

**FAIRFIELD TOWNSHIP SCHOOL
Science Curriculum Guide Grade 1**

Key:

Climate

Equity and Inclusion

SEL

Holocaust

Amistad

Career Readiness, Life Literacies, and Key Skills

Science Curriculum Guide Grade 1 Unit 1

Subject: Science	Grade Level: 1
Unit 1: Waves and their Applications in Technologies for Information Transfer	Pacing: 12 Weeks
Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> • What is light? • How does light travel? • What is the difference between a natural light source and an artificial light source? • What does illuminate mean? • What is reflection and how light reacts to reflective surfaces? • How does light react with different surfaces 	<p>PS4.A: Wave Properties</p> <ul style="list-style-type: none"> • Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1) (W.1.7) (W.1.8) (SL.1.1) <p>PS4.B: Electromagnetic Radiation</p> <ul style="list-style-type: none"> • Objects can be seen if light is available to illuminate them or if they give off their own light. (1-PS4-2) (W.1.2) (W.1.7) (W.1.8) (SL.1.1) • Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (Boundary: The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.) (1- PS4-3) (W.1.7) (W.1.8) (SL.1.1) <p>PS4.C: Information Technologies and Instrumentation</p> <ul style="list-style-type: none"> • People also use a variety of devices to communicate (send and receive information) over long distances. (1- PS4-4) (W.1.7) (MP.5) (1. MD.A.1) (1.MD.A.2)

<p>including transparent, translucent, opaque, and refraction? What devices are used to communicate long distances?</p> <ul style="list-style-type: none"> • What tools can be used to design or build a device that uses light or sound to solve a problem of communicating over a distance? • What devices are used to communicate long distances? • What tools can be used to design or build a device that uses light or sound to solve a problem of communicating over a distance? 	
<p>NJSL-S Standards</p>	<p>Classroom Applications</p>
<p>1-PS4-1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.</p>	<p>Objectives: Use evidence from several sources to provide evidence that sound can make matter vibrate. People use a variety of sound devices to communicate. (1-PS4-1) (W.1.7) (W.1.8) (SI.1.1)</p> <ul style="list-style-type: none"> • Investigate, using real world materials, how to communicate over a distance sound. • Describe what a vibration is and give examples. • Demonstrate how vibrations are made.

- Clarification
Statement: Examples of vibrating materials that make sound could include tuning forks and plucking a stretched string. Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making sound and holding an object near a vibrating tuning fork.

1-PS4-2.
Make observations to construct an evidence-based account that objects can be seen only when illuminated.

- Clarification
Statement: Examples of observations could include those made in a completely dark room, a pinhole box, and a video of a cave explorer with a flashlight. Illumination could be from an external light source or by an object giving off its own light.

Use evidence from several sources to provide evidence that objects can be seen if there is a light source (1-PS-4-2) (W.1.2) (W.1.7) (W.1.8) (SL.1.1)

- Investigate the effects of varying amounts of light on objects, example day vs. night.
- Describe how use of senses changes due to the amount of light present.

Plan and investigate to determine the effect of placing transparent, translucent, opaque objects in the path of a beam of light. (1- PS4-3) (W.1.7) (W.1.8) (SL.1.1)

- Describe what light is.
- Describe how light travels.
- Be able to name and explain sources of light.
- Identify transparent, translucent, opaque.

Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance. (1-PS-4-4) (W.1.7) (MP.5) (1. MD.A.1) (1.MD.A.2)

- Identify what light and sound are.
- Describe materials light will travel through.
- Demonstrate the steps to build a communication device.

Teaching Strategies/Materials:

Lesson Structure: Anticipatory Set, Mini-Lesson, Whole Group, Small Group, Independent Work, Closure

Strategies: Think-Pair-Share, Read Aloud, Jigsaw, Investigations, Guided Explorations, Projects

Materials: Science A-Z, Reading A-Z, Scholastic News, Brain Pop, NJCTL.org, Teacher Pay Teacher, Pinterest, Sploder, Magic School Bus, Anchor Charts

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.

