people with asthma.
- Google Expeditions:
    - Amazon: describe the factors that contribute to the biodiversity in the Amazon Rainforest and the Amazon River and identify factors that threaten its biodiversity
    - Antarctica: students will construct an explanation based on evidence that Earth's spheres interact and that changes in one sphere can affect another sphere
    - Big Cypress National Reserve: compare and contrast wetland ecosystems
    - Corkscrew Swamp Sanctuary: understand that wetlands offer many ecosystems
    - The Everglades: use evidence to model the interactions between living and nonliving things within an ecosystem
    - The Great Barrier Reef: explain the impact of human activities on coral reefs
    - Northern Great Plains: identify various plants and animals that interact for survival

Integrated Accommodations and Modifications

Special Education, ELL and 504	Gifted and Talented
• Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities	• Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play

• Flexible grouping • Games • Kinesthetic Activity • Role Play	• Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • (ELA, Math, Science, Social Studies) • Technology • Character education • Career Education • (SEP) Science and Engineering infusions • (CCC) Crosscutting concepts: patterns, cause and effect, systems and system models, stability and change	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04 • DOGONews - www.dogonews.com • Time4Kids magazines • YouTube Videos: The Dr. Bionics Show; FreeSchool videos; Crash Course Kids videos, AumSum Time videos, SciShow Kids videos, National Geographic Kids videos, • Animal Adaptations: https://www.generationgenius.com/videolessons/adaptations-video-for-kids/ • Biomes: https://earthobservatory.nasa.gov/experiments/biome, http://planeta42.com/geography/biomepuzzle/, https://switchzoo.com/games/buildabiome.htm • Plant Structure and Functions: https://nj.pbslearningmedia.org/resource/5dea21b4-6c92-46ff-982c-8650f9429c01/think-garden-plant-structure/ • straws and plastic tubing • bean seeds • plastic cups or bottles • gravel • vermiculite • cotton balls • foam pellets • liquid nutrients • aluminum foil • plastic wrap • pipe cleaner • flour • pinecones • craft sticks • cardboard • felt/fabric • vegetable shortening • resealable baggies • thermometer and timer	

• timer • graph paper • blindfold • assortment of items to smell • assortment of foods
Leveled Texts
• Advanced: Enrichment: Exploring the Galapagos Islands • Intermediate: On-Level Reader: How Do Plants and Animals Reproduce and Adapt? • Beginner: Extra Support: How Do Plants and Animals Reproduce and Adapt?

4th Grade

Unit 4: Earth's Place in the Universe, Earth Systems	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards • 4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. • • 4-ESS2-1 Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. • 4-ESS2-2 Analyze and interpret data from maps to describe patterns of Earth's features. • 4-ESS3-1 Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. • 4-ESS3-2 Generate and compare multiple solutions to reduce the impacts of natural Earth processes and climate change have on humans. • 8.1.5.DA.4: Organize and present climate change data visually to highlight relationships or support a claim	Technology Standards 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. 21st Century Life and Career Standards • 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 (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6). • 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 (e.g., 6.3.5.CivicsPD.3, W.5.7). • 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 (e.g., 8.2.5.ED.2, 1.5.5.CR1a). • 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 (e.g., W.4.7, 8.2.5.ED.6). • 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, 4-ESS3-1, 6.3.5.CivicsPD.2). • 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.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3). • 9.4.5.DC.8: Propose ways local and global communities can engage digitally to participate in and promote climate action (e.g., 6.3.5.GeoHE.1). • 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources). • 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3). • 9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols
Learning Outcomes	
Students will understand…. • that local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes • that the presence and location of certain fossil types indicate the order in which rock layers were formed • that rainfall helps to shape the land and affects the types of living things found in a region • that water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around • that the locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns • that most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans • that major mountain chains form inside continents or near their edges • that energy and fuels that humans use are	*Students will be able to answer….* • How has Earth has been shaped by water and other factors? • How have people mapped Earth's surface? • What types of patterns we can see from maps? • How do the different layers of rocks change? • What we can learn about fossils and ancient environments? • What types of patterns we can see in fossils and what they mean? • What renewable and nonrenewable resources are used for energy? • How people can reduce land- and water-based hazards and their impacts? • How can people reduce the impact of climate change?

derived from natural sources, and their use affects the environment in multiple ways • that some resources are renewable over time, and others are not • that multiple solutions for reducing impacts of climate change exist	
ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Apply What You Know responses • Can You Solve It? responses • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Preassessments • Lesson Check • Lesson Round Up • Unit Assessments • Alternate Assessments • Performance Tasks • Unit Projects • Choice Boards
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 13 Weeks	
Recommended Learning Activities	
• Complete Changes to Earth's Surface Lessons 1-4, How Does Water Shape Earth's Surface?, How Do Other Factors Shape Earth's Surface?, How Can Maps Help Us Learn about Earth's Surface?, and What Patterns Do Maps Show Us? activities in student edition • Complete Rocks and Fossils Lessons 1-3, How Do Rock Layers Change? What Do Fossils Tell Us About Ancient Environments? What are Some Patterns Fossils Show Us? activities in student edition • Complete Natural Resources and Hazards Lessons 1-4, Nonrenewable Resources, Renewable Resources, Reducing the Impact of Land-Based Hazards, and Reducing the Impact of Water-Based Hazards activities in student edition • Vocabulary Games: Guess the Word, Picture It, BINGO • View Can You Solve It videos and discuss and respond to questions • Complete Hands On Activities: The Rate of Change, Finding Change, Park Designer, Tracking Quakes, Modeling How Rocks Can Form and Change, Old and New, Layer by Layer, Catch that Dirt, Running on Sunshine, Reduce the Risk, Is It Safe? • Complete Apply What You Know Activities: Water Effects, Watching Water Grow, Dry Plants, A Slower Process, Make a Map, Earthquakes and Buildings, Modeling Features of the Ocean Floor,	

Making Mountains, Layered Landforms, The Story of the Canyon, Past Meets Present, Where Else, Disordered Days, The School's Energy, Mining Challenge, Plastics From Plants, Make Your Own Seismometer, Disaster Supply Kit, Take Action

- Complete Engineer it Activities: Blast Off; Slowing Change; Mapping the Ocean Floor;
- Read Take it Further Texts: People in Science & Engineering: Anjali Fernandes, Lewis and Clark, Bernard Hubbard Studying Evidence of the Past, Elon Musk; Careers in Science and Engineering: City Planner, Types of "ISTs", Hurricanes and Their Effects
- You Solve It Unit 6: Evidence of Change: compare and contrast a change to earth's surface
- You Solve It Unit 7: Layers of Change: observe and record the rock layers and acknowledge the differences
- You Solve It Unit 8: Solutions for Natural Hazards: create a flood damage prevention solution from a given menu
- Video Based Project: Tornado Warning: Students learn the engineering necessary to build structures that can withstand severe weather such as tornadoes
- Unit 6 Performance Task: Model It, Map It: Choose one of these land features to model: a changing coastline, a canyon, a winding river path, or sand dunes. Write a brief description of factors that shape and change that type of land feature.
- Unit 7 Performance Task: Rocking the Layers: Design a model of the process that formed the rock layers or model one of the other processes that change rock layers.
- Unit 8 Performance Task: Avoiding Disaster: Create a document to detail a flood strategy. Describe the precautions to be put in place. List steps to be carried out during a flood emergency.
- Google Expeditions:
    - How People Use Natural Resources: students will describe the problems faced by the Seminoles and the materials available for the solutions to those problems
    - Volcanoes around the World: construct an explanation based on evidence for how volcanoes around the world have changed Earth's surface
- Visit the Interactive Climate Time Machine: https://climate.nasa.gov/climate_resources/25/interactive-climate-time-machine/
- Climate Change Games: https://climatekids.nasa.gov/menu/play/ and http://gamesforchange.org/studentchallenge/nyc/climate-change/
- Study the Infographic of Greenland's melting ice sheet: https://www.nationalgeographic.org/photo/8icesheet-melt/
- Visit NASA's Climate Change resources https://climatekids.nasa.gov/

Integrated Accommodations and Modifications

Special Education, ELL and 504

- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping

Gifted and Talented

- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies

<table>
<tr><td>Games
Kinesthetic Activity
Role Play</td><td>Accelerated learning
Independent study</td></tr>
<tr><td colspan="2">Connections</td></tr>
<tr><td>Interdisciplinary Connections
(ELA, Math, Science, Social Studies)
Technology
Character education
Career Education
(SEP) Science and Engineering infusions
(CCC) Crosscutting concepts: patterns, cause and effect, systems and system models, stability and change</td><td>21st Century Skills and Career Education
Problem Solving
Critical Thinking
Communication
Collaborative learning
Productivity
Real-world applications</td></tr>
<tr><td colspan="2">Instructional and Supplemental Materials</td></tr>
<tr><td colspan="2">HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
DOGONews - www.dogonews.com
Time4Kids magazines
HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
DOGONews - www.dogonews.com
YouTube Videos: The Dr. Bionics Show; FreeSchool videos; Crash Course Kids videos, AumSum Time videos, SciShow Kids videos, National Geographic Kids videos,
Interactive Notebook: Changes to Earth's Surface: https://www.teacherspayteachers.com/Product/Science-Doodle-Changes-to-the-EARTH-Interactive-Notebook-Foldable-Notes-1048041
Volcano Lab: https://www.pbs.org/parents/crafts-and-experiments/build-your-own-volcano
NASA's Space Volcanoes: https://spaceplace.nasa.gov/volcanoes/en/
Graham Cracker Plate Tectonics: https://www.playdoughtoplato.com/graham-cracker-plate-tectonics/
Live Volcano Webcams: http://www.volcanolive.com/volcanocams.html
American Museum of Natural History: Big Dig: https://www.amnh.org/explore/ology/paleontology
Interactive Types of Rocks: https://www.learner.org/series/interactive-rock-cycle/
Interactive Rock Cycle Diagram: https://www.learner.org/wp-content/interactive/rockcycle/rockdiagram/
Nearpod: Rock Cycle interactive slides https://nearpod.com/t/science/4th-grade/the-rock-cycle-L1422414
Interactive Climate Time Machine: https://climate.nasa.gov/climate_resources/25/interactive-climate-time-machine/
Climate Change Games: https://climatekids.nasa.gov/menu/play/ and http://gamesforchange.org/studentchallenge/nyc/climate-change/
Infographic of Greenland's melting ice sheet: https://www.nationalgeographic.org/photo/8icesheet-melt/
NASA's Climate Change resources https://climatekids.nasa.gov/
clear plastic and paper cups
straws
modeling clay and soil
pictures of a saguaro cactus, or live baby cactus</td></tr>
</table>

- sandpaper
- 4 cookie sheets
- sand
- fan
- ice cubes
- wooden stirring sticks
- beaker
- drawing paper
- printed park site map
- printed park material cutouts
- toothpicks
- shaving cream
- world map with country boundaries
- sand, dirt, and rice
- fossil kit
- magnifying glass
- fossil classification chart
- nature magazines or resources
- birdseed, beads, and sunflower seeds
- petroleum jelly
- food coloring
- corn oil, cornstarch, water
- thermometer
- shoebox

Leveled Texts

- Advanced: Enrichment: Conserving Earth's Resources
- Intermediate: On-Level Reader: Earth's Changing Surface and Natural Resources
- Beginner: Extra Support: Earth's Changing Surface and Natural Resources

Grade 5

Unit 1: Engineering and Technology	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: 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. Computer Science and Design Thinking: 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.1: Collect, organize, and display data in order to highlight relationships or support a claim. 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. 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. 8.2.5.ED.4: Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features,	Technology Standards (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3). 9.4.5.DC.1: Explain the need for and use of copyrights. 9.4.5.DC.2: Provide attribution according to intellectual property rights guidelines using public domain or creative commons media. 9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions. 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2). 9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity. 9.4.5.DC.6: Compare and contrast how digital tools have changed social interactions (e.g., 8.1.5.IC.1). 9.4.5.DC.7: Explain how posting and commenting in social spaces can have positive or negative consequences. 9.4.5.GCA.1: Analyze how culture shapes individual and community perspectives and points of view (e.g., 1.1.5.C2a, RL.5.9, 6.1.5.HistoryCC.8). 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources). 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3). 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the

