

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

Subject: Science	Grade Level: 1
Unit 1: Waves and their Applications in Technologies for Information Transfer	Pacing: 9 Weeks
Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>● What is light?</li> <li>● How does light travel?</li> <li>● What is the difference between a natural light source and an artificial light source?</li> <li>● What does illuminate mean?</li> <li>● What is reflection and how light reacts to reflective surfaces?</li> <li>● How does light react with different surfaces including transparent, translucent, opaque, and refraction? What devices are used to communicate long distances?</li> <li>● What tools can be used to design or build a device that</li> </ul>	<p>PS4.A: Wave Properties</p> <ul style="list-style-type: none"> <li>● Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1) (W.1.7) (W.1.8) (SI.1.1)</li> </ul> <p>PS4.B: Electromagnetic Radiation</p> <ul style="list-style-type: none"> <li>● 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) (SI.1.1)</li> <li>● 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) (WSI.1.1)</li> </ul> <p>PS4.C: Information Technologies and Instrumentation</p> <ul style="list-style-type: none"> <li>● 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)</li> </ul>

<p>uses light or sound to solve a problem of communicating over a distance?</p> <ul style="list-style-type: none"> <li>• What devices are used to communicate long distances?</li> <li>• 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?</li> </ul>	
<p>NJSLS 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> <ul style="list-style-type: none"> <li>• 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</li> </ul>	<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. (PS4-1) (W.1.7) (W.1.8) (SI.1.1)</p> <ul style="list-style-type: none"> <li>• Investigate, using real world materials, how to communicate over a distance sound.</li> <li>• Describe what a vibration is and give examples.</li> <li>• Demonstrate how vibrations are made.</li> </ul> <p>Use evidence from several sources to provide evidence that objects can be seen if there is a light source (PS-4-2) (W.1.2) (W.1.7) (W.1.8) (SI.1.1)</p> <ul style="list-style-type: none"> <li>• Investigate the effects of varying amounts of light on objects, example day vs. night.</li> <li>• Describe how use of senses changes due to amount of light present.</li> </ul> <p>Plan and investigate to determine the effect of placing transparent, translucent, opaque objects in the path of a beam of light. (PS-4-3) (WSI.1.1)</p> <ul style="list-style-type: none"> <li>• Describe what light is.</li> </ul>

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.

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

- 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. (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  
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

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 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 21<sup>st</sup> Century 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.

21<sup>st</sup> Century Skills –

9.2.4.

A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

9.2.4. A.2 Identify various life roles and civic and work related activities in the school, home, and community.

9.2.4. A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

9.2.4. A.4 - Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Unit Resources:

Pearson Realize Interactive Science for First Grade, Chapter 1: Energy (Lesson 1: How do we use energy?, Lesson 2: What gives off heat?, Lesson 3: What is light?, Lesson 4: What is sound?)

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](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
- Chapter Test

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

Subject: Science

Grade Level: 1

Unit 2: Molecules to Organisms: Structures and Processes	Pacing: 9 Weeks
Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>● What is structure and function?</li> <li>● How do animals use external structures to survive?</li> <li>● What are some examples of external parts of an animal?</li> <li>● What are the external structures of a plant?</li> <li>● How do plants and animals respond to their environments?</li> <li>● What is reproduction?</li> <li>● In what types of ways do animals reproduce?</li> <li>● How do plants reproduce?</li> <li>● How do eggs help offspring to survive?</li> <li>● How do nest/dens help offspring to survive?</li> <li>● How does parental care help the offspring to survive?</li> <li>● What offspring behaviors help the offspring to survive?</li> <li>● How does the structure of seeds</li> </ul>	<p>LS1.A: Structure and Function</p> <ul style="list-style-type: none"> <li>● 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)</li> </ul> <p>LS1.B: Growth and Development of Organisms</p> <ul style="list-style-type: none"> <li>● 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) (RI.1.1) (RI.1.2) (RI.1.10) (1.NBT.B.3) (1.NBT.C.4) (1.NBT.C5) (1.NBT.C.6)</li> </ul> <p>LS1.D: Information Processing</p> <ul style="list-style-type: none"> <li>● 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)</li> </ul> <p>LS3.A: Inheritance of Traits</p> <ul style="list-style-type: none"> <li>● 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) (MP.2) (MP.5) (1.MD.A.1)</li> </ul> <p>LS3.B: Variation of Traits</p> <ul style="list-style-type: none"> <li>● Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1)</li> </ul>

<p>help plant offspring to survive?</p> <ul style="list-style-type: none"> <li>• How are young animals like their parents?</li> <li>• How are young plants similar to full grown plants of the same kind?</li> <li>• What are the similarities and differences between plants and animals of the same kind/breed?</li> <li>• What characteristics do most plants share?</li> <li>• What characteristics do animals share?</li> </ul>	
<p>NJSLS Standards</p>	<p>Classroom Applications</p>
<p>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.</p> <ul style="list-style-type: none"> <li>• Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by</li> </ul>	<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> <ul style="list-style-type: none"> <li>• Student will distinguish between needs and wants</li> <li>• Describe what plants need to survive</li> <li>• Explain how animals use external parts to protect themselves</li> </ul> <p>Explore texts and media to understand parent and offspring behavior that enables survival. (1-LS1-2) (RI.1.1) (RI.1.2) (RI.1.10) (1.NBT.B.3) (1.NBT.C.4) (1.NBT.C5) (1.NBT.C.6)</p> <ul style="list-style-type: none"> <li>• Give examples of signal and response behavior of offspring and parent.</li> <li>• Use video to explore animal behaviors</li> </ul> <p>Describe how offspring are a combination of parent traits. (1-LS3-1) (MP.2) (MP.5) (1.MD.A.1)</p> <ul style="list-style-type: none"> <li>• Discuss that offspring will mostly resemble parents.</li> </ul>

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 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-

- 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

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

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 metamorphosis or hybrids.

