CAPE MAY CITY
ELEMENTARY SCHOOL

Grade 1 Science Curriculum

This curricula and accompanying instructional materials have been developed to align with the NJSLS and in accordance with the NJ Department of Education's guidelines to include: Curriculum designed to meet grade level expectations, integrated accommodations and modifications for students with IEPs, 504s, ELLs, and gifted and talented students, assessments including benchmarks, formative, summative, and alternative assessments, a list of core instructional and supplemental materials, pacing guide, interdisciplinary connections, integration of 21st century skills, integration of technology, and integration of 21st Century Life and Career standards.

About the Standards

In 1996, the New Jersey State Board of Education adopted the state's first set of academic standards called the Core Curriculum Content Standards. The standards described what students should know and be able to do upon completion of a thirteen-year public school education. Over the last twenty years, New Jersey's academic standards have laid the foundation for local district curricula that are used by teachers in their daily lesson plans.

Revised every five years, the standards provide local school districts with clear and specific benchmarks for student achievement in nine content areas. Developed and reviewed by panels of teachers, administrators, parents, students, and representatives from higher education, business, and the community, the standards are influenced by national standards, research-based practice, and student needs. The standards define a "Thorough and Efficient Education" as guaranteed in 1875 by the New Jersey Constitution. Currently the standards are designed to prepare our students for college and careers by emphasizing high-level skills needed for tomorrow's world.

The New Jersey Student Learning Standards include Preschool Teaching and Learning Standards, as well as nine K-12 standards for the following content areas: **21st Century Life and Careers, Comprehensive Health and Physical Education, English Language Arts, Mathematics, Science, Social Studies, Technology, Visual and Performing Arts, World Languages**
The 2020 NJSLS in Science were adopted by the State Board of Education on June 3, 2020. Districts are required to implement it by September 2022. The 2020 New Jersey Student Learning Standards webpage provides links to the 2020 NJSLS and information regarding curriculum implementation dates.

Cape May City Elementary School District Grade 1 Science Curriculum

Content Area: Science

Our elementary science program is founded upon the New Jersey Student Learning Standards for Science, which emphasizes three dimensions to promote scientific literacy for all student scientists. The core three dimensions of science learning, which are integrated into all science learning activities, are: **Science and Engineering Practices, Disciplinary Core Ideas, and Cross Cutting Concepts.** These three dimensions can also be thought of as, **"what scientists do," "what scientists need to know," and "common themes found throughout all science disciplines."**

To implement these standards and corresponding dimensions, our district utilizes highly interactive and engaging activities. These dynamic activities are categorized into three main units of study. and present hands-on, real-world science experiences matched to the developmental level of students.

Three Main Units of Study:

1. Physical Science,
2. Earth & Space Science, and
3. Life Science

Course Title: Grade 1 Science	**Grade level: 1**
Unit I: 1-ESS1 Earth's Place in the Universe **Instructional Days: 15** In this unit of study, students observe, describe, and predict some patterns in the movement of objects such as the sun, moon, stars, and clouds in the sky. The crosscutting concept of patterns is called out as an organizing concept for the disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in planning and carrying out investigations and analyzing and interpreting data. Students are also expected to use these practices to demonstrate understanding of the core ideas. This unit is based on 1-ESS1-1 and 1-ESS1-2.	**Dates for Unit: September to November** **Pacing Guide: 15 days** Week 1: Make and learn about sundials. Week 2:Star Trails, Constellations, and Meteor Showers Week 3: Make a "Cloud Mobile" and study cloud types Week 4: "Water Cycle" activities Week 5: "Moon Cycle" activities
Unit II:1-LS3 Heredity: Inheritance and Variation of Traits **Instructional Days: 15** In this unit of study, students develop an understanding of how plants and animals use their external parts to help them survive, grow, and meet their needs, as well as how the behaviors of parents and offspring help offspring survive. The understanding that young plants and animals are like, but not exactly the same as, their parents is developed.	**Dates for Unit: November to February** **Pacing Guide: 15 Days** Week 1: Living and Non-Living Things Week 2: Parts and Functions of Seeds Week 3: Parts of Plants and Basic Needs Week 4: Begin a journal for drawing and writing about growing a seed into a plant. Week 5: Identify various plants, and keep a journal to draw and write about them.