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. 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.ITH.2: Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have. 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. 8.2.5.NT.1: Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem. 8.2.5.NT.2: Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies. 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. 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.3: Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved. 8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment. 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.	data. 9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each. 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings. 9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols. 9.4.5.TL.4: Compare and contrast artifacts produced individually to those developed collaboratively (e.g., 1.5.5.CR3a). 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d). 21st Century Life and Career Standards Career Readiness, Life Literacies, and Key Skills: 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes. 9.2.5.CAP.2: Identify how you might like to earn an income. 9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations. 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. 9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers. 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 (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6). 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 (e.g., 6.3.5.CivicsPD.3, W.5.7). 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 (e.g., 8.2.5.ED.2, 1.5.5.CR1a). 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 (e.g., W.4.7, 8.2.5.ED.6). 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, 4-ESS3-1, 6.3.5.CivicsPD.2). 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. 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems
Learning Outcomes	
Students will understand…. ● The purpose of engineering and technology. ● How engineering and math are used in science. ● Problems seen in photographs and maps, using the engineering design process to find good solutions to the problems. ● How society affects the evolution and development of technology; positive and negative- and planned and unintended- consequences of technology; and how tradeoffs balance opposing needs or wants.	*Students will understand….* ● The purpose of engineering and technology. ● How engineering and math are used in science. ● Problems seen in photographs and maps, using the engineering design process to find good solutions to the problems. How society affects the evolution and development of technology; positive and negative- and planned and unintended- consequences of technology; and how tradeoffs balance opposing needs or wants.
ASSESSMENT	
Formative	Formative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Apply What You Know responses ● Can You Solve It? responses ● Interactive online games ● Open-ended response questions & comprehension questions ● Running records ● Teacher observation ● Classwork Practice	● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Apply What You Know responses ● Can You Solve It? responses ● Interactive online games ● Open-ended response questions & comprehension questions ● Running records ● Teacher observation ● Classwork Practice

• Discussion Trifolds • Video logs	• Discussion Trifolds Video logs
Benchmark	Benchmark
• Unit pre and post assessments that align to text series	• Unit pre and post assessments that align to text series
LEARNING PLAN	
Pacing Guide: 4 Weeks	
Recommended Learning Activities	
• Complete Lesson 1-3 How Are Science and Math Used in Engineering?, What is the Design Process?, and How Does Technology Affect Society? activities in student edition • Vocabulary Game: Concentration • View Can You Solve It videos and discuss and respond to questions • Complete Hands On Activities: Testing straw beams, Testing a Path with a Scale Model, Car Competition • Complete Apply What You Know Activities: In Touch with Technology, Brainstorm and Document, Collaborating and Communicating, Make That Sale • Read Take it Further Texts: People in Science, Careers in Science and Engineering, Safety Engineers • You Solve It: Cat Tree – Students will apply the design process to build a cat tree and stay within the given criteria and constraints. • Unit Project: Dropping Off, Picking Up – Students will work together to design a school entranceway that will improve access to the school during congested time periods. • Unit Performance Task: Lunch Line Lifehack – Students will apply design concepts to improve the process of getting food in a lunch line.	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity Role Play
Connections	
Interdisciplinary Connections • (ELA, Math, Science, Social Studies) • Technology • Character education • Career Education	Interdisciplinary Connections • (ELA, Math, Science, Social Studies) • Technology • Character education • Career Education
Instructional and Supplemental Materials	
• HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04	

• DOGONews - www.dogonews.com • BrainPOP: https://www.brainpop.com/ • Engineering Process for Kids: https://www.youtube.com/watch?v=fxJWin195kU • Straws • Masking tape • Books • Foam cups • Paper clips • String • Pennies • Rulers • Topographic map • Clay and soil • Craft sticks • Paint tray/large pan • Paper and cardboard • Plastic bricks • Plastic wrap or foil • Watering can/sprayer • Drawing utensils • Drawing paper • Balloons • Toy car/cart • Stopwatch • Egg in sealable plastic bag • Small weights • Scissors • Plastic bottles
Leveled Texts
• Advanced: Enrichment - Harnessing the Wind • Intermediate: On-Level Reader - How Do Engineers Solve Problems? (Blue) • Beginner: Extra Support - How Do Engineers Solve Problems? (Red)

Grade 5

Unit 2: Matter	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: 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	Technology Standards (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness

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. Computer Science and Design Thinking: 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim. 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. 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.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment	of using print and non-print electronic information sources to complete a variety of tasks. 21st Century Life and Career Standards Career Readiness, Life Literacies, and Key Skills: 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes. 9.2.5.CAP.2: Identify how you might like to earn an income. 9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations. 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. 9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers. 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 (e.g., 6.3.5.CivicsPD.3, W.5.7). 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 (e.g., 8.2.5.ED.2, 1.5.5.CR1a). 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 (e.g., W.4.7, 8.2.5.ED.6). 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, 4-ESS3-1, 6.3.5.CivicsPD.2). 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. 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).

	9.4.5.DC.1: Explain the need for and use of copyrights. 9.4.5.DC.2: Provide attribution according to intellectual property rights guidelines using public domain or creative commons media. 9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions. 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2). 9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity. 9.4.5.DC.6: Compare and contrast how digital tools have changed social interactions (e.g., 8.1.5.IC.1). 9.4.5.DC.7: Explain how posting and commenting in social spaces can have positive or negative consequences. 9.4.5.GCA.1: Analyze how culture shapes individual and community perspectives and points of view (e.g., 1.1.5.C2a, RL.5.9, 6.1.5.HistoryCC.8). 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources). 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3). 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data. 9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each. 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings. 9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols. 9.4.5.TL.4: Compare and contrast artifacts produced individually to those developed collaboratively (e.g., 1.5.5.CR3a). 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).

<table>
<tr><th colspan="2">Learning Outcomes</th></tr>
<tr><td>Students will understand….
That all objects are made of tiny particles of matter too small to be seen.
That solids, liquids, and gases are states of matter.
How to measure matter, including measuring length, weight, and volume.
The properties of matter and how to compare substances based on their physical properties.
How to recognize factors affecting properties of matter, identify mixtures and solutions, and relate the properties of mixtures with the properties of starting materials.
How to recognize a variety of physical and chemical changes and the differences between them.
The conservation of matter.</td><td>Students will be able to answer….
What Is Matter?
What Are the Properties of Matter?
How Does Matter Change?</td></tr>
<tr><th colspan="2">ASSESSMENT</th></tr>
<tr><td>Formative</td><td>Summative</td></tr>
<tr><td>Exit Slips
Journals
Oral reading
Graphic Organizers
Class discussion
Response to reading
Apply What You Know responses
Can You Solve It? responses
Interactive online games
Open-ended response questions & comprehension questions
Running records
Teacher observation
Classwork Practice
Discussion Trifolds
Video logs</td><td>Pre Assessments
Lesson Check
Lesson Roundup
Unit Assessments
Alternate Assessments
Performance Tasks
Unit Projects
Choice Boards</td></tr>
<tr><td>Benchmark</td><td>Alternative</td></tr>
<tr><td>Unit pre and post assessments that align to text series</td><td>Portfolio
Unit project
Performance Task</td></tr>
<tr><th colspan="2">LEARNING PLAN</th></tr>
<tr><td colspan="2">Pacing Guide: 4 Weeks</td></tr>
<tr><td colspan="2">Recommended Learning Activities</td></tr>
</table>

- Complete Lesson 1-3 What is Matter?, What Are the Properties of Matter?, and How Does Matter Change? activities in student edition
- Vocabulary Game: Picture It
- View Can You Solve It videos and discuss and respond to questions
- Complete Hands On Activities: How Much Matter Do You Have?, What Affects the Rate of Dissolving, Which Will React?
- Complete Apply What You Know Activities: Is It Still There?, Air is Matter, How Does Matter Fit Together? Bridge Building, Conducting Conductors, Colors on the Move, Seeing Chemical Changes, Pull the Wool Over Your Eyes.
- Read Take it Further Texts: People in Science & Engineering, Careers in Science and Engineering.
- You Solve It: Maze Matters - Students will apply an understanding of the properties of matter to solve problems and demonstrate that properties of matter can be used to identify substances.
- Unit Project: Conservation of Matter - Students will design an experiment to prove that matter is conserved during physical or chemical changes.
- Unit Performance Task: Physical or Chemical? Students will apply concepts of matter and change to investigate materials.

Integrated Accommodations and Modifications

Special Education, ELL and 504	Gifted and Talented
• Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	• Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study

Connections

Interdisciplinary Connections	21st Century Skills and Career Education
• (ELA, Math, Science, Social Studies) • Technology • Character education • Career Education	• Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications

Instructional and Supplemental Materials

- HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
- BrainPOP: https://www.brainpop.com/
- DOGONews - www.dogonews.com
- Matter Compilation: https://www.youtube.com/watch?v=wyRy8kowyM8&t=1141s
- Bill Nye The Science Guy Phases of Matter: https://www.youtube.com/watch?v=k3SJuozgbfU&t=1620s
- Water
- Sugar cubes

- Plastic spoons
- Plastic cups
- Paper towels
- 100-mL graduated cylinder
- Plastic cup or bowl
- Rice
- Dried beans
- Balance
- Beaker
- Meter stick
- Metric ruler
- Unit cubes
- Modeling clay
- Craft sticks
- Glue
- Toothpicks
- Masking tape
- Safety goggles
- Light bulb in holder
- Copper wire
- AA batteries
- Foil
- Yarn
- Plastic
- Scissors
- Filter paper
- Tape
- Pencils
- 100-mL beakers
- Lab apron
- Spoons
- 100-mL containers
- Measuring spoons and cups
- Stopwatch
- Salt
- Epsom salts
- Ammonia
- 50-mL beakers
- Steel wool pad
- Droppers
- Test tubes
- Baking soda
- Cornstarch
- Cream of tartar
- Iodine solution
- Vinegar
- Labels

• Test tube brushes • Soap
Leveled Texts
• Advanced: Enrichment - Clean Water • Intermediate: On-Level Reader - What Are the Physical Properties of Matter? (Blue) • Beginner: Extra Support - What Are the Physical Properties of Matter? (Red)

Grade 5

Unit 3: Energy and Matter in Organisms	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: 5-LS1-1.Support an argument that plants get the materials they need for growth chiefly from air and water 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. Computer Science and Design Thinking: 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim. 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. 8.2.5.ETW.2: Describe ways that various technologies are used to reduce improper use of resources. 8.2.5.ETW.3: Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved 8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment. 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.	Technology Standards (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. 21st Century Life and Career Standards Career Readiness, Life Literacies, and Key Skills: 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes. 9.2.5.CAP.2: Identify how you might like to earn an income. 9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations. 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. 9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers. 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

	(e.g., 6.3.5.CivicsPD.3, W.5.7). 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 (e.g., 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 (e.g., 2.1.5.EH.4, 4-ESS3-1, 6.3.5.CivicsPD.2). 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.DC.1: Explain the need for and use of copyrights. 9.4.5.DC.2: Provide attribution according to intellectual property rights guidelines using public domain or creative commons media. 9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions. 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2). 9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity. 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources). 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3). 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data. 9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each. 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings. 9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols. 9.4.5.TL.4: Compare and contrast artifacts produced individually to those developed

	collaboratively (e.g., 1.5.5.CR3a). 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).
Learning Outcomes	
Students will understand…. ● How to use models to support an argument that plants acquire material for growth mainly from air and water. ● That animals need food for the materials necessary for body growth and repair and that they obtain gases and water from the environment and release waste matter (gas, liquid, or solid) back into the environment. ● How models can be used to explore how organisms interact and survive in environments where their needs are met.	*Students will be able to answer….* ● How Does Energy Get Transformed by Plants? ● How Do Organisms Use Matter and Energy? ● How Do Organisms Interact?
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Apply What You Know responses ● Can You Solve It? responses ● Interactive online games ● Open-ended response questions & comprehension questions ● Running records ● Teacher observation ● Classwork Practice ● Discussion Trifolds ● Video logs	● Pre Assessments ● Lesson Check ● Lesson Roundup ● Unit Assessments ● Alternate Assessments ● Performance Tasks ● Unit Projects ● Choice Boards
Benchmark	Alternative
● Unit pre and post assessments that align to text series	● Portfolio ● Unit project ● Performance Task
LEARNING PLAN	
Pacing Guide: 4 Weeks	
Recommended Learning Activities	
● Complete Energy and Matter in Organisms Lesson 1-3 How Does Energy Get Transformed by Plants?, How Do Organisms Use Matter and Energy?, and How Do Organisms Interact? activities in student edition ● Vocabulary Game: Picture It ● View Can You Solve It videos and discuss and respond to questions	

- Complete Hands On Activities: Lights Out!, What Was for Dinner?, What's Out There?
- Complete Apply What You Know Activities: What Do Plants Need to Grow?, In and Out, Where's the Heat?, What's In Your Environment?
- Complete Engineer It! Activities: What's the Right Amount?, Let's Clean Up!
- Read Take it Further Texts: Careers in Science and Engineering, People in Science & Engineering.
- You Solve It: What Do Plants Need? Students will determine the cause and effect of three different plants growing in three different colored lights and analyze data to determine what type of light plants need to grow.
- Unit Project: The Best Light - Students will work together to investigate how different kinds of light affect the growth of plants.
- Unit Performance Task: Business Has Bean Bad - Students will apply what they know about plants' needs and energy to figure out what might be affecting plant growth.

