First Grade Science

Content Area: **Science**
Course(s):
Time Period: **Sample Time Period**
Length: **Full Year**
Status: **Not Published**

Title Page, Table of Contents, Statement of purpose

First Grade Science

Science inquiry is an integral part of building curiosity about the world around us. As natural phenomena occur every day, the ability to observe, question and analyze them are crucial skills. In developing these skills, students will become independent, lifelong thinkers and self-catalyzed learners. The first grade science curriculum has been developed through integration of crosscutting concepts, disciplinary core ideas, and science and engineering practice standards promoting inquiry and exploration into natural phenomena through the New Jersey Student Learning Standards in Science (NJSLS-S). Through hands-on activities, students will see themselves as problem-solvers and engineers. They will engage in the engineering and design process to identify and solve problems. The first grade science curriculum will foster curiosity for science and facilitate exploration beyond the walls of the classroom. First grade students will learn that patterns in the natural world can be observed, used to describe phenomena, and used as evidence. They will explore ideas of heredity, recognizing that offspring and adults share certain traits, but are not exactly the same. They will also learn that light and sounds travel in waves and can be used as tools to communicate ideas.

Unit 1: Earth's Place in the Universe

Content Area: **Science**
Course(s):
Time Period: **1st Trimester**
Length: **15 days**
Status: **Published**

Summary of the Unit

In this unit of study, students observe, describe, and predict some patterns of the movement of objects in the sky. Throughout the unit students look for patterns as they plan and carry out investigations and analyze and interpret data. In this unit's progression of learning, students develop the understanding that natural events happen today as they happened in the past, and that many events are repeated. In addition, they observe and use patterns in the natural world as evidence and to describe phenomena. First graders ask questions and use observations of the sun, moon, and stars to describe apparent patterns of change in each. In this unit, students also learn that seasonal patterns of sunrise and sunset can be observed, described, and predicted.

Enduring Understandings

- Science assumes that natural events happen today as they happened in the past.
- Many events are repeated.
- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- Patterns in the motion of the sun, moon, and stars in the sky can be observed, described, and predicted.

Essential Questions

- What patterns of change can be predicted when observing the sun, moon, and stars?
- What is the relationship between the amount of daylight and the time of year?
- Where is the Earth in relation to the other planets/sun?

Summative Assessment and/or Summative Criteria

Mystery Science assessments

Science journal and/or writing samples

Lesson participation/observation

Planet research activity

Resources

Mystery Science

Discovery Education

Pebble, Go! (username: trumannj password: school)

Epic! books (space/planet collection)

Raz Collection

Lakeshore Science kits- Solar System

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
Patterns of the sun, moon, and stars. (4-5 lessons)	Students will be able to describe patterns of the sun, moon, and stars.	• Mystery Science "When Can You See the Full Moon?" • Ask students "Where does the sun go at night?" ○ Discovery Education video clip (Where does the sun go at night?" (5:32) . Use a flashlight to show how shadow positions change because the "sun" is moving. **Lakeshore Kit Earth, Moon, and Sun model Mystery Science"Can a Statue's Shadow Move?" • Use a diagram to show	Mystery Science lesson activity (drawing phases of the moon and predicting the next full moon) Mystery Science Assessment *See resources. Mystery Science lesson activity *See resources.	1-ESS1-1 ESS1.B ETS1.A 1PS4-1-4

		the positions of the sun, moon, and stars throughout the day/month/year.
		• Discuss why we can only see stars at night time.
		  ○ The sun is also a star, but is so close to us that we can see/feel it during the day.
		  ○ Mystery Science "Why do the stars come out at night?"
		• Create an Earth/Moon/Sun "spinner" model (read Pebble Go!) books for more information *optional- Lakeshore "Moon Mystery activity card.
		• If another day is desired, talk about constellations. The Lakeshore kit has a "Constellation Viewer". Students can create constellations with star stickers and white crayons on black paper after viewing Earth to Luna on Discovery Education.		