The crosscutting concept of patterns is called out as an organizing concept for the disciplinary core ideas. Students are expected to demonstrate grade appropriate proficiency in obtaining, evaluating, and communicating information and constructing explanations. Students are also expected to use these practices to demonstrate understanding of the core ideas. This unit is based on 1-LS3-1 and 1-LS1-2.	
Unit III: 1-LS1 From Molecules to Organisms: Structure and Processes **Instructional Days: 20** In this unit of study, students develop an understanding of how plants and animals use their parts to help them survive, grow, and meet their needs. Students also need opportunities to develop possible solutions. As students develop possible solutions, one challenge will be to keep them from immediately implementing the first solution they think of and to instead think through the problem carefully before acting. Having students sketch their ideas or make a physical model is a good way to engage them in shaping their ideas to meet the requirements of the problem. The crosscutting concept of structure and function is called out as an organizing concept for the disciplinary core ideas. Students are expected to demonstrate grade appropriate proficiency in constructing explanations, designing solutions, and in developing and using models. Students are expected to use these practices to demonstrate understanding of the core ideas. This unit is based on 1-LS1-1 and K-2-ETS1-2.	**Dates for Units: February to March** **Pacing Guide: 20 Days** Week 1: Plants Grow and Change/Continue your plant journal. Week 2: Plants and Their Parents Week 3: Compare Animals Week 4: Animals and their Parents Week 5: Offspring Survival
Unit IV: 1-PS4 Waves and their Applications in Technologies for Information Transfer **Instructional Days: 20** In this unit of study, students continue to develop their understanding of the relationship between sound and vibrating materials as well as between the availability of light and the ability to see objects. Students apply their knowledge of light and sound to engage in engineering design to solve a simple problem involving communication with light and sound. The crosscutting concepts of structure and function and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for the disciplinary core ideas.	**Dates for Units: March to May** **Pacing Guide: 20 Days** Week 1: Sound Week 2: Light and Shadows Week 3: Properties of Light Week 4: How Light Travels Week 5: Communicate with Light and Sound

Students are expected to demonstrate grade appropriate proficiency in constructing explanations and designing solutions, asking questions and defining problems, and developing and using models. Students are also expected to use these practices to demonstrate understanding of the core ideas. This unit is based on 1-PS4-4, K-2-ETS1-1, and K-2-ETS1-2.	
Unit V: K-2-ETSI: Engineering Design **Instructional Days: 10** In this unit of study, students will ask questions, make observations, and gather information about a situation people want to change. They will define a simple problem that can be solved through the development of a new or improved object or tool. They will 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. Students will analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. This unit is based on K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3	**Dates for Unit: May to June** **<u>Pacing Guide: 10 days</u>** Week 1: Brainstorm a situation people want to change. Brainstorm a new tool or object to solve the problem. Week 2: Sketch a model of the object. Week 3: Analyze to see if the objects will be useful to solve the problem. Week 4: Create cup phones, and discuss how the shape helps the cups to function.
Date Created: 04/07/2022	**Board Approved On:** 8/18/22

Note: The number of instructional days is an estimate based on the information available at this time. 1 day equals approximately 42 minutes of seat time. Teachers are strongly encouraged to review the entire unit of study carefully and collaboratively to determine whether adjustments to this estimate need to be made.

Cape May City Elementary School District Grade 1 Science Curriculum

Unit I Overview

Content Area: Science

Unit Title: Unit I:

1-ESS1 Earth's Place in the Universe

Target Course/Grade Level: Grade 1

Unit Summary:

Students will be able to:

- Students will make observations of the sun, moon, stars, and clouds to describe patterns that can be predicted. 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.

Interdisciplinary Connections:

- Science, Technology, English / Language Arts, Health, Social Emotional Learning, Mathematics, Social Studies

Career Readiness: Life Literacies and Key Skills Standards:

- Career Readiness, Life Literacies and Key Skills
  - These include critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding, and interpersonal communication and science.
  - Incorporation of relevant technologies as tools as part of instruction (i.e. Chromebooks, Touch screen devices, manipulatives, certified assistive technologies for students with special needs, etc.)
  - Developing effective communication
  - Developing Independent Learning Strategies
  - Incorporating Science, Technology, Engineering, and Mathematical themes into daily lessons

Learning Targets:

Students who demonstrate understanding can:

1-ESS1-1 Use observations of the sun, moon, and stars to describe patterns that can be predicted. [Clarification 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 daylight, not quantifying the hours or time of daylight.]

ESS2.D: Weather and Climate Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.

ESS3.B: Natural Hazards Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events.