Integrated Accommodations and Modifications

Special Education, ELL and 504

- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

Gifted and Talented

- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

Connections

Interdisciplinary Connections

- (ELA, Math, Science, Social Studies)
- Technology
- Character education
- Career Education

21st Century Skills and Career Education

- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

Instructional and Supplemental Materials

- HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
- BrainPOP: https://www.brainpop.com/
- DOGONews - www.dogonews.com
- Energy and Matter in Organisms: https://www.youtube.com/watch?v=RdEzMW_vJkk&t=36s
- Energy and Living Things: Why Do Living Things Need Energy?: https://www.youtube.com/watch?v=G1aL_Jhbs4o
- Photosynthesis: https://www.youtube.com/watch?v=UPBMG5EYydo
- Photosynthesis – Crash Course: https://www.youtube.com/watch?v=sQK3Yr4Sc_k
- Paper
- Pencil/colored pencils/markers
- Microscope/Hand Lens
- Small potted plants

- Masking tape
- Measuring cups
- Water
- Metric rulers
- Graph paper
- Thermometer
- Forehead thermometer strips
- Timer
- Fruits and vegetables
- Balance
- Nutrition information
- Paper plates
- Calculator
- Gloves
- String
- Wooden dowels
- Jars
- Scissors
- Field guide
- Lamps
- Bulbs
- Aprons

Leveled Texts

- Advanced: Enrichment - Predators of Shark River
- Intermediate: On-Level Reader - How Do Organisms and Their Environments Form an Ecosystem? (Blue)
- Beginner: Extra Support - How Do Organisms and Their Environments Form an Ecosystem? (Red)

Grade 5

Unit 4: Energy and Matter in Ecosystems

DESIRED RESULTS

Standards

New Jersey Student Learning Standards

Science:
5-LS2-1.Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Computer Science and Design Thinking:
8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim.
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

Technology Standards

(3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.
8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks.

21st Century Life and Career Standards

Career Readiness, Life Literacies, and Key Skills:

data. 8.2.5.ETW.2: Describe ways that various technologies are used to reduce improper use of resources. 8.2.5.ETW.3: Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved 8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment. 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.	9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes. 9.2.5.CAP.2: Identify how you might like to earn an income. 9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations. 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. 9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers. 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 (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6). 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 (e.g., 6.3.5.CivicsPD.3, W.5.7). 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 (e.g., 8.2.5.ED.2, 1.5.5.CR1a). 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 (e.g., W.4.7, 8.2.5.ED.6). 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, 4-ESS3-1, 6.3.5.CivicsPD.2). 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. 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3). 9.4.5.DC.1: Explain the need for and use of

	copyrights. 9.4.5.DC.2: Provide attribution according to intellectual property rights guidelines using public domain or creative commons media. 9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions. 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2). 9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity. 9.4.5.DC.6: Compare and contrast how digital tools have changed social interactions (e.g., 8.1.5.IC.1). 9.4.5.DC.7: Explain how posting and commenting in social spaces can have positive or negative consequences. 9.4.5.GCA.1: Analyze how culture shapes individual and community perspectives and points of view (e.g., 1.1.5.C2a, RL.5.9, 6.1.5.HistoryCC.8). 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources). 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3). 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data. 9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each. 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings. 9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols. 9.4.5.TL.4: Compare and contrast artifacts produced individually to those developed collaboratively (e.g., 1.5.5.CR3a). 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).
Learning Outcomes	

Students will understand….	*Students will be able to answer….*
• That the flow of energy derived from the sun is transferred as matter through a food chain and food web to consumers and decomposers. • That only a portion of energy at any level of a food web is available to the next higher step and how this affects population sizes. • How organisms, including newly introduced species affect ecosystems.	• How Do Energy and Matter Move Through Ecosystems? • How Do Organisms Change Their Ecosystems?
ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Apply What You Know responses • Can You Solve It? responses • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Pre Assessments • Lesson Check • Lesson Roundup • Unit Assessments • Alternate Assessments • Performance Tasks • Unit Projects • Choice Boards
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Unit project • Performance Task
LEARNING PLAN	
Pacing Guide: 3 Weeks	
Recommended Learning Activities	
• Complete Energy and Matter in Ecosystems Lesson 1-2 How Do Energy and Matter Move Through Ecosystems? and How Do Organisms Change Their Ecosystems? • Vocabulary Game: Forbidden Words • View Can You Solve It videos and discuss and respond to questions • Complete Hands On Activities: Modeling Matter Moving within an Ecosystem, Invasion • Complete Apply What You Know Activity: Picturing Energy Transfer • Complete Engineer It! Activities: Clean It Up!, Toad Trap • Read Take it Further Texts: Careers in Science and Engineering, People in Science & Engineering. • You Solve It: Build an Ecosystem - Students will design a model to represent the movement of matter in an ecosystem and describe the movement of matter in an ecosystem by providing evidence to support a claim.	

- Unit Project: Modeling an Ecosystem - Students will work together to investigate how organisms at an African watering hole interact.
- Unit Performance Task: Design an Ecosystem - Students will design an artificial ecosystem for an animal brought in from the wild.

Integrated Accommodations and Modifications

Special Education, ELL and 504
- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

Gifted and Talented
- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

Connections

Interdisciplinary Connections
- (ELA, Math, Science, Social Studies)
- Technology
- Character education
- Career Education

21st Century Skills and Career Education
- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

Instructional and Supplemental Materials

- HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
- BrainPOP: https://www.brainpop.com/
- DOGONews - www.dogonews.com
- Energy Flow in Ecosystems: https://www.youtube.com/watch?v=5jBV9vJmXZI
- Ecosystem Ecology: https://www.youtube.com/watch?v=v6ubvEJ3KGM
- Paper
- Pencils/colored pencils/ markers
- Modeling materials
- Scissors
- Index cards
- Markers
- Paste
- String/yarn
- Stapler
- Construction paper
- Paper Clips
- Poster board
- Rulers

Leveled Texts

- Advanced: Enrichment - Predators of Shark River

- Intermediate: On-Level Reader - How Do Organisms and Their Environments Form an Ecosystem? (Blue)
- Beginner: Extra Support - How Do Organisms and Their Environments Form an Ecosystem? (Red)

Grade 5

Unit 5: Systems in Space	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: 5-PS2-1.Support an argument that the gravitational force exerted by Earth on objects is directed down. 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 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. Computer Science and Design Thinking: 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim. 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.	Technology Standards (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. 21st Century Life and Career Standards Career Readiness, Life Literacies, and Key Skills: 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes. 9.2.5.CAP.2: Identify how you might like to earn an income. 9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations. 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. 9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers. 9.4.5.DC.1: Explain the need for and use of copyrights. 9.4.5.DC.2: Provide attribution according to intellectual property rights guidelines using public domain or creative commons media. 9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright

	restrictions. 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2). 9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity. 9.4.5.DC.6: Compare and contrast how digital tools have changed social interactions (e.g., 8.1.5.IC.1). 9.4.5.DC.7: Explain how posting and commenting in social spaces can have positive or negative consequences. 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources). 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data. 9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each. 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings. 9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols. 9.4.5.TL.4: Compare and contrast artifacts produced individually to those developed collaboratively (e.g., 1.5.5.CR3a). 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).
Learning Outcomes	
Students will understand…. ● That the gravity of the Earth pulls objects toward the planet's center. ● Patterns caused by interactions of bodies in the solar system. ● How Earth orbits around the sun and the moon orbits around Earth. ● That the sun appears larger and brighter than other stars due to its distance from Earth.	*Students will be able to answer….* ● How Does Gravity Affect Matter on Earth? ● What Daily Patterns Can Be Observed? ● What Patterns Can be Observed in a Year? ● What Is the Sun?
ASSESSMENT	
Formative	Summative
● Exit Slips	● Pre Assessments

• Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Apply What You Know responses • Can You Solve It? responses • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Lesson Check • Lesson Roundup • Unit Assessments • Alternate Assessments • Performance Tasks • Unit Projects • Choice Boards
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Unit project • Performance Task
LEARNING PLAN	
Pacing Guide: 5 Weeks	
Recommended Learning Activities	
• Complete Lesson 1-4 How Does Gravity Affect Matter on Earth?, What Daily Patterns Can Be Observed?, What Patterns Can Be Observed in a Year?, and What Is the Sun? activities in student edition • Vocabulary Game: Forbidden Words • View Can You Solve It videos and discuss and respond to questions • Complete Hands On Activities: A Trip around the World, How Does a Shadow Grow?, Sunrise, Sunset, Find the Light • Complete Apply What You Know Activities: An Ant's View of the World, Rotating Earth or Rotating Sun and Stars?, Moon Myths, The Night Moves, Sun Project, Judging Distance, Blinded by the Light • Complete Engineer It! Activities: Gravity Challenges, Engineer a Parachute, History of Telling Time, Observing Objects in the Sky • Read Take it Further Texts: Careers in Science and Engineering, People in Science & Engineering. • You Solve It: Measuring Shadows - Students will represent data in a graph to reveal patterns in the length and direction of shadows during the course of one day. • Unit Project: Starry Sky - Students will do research in order to create a star a guide that will enable them to track a limited number of constellations over time. • Unit Performance Task: Solar Size - Students will apply the concepts of scale and proportion to develop and use a model of stellar distance, size, and brightness.	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology

• Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	• Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • (ELA, Math, Science, Social Studies) • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04 • BrainPOP: https://www.brainpop.com/ • DOGONews - www.dogonews.com • Gravity Compilation - https://www.youtube.com/watch?v=EwY6p-r_hyU • Earth's Rotation and Revolution - https://www.youtube.com/watch?v=l64YwNl1wr0 • Golf ball • Basketball • Large beach ball • Clear inflatable globe with labeled continents and compass rose • Small plastic figures • Transparent tape • Images of sun, Earth, and at least 3 constellations • Pencils • Modeling clay • Poster board • Metric rulers • Markers • Rocks • Butcher block paper • String • Star maps • Globes • Graph paper • Glow sticks • Water • Cups • Thermometers • Cardboard • Glue • Aluminum foil	

• Scissors • Index cards • Lamps • Bulbs
Leveled Texts
• Advanced: Enrichment - To the Moon • Intermediate: On-Level Reader - How Do the Sun, Earth, and Moon Move in Space? (Blue) • Beginner: Extra Support - How Do the Sun, Earth, and Moon Move in Space? (Red)