- Examples of materials could include those that are transparent (such as clear plastic), translucent (such as wax paper), opaque (such as cardboard), and reflective (such as a mirror).
- Assessment Boundary:
Assessment does not include the speed 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.

- Examples of devices could include a light source to send

Mentor Texts, DVDs, Internet, Technology (Smart Board, student computers/laptops, PowerPoint, Websites, etc.), supplemental books, visual aids, manipulatives, supplemental materials for investigations

Differentiation Strategies/Modifications

SWD/ Students at risk of failure: 1:1 teacher redirect / re-teach, peer helper, visual aids, modified tests/quizzes, modified homework

Gifted/Enrichment: computer-based research, high level task, class presentation

signals, paper cup and string
“telephones,” and a pattern of drum beats.

- Assessment Boundary:
Assessment does not include technological details for how communication devices work.

Connections to other content areas, including Career Readiness, Life Literacies, and Key Skills:

ELA/Literacy –

W.1.2 Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.

W.1.7 Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions).

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.

Mathematics –

MP.5 Use appropriate tools strategically.

1. MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.

1. MD.A.2 Express the length of an object as a whole number of length units, by layering multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.

Career Readiness, Life Literacies, and Key Skills –

9.4.2.CI.1: Demonstrate openness to new ideas and perspectives.

9.4.2.CI.2: Demonstrate originality and inventiveness in work .

9.4.2.CT.1: Gather information about an issue, such as climate change and collaboratively brainstorm ways to solve the problem.

9.4.2.CT.2- Identify possible approaches and resources to execute a plan.

9.4.2.CT.3- Use a variety of types of thinking to solve problems (e.g. inductive, deductive).

Unit Resources:

Savvas Elevate Science for First Grade, Topic 1: Sound

Savvas Elevate Science for First Grade, Topic 2: Light

Hands-on & Virtual Labs

STEM Quest PBL

Inquiry in Action: Investigating Matter through Inquiry

Conservation of Matter

<http://strandmaps.nsd.org/?id=SMS-MAP-1332>

Science Refreshers

<http://nsdl.org/refreshers/science/>

Science Kids <http://www.sciencekids.co.nz/gamesactivities/gases.html>

<http://archive.fossweb.com/modulesK-2/SolidsandLiquids/activities/changeit.swf>

http://coolsciencelab.com/ice_cream.htm

Unit Assessment Opportunities:

- Journal Entries and Response Sheets
- Observations, Questioning, and discussions
- Comprehension Checks in literature
- Class Webs
- Presentations
- Collaboration
- Projects
- Rubrics (<http://www.nextgenscience.org/resources>)
- Lesson Check
- Lesson Quiz
- Performance Expectations Activities
- Topic Tests

FAIRFIELD TOWNSHIP SCHOOL
Curriculum Guide Grade 1 Unit 2

Subject: Science	Grade Level: 1
Unit 2: Molecules to Organisms: Structures and Processes/ Heredity: Inheritance and Variation of Traits	Pacing: 12 Weeks
Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> ● What is structure and function? ● How do animals use external structures to survive? ● What are some examples of external parts of an animal? ● What are the external structures of a plant? ● How do plants and animals respond to their environments? ● What is reproduction? ● In what types of ways do animals reproduce? ● How do plants reproduce? 	<p>LS1.A: Structure and Function</p> <ul style="list-style-type: none"> ● All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1) (W.1.7) <p>LS1.B: Growth and Development of Organisms</p> <ul style="list-style-type: none"> ● Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2) (RL.1.1) (RL.1.2) (RL.1.10) (1.NBT.B.3) (1.NBT.C.4) (1.NBT.C5) (1.NBT.C.6) <p>LS1.D: Information Processing</p> <ul style="list-style-type: none"> ● Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1) (W.1.7) <p>LS3.A: Inheritance of Traits</p>