**** In addition there will be continuous incorporation of the NJSLS ELA standards specifically those that deal with: reading and analyzing informational text, writing responses, speaking and listening****

Unit Activity	Suggested Unit Activity
I.	 **Lesson Activity: How to Make a Sundial** **Please see the directions in the link for more details.** **https://www.teachstarter.com/au/blog/how-to-make-a-sundial/** Learning about space is awesome. Who doesn't get excited by the infinite possibilities of the universe? Luckily for our students, we don't need to charter a space shuttle to experience some real-world learning about how parts of our solar system work. The simple act of making a sundial provides us with the means to examine the Earth's rotation on its axis. Through this activity, students can begin to understand this key concept of space science. **How to Make a Sundial:** 1. Download and print the "How to Make a Sundial" teaching resource. 2. Follow the instructions to assemble the sundial. 3. At midday, position your sundial as directed and secure it to the ground. You may like to use sticky tack to hold the paper plate sundial down on the ground, rather than thumbtacks. 4. One hour later, return to your sundial and mark where the shadow lays at the edge of the plate. 5. Mark this spot with the number 1. 6. Carefully remove your sundial from the ground and use the positions of 12 and 1 to predict the positions of the other numbers on the sundial. **There are other ways to make a sundial too! See below:** https://www.kcedventures.com/blog/how-to-make-a-sundial-for-kids

Gifted and Talented: Enrichment Links and Writing Prompts

Links:
How Do Sundials Work?
Star Trails
Seeing the Moon During the Day
Moon Phases
Pipehenge
The Cloud Book

Writing:
Draw or write sentences to finish the prompts.
"Where does the sun go at night?"
"What is the longest day of the year?"
"Do shadows move, Why or Why Not?"
"How can the sun help you if you are lost?"

At-Risk, Including ELL: Resources to Enhance Understanding

Books: The Moon Book by Gail Gibbons, So That's How the Moon Changes, by Adam Fowler, Faces of the Moon by Bob Crelin, Phases of the Moon by Gillia M. Olson, Papa, Please Get the Moon for Me by Eric Carle, Where are the Stars During the Day?: A Book about Stars by Melva Berger, Sun Up, Sun Down by Gail Gibbons, The Sun is Always Shining Somewhere by Allan Fowler, What Makes Day and Night? by Franklyn Branley, Where Does the Sun Go? by Gary Craig, The Reasons for the Seasons by Gail Gibbons, Four Seasons Make a Year by Anne Rockwell, The Sun by Seymour Simon

Reading A to Z: Most Books are in English and Spanish
Friends in the Stars, Level F
My Stars, Level I
The Sun, Earth, and Moon, Level V
The Sun - Level V
Changing Seasons Level F
The Four Seasons Level E
Introducing Planet Earth Level L
Fall Forward, Spring Back Level J

Video Links:
Star Science Projects
Make a Cloud Mobile
What is the Sun?
What are Constellations?
What is a Meteor Shower?
Make Oreo moon phases

Cape May City Elementary School District Grade 1 Science Curriculum
Unit II Overview

Content Area: Science

Unit Title: Unit II:
1-LS3 Heredity: Inheritance and Variation of Traits

Target Course/Grade Level: Grade 1

Unit Summary:

- Students will be able to:
- Differentiate between living and nonliving things
- Explain basic needs all living things need to survive
- Articulate how all living things have similar characteristics and processes
- Know and identify differences in plants, animals, and their habitats.

Interdisciplinary Connections:

- Science, Technology, English/Language Arts, Health, Social Emotional Learning, Mathematics

Career Readiness: Life Literacies and Key Skills Standards:

- Career Readiness, Life Literacies and Key Skills
  - These include critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding, and interpersonal communication and science.
  - Incorporation of relevant technologies as tools as part of instruction (i.e. Chromebooks, Touch screen devices, manipulatives, certified assistive technologies for students with special needs, etc.)
  - Developing effective communication
  - Developing Independent Learning Strategies
  - Incorporating Science, Technology, Engineering, and Mathematical themes into daily lessons

Learning Targets

Students who demonstrate understanding can:

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

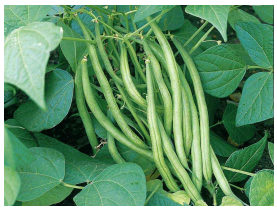
Engineering Standards

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-ETS1-1 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-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

**** In addition there will be continuous incorporation of the NJSLS ELA standards specifically those that deal with: reading and analyzing informational text, writing responses, speaking and listening****

Unit Activity	**Suggested Unit Activity**
II.	 **<u>Lesson Activity: My Beanstalk</u>** Directions: Read the popular folktale – Jack and the Beanstalk by Benjamin Tabart or check out the book from the Library to read aloud to the class. Discuss the story with class. ● Discuss what you think helped the Beanstalk grow so tall? ● Could a Beanstalk really grow in one night with magic beans? ● Are real beanstalks strong enough to climb? ● Do all of the beans look exactly alike? Materials – Lima Bean Seeds, soil, plastic cups, water, paper towels <u>PART ONE (OPTIONAL)</u> 1. Soak 2 bean seeds in plastic cups overnight (per student) 2. Take out one bean seed and split it in half (they are soft and can be easily split) 3. Find the three parts of the seed and separate them – Seed Coat, Embryo, Sugar (Food)

	4. Describe the function of each part of the seed 5. On a separate piece of paper, draw and label each part of the seed. <u>PART TWO (Beans must be pre soaked overnight if Part One is eliminated)</u> 1. Take the second seed that was soaked and place it deep in a cup of soil 2. Place cups on the window sill 3. Water the seed daily 4. Observe/ record/draw daily progress in a journal 5. Write a short summary of what your plant needed to grow and survive 6. Why is this plant an important part of our world?