Grade 5

Unit 6: Earth's Systems	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: 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. Computer Science and Design Thinking: 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim. 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. 8.2.5.ETW.2: Describe ways that various technologies are used to reduce improper use of resources. 8.2.5.ETW.3: Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved. 8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment. 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.	Technology Standards (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. 21st Century Life and Career Standards Career Readiness, Life Literacies, and Key Skills: 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes. 9.2.5.CAP.2: Identify how you might like to earn an income. 9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations. 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. 9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers. 9.4.5.DC.1: Explain the need for and use of copyrights. 9.4.5.DC.2: Provide attribution according to

	intellectual property rights guidelines using public domain or creative commons media. 9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions. 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2). 9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity. 9.4.5.DC.6: Compare and contrast how digital tools have changed social interactions (e.g., 8.1.5.IC.1). 9.4.5.DC.7: Explain how posting and commenting in social spaces can have positive or negative consequences. 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources). 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3). 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data. 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings. 9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols. 9.4.5.TL.4: Compare and contrast artifacts produced individually to those developed collaboratively (e.g., 1.5.5.CR3a). 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).
Learning Outcomes	
Students will understand…. ● Each of Earth's systems and the cycles that occur within them. ● How Earth's systems interact. ● The distribution of water on Earth, and the effect of the oceans on landforms, climates, and ecosystems.	*Students will be able to answer….* ● What Are Earth's Major Systems? ● How Do Earth's Systems Interact? ● What Is the Role of the Oceans in Earth's Systems?
ASSESSMENT	
Formative	Summative

• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Apply What You Know responses • Can You Solve It? responses • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Pre Assessments • Lesson Check • Lesson Roundup • Unit Assessments • Alternate Assessments • Performance Tasks • Unit Projects • Choice Boards
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Unit project • Performance Task
LEARNING PLAN	
Pacing Guide: 4 Weeks	
Recommended Learning Activities	
• Complete Lesson 1-3 What are Earth's Major Systems?, How Do Earth's Systems Interact?, and What Is the Role of the Oceans in Earth's Systems? activities in student edition • Vocabulary Game: Password • View Can You Solve It videos and discuss and respond to questions • Complete Hands On Activities: Modeling Earth's Layers, What Happens During the Water Cycle?, How Do Oceans Shape Coastlines? • Complete Apply What You Know Activities: Water Fresh and Salty, Pollution in Action, Let it Shine!, Salty Seas, Losing Light • Read Take it Further Texts: Careers in Science and Engineering, People in Science & Engineering. • You Solve It: Analyzing Systems - Students will identify the ways Earth systems change in response to changes in each of the four major spheres and predict changes in Earth systems. • Unit Project: Cleaning Water - Students will work together to design a system to remove salt from saltwater to make it drinkable. • Unit Performance Task: Saltwater Plants - Students will design a system for growing saltwater plants.	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities

• Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	• Role Play • Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • (ELA, Math, Science, Social Studies) • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04 • BrainPOP: https://www.brainpop.com/ • DOGONews - www.dogonews.com • Four Spheres 1 - https://www.youtube.com/watch?v=VMxjzWHbyFM • Four Spheres 2 - https://www.youtube.com/watch?v=UXh_7wbnS3A • Earth's Systems - https://www.youtube.com/watch?v=BnpF0ndXk-8 • 1-liter container • 50-mL graduated cylinder • Food coloring • Water – fresh and salty • Newspaper • Rulers • Modeling clay • Clear, plastic straws • Calculators • Food dye • Teaspoon/dropper • Black paper • Thermometers • Lamps with incandescent bulbs • Containers • Measuring spoons • Measuring cups • Salt • Plastic wrap • Rubber bands • Weights • Making tape • Permanent markers • Paper towels • Golf balls • Pitcher • Beakers	

• Flashlight • Dishwashing basin/deep baking dish • Gloves • Soil • Sand • Board
Leveled Texts
• Advanced: Enrichment - The Coldest Place on Earth • Intermediate: On-Level Reader - How Are Climate and Weather Different? (Blue) • Beginner: Extra Support - How Are Climate and Weather Different? (Red)

Grade 5

Unit 7: Earth and Human Activities	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: 5-ESS3-1.Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources, environment, and address climate change issues. Computer Science and Design Thinking: 8.1.5.DA.1: Collect, organize, and display data in order to highlight relationships or support a claim. 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.4: Organize and present climate change data visually to highlight relationships or support a claim. 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data. 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.ITH.2: Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have. 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	Technology Standards (3-5) 8.1.5.A.1-Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.5.E.1-Use digital tools to research and evaluate the accuracy of, relevance to, and appropriateness of using print and non-print electronic information sources to complete a variety of tasks. 21st Century Life and Career Standards Career Readiness, Life Literacies, and Key Skills: 9.2.5.CAP.1: Evaluate personal likes and dislikes and identify careers that might be suited to personal likes. 9.2.5.CAP.2: Identify how you might like to earn an income. 9.2.5.CAP.3: Identify qualifications needed to pursue traditional and non-traditional careers and occupations. 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. 9.2.5.CAP.5: Identify various employee benefits, including income, medical, vacation time, and lifestyle benefits provided by different types of jobs and careers. 9.4.5.CI.1: Use appropriate communication

new business or career. 8.2.5.NT.1: Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem. 8.2.5.NT.2: Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies. 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. 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.3: Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved. 8.2.5.ETW.4: Explain the impact that resources, such as energy and materials used to develop technology, have on the environment. 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.	technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions (e.g., W.4.6, 3.MD.B.3,7.1.NM.IPERS.6). 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 (e.g., 6.3.5.CivicsPD.3, W.5.7). 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 (e.g., 8.2.5.ED.2, 1.5.5.CR1a). 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 (e.g., W.4.7, 8.2.5.ED.6). 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, 4-ESS3-1, 6.3.5.CivicsPD.2). 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. 9.4.5.CT.4: Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3). 9.4.5.DC.1: Explain the need for and use of copyrights. 9.4.5.DC.2: Provide attribution according to intellectual property rights guidelines using public domain or creative commons media. 9.4.5.DC.3: Distinguish between digital images that can be reused freely and those that have copyright restrictions. 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2). 9.4.5.DC.5: Identify the characteristics of a positive and negative online identity and the lasting implications of online activity. 9.4.5.DC.6: Compare and contrast how digital tools have changed social interactions (e.g., 8.1.5.IC.1). 9.4.5.DC.7: Explain how posting and commenting

	in social spaces can have positive or negative consequences. 9.4.5.GCA.1: Analyze how culture shapes individual and community perspectives and points of view (e.g., 1.1.5.C2a, RL.5.9, 6.1.5.HistoryCC.8). 9.4.5.IML.1: Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources). 9.4.5.IML.2: Create a visual representation to organize information about a problem or issue (e.g., 4.MD.B.4, 8.1.5.DA.3). 9.4.5.IML.3: Represent the same data in multiple visual formats in order to tell a story about the data. 9.4.5.TL.1: Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each. 9.4.5.TL.2: Sort and filter data in a spreadsheet to analyze findings. 9.4.5.TL.3: Format a document using a word processing application to enhance text, change page formatting, and include appropriate images graphics, or symbols. 9.4.5.TL.4: Compare and contrast artifacts produced individually to those developed collaboratively (e.g., 1.5.5.CR3a). 9.4.5.TL.5: Collaborate digitally to produce an artifact (e.g., 1.2.5CR1d).
Learning Outcomes	
Students will understand…. ● How people affect Earth's resources. ● The importance of reducing, reusing, and recycling and other ways people protect the environment.	*Students will be able to answer….* ● How Does Resource Use Affect Earth? ● How Can People Protect the Environment?
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Apply What You Know responses ● Can You Solve It? responses ● Interactive online games	● Pre Assessments ● Lesson Check ● Lesson Roundup ● Unit Assessments ● Alternate Assessments ● Performance Tasks ● Unit Projects ● Choice Boards

• Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Unit project • Performance Task
LEARNING PLAN	
Pacing Guide: 3 Weeks	
Recommended Learning Activities	
• Complete Lesson 1-2 How Does Resource Use Affect Earth? and How Can People Protect the Environment? activities in student edition • Vocabulary Game: Picture It • View Can You Solve It videos and discuss and respond to questions • Complete Hands On Activities: A Solution for All This Pollution!, Pocket Park • Complete Apply What You Know Activities: Oil Spills, Cleaning Up Space Debris, Recyclables in the Room, Conserving at Home • Complete Engineer It! Activities: Reusing at Home • Read Take it Further Texts: Careers in Science and Engineering, People in Science & Engineering. • You Solve It: Build a Green City - Students will make predictions of the best solutions for environmental issues. • Unit Project: My Environmental Impact - Students will work together to determine their impact as individuals on the world around them. • Unit Performance Task: Protecting a Sphere - Students will design a way to protect one of Earth's systems, of spheres.	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • (ELA, Math, Science, Social Studies) • Technology	21st Century Skills and Career Education • Problem Solving • Critical Thinking

• Character education • Career Education	• Communication • Collaborative learning • Productivity • Real-world applications

Instructional and Supplemental Materials

- HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
- BrainPOP: https://www.brainpop.com/
- DOGONews - www.dogonews.com
- Human Impacts on the Environment - https://www.youtube.com/watch?v=5eTCZ9L834s
- Pollution - https://www.youtube.com/watch?v=kdDSRRCKMiI
- Reduce, Reuse, Recycle Song - https://www.youtube.com/watch?v=qtyBzFV9yTs
- Conservation and Restoration - https://www.youtube.com/watch?v=Kaeyr5-O2eU
- Climate Change - https://www.youtube.com/watch?v=M2Jxs7lR8ZI&t=0s
- Dirty water
- Small graduated cylinders
- Pieces of wire screen
- Coffee filters
- Large gravel
- Funnel
- Potting soil
- Large jar
- Sand
- Small pebbles
- Newspaper
- Paper towels
- Pencils
- Copy paper
- Graph paper
- Ruler

Leveled Texts

- Advanced: Enrichment - Alternative Energy Resources
- Intermediate: On-Level Reader - How Can Conservation Save Earth's Resources? (Blue)
- Beginner: Extra Support - How Can Conservation Save Earth's Resources? (Red)

Grade 6

Module A - Engineering & Science **Unit 1: Introduction to Engineering and Science**	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: MS-ETS1-1.Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. MS-ETS1-4.Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. Computer Science and Design Thinking: 8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices. 8.1.8.IC.1: Compare the trade-offs associated with computing technologies that affect individual's everyday activities and career options. 8.1.8.IC.2: Describe issues of bias and accessibility in the design of existing technologies. 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose. 8.1.8.DA.5: Test, analyze, and refine computational models. 8.2.8.ED.1: Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer. 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem. 8.2.8.ED.3: Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch). 8.2.8.ED.4: Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team. 8.2.8.ED.5: Explain the need for optimization in a	Technology Standards (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. 21st Century Life and Career Standards 9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest. 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. 9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement. 9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally. 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances. 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. 9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4). 9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3). 9.4.8.CI.3: Examine challenges that may exist in the adoption of new ideas (e.g., 2.1.8.SSH,

design process. 8.2.8.ED.6: Analyze how trade-offs can impact the design of a product. 8.2.8.ED.7: Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches). 8.2.8.ITH.1: Explain how the development and use of technology influences economic, political, social, and cultural issues. 8.2.8.ITH.2: Compare how technologies have influenced society over time. 8.2.8.ITH.3: Evaluate the impact of sustainability on the development of a designed product or system. 8.2.8.ITH.4: Identify technologies that have been designed to reduce the negative consequences of other technologies and explain the change in impact. 8.2.8.ITH.5: Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another. 8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem. 8.2.8.NT.2: Analyze an existing technological product that has been repurposed for a different function. 8.2.8.NT.3: Examine a system, consider how each part relates to other parts, and redesign it for another purpose. 8.2.8.NT.4: Explain how a product designed for a specific demand was modified to meet a new demand and led to a new product. 8.2.8.ETW.1: Illustrate how a product is upcycled into a new product and analyze the short- and long-term benefits and costs. 8.2.8.ETW.2: Analyze the impact of modifying resources in a product or system (e.g., materials, energy, information, time, tools, people, capital). 8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact. 8.2.8.ETW.4: Compare the environmental effects of two alternative technologies devised to address	6.1.8.CivicsPD.2). 9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries. 9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2). 9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1). 9.4.8.CT.3: Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome. 9.4.8.DC.1: Analyze the resource citations in online materials for proper use. 9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). 9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences. 9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure. 9.4.8.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation. 9.4.8.DC.7: Collaborate within a digital community to create a digital artifact using strategies such as crowdsourcing or digital surveys. 9.4.8.DC.8: Explain how communities use data and technology to develop measures to respond to effects of climate change (e.g., smart cities). 9.4.8.GCA.1: Model how to navigate cultural differences with sensitivity and respect (e.g., 1.5.8.C1a). 9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal. 9.4.8.IML.1: Critically curate multiple resources to assess the credibility of sources when searching for information. 9.4.8.IML.3: Create a digital visualization that

climate change issues and use data to justify which choice is best. 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies. 8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development.	effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b). 9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making. 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4). 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
Learning Outcomes	
Students will understand…. ● How engineers solve problems through connecting engineering, science, and society. ● The systems and system models that are used to describe natural and engineered designs. ● The engineering design process and how to develop criteria and constraints for a problem so as to ensure a successful solution.	*Students will be able to answer….* ● How do engineers solve problems through connecting engineering, science, and society? ● What systems and system models are used in engineering? ● What is the engineering design process?
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Explorations ● Interactive online games ● Open-ended response questions & comprehension questions ● Running records ● Teacher observation ● Classwork Practice ● Discussion Trifolds ● Video logs	● Pre Assessments ● Lesson Check ● Lesson Quiz ● Unit Assessments ● Alternate Assessments ● Performance Tasks ● Unit Projects ● Choice Boards
Benchmark	Alternative
● Unit pre and post assessments that align to text series	● Portfolio ● Performance assessments
LEARNING PLAN	
Pacing Guide: 4 Weeks	
Recommended Learning Activities	