<ul style="list-style-type: none"> ● How do eggs help offspring to survive? ● How do nest/dens help offspring to survive? ● How does parental care help the offspring to survive? ● What offspring behaviors help the offspring to survive? ● How does the structure of seeds help plant offspring to survive? ● How are young animals like their parents? ● How are young plants similar to full grown plants of the same kind? ● What are the similarities and differences between plants and animals of the same kind/breed? ● What characteristics do most plants share? ● What characteristics do animals share? 	<ul style="list-style-type: none"> ● Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents. (1- LS3-1) (RI.1.1) (W.1.7) (W.1.8) (MP.2) (MP.5) (1.MD.A.1) <p>LS3.B: Variation of Traits</p> <ul style="list-style-type: none"> ● Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1) (RI.1.1) (W.1.7) (W.1.8) (MP.2) (MP.5) (1.MD.A.1)
<p>NJSL-S Standards</p>	<p>Classroom Applications</p>
<p>1-LS1-1. Use materials to design a solution to a human problem by mimicking</p>	<p>Objectives: Use materials to solve human problems such as the need for food, shelter, and protection by mimicking how plants and animals meet their own needs for survival. (1-LS-1) (W.1.7)</p>

how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

- Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking animal tails and roots on plants; keeping out intruders by mimicking thorns on branches and animal quills; and, detecting intruders by mimicking eyes and ears.

1-LS1-2.

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

- Examples of patterns of behaviors could

- Student will distinguish between needs and wants
- Describe what plants need to survive
- Explain how animals use external parts to protect themselves

Explore texts and media to understand parent and offspring behavior that enables survival. (1-LS1-2) (RL.1.1) (RL.1.2) (RL.1.10) (1.NBT.B.3) (1.NBT.C.4) (1.NBT.C.5) (1.NBT.C.6)

- Give examples of signal and response behavior of offspring and parent.
- Use video to explore animal behaviors

Describe how offspring are a combination of parent traits. (1-LS3-1) (RI.1.1) (W.1.7) (W.1.8) (MP.2) (MP.5) (1.MD.A.1)

- Discuss that offspring will mostly resemble parents.
- Classify living things according to their attributes; same and different

Teaching Strategies/Materials:

Lesson Structure: Anticipatory Set, Mini-Lesson, Whole Group, Small Group, Independent Work, Closure

Strategies: Think-Pair-Share, Read Aloud, Jigsaw, Investigations, Guided Explorations, Projects

Materials: Science A-Z, Reading A-Z, Scholastic News, Brain Pop, NJCTL.org, Teacher Pay Teacher, Pinterest, Sploder, Magic School Bus, Anchor Charts, Mentor Texts, DVDs, Internet, Technology (Smart Board, student computers/laptops, PowerPoint, Websites, etc.), supplemental books, visual aids, manipulatives, supplemental materials for investigations

Differentiation Strategies/Modifications

include the signals that offspring make (such as crying, cheeping, and other vocalizations) and the responses of the parents (such as feeding, comforting, and protecting the offspring).

1-LS3-1.

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

- Examples of patterns could include features plants or animals share. Examples of observations could include leaves from the same kind of plant are the same shape but can differ in size; and, a particular breed of dog looks like its parents but is not exactly the same.
- Assessment Boundary:
Assessment does not include inheritance or animals that undergo

SWD/ Students at risk of failure: 1:1 teacher redirect / re-teach, peer helper, visual aids, modified tests/quizzes, modified homework

Gifted/Enrichment: computer-based research, high level task, class presentation

metamorphosis or hybrids.

Connections to other content areas, including Career Readiness, Life Literacies, and Key Skills:

ELA/Literacy-

RL.1.1 Ask and answer questions about key details in a text.

RL.1.2 Identify the main topic and retell key details of a text.

RL.1.10 With prompting and support, read and comprehend stories and poetry at grade level text complexity or above.

RI.1.1 Ask and answer questions about key details in a text.

W.1.7 Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions).

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

Mathematics –

MP.2 Reason abstractly and quantitatively.

MP.5 Use appropriate tools strategically.

1. MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.

1.NBT.B.3 Compare two two-digit numbers based on the meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.