Gifted and Talented: Enrichment Links and Writing Prompts
Links: Plant and Animal Cards for Activities Beetle Harvests Water Welcome to the Garden Plants Need Song Basic Needs for All Basics Song Jack Hartmann, Living/Non-Living **Writing:** Draw or write sentences to finish the prompts. "Tell about the basic needs of plants." "Do people need the same things as plants to survive?" "Write about something that is living, and something that is non-living." "Do non-living things breathe air?"
At-Risk, Including ELL: Resources to Enhance Understanding
Books: <u>From Seed to Plant,</u> Nat Geo, <u>From Seed to Sunflower</u>, Lerner, <u>Planting a Rainbow,</u> Ehlert, <u>If You Plant a Seed</u>, <u>Basic Needs,</u> Dr. Jean, **Reading A to Z: Most Books are in English and Spanish** <u>Healthy Me</u>, Level I <u>Strange Plants,</u> Level K **Video Links:** Habitats Ocean Habitat How Does a Seed Become a Plant Living and Nonliving

Cape May City Elementary School District Grade 1 Science Curriculum
Unit III Overview

Content Area: Science

Unit Title: Unit III:
1-LS1 From Molecules to Organisms: Structure and Processes

Target Course/Grade Level: Grade 1

Unit Summary:

- Students will be able to:
- Understand that plants and animals produce young
- Plants and Animals go through a process of reproduction and growth called a Life Cycle
- Life Cycles are an ongoing process for plants and animals
- Plants and animals adapt to their environment

Interdisciplinary Connections:

- Science, Technology, English/Language Arts, Health, Social Emotional Learning, Mathematics

Career Readiness: Life Literacies and Key Skills Standards:

- Career Readiness, Life Literacies and Key Skills
  - These include critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding, and interpersonal communication and science.
  - Incorporation of relevant technologies as tools as part of instruction (i.e. Chromebooks, Touch screen devices, manipulatives, certified assistive technologies for students with special needs, etc.)
  - Developing effective communication
  - Developing Independent Learning Strategies
  - Incorporating Science, Technology, Engineering, and Mathematical themes into daily lessons

Learning Targets

Students who demonstrate understanding can:

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. Clarification Statement: 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. [Clarification Statement: 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).]

Engineering Standards

K-2-ETS1 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.

Unit Activity	**Suggested Unit Activity**
III.	 **<u>Guess the Animal!</u>** Students will choose a favorite animal and draw and color the animal in its environment - One by one, students will present the animal picture to the class. The class must ask questions to determine the animal, and the student will answer the following questions to help the class determine the kind of animal in the drawing. 1. Does the animal have feathers, scales, fur? 2. Is the animal big or small? 3. What does the animal eat? 4. Does the animal live on water or land? 5. Why is this animal an important part of our world? 6. Is this animal like the parent? 7. How does the parent care for this animal?

Gifted and Talented: Enrichment Links and Writing Prompts

Links:
Ask a Penguin
Animal Tricksters
Animal Camouflage
Animal Habitats
Shelter Around the World
Butterfly Life Cycle

Writing:
Draw or write sentences to finish the prompts.
"Why does a deer live in a forest?"
"Do all animals look like their parents?"

At-Risk, Including ELL: Resources to Enhance Understanding

Books: What Can Live in a Desert? by Sheila Anderson, What Can Live in an Ocean? by Sheila Anderson, What Can Live in a Forest? by Sheila Anderson, Who Has These Feet? by Laura Hulbert, Who Has This Tail? by Laura Hulbert, Feathers: Not Just for Flying by Melissa Stewart, What Color is Camouflage? by Carolyn B. Otto, How People Learned to Fly by Fran Hodgkins, Nature Got There First by Phil Gates

Reading A to Z: Most Books are in English and Spanish
Baby Animals Level A
Animal Dads Level F
Animal Ears Level B
Animal Horns Level D
Bats Day and Night Level D
Blue Whales; Giant Mammals Level H
Cockroaches Level G
Condors; Giant Birds Level H
Extreme Animals Level K
Komodo Dragons; Giant Reptiles Level I

Video Links:
Why Do Birds Have Beaks?
Why Are Polar Bears White?
Baby Animals Who Don't Look Like Their Parents
Biomimicry

Content Area: Science

Unit Title: Unit IV:

1-PS4 Waves and their Applications in Technologies for Information Transfer

Target Course/Grade Level: Grade 1

Unit Summary:

Students will explore the properties of light and sound in order to recognize how human beings create fun and useful things.