Connections to other content areas, including 21<sup>st</sup> Century Skills:

*ELA/Literacy-*

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

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

RI.1.10 With prompting and support, read informational texts appropriately complex for grade.

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).

#### 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.

#### 21<sup>st</sup> Century Skills –

9.2.4.

A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

9.2.4. A.2 Identify various life roles and civic and work-related activities in the school, home, and community.

9.2.4. A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

9.2.4. A.4 - Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

#### Unit Resources:

Pearson Realize Interactive Science for First Grade, Chapter 2: Plants & Animals (Lesson 1: What are some groups of living things?, Lesson 2: What are some parts of a plant?, Lesson 3: How do plants grow?, Lesson 4: How do some animals grow?, Lesson 5: How are living things like their parents?, Lesson 6: How are groups of living things different?)

Hands-on & Virtual Labs  
STEM Quest PBL

*Websites:*

Education.com

Easyscienceforkids.org

Kidsgrowingstrong.org/Plant Needs

Ducksters.com/science/photosynthesis.php

Animalatlas.tv

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
- Chapter Test
- Unit Test

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

Subject: Science	Grade Level: 1
Unit 3: Earth's Place in the Universe	Pacing: 9 Weeks

Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>● What is the pattern of the sun’s movement?</li> <li>● Can the patterns of the day sky be predicted?</li> <li>● What are the four directions displayed on a compass?</li> <li>● What makes something a moon?</li> <li>● Does the Moon create its own light?</li> <li>● How does the Moon’s appearance change over time?</li> <li>● Why can we only see other distant stars at night?</li> <li>● What causes the seasons?</li> <li>● How does the Sun’s path across the sky differ during the summer and winter?</li> </ul>	<p>ESS1.A: The Universe and its Stars</p> <ul style="list-style-type: none"> <li>● 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)</li> </ul> <p>ESS1.B: Earth and the Solar System</p> <ul style="list-style-type: none"> <li>● 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)</li> </ul>
NJSL-S Standards	Classroom Applications
<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"> <li>● Clarification</li> </ul>	<p>Objectives: Use observations of the sun moon and starts 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"> <li>● Describe the differences between the day and the night sky</li> </ul>

Statement: Examples 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

- Identify the patterns that cause day and night
- 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

daylight, not  
quantifying the hours  
or time of daylight.

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

Connections to other content areas, including 21<sup>st</sup> Century 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.

21<sup>st</sup> Century Skills –

9.2.4.

A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

9.2.4. A.2 Identify various life roles and civic and work- related activities in the school, home, and community.

9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

9.2.4.A.4 explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Unit Resources:

Pearson Realize Interactive Science for First Grade, Chapter 3: Patterns in Space (Lesson 1: What is the sun?, Lesson 2: What causes day & night?, Lesson 3: What are the four 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.nsdl.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
- Chapter Test
- Unit Test

**FAIRFIELD TOWNSHIP SCHOOL  
Curriculum Guide Grade 1**

Subject: Science	Grade Level: 1
Unit 4: Engineering Design	Pacing: 9 Weeks
Essential Questions	Enduring Understandings
<ul style="list-style-type: none"> <li>● How have objects or tools been developed in the past to solve a simple problem?</li> <li>● What simple problem can I solve by developing a new object or tool?</li> <li>● Compare the strengths and weaknesses of two objects or tools that are designed to solve the same problem.</li> </ul>	<p>ETS1.A: Defining and Delimiting Engineering Problems</p> <ul style="list-style-type: none"> <li>● A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1)</li> <li>● Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1)</li> <li>● Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1)</li> </ul> <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> <li>● 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)</li> </ul> <p>ETS1.C: Optimizing the Design Solution</p>

	<ul style="list-style-type: none"> <li>● Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)</li> </ul>
<p>NJSL-S Standards</p>	<p>Classroom Applications</p>
<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</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</p>

weaknesses of how each performs.

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

Connections to other content areas, including 21<sup>st</sup> Century Skills:

*ELA/Literacy:*

RI.2.1 Ask and answer such questions as who, what, where, why, and how to demonstrate understanding of key details in a text. (K-2-ETS1-1)

W.2.6 With guidance and support from adults, use a variety of digital tools to produce a publish writing, including in collaboration with peers. (K-2-ETS1-1), (K-2-ETS1-3)

W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1) (K-2-ETS1-3)

SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (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)

21<sup>st</sup> Century Skills –

9.2.4.A. Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

9.2.4.A.2 Identify various life roles and civic and work- related activities in the school, home, and community.

9.2.4. A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.

9.2.4. A.4 - Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Unit Resources:

Pearson Realize Interactive Science for First Grade, Skills Handbook Part 1: The Nature of Science, Skills Handbook Part 2: The Design Process  
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  
Samuel Morese and the Telegraph  
Philo Farnsworth and the Television  
Steve Jobs and Steven Wozniak and the Personal Computer

*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](http://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