Sunlight in the Summer (1-2 lessons)	Students will be able to compare the amount of daylight in the summer to other times of the year.	• Ask students why it seems like they have to go to bed earlier in the summer. Mystery Science read along • Make a T-chart that distinguishes the difference between the amount of sunlight in the summer time versus the winter time.	Mystery Science lesson activity	1-ESS1-1 1-ESS1-2 ETS1.A 1PS4-1-4
The Earth's Place in the Universe (4-5 days)	Students will be able to name the planets and recall facts about each.	• Discuss how Earth is where we live and how it is a planet. • Watch, Earth, Yay! on Discovery Education. Pause and talk about how the planets go around the sun. • Write planet names on an anchor chart (facts to	1. Write the room. 2. Planet Class Book (research) 3. Participation in class. * See resources.	1-ESS1-1 ESS1.B ETS1.A RI 1.1-1.10 RF 1.3

		be added later) • Hang or show the Lakeshore Solar System poster of the planets. • Read planet mini book and add facts to an anchor chart. • Students "Write the Room" with planet names. • Students work together to create a planet class book using books (Epic! or Pebble Go - Sayreville has a subscription)		NJSLSA.W2 NJSLSA.W10 1PS4-1-4

Standards

LA.RI.1.4	Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.
LA.RI.1.5	Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.
LA.RI.1.6	Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.
LA.SL.1.2	Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
LA.RI.1.7	Use the illustrations and details in a text to describe its key ideas.
SCI.1-ESS1-1	Use observations of the sun, moon, and stars to describe patterns that can be predicted.
SCI.1.ESS1.A	The Universe and its Stars
SCI.1-ESS1-2	Make observations at different times of year to relate the amount of daylight to the time of year.
LA.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.

Suggested Modifications for Special Education, ELL and Gifted Students

- Modifications for any individual student's IEP plan must be met.

- Alter assignment lengths if necessary.
- Provide additional examples of annotation and the signposts.
- Allow additional time when in full class discussing for processing and discussion.
- Students should be provided with graphic organizers during annotations and discussions.
- Check for understanding by conferencing with the teacher.
- Students may choose a partner or teacher may choose a partner to work that student is comfortable with.
- Repeat and clarify any directions given.
- Allow for preferential seating within groups and the whole class.
- Modify amount of vocabulary words used
- Read chapter tests aloud/test orally

Suggested Technological Innovations/Use

- CS.K-2.8.1.2.CS.1: Select and operate computing devices that perform a variety of tasks accurately and quickly based on user needs and preferences.
- CS.K-2.NI: Computer networks can be used to connect individuals to other individuals, places, information, and ideas. The Internet enables individuals to connect with others worldwide.
- CS.K-2.8.1.2.IC.1: Compare how individuals live and work before and after the implementation of new computing technology.
- CS.K-2.ITH.1-2: Human needs and desires determine which new tools are developed.
- CS.K-1.ITH.3-5: Technology has changed the way people live and work. Various tools can improve daily tasks and quality of life.
- CS.K-2.ETW: The use of technology developed for the human designed world can affect the environment, including land, water, air, plants, and animals. Technologies that use natural sources can have negative effects on the environment, its quality, and inhabitants. Reusing and recycling materials can save money while preserving natural resources and avoiding damage to the environment.

CS.K-2.8.2.2.EC.1: Identify and compare technology used in different schools, communities, regions, and parts of the world.

Cross Curricular/21st Century Connections

All students will possess an understanding of scientific concepts and processes required for personal decision making, participation in civic life, and preparation for careers in STEM fields (for those that chose).

Prepare students to become scientifically literate individuals who can effectively:

• Apply scientific thinking, skills, and understanding to real-world phenomena and problems;

• Engage in systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned;

• Conduct investigations, solve problems, and engage in discussions;

• Discuss open-ended questions that focus on the strength of the evidence used to generate claims;

• Read and evaluate multiple sources, including science-related magazine and journal articles and web-based resources to gain knowledge about current and past science problems and solutions and develop well reasoned claims;

• Communicate ideas through journal articles, reports, posters, and media presentations that explain and argue.

- 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). (1-ESS1-1), (1-ESS1-2) •
- W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-ESS1-1), (1-ESS1-2) Connections to NJSLS – Mathematics •
- MP.2 Reason abstractly and quantitatively. (1-ESS1-2) • MP.4 Model with mathematics. (1-ESS1-2) •
- MP.5 Use appropriate tools strategically. (1-ESS1-2) • 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-ESS1-2)

- SOC.6.1.2.CivicsPD.1: Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.

- SEL.PK-12.1: Self Awareness: Recognize one's feelings and thoughts; personal traits, strengths, and limitations.

- SEL.PK-12.2.2: Self Management: Recognize the skills needed to establish and achieve personal and educational goals

- SEL.PK-12.5: Relationship Skills: Utilize positive communication and social skills to interact effectively with others; Identify who, when, where, or how to seek help for oneself or others when needed

Unit 2: How Living Organisms Grow and Survive

Content Area: **Science**
Course(s):
Time Period: **2nd Trimester**
Length: **13 days**
Status: **Published**

Summary of the Unit

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. They will recognize that all living organisms need air, food, and water to grow and survive. Also, that plants have parts that help them grow and survive. Students will understand that living organisms adapt and respond to their environment. They will learn that engineers get ideas from plants and animals when designing solutions to human problems.