- Students will be able to understand that objects can be seen if light is available to illuminate them or if they give off their own light, and sound can make matter vibrate, and vibrating matter can make sound.

Interdisciplinary Connections:

- Science, Technology, English / Language Arts, Health, Social Emotional Learning, Mathematics

Career Readiness: Life Literacies and Key Skills Standards:

- Career Readiness, Life Literacies and Key Skills
  - These include critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding, and interpersonal communication and science.
  - Incorporation of relevant technologies as tools as part of instruction (i.e. Chromebooks, Touch screen devices, manipulatives, certified assistive technologies for students with special needs, etc.)
  - Developing effective communication
  - Developing Independent Learning Strategies
  - Incorporating Science, Technology, Engineering, and Mathematical themes into daily lessons

Learning Targets

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 in darkness can be seen only when illuminated.

1-PS4-3 Plan and conduct investigations 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

Engineering Standards

K-2-ETS1 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

Unit Activity	Suggested Unit Activities

IV.

Lesson Activity: Light and Materials Investigation

Materials: Flashlight Construction Paper. Tin Foil, Plastic Wrap. Clear Plastic Cup, Red Solos Cup, and any other materials in the classroom the students want to investigate

Directions for Investigation - Students will make a prediction on what materials light will pass through, then test each material with a flashlight. Students will document which materials let light pass through and which ones block the light.

Material	Blocks Light	Passes Light Through	Notes
Tin Foil			
Plastic Wrap			
Construction Paper			
Clear Plastic Cup			
Red Solo Cup			

Gifted and Talented: Enrichment Links and Writing Prompts

Links:
Ruben's Tube with Music
Can You Solve the Shadow Illusion
Writing:
Draw or write sentences to finish the prompts.
"How do they make sounds in cartoons?"
"What if there were no windows?"
"Using only a flashlight, how could you send someone a message?"
"How do lighthouses help boats find their way?"

At-Risk, Including ELL: Resources to Enhance Understanding

Books: What are Light Waves?, What are Shadows and Reflections?, How Does Sound Change?, Curious Pearl, Science Girl, What's That Sound, Hearing, Fireflies by Julie Brinckloe, All About Light by Lisa Trumbauer, Nothing Sticks like a Shadow by Ann Tompert, Shadows by Carolyn B. Otto, What are Sound Waves? by Robin Johnson
This link is a list of free light and sound books from Epic Books

Reading A to Z: Most Books are in English and Spanish
Alive with Light, Level E
Science Dad, Lessons in Light, Level S
How to Make a Drum, Level H
How Sound Works, Level T
We Can Make Sounds, Level A
All Kinds of Musical Instruments, Level E
Video Links:
Music in Your Ear
Light
How to See Sound
Sunrise, Sunset

Cape May City Elementary School District Grade 1 Science Curriculum
Unit V Overview

Content Area: Science

Unit Title: Unit V:
K-2-ETS1 Engineering Design

Target Course/Grade Level: Grade 1

Unit Summary:

Students will 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.

Interdisciplinary Connections:

- Science, Technology, English / Language Arts, Health, Social Emotional Learning, Mathematics

Career Readiness: Life Literacies and Key Skills Standards:

- Career Readiness, Life Literacies and Key Skills
  - These include critical thinking, problem solving, creativity, innovation, collaboration, teamwork and leadership, cross-cultural understanding, and interpersonal communication and science.
  - Incorporation of relevant technologies as tools as part of instruction (i.e. Chromebooks, Touch screen devices, manipulatives, certified assistive technologies for students with special needs, etc.)
  - Developing effective communication
  - Developing Independent Learning Strategies
  - Incorporating Science, Technology, Engineering, and Mathematical themes into daily lessons

Learning Targets:

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. [Clarification Statement: 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.]