- Complete Lesson 1-3 Engineering, Science, and Society, Systems and System Models, and The Engineering Design Process activities in student edition
- Vocabulary Review Game
- View Can You Explain It videos and discuss and respond to questions
- Complete Hands On Lab Activities: Investigate a Technology Inspired by Nature, Investigate Components, Inputs, and Outputs of a System, Design a Bicycle Helmet
- Read Take it Further Texts: Careers in Engineering
- You Solve It: How Can You Plan Efficient Cargo Shipping? – Students will run simulations to determine how different factors affect the cost of shipping goods via ocean transportation. Students will analyze data, including the type of ship and the routes that may be traveled, to find how shipping factors affect the efficiency of shipping.
- Unit Project: Solution Power! – Students will identify and define a problem in their school, design and model a solution, and communicate information about why the solution is feasible and useful.
- Unit Performance Task: Which is the better water purification design? – Students will consider how two water purification designs fit the criteria and constraints of a design problem.

Integrated Accommodations and Modifications

Special Education, ELL and 504

- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

Gifted and Talented

- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

Connections

Interdisciplinary Connections

- (ELA, Math, Science, Social Studies)
- Technology
- Character education
- Career Education

21st Century Skills and Career Education

- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

Instructional and Supplemental Materials

- HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
- BrainPOP: https://www.brainpop.com/
- DOGONews - www.dogonews.com
- Engineering Process for Kids: https://www.youtube.com/watch?v=fxJWin195kU
- Movie - Dream Big: Engineering Our World
- Artificial animal fur
- Cocklebur fruit
- Hook-and-loop fastener

• Magnifying lens • Flashlight • Scissors • Showbox • Tennis ball • Aluminum foil • Bubble packing with small bubbles • Duct tape • Eggs (raw) • Flexible foam sheeting • Newspaper • Paperboard strips • String/yarn
Leveled Texts
• Advanced: Aerospace Engineering and the Principles of Flight by Anne Rooney • Intermediate: Design Thinking by Kristin Fontichiaro • Beginner: FIRST Robotics by Nancy Benovich Gilby

Grade 6

Module A - Engineering & Science **Unit 2: The Practices of Engineering**	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: MS-ETS1-1.Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. MS-ETS1-2.Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. MS-ETS1-3.Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. MS-ETS1-4.Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. Computer Science and Design Thinking:	Technology Standards (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. 21st Century Life and Career Standards 9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest. 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. 9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement. 9.2.8.CAP.10: Evaluate how careers have evolved

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices. 8.1.8.IC.1: Compare the trade-offs associated with computing technologies that affect individual's everyday activities and career options. 8.1.8.IC.2: Describe issues of bias and accessibility in the design of existing technologies. 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose. 8.1.8.DA.5: Test, analyze, and refine computational models. 8.2.8.ED.1: Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer. 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem. 8.2.8.ED.3: Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch). 8.2.8.ED.4: Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team. 8.2.8.ED.5: Explain the need for optimization in a design process. 8.2.8.ED.6: Analyze how trade-offs can impact the design of a product. 8.2.8.ED.7: Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches). 8.2.8.ITH.1: Explain how the development and use of technology influences economic, political, social, and cultural issues. 8.2.8.ITH.2: Compare how technologies have influenced society over time. 8.2.8.ITH.3: Evaluate the impact of sustainability on the development of a designed product or system. 8.2.8.ITH.4: Identify technologies that have been designed to reduce the negative consequences of other technologies and explain the change in impact.	regionally, nationally, and globally. 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances. 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. 9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4). 9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3). 9.4.8.CI.3: Examine challenges that may exist in the adoption of new ideas (e.g., 2.1.8.SSH, 6.1.8.CivicsPD.2). 9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries. 9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2). 9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1). 9.4.8.CT.3: Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome. 9.4.8.DC.1: Analyze the resource citations in online materials for proper use. 9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). 9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences. 9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure. 9.4.8.DC.6: Analyze online information to

8.2.8.ITH.5: Compare the impacts of a given technology on different societies, noting factors that may make a technology appropriate and sustainable in one society but not in another. 8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem. 8.2.8.NT.2: Analyze an existing technological product that has been repurposed for a different function. 8.2.8.NT.3: Examine a system, consider how each part relates to other parts, and redesign it for another purpose. 8.2.8.NT.4: Explain how a product designed for a specific demand was modified to meet a new demand and led to a new product. 8.2.8.ETW.1: Illustrate how a product is upcycled into a new product and analyze the short- and long-term benefits and costs. 8.2.8.ETW.2: Analyze the impact of modifying resources in a product or system (e.g., materials, energy, information, time, tools, people, capital). 8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact. 8.2.8.ETW.4: Compare the environmental effects of two alternative technologies devised to address climate change issues and use data to justify which choice is best. 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies. 8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development.	distinguish whether it is helpful or harmful to reputation. 9.4.8.DC.7: Collaborate within a digital community to create a digital artifact using strategies such as crowdsourcing or digital surveys. 9.4.8.DC.8: Explain how communities use data and technology to develop measures to respond to effects of climate change (e.g., smart cities). 9.4.8.GCA.1: Model how to navigate cultural differences with sensitivity and respect (e.g., 1.5.8.C1a). 9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal. 9.4.8.IML.1: Critically curate multiple resources to assess the credibility of sources when searching for information. 9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b). 9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making. 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4). 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
Learning Outcomes	
Students will understand…. ● How to define an engineering problem and how to identify criteria and constraints. ● How to analyze and interpret data to develop and evaluate solutions to engineering problems. ● How to develop and test modifications to designs and analyze results in order to optimize a design solution. ● The importance of tradeoffs by comparing solutions based on criteria and constraints.	*Students will be able to answer….* ● How do you define an engineering problem? ● How do you develop and test solutions? ● How do you optimize solutions?
ASSESSMENT	

Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Explorations • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Pre Assessments • Lesson Check • Lesson Quiz • Unit Assessments • Alternate Assessments • Performance Tasks • Unit Projects • Choice Boards
Benchmark	**Alternative**
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 3 Weeks	
Recommended Learning Activities	
• Complete Lesson 1-3 Defining Engineering Problems, Developing and Testing Solutions, and Optimizing Solutions activities in student edition • Vocabulary Review Game • View Can You Explain It videos and discuss and respond to questions • Complete Hands On Lab Activities: Design a Model Car, Design a Model Car Part 2, Design a Model Car Part 3 • Read Take it Further Texts: People in Engineering • You Solve It: How Can You Design a Ship to Carry Cargo? - Students will run simulations to determine how different factors affect the cost of shipping goods via ocean transportation. Students modify the design of a container ship to evaluate how design affects which shipping routes can be used and the overall efficiency of the shipping routes. • Unit Project: Off to the Races - Students develop a model for a boxcar tack, build a prototype, test the prototype track, and optimize their design based on test data. • Unit Performance Task: What is the best feature for a new pool entry ramp? - Students consider which modifications to a pool ramp best for the criteria and constraints of a design problem.	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play

• Flexible grouping • Games • Kinesthetic Activity • Role Play	• Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • (ELA, Math, Science, Social Studies) • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04 • BrainPOP: https://www.brainpop.com/ • DOGONews - www.dogonews.com • Engineering Process for Kids: https://www.youtube.com/watch?v=fxJWin195kU • Corrugated cardboard • Digital balance scales • Measuring tape • Metal washers • Scissors • Smoothie straws • Tape • Wooden axles • Wooden wheels • Paper • Pencils • Steel • Wood • Tape • Glue • Stopwatch • Meter sticks	
Leveled Texts	
• Advanced: Aerospace Engineering and the Principles of Flight by Anne Rooney • Intermediate: Design Thinking by Kristin Fontichiaro • Beginner: FIRST Robotics by Nancy Benovich Gilby	

Grade 6

Module B - Cells & Heredity Unit 1: Cells	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science:	Technology Standards (6) 8.1.8.A.1-Demonstrate knowledge of a real

MS-LS1-1.Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. MS-LS1-2.Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. Computer Science and Design Thinking: 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose. 8.1.8.DA.5: Test, analyze, and refine computational models. 8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact. 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies. 8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development.	world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. 21st Century Life and Career Standards 9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest. 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. 9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement. 9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally. 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances. 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. 9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries. 9.4.8.DC.1: Analyze the resource citations in online materials for proper use. 9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). 9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences. 9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure. 9.4.8.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation. 9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using

	formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b). 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
Learning Outcomes	
Students will understand…. ● How to observe magnified images of living things in order to support the claim that living things are made up of tiny structures called cells. ● The functions of cells as a whole and the ways in which cell parts contribute to cell function.	*Students will be able to answer….* ● What are the characteristics of cells? ● How do cell structures relate to their functions?
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Explorations ● Interactive online games ● Open-ended response questions & comprehension questions ● Running records ● Teacher observation ● Classwork Practice ● Discussion Trifolds ● Video logs	● Pre Assessments ● Lesson Check ● Lesson Quiz ● Unit Assessments ● Alternate Assessments ● Performance Tasks ● Unit Projects ● Choice Boards
Benchmark	Alternative
● Unit pre and post assessments that align to text series	● Portfolio ● Performance assessments
LEARNING PLAN	
Pacing Guide: 2 Weeks	
Recommended Learning Activities	
● Complete Lesson 1-2 The Characteristics of Cells and Cell Structures and Function activities in student edition ● Vocabulary Review Game ● View Can You Explain It videos and discuss and respond to questions ● Complete Hands On Lab Activities: Observe Cells with a Microscope, Use Cell Models to Investigate Cell Size ● Complete Engineer It! Activities: Define the Problem, Identify Solutions ● Read Take it Further Texts: People in Science ● Unit Project: Analyze Bioindicators to Assess Water Quality - Students will research microorganisms found in clean and polluted water and use this information to analyze collected	

water of their choosing under a microscope. They analyze and interpret their microscopic data to assess the quality of their water sample, and they communicate their findings.
- Unit Performance Task: How can doctors explain what sickle cell anemia is to affected children? - Students will plan, construct, and present an educational campaign that will help young patients understand their diagnosis.