Enduring Understandings

- Patterns in the natural world can be observed and used to describe phenomena.
- 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 have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow.
- The shape and stability of structures of natural and designed objects are related to their function(s).

Essential Questions

- What helps plants and animals survive?
- What are the roles of animal and plant parts?

Summative Assessment and/or Summative Criteria

Mystery Science assessments

Science journal and/or writing samples

Lesson participation/observation

Lesson assignments/writing samples

Resources

Mystery Science

Discovery education

YouTube video links (listed and linked)

Worksheets in resources (and linked)

F and P Shared Reading (Big and Little Series)

EPIC! book collection

Fountas & Pinnell IRA- "Planting and Growing"

Lakeshore Science kit- Plants

Shared Readings- (Animal/ plant related books) Creep, Crawl, Fly

Scrunch the Caterpillar, Not Ladybugs, Garden Helpers, Animal Surprises, The Cactus Hotel, How Animals Eat, Inventions and Nature

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
1 day	Students will be able to understand the needs of living things	Discuss what the students need throughout the day. Ask why they need certain things (food, water, clothes, shelter, etc.). Make a list on an anchor chart or on a web. Discovery Education video about living/nonliving things.(2:25)	Students write a sentence to tell something living things need. Illustrate.	1-LS1-2 RI 1.1 RI 1.2 W 1.8
1 day	Students will be able to be categorize items by living and non-living	Remind students what living things need. Name some living things they can think of. Ask if a book is living. Why or why not? What about a pencil? Sort living/nonliving.	Living/nonliving sort	1-LS1-1 RI 1.1 RI 1.2 W 1.8
2 days (see below)	Students will be able to Identify the main parts of a plant.	Watch the Discovery Education plant parts video clip. Discuss. Students label a plant part picture. (or complete	Plant part labeling	1-LS1-1 K-2-ETS1-2

		online as a class) Plant parts song		K-2-ETS1-3 RI 1.1 RI 1.2 W 1.8
	Students will be able to explain the purpose of each main part of a plant and how they help it meet its needs Students will be able to identify how the shape of the plant helps it to meet its needs.	Watch the Discovery Education plant parts video clip. Discuss. Students label a plant part picture. (or complete online as a class) Plant parts song	Plant Part Labeling *See resources.	1-LS1-1 K-2-ETS1-2 K-2-ETS1-3 RI 1.1 RI 1.2 W 1.8
1 day	Students will be able to compare varying animals based on parts.	Remind students that we are learning about living things. Plants are living things and so are animals. Sort animals based on their traits. (Use the animal pictures from the animal classification pdf **not the animal groups page). Have students explain why they put certain animals together (i.e. some have hair, some live in water, some have feathers, etc.) *Can be printed and completed on a pocket chart together.	Animal sort observation/participation	1-LS1-1 K-2-ETS1-2 K-2-ETS1-3 RI 1.1 RI 1.2 W 1.8
2 days	Students will be able to indicate the parts of animals that help protect them from danger and stay safe in severe weather. Construct explanations of how the parts of an animal help it to meet its needs.	Mystery Science "Why do birds have beaks?" Discuss and complete the activity on Mystery Science.	Mystery Science lesson and activity, assessment	1-LS1-1 K-2-ETS1-2 K-2-ETS1-3 RI 1.1 RI 1.2 W 1.8
1 day	Students will be able to illustrate how plants change and adapt with the seasons.	Mystery Science read aloud lesson,"What do sunflowers do when you're not looking?"	Mystery Science lesson	1-LS1-1 K-2-ETS1-2 K-2-ETS1-3 RI 1.1 RI 1.2 W 1.8
2 days	Students will be able to Identify examples of how engineers use characteristics of plants and animals in their designs	Mystery Science, "Why don't plants blow down in the wind?" lesson and activity. Biomimicry song	Mystery Science lesson and activity, assessment	1-LS1-1 K-2-ETS1-2 K-2-ETS1-3 RI 1.1 RI 1.2

	Utilize knowledge of important plant and animal parts to solve a problem or address a human need.			W 1.8

Standards

SCI.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.
SCI.1.LS1.B	Growth and Development of Organisms
LA.RI.1.1	Ask and answer questions about key details in a text.
SCI.1.LS1.A	Structure and Function
LA.RI.1.4	Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.
LA.RI.1.5	Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.
LA.RI.1.6	Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.
LA.RI.1.7	Use the illustrations and details in a text to describe its key ideas.
SCI.1-LS1-2	Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.
SCI.1.LS1.D	Information Processing

Suggested Modifications for Special Education, ELL and Gifted Students

Consistent with individual plans, when appropriate.