Engineering 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

Unit Activity	**Suggested Unit Activities**
V.	 **Lesson Activity: Paper Cup Phone** **Materials –** Meter stick, 3 strings (1 meter, 3 meters, 7 meters long) paper cups paper clips. S*tudents will investigate if the length of the string affects the sound in the paper cups.* **Advance Preparation for Teacher** 1. Poke a hole in the bottom of each paper cup big enough for the string to be pushed through 2. Push each through each paper cup to create a paper cup phone. Use the paper clips to keep the string from pulling out of the bottom of the cup Student Activity - Students will make a prediction determining which length of rope will make the best paper cup phone. With a partner, students will test out each length of string on their phone (1-meter string, 3-meter string, 7-meter string) to see which carries the sound best and record their results on a graph or chart.

Gifted and Talented: Enrichment Links and Writing Prompts
Links: First Grade Science Experiments

What is an engineer?
Make a Straw Rocket
Simple Machines for Kids
Paper Cup Phones
What is the Perfect Road for a Square Wheel?

Writing:

Draw or write sentences to finish the prompts.
"Is your pencil a tool?" "Why?"
"Write about a problem you solved."
"How do shapes help us solve problems?"

At-Risk, Including ELL: Resources to Enhance Understanding

Books: The Kids Book of Simple Machines, Simple Machines the Way They Work, Simple Machines, Wheels, Levers, Pulleys by Adler, Simple Machines, Let's Read,

Reading A to Z: Most Books are in English and Spanish

The Steam Engine, Level P
Simple Machines, Level K
Tools, Level C

Video Links:

Engineer Song
Solving Problems with Simple Tools

Cape May City Elementary School District Grade 1 Science Curriculum
Evidence of Learning

Specific Formative Assessments Utilized in Daily Lessons:

- Suggested Formative Assessment
- Daily independent practice
- Peer Discussions
- Student Portfolio
- Reading/Writing Conferences
- Self-Evaluations
- Anecdotal Notes
- Open-Ended Responses
- Journal Entries
- Reading Logs
- Exit Tickets

Summative Assessment Utilized throughout Units:

- Performance Task

- Technology Task

Benchmarks:

- Quarterly Benchmarks Generated by the Teacher / Curriculum Committee

Modifications for English Language Learner's [ELL]

- Teacher tutoring
- Peer tutoring
- Online Resources
- Cooperative Learning Groups
- Modified Assignments
- Differentiated Instruction
- Response to Intervention (www.help4teachers.com)
- Provide additional examples and opportunities for additional problems for repetition with visuals and manipulatives
- Picture vocabulary
- Picture books
- Simplified language for understanding
- Reader's Theater
- Modify Homework, Assignments and Assessment (can be oral if necessary)
- Cooperative learning
- Retell stories using props
- Additional Center work focusing on alphabet and HFW
- Additional Phonemic Awareness teaching and practice
- Re-teach alphabet and alphabet sounds
- Sentence frames with word bank and pictures
- Songs
- Total Physical Response
- Picture word wall

Modifications for Special Education Students [IEPs]:

- Follow all IEP accommodations for each student as to meet each student's individual need
- For extra strategies please review list above in the ELL category for students who have IEPs
- Provide instructional breaks / practice chunking
- Circling back to original topic
- Lexile score modifications

Modifications for students with 504s:

- Adhere to the modifications of the 504
- For extra strategies please review list above in the ELL category for students who have IEPs

- Provide instructional breaks / practice chunking
- Circling back to original topic
- Lexile score modifications

Modifications Gifted and Talented Students:

- Advanced Lexile Resources
- Independent Study
- Advanced Assignments

Modifications At-Risk/Basic Skills:

- Teacher tutoring
- Supplemental / Pull Out Teaching
- Peer tutoring
- Cooperative Learning Groups / Centers
- Modified Assignments
- Differentiated Instruction
- Response to Intervention (www.help4teachers.com)
- Provide additional examples and opportunities for additional problems for repetition with visuals and manipulatives
- Picture vocabulary
- Picture books
- Simplified language for understanding
- Reader's Theater
- Modify Homework, Assignments and Assessment (can be oral if necessary)
- Cooperative learning
- Retell stories using props
- Additional Center work focusing on alphabet and HFW
- Additional Phonemic Awareness teaching and practice
- Re-teach alphabet and alphabet sounds
- Sentence frames with word bank and pictures
- Songs
- Total Physical Response
- Picture word wall

Teacher Notes:

- **Career Readiness, Life Literacies, and Key Skills:** Rapid advancements in technology and subsequent changes in the economy have created opportunities for individuals to compete and connect on a global scale. In this increasingly diverse and complex world, the successful entrepreneur or employee must not only possess the requisite education for specific industry pathways but also employability skills necessary to collaborate with others and manage resources effectively in order to establish and maintain stability and independence. This document outlines concepts and skills necessary for New Jersey's students to thrive in an ever-changing world. Intended for integration throughout all K–12

academic and technical content areas, the New Jersey Student Learning Standards- Career Readiness, Life Literacies, and Key Skills (NJSLS-CLKS) provides the framework for students to learn the concepts, skills, and practices essential to the successful navigation of career exploration and preparation, personal finances and digital literacy that rewards innovation, creativity, and adaptation to change.