Integrated Accommodations and Modifications

Special Education, ELL and 504
- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

Gifted and Talented
- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

Connections

Interdisciplinary Connections
- (ELA, Math, Science, Social Studies)
- Technology
- Character education
- Career Education

21st Century Skills and Career Education
- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

Instructional and Supplemental Materials
- HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
- BrainPOP: https://www.brainpop.com/
- DOGONews - www.dogonews.com
- Biology: Cell Structure: https://www.youtube.com/watch?v=URUJD5NEXC8
- Introduction to Cells: https://www.youtube.com/watch?v=8IlzKri08kk&list=PLwL0Myd7Dk1HR9u5jw19E1_Q5u25PKg8v&index=3
- Celery stalks
- Celery leaves
- Cork
- Eyedroppers
- Human hair
- Light microscope
- Microscope slides with coverslips
- Salt
- Sand
- Tissue paper
- Water
- Breaker, 250 mL

• Calculator • Container, plastic, 473 mL • Gelatin cubes, prepared • Ruler, metric • Stopwatch • Water, warm • Disposable gloves • Poster board • Sterile container
Leveled Texts
• Advanced: Biology: Life As We Know It! by Dan Green • Intermediate: Belly - Busting Worm Invasions! Parasites That Love Your Insides! By Thomasine E. Lewis Tilden • Beginner: Adaptation and Survival by Robert Snedden

Grade 6

Module B - Cells & Heredity **Unit 2: Organisms as Systems**	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: MS-LS1-3.Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. MS-LS1-8.Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. Computer Science and Design Thinking: 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose. 8.1.8.DA.5: Test, analyze, and refine computational models. 8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact. 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies. 8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development.	Technology Standards (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. 21st Century Life and Career Standards 9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest. 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. 9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement. 9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally. 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the

	possible impact on personal finances. 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. 9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries. 9.4.8.DC.1: Analyze the resource citations in online materials for proper use. 9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). 9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences. 9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure. 9.4.8.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation. 9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b). 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
Learning Outcomes	
Students will understand…. ● How to study models of a variety of organisms to relate structure to function at each level in an organism. ● The structure and function of systems in plants. ● How the systems meet the needs of plants and respond to the environment. ● The structure and function of systems in animals. ● How the systems meet the needs of animals and respond to the environment. ● The cause-and-effect relationship between the information animals gather from the environment and their resulting behaviors.	*Students will be able to answer….* ● What are the levels of organization in Organisms? ● What is the structure and function of systems in plant bodies? ● What is the structure and function of systems in animal bodies? ● How do animals process information?
ASSESSMENT	
Formative	Summative
● Exit Slips	● Pre Assessments

• Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Explorations • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Lesson Check • Lesson Quiz • Unit Assessments • Alternate Assessments • Performance Tasks • Unit Projects • Choice Boards
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 4 Weeks	
Recommended Learning Activities	
• Complete Lesson 1-4 Levels of Organization in Organisms, Plant Bodies as Systems, Animal Bodies as Systems, and Information Processing in Animals activities in student edition • Vocabulary Review Game • View Can You Explain It videos and discuss and respond to questions • Complete Hands On Lab Activities: Model Tissue Structure and Function, Observe Transport, Measure System Response to Exercise, Measure Reaction Time • Complete Engineer It! Activities: Compare Natural and Designed Systems, Identify and Recommend a Solution, Design a Video Game Character, Compare Information Processing in Different Systems • Read Take it Further Texts: Careers in Science • Unit Project: Investigate an Animal Behavior - Students conduct research about an animal's behavior and use evidence to construct an explanation about how structure and function relate to the animal's behavior. • Unit Performance Task: How can dehydration be prevented? - Students research information about dehydration and the body structures and functions that are affected and then determine a solution for preventing dehydration.	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies

<table>
<tr><td>

- Games
- Kinesthetic Activity
- Role Play

</td><td>

- Accelerated learning
- Independent study

</td></tr>
<tr><td colspan="2">Connections</td></tr>
<tr><td>

Interdisciplinary Connections

- (ELA, Math, Science, Social Studies)
- Technology
- Character education
- Career Education

</td><td>

21st Century Skills and Career Education

- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

</td></tr>
<tr><td colspan="2">Instructional and Supplemental Materials</td></tr>
<tr><td colspan="2">

- HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
- BrainPOP: https://www.brainpop.com/
- DOGONews - www.dogonews.com
- The Circulatory & Respiratory Systems: https://www.youtube.com/watch?v=9fxm85Fy4sQ&list=PLGxDZD6sVVOKGu0gq_RMxTh_J-WWhaIup
- The Excretory System: https://www.youtube.com/watch?v=WtrYotjYvtU&list=PLGxDZD6sVVOKGu0gq_RMxTh_J-WWhaIup&index=3
- The Nervous System: https://www.youtube.com/watch?v=x4PPZCLnVkA&list=PLGxDZD6sVVOKGu0gq_RMxTh_J-WWhaIup&index=4
- Adhesive putty
- Beads
- Cardboard
- Construction paper
- Foam peanuts
- Glue
- Markers
- Modeling clay
- Pompoms
- Rice
- Rubberbands
- Scissors
- Sponges
- Tape
- Asparagus spears
- Broccoli stems
- Clear plastic cups, 16 oz
- Graduated cylinders
- Knives
- Red food coloring
- Stir stick
- Chair
- Stopwatch

</td></tr>
</table>

• Meter stick • Cardstock
Leveled Texts
• Advanced: Biology: Life As We Know It! by Dan Green • Intermediate: Belly - Busting Worm Invasions! Parasites That Love Your Insides! By Thomasine E. Lewis Tilden • Beginner: Adaptation and Survival by Robert Snedden

Grade 6

Module B - Cells & Heredity **Unit 3: Reproduction, Heredity, and Growth**	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: MS-LS1-4.Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. MS-LS1-5.Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. MS-LS3-2.Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. Computer Science and Design Thinking: 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose. 8.1.8.DA.5: Test, analyze, and refine computational models. 8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact. 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies. 8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development.	Technology Standards (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. 21st Century Life and Career Standards 9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest. 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. 9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement. 9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally. 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances. 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. 9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries.

	9.4.8.DC.1: Analyze the resource citations in online materials for proper use. 9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). 9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences. 9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure. 9.4.8.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation. 9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b). 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
Learning Outcomes	
Students will understand…. ● How genetic factors influence an organism's traits. ● How asexual reproduction results in offspring with identical genetic information. ● How sexual reproduction results in offspring with genetic variation. ● How genetic and environmental factors affect the growth and reproduction of plants. ● How an animal's behavior influences its reproductive success and survival.	*Students will be able to answer….* ● How does inheritance influence an organism's traits? ● How does reproduction relate to genetic diversity? ● How does genetic and environmental factors affect the growth and reproduction of plants? ● How does an animal's behavior influence its reproductive success?
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Explorations ● Interactive online games ● Open-ended response questions & comprehension questions	● Pre Assessments ● Lesson Check ● Lesson Quiz ● Unit Assessments ● Alternate Assessments ● Performance Tasks ● Unit Projects ● Choice Boards

• Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 4 Weeks	
Recommended Learning Activities	
• Complete Lesson 1-4 Inheritance, Asexual and Sexual Reproduction, Plant Reproduction and Growth, and Animal Reproduction and Growth activities in student edition • Vocabulary Review Game • View Can You Explain It videos and discuss and respond to questions • Complete Hands On Lab Activities: Model Genes and Traits, Model Sexual Reproduction, Investigate Flower Structures, Model the Growth of an Animal • Complete Engineer It! Activities: Identify and Recommend a Solution, Develop a Hybrid, Explore Plant Hybrids, Explain Trait Selection in Dog Breeds • Read Take it Further Texts: People in Science • You Solve it: What Factors Can Affect Reproductive Success? - Students analyze data to determine how female mate choice and environmental factors influence the reproductive success of Indian peacocks. Students run simulations in which they control variables related to make courtship displays and environmental conditions. • Unit Project: Analyze Factors that Affect Plant Growth - Students identify different varieties of radishes, grow samples under various environmental conditions, and analyze data to determine how genetic and environmental factors affect the growth of each plant sample. • Unit Performance Task: Save the Whitebark Pines! - Students conduct research and propose solutions to improve the genetic variation, growth, and reproduction of whitebark pines in Yellowstone National Park.	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • (ELA, Math, Science, Social Studies)	21st Century Skills and Career Education • Problem Solving

• Technology • Character education • Career Education	• Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications

Instructional and Supplemental Materials

- HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
- BrainPOP: https://www.brainpop.com/
- DOGONews - www.dogonews.com
- DNA, Chromosomes, Genes, and Traits: https://www.youtube.com/watch?v=8m6hHRlKwxY&list=PLwL0Myd7Dk1FVxYPO_bVbk8oOD5EZ2o5W&index=2
- Chromosomes and Karyotypes: https://www.youtube.com/watch?v=mBq1ULWJp_M&list=PLwL0Myd7Dk1FVxYPO_bVbk8oOD5EZ2o5W&index=3
- Alleles and Genes: https://www.youtube.com/watch?v=pv3Kj0UjiLE&list=PLwL0Myd7Dk1FVxYPO_bVbk8oOD5EZ2o5W&index=4
- Asexual and Sexual Reproduction: https://www.youtube.com/watch?v=fcGDUcGjcyk&list=PLwL0Myd7Dk1FVxYPO_bVbk8oOD5EZ2o5W&index=1
- Cups
- Red Beads
- Yellow Beads
- Coins
- Colored pencils
- Markers
- Masking Tape
- Flowers
- Hand lens
- Lab gloves
- Scalpels
- Surgical masks
- Paper
- Poster board
- Scissors
- Radish seeds or sprouts
- Soil
- Water

Leveled Texts

- Advanced: Biology: Life As We Know It! by Dan Green
- Intermediate: Belly - Busting Worm Invasions! Parasites That Love Your Insides! By Thomasine E. Lewis Tilden
- Beginner: Adaptation and Survival by Robert Snedden

Grade 6

Module C - Ecology & The Environment **Unit 1: Matter and Energy in Living Systems**	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: MS-LS1-6.Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. MS-LS1-7.Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism. MS-LS2-3.Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. Computer Science and Design Thinking: 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose. 8.1.8.DA.5: Test, analyze, and refine computational models. 8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact. 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies. 8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development.	Technology Standards (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. 21st Century Life and Career Standards 9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest. 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. 9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement. 9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally. 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances. 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. 9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries. 9.4.8.DC.1: Analyze the resource citations in online materials for proper use. 9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). 9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences.

	9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure. 9.4.8.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation. 9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b). 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
Learning Outcomes	
Students will understand…. ● How different organisms get matter and energy in various ways. ● The importance of aquatic producers in sustaining life on Earth. ● That matter and energy are neither created nor destroyed in chemical processes. ● How matter and energy are transferred between organisms.	*Students will be able to answer….* ● How do organisms use matter and energy? ● What are the roles of photosynthesis and cellular respiration in the flow of energy and matter through organisms? ● How does the flow of energy drive the cycling of matter in ecosystems?
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Explorations ● Interactive online games ● Open-ended response questions & comprehension questions ● Running records ● Teacher observation ● Classwork Practice ● Discussion Trifolds ● Video logs	● Pre Assessments ● Lesson Check ● Lesson Quiz ● Unit Assessments ● Alternate Assessments ● Performance Tasks ● Unit Projects ● Choice Boards
Benchmark	Alternative
● Unit pre and post assessments that align to text series	● Portfolio ● Performance assessments
LEARNING PLAN	
Pacing Guide: 3 Weeks	
Recommended Learning Activities	

- Complete Lesson 1-3 Matter and Energy in Organisms, Photosynthesis and Cellular Respiration, and Matter and Energy in Ecosystems activities in student edition
- Vocabulary Review Game
- View Can You Explain It videos and discuss and respond to questions
- Complete Hands On Lab Activities: Investigate Decomposition, Investigate the Effect of Sunlight on Elodea, Model Energy Flow in an Ecosystem
- Complete Engineer It! Activities: Explore Bioremediation, Explore the Use of Algae as Biofuel, Analyze a Solution
- Read Take it Further Texts: People in Science
- Unit Project: Food Webs around the World - Students will choose an ecosystem, research the feeding relationships in the ecosystem, and develop a model showing the transfer of matter and energy within the food web and more specifically within a particular food chain.
- Unit Performance Task: Should your School use vermicomposting? - Students will research vermicomposting, develop a model to explain how a unit could be constructed, and identify and recommend a solution for a vermicomposting unit to be built in their school.