1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

1.NBT.C.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

1.NBT.C.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Career Readiness, Life Literacies, and Key Skills –

9.4.2.CI.1: Demonstrate openness to new ideas and perspectives.

9.4.2.CI.2: Demonstrate originality and inventiveness in work .

9.4.2.CT.1: Gather information about an issue, such as climate change and collaboratively brainstorm ways to solve the problem.

9.4.2.CT.2- Identify possible approaches and resources to execute a plan.

9.4.2.CT.3- Use a variety of types of thinking to solve problems (e.g. inductive, deductive).

Unit Resources:

Savvas Elevate Science for First Grade, Topic 5: Living Things

Savvas Elevate Science for First Grade, Topic 6: Parents and Offspring

Hands-on & Virtual Labs

STEM Quest PBL

Read Alouds:

The Color of Us-Karen Katz

Two Eyes a Nose and a Mouth- Roberta Grobel Intrater

We're Different, We're the Same and We are All Wonderful

<https://www.calacademy.org/>

Websites:

Education.com

Easyscienceforkids.org

Kidsgrowingstrong.org/Plant Needs

Ducksters.com/science/photosynthesis.php

Animalatlas.tv

Technology

8.1.5.A.1 to 3 - Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.

- Understand and use technology systems.
- Select and use applications effectively and productively.

8.1.5.D.1 to 4 - Digital Citizenship : Students understand human, cultural, societal issues related to technology and practice legal and ethical behaviors

- Advocate and practice safe, legal, and responsible use of information and technology.
- Demonstrate personal responsibility for lifelong learning.
- Exhibit leadership for digital citizenship.

8.1.5.E.1 - Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.

- Plan strategies to guide inquiry.
- Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
- Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.

**FAIRFIELD TOWNSHIP SCHOOL
Curriculum Guide Grade 1 Unit 3**

Subject: Science	Grade Level: 1
Unit 3: Earth’s Place in the Universe	Pacing: 12 Weeks
Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> ● What is the pattern of the sun’s movement? ● Can the patterns of the day sky be predicted? ● What are the four directions displayed on a compass? 	<p>ESS1.A: The Universe and its Stars</p> <ul style="list-style-type: none"> ● Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) (W.1.7) (W.1.8) <p>ESS1.B: Earth and the Solar System</p> <ul style="list-style-type: none"> ● Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (1-ESS1-2) (W.1.7) (W.1.8) (MP.2) (MP.4) (MP.5) (1. OA.A.1) (1.MD.C.4)

<ul style="list-style-type: none"> • What makes something a moon? • Does the Moon create its own light? • How does the Moon's appearance change over time? • Why can we only see other distant stars at night? • What causes the seasons? • How does the Sun's path across the sky differ during the summer and winter? 	<p>Climate change activity:</p> <p>https://mysteryscience.com/lessons?query=climate</p> <p>Climate change lessons:</p> <p>https://www.brainpop.com/science/weather/climatechange/</p> <p>Holocaust</p> <p>Amistad</p> <p>African American & Differently abled/LGBTQ Scientists:</p> <p>https://www.brainpop.com/search/?keyword=scientists</p> <p>10 famous scientists with disabilities</p> <ul style="list-style-type: none"> • Thomas Edison. Born in 1847, Thomas Edison lost much of his hearing by his early twenties. ... • Temple Grandin. ... • Ralph Braun. ... • Sang-Mook Lee. ... • Stephen Hawking. ... • Geerat Vermeij. ... • Farida Bedwei. ... • Richard Mankin. <p>https://royalsociety.org/topics-policy/diversity-in-science/scientists-with-disabilities/</p> <p>https://www.discovery.com/science/LGBT-Scientists-Who-Changed-World</p>
<p>NJSL-S Standards</p>	<p>Classroom Applications</p>
<p>1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted.</p> <ul style="list-style-type: none"> • Clarification Statement: Examples 	<p>Objectives: Use observations of the sun moon and stars to describe patterns such as day and night, movement of the moon in the night sky, and the sun throughout the day. (1-ESS1-1) (W.1.7) (W.1.8)</p> <ul style="list-style-type: none"> • Describe the differences between the day and the night sky • Identify the patterns that cause day and night

of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars other than our sun are visible at night but not during the day.