Project-based Learning Tasks:

- Ongoing student portfolio assessments [created by faculty] to monitor student progress.

Vocabulary:

- In-text vocabulary should be incorporated into every unit. Word journals, vocabulary walls, and/or various other activities should be utilized by the instructor to teach vocabulary.
- Story, key details, retell, describe, main topic, rhyming words, syllables, story elements, character, setting, question, question words, front cover, back cover, title page, narrative, favorite, informational text, rules, connection, discuss, conversation, information, illustrator, author, illustrate, picture

The Research Process:

- The research process must be integrated within each course curriculum. Students will be provided with opportunities to investigate issues from thematic units of study. As the NJSLS indicate, students will develop proficiency with MLA or APA format as applicable.
- https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/general_format.html
- https://owl.purdue.edu/owl/research_and_citation/mla_style/mla_formatting_and_style_guide/mla_formatting_and_style_guide.html

Technology:

- Students must engage in technology applications integrated throughout the curriculum, though technology provided by us in their individual classroom, and in our technology centered classrooms.
- BrainPop
- Time for Kids Magazine online
- Scholastic Magazine online
- Google Earth
- Nationalgeographic.com

Resources:

- Ancillary resources and materials used to deliver instruction are included below:
- Learning New Jersey Model Curriculum
- ThinkCentral
- Achieve3000
- Reading A-Z.com
- Abcmouse .com
- EnchantedLearning,Com
- Sing Along Songs
- Scholastic.com

- Bilingualplanet.com
- Frog street
- Press.com
- 122 teachme.com
- Starfall
- www.teacherspayteachers.com
- www.udl.org
- http://www.state.nj.us/education/aps/cccs/ss/
- www.macmillanmh.com –downloadable graphic organizers

Career Education & Resources:

- **NJDOE CTE (https://www.nj.gov/education/cte/)**
- Careers are Everywhere Workbook (https://lmci.state.tx.us/shared/careersareeverywhere.asp)
- Career Bingo (http://www.breitlinks.com/careers/career_pdfs/careerbingo.pdf)
- Vocational Information Center / Career Exploration Guides and Resources for Younger Students (http://www.khake.com/page64.html)

Differentiation Strategies

Differentiation strategies can require varied amounts of preparation time. High-prep strategies often require a teacher to both create multiple pathways to process information/demonstrate learning and to assign students to those pathways. Hence, more ongoing monitoring and assessment is often required. In contrast, low-prep strategies might require a teacher to strategically create process and product choices for students, but students are allowed to choose which option to pursue given their learning profile or readiness level. Also, a low-prep strategy might be focused on a discrete skill (such as vocabulary words), so there are fewer details to consider. Most teachers find that integration of one to two new low-prep strategies and one high-prep strategy each quarter is a reasonable goal.

Low Prep Strategies	
Varied journal prompts, spelling or vocabulary lists	Students are given a choice of different journal prompts, spelling lists or vocabulary lists depending on level of proficiency/assessment results.
Anchor activities	Anchor activities provide meaningful options for students when they are not actively engaged in classroom activities (e.g., when they finish early, are waiting for further directions, are stumped, first enter class, or when the teacher is working with other students). Anchors should be directly related to the current learning goals.
Choices of books	Different textbooks or novels (often at different levels) that students are allowed to choose from for content study or for literature circles.
Choices of review activities	Different review or extension activities are made available to students during a specific section of the class (such as at the beginning or end of the period).