Integrated Accommodations and Modifications

Special Education, ELL and 504

- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

Gifted and Talented

- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

Connections

Interdisciplinary Connections

- (ELA, Math, Science, Social Studies)
- Technology
- Character education
- Career Education

21st Century Skills and Career Education

- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

Instructional and Supplemental Materials

- HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
- BrainPOP: https://www.brainpop.com/
- DOGONews - www.dogonews.com
- Energy Flow: https://www.youtube.com/watch?v=5jBV9vJmXZI
- Matter and Energy in Organisms: https://www.youtube.com/watch?v=RdEzMW_vJkk&t=55s
- Energy and Living Things: https://www.youtube.com/watch?v=G1aL_Jhbs4o&t=318s
- Dry sand and potting soil
- Graduated cylinder
- Plastic baggies

• Variety of fruits and vegetables, cut into pieces • Water • Beaker, 500 mL • Bromothymol blue • Elodea plants • Flask, 250 mL • Foil • Graduated cylinder, 200 mL • Light source • Straw • Test tubes • Index cards • Resealable bags • Dried beans • Poster board
Leveled Texts
• Advanced: Endangered Rain Forests: Investigating Rain Forests in Crisis by Rani Iyer • Intermediate: Deserts Inside Out by Marina Cohen, Ecology by Brian Lane • Beginner: Coniferous Forests: An Evergreen World by Jeanne M. Nagle

Grade 6

Module C - Ecology & The Environment Unit 2: Relationships in Ecosystems	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: MS-LS2-1.Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. MS-LS2-2.Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. Computer Science and Design Thinking: 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose. 8.1.8.DA.5: Test, analyze, and refine computational models. 8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact. 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies.	Technology Standards (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. 21st Century Life and Career Standards 9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest. 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. 9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact

8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development.	opportunities for employment or advancement. 9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally. 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances. 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. 9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries. 9.4.8.DC.1: Analyze the resource citations in online materials for proper use. 9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). 9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences. 9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure. 9.4.8.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation. 9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b). 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
Learning Outcomes	
Students will understand…. ● How the living and nonliving factors of an ecosystem are organized into levels and that all ecosystems can be studied at these levels. ● How limited resources can result in competition and reduce the growth of individuals and populations. ● The relationships among organisms in an ecosystem.	*Students will be able to answer….* ● What are the needs of organisms to the levels of organization in an ecosystem? ● What is the impact of resource availability on the growth of organisms and populations in an ecosystem? ● What are the patterns of interaction between organisms?
ASSESSMENT	
Formative	Summative
● Exit Slips	● Pre Assessments

• Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Explorations • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Lesson Check • Lesson Quiz • Unit Assessments • Alternate Assessments • Performance Tasks • Unit Projects • Choice Boards
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 3 Weeks	
Recommended Learning Activities	
• Complete Lesson 1-3 Parts of an Ecosystem, Resource Availability in Ecosystems, and Patterns of Interaction activities in student edition • Vocabulary Review Game • View Can You Explain It videos and discuss and respond to questions • Complete Hands On Lab Activities: Investigate Your Schoolyard, Investigate Effects of Limited Resources, Simulate Feeding Relationships • Complete Engineer It! Activities: Consider Tradeoffs, Identify Solutions • Read Take it Further Texts: People in Science • Unit Project: How Organisms Interact - Students will choose an ecosystem and research different interactions among organisms in the ecosystems. They analyze and interpret data to make predictions about how resource availability may affect the organisms involved in the interactions. • Unit Performance Task: How do lionfish affect relationships in local ecosystems? - Students will ask questions about how lionfish affect species around them and describe ways to reduce the population size of this invasive species.	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments • Sensory integration activities • Flexible grouping • Games	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities • Role Play • Critical thinking strategies • Accelerated learning

• Kinesthetic Activity • Role Play	• Independent study
Connections	
Interdisciplinary Connections • (ELA, Math, Science, Social Studies) • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04 • BrainPOP: https://www.brainpop.com/ • DOGONews - www.dogonews.com • Ecological Relationships - https://www.youtube.com/watch?v=rNjPI84sApQ • Craft sticks • Field guides to local plants and animals • Forceps • Hand lenses • Markers/Colored pencils • Meter stick/Tape measure • Notebook • Paper cups • Paper • String • Thermometer • Trowel/Forks • Cups with sprouted bean plants • Ruler • Water • Beans (red kidney) • Beans (white navy) • Graph paper • Peas, split green • Pennies	
Leveled Texts	
• Advanced: Endangered Rain Forests: Investigating Rain Forests in Crisis by Rani Iyer • Intermediate: Deserts Inside Out by Marina Cohen, Ecology by Brian Lane • Beginner: Coniferous Forests: An Evergreen World by Jeanne M. Nagle	

Grade 6

Module C - Ecology & The Environment Unit 3: Ecosystem Dynamics	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards	Technology Standards

Science: MS-LS2-4.Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. MS-LS2-5.Evaluate competing design solutions for maintaining biodiversity and ecosystem services. MS-ETS1-2.Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. Computer Science and Design Thinking: 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose. 8.1.8.DA.5: Test, analyze, and refine computational models. 8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact. 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies. 8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development.	(6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem. 21st Century Life and Career Standards 9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest. 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. 9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement. 9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally. 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances. 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. 9.4.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4). 9.4.8.CI.2: Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3). 9.4.8.CI.3: Examine challenges that may exist in the adoption of new ideas (e.g., 2.1.8.SSH, 6.1.8.CivicsPD.2). 9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries. 9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to

	predict which one(s) are likely to be effective (e.g., MS-ETS1-2). 9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1). 9.4.8.CT.3: Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome. 9.4.8.DC.1: Analyze the resource citations in online materials for proper use. 9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). 9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences. 9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure. 9.4.8.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation. 9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b). 9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making. 9.4.8.TL.2: Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4). 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
Learning Outcomes	
Students will understand…. ● The relationship between biodiversity and the health of an ecosystem. ● How the dynamic nature of ecosystems can result in changes over time. ● The importance of biodiversity to humans. ● What the main causes of biodiversity loss are.	*Students will be able to answer….* ● How can an ecosystem's biodiversity recover from change? ● How can changes in an ecosystem affect populations within it? ● What design solutions will maintain biodiversity and ecosystem services?

<table>
<tr><th colspan="2">ASSESSMENT</th></tr>
<tr><td>Formative</td><td>Summative</td></tr>
<tr><td>Exit Slips
Journals
Oral reading
Graphic Organizers
Class discussion
Response to reading
Explorations
Interactive online games
Open-ended response questions & comprehension questions
Running records
Teacher observation
Classwork Practice
Discussion Trifolds
Video logs</td><td>Pre Assessments
Lesson Check
Lesson Quiz
Unit Assessments
Alternate Assessments
Performance Tasks
Unit Projects
Choice Boards</td></tr>
<tr><td>Benchmark</td><td>Alternative</td></tr>
<tr><td>Unit pre and post assessments that align to text series</td><td>Portfolio
Performance assessments</td></tr>
<tr><th colspan="2">LEARNING PLAN</th></tr>
<tr><td colspan="2">Pacing Guide: 3 Weeks</td></tr>
<tr><td colspan="2">Recommended Learning Activities</td></tr>
<tr><td colspan="2">Complete Lesson 1-3 Biodiversity in Ecosystems, Changes in Ecosystems, and Engineer It: Maintaining Biodiversity activities in student edition
Vocabulary Review Game
View Can You Explain It videos and discuss and respond to questions
Complete Hands On Lab Activities: Measure Biodiversity, What Factors Influence a Population Change?, Model Habitat Fragmentation
Complete Engineer It! Activities: Optimize Solution, Brainstorm Solution
Read Take it Further Texts: Careers in Science
Unit Project: Evaluate Biodiversity Design Solutions - Students will select an issue related to biodiversity loss, research the design problem, evaluate several solutions based on how well they meet criteria and constraints, and propose a modification to a chosen solution.
Unit Performance Task: What is the best way to prevent shoreline erosion? - Students will compare and contrast the use of natural vegetation versus the use of a stone wall to prevent shoreline erosion on a lake.</td></tr>
<tr><td colspan="2">Integrated Accommodations and Modifications</td></tr>
<tr><td>Special Education, ELL and 504
Repeat/modify directions
Visual models
Assistive technology
Extended time
Preferred/flexible seating
Differentiated activities (centers)
Shortened assignments
Sensory integration activities</td><td>Gifted and Talented
Flexible grouping
Differentiated activities (centers)
Games
Assistive technology
Problem solving strategies
Tiered choice activities
Kinesthetic Activities
Role Play</td></tr>
</table>

• Flexible grouping • Games • Kinesthetic Activity • Role Play	• Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • (ELA, Math, Science, Social Studies) • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04 • BrainPOP: https://www.brainpop.com/ • DOGONews - www.dogonews.com • Why is biodiversity so important? - https://www.youtube.com/watch?v=GK_vRtHJZu4 • Bill Nye The Science Guy Biodiversity - https://www.youtube.com/watch?v=-Sybgof-X2k • Jar of dried beans (6 different types) • Scoop • Cup • Dice • Pencils • Popcorn kernels • Calculator • Ruler • Scissors • Sheets of paper	
Leveled Texts	
• Advanced: Endangered Rain Forests: Investigating Rain Forests in Crisis by Rani Iyer • Intermediate: Deserts Inside Out by Marina Cohen, Ecology by Brian Lane • Beginner: Coniferous Forests: An Evergreen World by Jeanne M. Nagle	

Grade 6

Module D - The Diversity of Living Things Unit 1: The History of Life on Earth	
DESIRED RESULTS	
Standards	
New Jersey Student Learning Standards Science: MS-LS4-1.Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.	Technology Standards (6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools. 8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities. 8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.

MS-LS4-2.Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. MS-LS4-3.Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. Computer Science and Design Thinking: 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose. 8.1.8.DA.5: Test, analyze, and refine computational models. 8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact. 8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies. 8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development.	21st Century Life and Career Standards 9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest. 9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income. 9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement. 9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally. 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances. 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. 9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries. 9.4.8.DC.1: Analyze the resource citations in online materials for proper use. 9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). 9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences. 9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure. 9.4.8.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation. 9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b). 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
Learning Outcomes	

Students will understand….	*Students will be able to answer….*
• The conditions necessary for fossilization. • How the relative and absolute ages of rock layers are used to determine the ages of fossils in the context of the geologic timescale. • Patterns in the fossil record that indicate extinction events. • That physical evidence can describe an extinct organism's behavior • How fossils document the existence, diversity, extinction, and change of many life forms over time. • Patterns of similarities in the anatomy and embryological development across species. • How to use patterns to infer evolutionary relationships among modern and extinct species.	• How can fossil data be used to provide evidence of the history of life on Earth? • How can you explain how life changed over time using the fossil record? • How can you provide evidence for evolutionary relationships among organisms?
ASSESSMENT	
Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Explorations • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Pre Assessments • Lesson Check • Lesson Quiz • Unit Assessments • Alternate Assessments • Performance Tasks • Unit Projects • Choice Boards
Benchmark	Alternative
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 2 Weeks	
Recommended Learning Activities	
• Complete Lesson 1-3 The Fossil Record, Patterns of Change in Life on Earth, and Evidence of Common Ancestry activities in student edition • Vocabulary Review Game • View Can You Explain It videos and discuss and respond to questions • Complete Hands On Lab Activities: Model Fossil Formation, Model Analysis of the Fossil Record,	

Make Inferences from Evidence

- Complete Engineer It! Activities: Identify the Need, Apply the Use of 3D Printing to Model Fossils
- Read Take it Further Texts: People in Science, Careers in Science
- Unit Project: All in the Family - Students will choose an organism, research possible relatives including other living and extinct species, and create a timeline which constructs an explanation about how these organisms are related based on anatomical similarities.
- Unit Performance Task: Which species is more closely related to the red panda? - Students will obtain information about the habits, physical features, and diets of the red panda, giant panda, and raccoon and use reasoning to explain whether the giant panda or raccoon is the closest living relative to the red panda.