- Assessment Boundary: Assessment of star patterns is limited to stars being seen at night and not during the day.

1-ESS1-2.

Make observations at different times of year to relate the amount of daylight to the time of year.

- Clarification Statement: Emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring or fall.
- Assessment Boundary: Assessment is limited to relative amounts of daylight, not

- Identify the rotation pattern of the Earth
- Understand that the Earth revolves around the sun

Observe the different amounts of daylight throughout the seasons and the seasonal effect on the environment

(1-ESS1-2) (W.1.7) (W.1.8) (MP.2) (MP.4) (MP.5) (1.OA.A.1) (1.MD.C.4)

- Describe the seasons of the year
- Identify the effects of the amount of daylight on the environment
- Describe temperature and weather
- Describe that seasons can be different in other parts of the world

Teaching Strategies/Materials:

Lesson Structure: Anticipatory Set, Mini-Lesson, Whole Group, Small Group, Independent Work, Closure

Strategies: Think-Pair-Share, Read Aloud, Jigsaw, Investigations, Guided Explorations, Projects

Materials: Science A-Z, Reading A-Z, Scholastic News, Brain Pop, NJCTL.org, Teacher Pay Teacher, Pinterest, Sploder, Magic School Bus, Anchor Charts
Mentor Texts, DVDs, Internet, Technology (Smart Board, student computers/laptops, PowerPoint, Websites, etc.), supplemental books, visual aids, manipulatives, supplemental materials for investigations

Differentiation Strategies/Modifications

SWD/ Students at risk of failure: 1:1 teacher redirect / re-teach, peer helper, visual aids, modified tests/quizzes, modified homework

Gifted/Enrichment: computer-based research, high level task, class presentation

quantifying the hours
or time of daylight.

Connections to other content areas, including Career Readiness, Life Literacies, and Key Skills:

ELA/Literacy –

W.1.7 Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions).

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

Mathematics –

MP.2 Reason abstractly and quantitatively.

MP.4 Model with mathematics.

MP.5 Use appropriate tools strategically.

1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations to represent the problem.

1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Career Readiness, Life Literacies, and Key Skills –

9.4.2.Cl.1: Demonstrate openness to new ideas and perspectives.

9.4.2.Cl.2: Demonstrate originality and inventiveness in work.

9.4.2.CT.1: Gather information about an issue, such as climate change and collaboratively brainstorm ways to solve the problem.

9.4.2.CT.2- Identify possible approaches and resources to execute a plan.

9.4.2.CT.3- Use a variety of types of thinking to solve problems (e.g. inductive, deductive).

Unit Resources:

Savvas Realize for First Grade, Topic 3: Earth and Sky

Savvas Realize for First Grade, Topic 4: Weather and Seasons

Hands-on & Virtual Labs
STEM Quest PBL

List of books to be used:

Volcanoes! by Cy Armour

Volcanoes by Anne Schreiber

Landforms series (*Caves, Islands, Mountains, Volcanoes*) by Cassie Mayer

Looking at Earth series (*Earth's Mountains, Introducing Landforms, Earth's Rivers, Volcanoes on Earth, What Shapes the Land?*) by Bobbie Kalman

Hurricane! by Jonathan London

Earth by David Bennett

Rocking and Rolling -- The Earth by Phillip Steele

Inquiry in Action: Investigating Matter through Inquiry

Conservation of Matter

<http://strandmaps.nsd.org/?id=SMS-MAP-1332>

Science Refreshers

<http://nsdl.org/refreshers/science/>

<http://www.sciencekids.co.nz/earth.html>

<http://science.nationalgeographic.com/science/earth/>

Unit Assessment Opportunities:

- Journal Entries and Response Sheets
- Observations, Questioning, and Discussions
- Comprehension Checks in Literature
- Class Webs
- Presentations
- Collaboration
- Lesson Check
- Lesson Quiz
- Performance Expectations Activities
- Topic Tests