Homework options	Students are provided with choices about the assignments they complete as homework. Or, students are directed to specific homework based on student needs.
Student-teacher goal setting	The teacher and student work together to develop individual learning goals for the student.
Flexible grouping	Students might be instructed as a whole group, in small groups of various permutations (homogeneous or heterogeneous by skill or interest), in pairs or individuals. Any small groups or pairs change over time based on assessment data.
Varied computer programs	The computer is used as an additional center in the classroom, and students are directed to specific websites or software that allows them to work on skills at their level.
Multiple Intelligence or Learning Style options	Students select activities or are assigned an activity that is designed for learning a specific area of content through their strong intelligence (verbal-linguistic, interpersonal, musical, etc.)
Varying scaffolding of same organizer	Provide graphic organizers that require students to complete various amounts of information. Some will be more filled out (by the teacher) than others.
Think-Pair-Share by readiness, interest, and/or learning profile	Students are placed in predetermined pairs, asked to think about a question for a specific amount of time, then are asked to share their answers first with their partner and then with the whole group.
Mini workshops to re-teach or extend skills	A short, specific lesson with a student or group of students that focuses on one area of interest or reinforcement of a specific skill.
Orbitals	Students conduct independent investigations generally lasting 3-6 weeks. The investigations "orbit" or revolve around some facet of the curriculum.
Games to practice mastery of information and skill	Use games as a way to review and reinforce concepts. Include questions and tasks that are on a variety of cognitive levels.
Multiple levels of questions	Teachers vary the sorts of questions posed to different students based on their ability to handle them. Varying questions is an excellent way to build the confidence (and motivation) of students who are reluctant to contribute to class discourse. Note: Most teachers would probably admit that without even thinking about it they tend to address particular types of questions to particular students. In some cases, such tendencies may need to be corrected. (For example, a teacher may be unknowingly addressing all of the more challenging questions to one student, thereby inhibiting other students' learning and fostering class resentment of that student.)
High Prep Strategies	

Cubing	Designed to help students think about a topic or idea from many different angles or perspectives. The tasks are placed on the six sides of a cube and use commands that help support thinking (justify, describe, evaluate, connect, etc.). The students complete the task on the side that ends face up, either independently or in homogenous groups.
Tiered assignment/ product	The content and objective are the same, but the process and/or the products that students must create to demonstrate mastery are varied according to the students' readiness level.
Independent studies	Students choose a topic of interest that they are curious about and want to discover new information on. Research is done from questions developed by the student and/or teacher. The researcher produces a product to share learning with classmates.
4MAT	Teachers plan instruction for each of four learning preferences over the course of several days on a given topic. Some lessons focus on mastery, some on understanding, some on personal involvement, and some on synthesis. Each learner has a chance to approach the topic through preferred modes and to strengthen weaker areas
Jigsaw	Students are grouped based on their reading proficiency and each group is given an appropriate text on a specific aspect of a topic (the economic, political and social impact of the Civil War, for example). Students later get into heterogeneous groups to share their findings with their peers, who have read about different areas of study from source texts on their own reading levels. The jigsaw technique allows you to tackle the same subject with all of your students while discreetly providing them the different tools they need to get there.
Multiple texts	The teacher obtains or creates a variety of texts at different reading levels to assign strategically to students.
Alternative assessments	After completing a learning experience via the same content or process, the student may have a choice of products to show what has been learned. This differentiation creates possibilities for students who excel in different modalities over others (verbal versus visual).
Modified Assessments	Assessments can be modified in a variety of ways – for example by formatting the document differently (e.g. more space between questions) or by using different types of questions (matching vs. open ended) or by asking only the truly essential questions.
Learning contracts or Personal Agendas	A contract is a negotiated agreement between teacher and student that may have a mix of requirements and choice based on skills and understandings considered important by the teacher. A personal agenda could be quite similar, as it would list the tasks the teacher wants each student to accomplish in a given day/lesson/unit. Both Learning contracts and personal agendas will likely vary between students within a classroom.
Compacting	This strategy begins with a student assessment to determine level of knowledge or skill already attained (i.e. pretest). Students who demonstrate proficiency before

	the unit even begins are given the opportunity to work at a higher level (either independently or in a group).
Literature circles	Flexible grouping of students who engage in different studies of a piece of literature. Groups can be heterogeneous and homogeneous.
Learning Centers	A station (or simply a collection of materials) that students might use independently to explore topics or practice skills. Centers allow individuals or groups of students to work at their own pace. Students are constantly reassessed to determine which centers are appropriate for students at a particular time, and to plan activities at those centers to build the most pressing skills.
Tic-Tac-Toe Choice Board (sometimes called "Think-Tac-Toe"	The tic-tac-toe choice board is a strategy that enables students to choose multiple tasks to practice a skill, or demonstrate and extend understanding of a process or concept. From the board, students choose (or the teacher assigns) three adjacent or diagonal. To design a tic-tac-toe board: - Identify the outcomes and instructional focus - Design 9 different tasks - Use assessment data to determine student levels - Arrange the tasks on a tic-tac-toe board either randomly, in rows according to level of difficulty, or you may want to select one critical task to place in the center of the board for all students to complete.

Curriculum Development Resources/Instructional Materials:

List or Link Ancillary Resources and Curriculum Materials Here:

- New Jersey Student Learning Standards (https://www.nj.gov/education/cccs/)
    - NJSLS Science (https://www.nj.gov/education/modelcurriculum/sci//)

Board of Education Approved Text(s)

Scholastic Magazine

National Geographic for Kids

Time Magazine for Kids

STEMScopes