Integrated Accommodations and Modifications

Special Education, ELL and 504

- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

Gifted and Talented

- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

Connections

Interdisciplinary Connections

- (ELA, Math, Science, Social Studies)
- Technology
- Character education
- Career Education

21st Century Skills and Career Education

- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

Instructional and Supplemental Materials

- HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
- BrainPOP: https://www.brainpop.com/
- DOGONews - www.dogonews.com
- Fossils and Evidence for Evolution - https://www.youtube.com/watch?v=iYr3sYS9e0w
- Modeling clay
- Various items to form cast fossils
- White glue
- Colored pencils
- Scissors
- Picture cut into strips

Leveled Texts

- Advanced: Animals: Mammals, Birds, Reptiles, Amphibians, Fish, and Other Animals by Shar Levine, Fungi: Mushrooms, Toadstools, Molds, Yeasts, and Other Fungi by Judy Wearing
- Intermediate: Adaptation by Melanie Waldron, Battling Extinction by Tamra B. Orr

- Beginner: Adaptation and Survival by Robert Snedden

Grade 6

Module D - The Diversity of Living Things
Unit 2: Evolution

DESIRED RESULTS

Standards

New Jersey Student Learning Standards

MS-LS3-1.Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.
MS-LS4-4.Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
MS-LS4-6.Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.

Computer Science and Design Thinking:
8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
8.1.8.DA.5: Test, analyze, and refine computational models.
8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact.
8.2.8.EC.1: Explain ethical issues that may arise from the use of new technologies.
8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development.

Technology Standards

(6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools.
8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.
8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.

21st Century Life and Career Standards

9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest.
9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions, and personal behavior affect income.
9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement.
9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally.
9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances.
9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level.
9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries.
9.4.8.DC.1: Analyze the resource citations in online materials for proper use.
9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8).
9.4.8.DC.4: Explain how information shared

	digitally is public and can be searched, copied, and potentially seen by public audiences. 9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure. 9.4.8.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation. 9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b). 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
Learning Outcomes	
Students will understand…. ● How the information in genes is used to code for specific proteins that determine traits. ● How mutations in DNA can lead to changes in the structure and functions of proteins. ● That gene mutations are a source of variation in traits and that some traits can provide a survival advantage for organisms in specific environments. ● The relationship between adaptation and natural selection and how natural selection requires variation of traits in a population. ● The causes of speciation and extinction.	*Students will be able to answer….* ● How do changes to genes affect traits in an organism? ● What is the link between adaptation and natural selection? ● What are the causes of speciation and extinction?
ASSESSMENT	
Formative	Summative
● Exit Slips ● Journals ● Oral reading ● Graphic Organizers ● Class discussion ● Response to reading ● Explorations ● Interactive online games ● Open-ended response questions & comprehension questions ● Running records ● Teacher observation ● Classwork Practice	● Pre Assessments ● Lesson Check ● Lesson Quiz ● Unit Assessments ● Alternate Assessments ● Performance Tasks ● Unit Projects ● Choice Boards

<table>
<tr><td>

- Discussion Trifolds
- Video logs

</td><td></td></tr>
<tr><td>Benchmark</td><td>Alternative</td></tr>
<tr><td>

- Unit pre and post assessments that align to text series

</td><td>

- Portfolio
- Performance assessments

</td></tr>
<tr><td colspan="2">LEARNING PLAN</td></tr>
<tr><td colspan="2">Pacing Guide: 3 Weeks</td></tr>
<tr><td colspan="2">Recommended Learning Activities</td></tr>
<tr><td colspan="2">

- Complete Lesson 1-3 Genetic Change and Traits, Natural Selection, and Speciation and Extinction activities in student edition
- Vocabulary Review Game
- View Can You Explain It videos and discuss and respond to questions
- Complete Hands On Lab Activities: Model Protein Folding, Model Natural Selection in a Population, Analyze Speciation of Salamanders
- Complete Engineer It! Activities: Identify Design Solution Constraints, Control Selection to Meet Human Needs, Identify Solutions for a Wildlife Corridor
- Read Take it Further Texts: People in Science
- Unit Project: Real-World Example of Natural Selection - Students will conduct research about a real-world example of natural selection and use evidence to construct an explanation about how some individuals in the population have a greater probability of surviving and reproducing in the environment.
- Unit Performance Task: How does the use of insecticides lead to insecticide resistance? - Students will explain how insects have become resistant to insecticides over time and make a recommendation of how to manage insect resistance moving forward.

</td></tr>
<tr><td colspan="2">Integrated Accommodations and Modifications</td></tr>
<tr><td>

Special Education, ELL and 504

- Repeat/modify directions
- Visual models
- Assistive technology
- Extended time
- Preferred/flexible seating
- Differentiated activities (centers)
- Shortened assignments
- Sensory integration activities
- Flexible grouping
- Games
- Kinesthetic Activity
- Role Play

</td><td>

Gifted and Talented

- Flexible grouping
- Differentiated activities (centers)
- Games
- Assistive technology
- Problem solving strategies
- Tiered choice activities
- Kinesthetic Activities
- Role Play
- Critical thinking strategies
- Accelerated learning
- Independent study

</td></tr>
<tr><td colspan="2">Connections</td></tr>
<tr><td>

Interdisciplinary Connections

- (ELA, Math, Science, Social Studies)
- Technology
- Character education
- Career Education

</td><td>

21st Century Skills and Career Education

- Problem Solving
- Critical Thinking
- Communication
- Collaborative learning
- Productivity
- Real-world applications

</td></tr>
<tr><td colspan="2">Instructional and Supplemental Materials</td></tr>
</table>

- HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04
- BrainPOP: https://www.brainpop.com/
- DOGONews - www.dogonews.com
- Mutations - https://www.youtube.com/watch?v=GieZ3pk9YVo
- Natural Selection - https://www.youtube.com/watch?v=7VM9YxmULuo&list=PLwL0Myd7Dk1FuT0I6icE7octRIgJqMBhS&index=3
- Speciation - https://www.youtube.com/watch?v=udZUaNKXbJA&list=PLwL0Myd7Dk1FuT0I6icE7octRIgJqMBhS&index=5
- Colored pencils
- Paper strips
- Rulers
- Construction paper
- Hole punch
- Paper or fabric, patterned
- Stopwatch
- index cards

Leveled Texts

- Advanced: Animals: Mammals, Birds, Reptiles, Amphibians, Fish, and Other Animals by Shar Levine, Fungi: Mushrooms, Toadstools, Molds, Yeasts, and Other Fungi by Judy Wearing
- Intermediate: Adaptation by Melanie Waldron, Battling Extinction by Tamra B. Orr
- Beginner: Adaptation and Survival by Robert Snedden

Grade 6

Module D - The Diversity of Living Things
Unit 3: Human Influence on Inheritance

DESIRED RESULTS

Standards

New Jersey Student Learning Standards

Science:
MS-LS4-5.Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.

Computer Science and Design Thinking:
8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
8.1.8.DA.5: Test, analyze, and refine computational models.
8.2.8.ETW.3: Analyze the design of a product that negatively impacts the environment or society and develop possible solutions to lessen its impact.
8.2.8.EC.1: Explain ethical issues that may arise

Technology Standards

(6) 8.1.8.A.1-Demonstrate knowledge of a real world problem using digital tools.
8.1.P.C.1-Collaborate with peers by participating in interactive digital games or activities.
8.1.8.E.1-Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.

21st Century Life and Career Standards

9.2.8.CAP.1: Identify offerings such as high school and county career and technical school courses, apprenticeships, military programs, and dual enrollment courses that support career or occupational areas of interest.
9.2.8.CAP.3: Explain how career choices, educational choices, skills, economic conditions,

from the use of new technologies. 8.2.8.EC.2: Examine the effects of ethical and unethical practices in product design and development.	and personal behavior affect income. 9.2.8.CAP.4: Explain how an individual's online behavior (e.g., social networking, photo exchanges, video postings) may impact opportunities for employment or advancement. 9.2.8.CAP.10: Evaluate how careers have evolved regionally, nationally, and globally. 9.2.8.CAP.13: Compare employee benefits when evaluating employment interests and explain the possible impact on personal finances. 9.2.8.CAP.19: Relate academic achievement, as represented by high school diplomas, college degrees, and industry credentials, to employability and to potential level. 9.4.8.CI.4: Explore the role of creativity and innovation in career pathways and industries. 9.4.8.DC.1: Analyze the resource citations in online materials for proper use. 9.4.8.DC.2: Provide appropriate citation and attribution elements when creating media products (e.g., W.6.8). 9.4.8.DC.4: Explain how information shared digitally is public and can be searched, copied, and potentially seen by public audiences. 9.4.8.DC.5: Manage digital identity and practice positive online behavior to avoid inappropriate forms of self-disclosure. 9.4.8.DC.6: Analyze online information to distinguish whether it is helpful or harmful to reputation. 9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b). 9.4.8.TL.3: Select appropriate tools to organize and present information digitally.
Learning Outcomes	
Students will understand…. ● Artificial selection and how, over time, this process can result in offspring that are very different from earlier generations. ● That humans can choose specific traits that are considered desirable and then use technology to alter the genetic makeup of an organism so those traits are present.	*Students will be able to answer….* ● How does artificial selection influence the inheritance of traits in organisms? ● How can genetic engineering be used to influence traits in organisms?
ASSESSMENT	

Formative	Summative
• Exit Slips • Journals • Oral reading • Graphic Organizers • Class discussion • Response to reading • Explorations • Interactive online games • Open-ended response questions & comprehension questions • Running records • Teacher observation • Classwork Practice • Discussion Trifolds • Video logs	• Pre Assessments • Lesson Check • Lesson Quiz • Unit Assessments • Alternate Assessments • Performance Tasks • Unit Projects • Choice Boards
Benchmark	**Alternative**
• Unit pre and post assessments that align to text series	• Portfolio • Performance assessments
LEARNING PLAN	
Pacing Guide: 3 Weeks	
Recommended Learning Activities	
• Complete Lesson 1-2 Artificial Selection and Genetic Engineering activities in student edition • Vocabulary Review Game • View Can You Explain It videos and discuss and respond to questions • Complete Hands On Lab Activities: Analyze Selected Traits in Vegetables, Model the Modification of Bacteria • Complete Engineer It! Activities: Optimize Solutions, Evaluate Impacts of Genetically Modified Crops • Read Take it Further Texts: Careers in Science • Unit Project: Biotechnology and Crops - Students will gather research from multiple sources about a plant for which humans have influenced the inheritance of desired traits, and synthesize this research to determine how humans have influenced the traits of that plant species over time. • Unit Performance Task: Should we light our street with bioluminescent trees? - Students will obtain information about what bioluminescence is, organisms that are naturally bioluminescent, and organisms that have been genetically modified to be bioluminescent. Students evaluate this data and explain how trees might be genetically modified to be bioluminescent.	
Integrated Accommodations and Modifications	
Special Education, ELL and 504 • Repeat/modify directions • Visual models • Assistive technology • Extended time • Preferred/flexible seating • Differentiated activities (centers) • Shortened assignments	Gifted and Talented • Flexible grouping • Differentiated activities (centers) • Games • Assistive technology • Problem solving strategies • Tiered choice activities • Kinesthetic Activities

• Sensory integration activities • Flexible grouping • Games • Kinesthetic Activity • Role Play	• Role Play • Critical thinking strategies • Accelerated learning • Independent study
Connections	
Interdisciplinary Connections • (ELA, Math, Science, Social Studies) • Technology • Character education • Career Education	21st Century Skills and Career Education • Problem Solving • Critical Thinking • Communication • Collaborative learning • Productivity • Real-world applications
Instructional and Supplemental Materials	
• HMH Ed - Discover: https://www.hmhco.com/one/#/discover/SCI_NA18E_SCIDIM_G04 • BrainPOP: https://www.brainpop.com/ • DOGONews - www.dogonews.com • Natural Selection VS Artificial Selection - https://www.youtube.com/watch?v=9hzWbTpxME8 • Changing the Blueprints of Life - https://www.youtube.com/watch?v=FY_ZUEKWhBc • Colored pencils • Samples of fresh vegetables • Colored beads • Pipe cleaners • Scissors	
Leveled Texts	
• Advanced: Animals: Mammals, Birds, Reptiles, Amphibians, Fish, and Other Animals by Shar Levine, Fungi: Mushrooms, Toadstools, Molds, Yeasts, and Other Fungi by Judy Wearing • Intermediate: Adaptation by Melanie Waldron, Battling Extinction by Tamra B. Orr • Beginner: Adaptation and Survival by Robert Snedden	