**FAIRFIELD TOWNSHIP SCHOOL
Curriculum Guide Grade 1 Unit 4**

Subject: Science	Grade Level: 1
Unit 4: Engineering Design	Pacing: Incorporate All Year
Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> ● How have objects or tools been developed in the past to solve a simple problem? ● What simple problem can I solve by developing a new object or tool? ● Compare the strengths and weaknesses of two objects or tools that are designed to solve the same problem. 	<p>ETS1.A: Defining and Delimiting Engineering Problems</p> <ul style="list-style-type: none"> ● A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1) ● Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) ● Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> ● Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-2-ETS1-2) <p>ETS1.C: Optimizing the Design Solution</p> <ul style="list-style-type: none"> ● Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)

NJSL-S Standards	Classroom Applications
<p>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.</p> <p>K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps in function as needed to solve a given problem.</p> <p>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.</p>	<p>Objectives: Ask questions based on observations to find more information about the natural and/or designed world (K-2-ETS1-1)</p> <p>Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1)</p> <p>Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2)</p> <p>Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)</p> <p>Teaching Strategies/Materials: Lesson Structure: Anticipatory Set, Mini-Lesson, Whole Group, Small Group, Independent Work, Closure</p> <p>Strategies: Think-Pair-Share, Read Aloud, Jigsaw, Investigations, Guided Explorations, Projects</p> <p>Materials: Mentor Texts, DVDs, Internet, Technology (Smart Board, student computers/laptops, PowerPoint, Websites, etc.), supplemental books, visual aids, manipulatives, supplemental materials for investigations</p> <p>Differentiation Strategies/Modifications SWD/ Students at risk of failure: 1:1 teacher redirect / re-teach, peer helper, visual aids, modified tests/quizzes, modified homework Gifted/Enrichment: computer-based research, high level task, class presentation</p>

Connections to other content areas, including Career Readiness, Life Literacies, and Key Skills:

ELA/Literacy:

RI.1.1 Ask and answer questions about key details in a text. (K-2-ETS1-1)

W.1.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1), K-2-ETS1-3)

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question (K-2-ETS1-1) (K-2-ETS1-3)

SL.1.5 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question (K-2-ETS1-2)

Mathematics-

2. MD.D.10 Draw a picture graph or bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1) (K-2-ETS1-3)

Career Readiness, Life Literacies, and Key Skills –

9.4.2.CI.1: Demonstrate openness to new ideas and perspectives.

9.4.2.CI.2: Demonstrate originality and inventiveness in work .

9.4.2.CT.1: Gather information about an issue, such as climate change and collaboratively brainstorm ways to solve the problem.

9.4.2.CT.2- Identify possible approaches and resources to execute a plan.

9.4.2.CT.3- Use a variety of types of thinking to solve problems (e.g. inductive, deductive).

Unit Resources:

Savvas Elevate Science for First Grade Science Practices
Hands-on & Virtual Labs
STEM Quest PBL

List of Books to be read:

Inventions and Discovery Through Time-Graphic History: variety pack
Eli Whitney and the Cotton Gin
Henry Ford and the Model T
Garrett Morgan
George Washington Carver
Samuel Morse and the Telegraph
Philo Farnsworth and the Television
Steve Jobs and Steven Wozniak and the Personal Computer

5 Notable Inventors

Books found in media center:

Inventing Things by Julie Brown
Now & Ben by Gene Barretta
Imaginative Inventions by Charise Mericle Harper
Who Invented It & What Makes it Work? By Sarah Leslie
What's Next? By Lisa Thompson
Hoop Genius by John Coy

Websites:

Inventions.org

Unit Assessment Opportunities:

- Journal Entries and Response Sheets
- Observations, Questioning, and discussions
- Comprehension Checks in literature
- Class Webs
- Presentations
- Collaboration
- Projects

- Rubrics (<http://www.nextgenscience.org/resources>)
- Lesson Check
- Lesson Quiz
- Topic Tests