- Modifications for any individual student's IEP plan must be met.
- Alter assignment lengths if necessary.
- Provide additional examples of annotation and the signposts.
- Allow additional time when in full class discussing for processing and discussion.

- Students should be provided with graphic organizers during annotations and discussions.
- Check for understanding by conferencing with the teacher.
- Students may choose a partner or teacher may choose a partner to work that student is comfortable with.
- Repeat and clarify any directions given.
- Allow for preferential seating within groups and the whole class.
- Modify amount of vocabulary words used
- Read chapter tests aloud/test orally

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- CS.K-2.8.1.2.IC.1: Compare how individuals live and work before and after the implementation of new computing technology.
- CS.K-2.ITH.1-2: Human needs and desires determine which new tools are developed.
- CS.K-1.ITH.3-5: Technology has changed the way people live and work. Various tools can improve daily tasks and quality of life.
- CS.K-2.ETW: The use of technology developed for the human designed world can affect the environment, including land, water, air, plants, and animals. Technologies that use natural sources can have negative effects on the environment, its quality, and inhabitants. Reusing and recycling materials can save money while preserving natural resources and avoiding damage to the environment.

CS.K-2.8.2.2.EC.1: Identify and compare technology used in different schools, communities, regions, and parts of the world.

Cross Curricular/21st Century Connections

All students will possess an understanding of scientific concepts and processes required for personal decision making, participation in civic life, and preparation for careers in STEM fields (for those that chose).

Prepare students to become scientifically literate individuals who can effectively:

• Apply scientific thinking, skills, and understanding to real-world phenomena and problems;

• Engage in systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned;

• Conduct investigations, solve problems, and engage in discussions;

• Discuss open-ended questions that focus on the strength of the evidence used to generate claims;

• Read and evaluate multiple sources, including science-related magazine and journal articles and web-based resources to gain knowledge about current and past science problems and solutions and develop well reasoned claims;

• Communicate ideas through journal articles, reports, posters, and media presentations that explain and argue.

- 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). (1-ESS1-1), (1-ESS1-2) •
- W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-ESS1-1), (1-ESS1-2) Connections to NJSLS – Mathematics •
- MP.2 Reason abstractly and quantitatively. (1-ESS1-2) • MP.4 Model with mathematics. (1-ESS1-2) •
- MP.5 Use appropriate tools strategically. (1-ESS1-2) • 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-ESS1-2)

- SOC.6.1.2.CivicsPD.1: Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.

- SEL.PK-12.1: Self Awareness: Recognize one’s feelings and thoughts; personal traits, strengths, and limitations.

- SEL.PK-12.2.2: Self Management: Recognize the skills needed to establish and achieve personal and educational goals

- SEL.PK-12.5: Relationship Skills: Utilize positive communication and social skills to interact effectively with others; Identify who, when, where, or how to seek help for oneself or others when needed

Unit 3: Heredity: Inheritance and Variation of Traits

Content Area: **Science**
Course(s):
Time Period: **2nd Trimester**
Length: **12 days**
Status: **Published**

Summary of the Unit

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. Students will learn about various life cycles of animals in order to understand that patterns occur in nature.

Enduring Understandings

- Many characteristics of organisms are inherited from their parents.
- Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways.
- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.

Essential Questions

- What characteristics do you have that might be inherited from your parents?
- How are you like your parents and siblings? How are you different?
- How do plants and animals look like their parents?

Summative Assessment and/or Summative Criteria

Mystery Science assessments

Science journal and/or writing samples

Lesson participation/observation

Lesson assignments/writing samples

Resources

Mystery Science

Discovery Education

YouTube (links in the lessons)

Raz-Plus (book list shared)

Epic! collection (linked in lessons)

Optional Literature "Are You My Mother?" "Is Your Mama a Llama?"

Pebble, Go!

Lakeshore Science kits- Plants

Chicken Coop Kit

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
3 days	**Compare** and contrast the physical characteristics of an adult animal or plant and their offspring.	Mystery Science (coming October 2022) "Plants and their Offspring" "How can you help a lost baby animal find its parents?" AND/OR Read Along, "Why do family members look alike?"	Mystery Science activity/lesson assessment- plants Mystery Science activity/assessment animals *See resources	1-LS1-1 1-LS1-2 RL.1.1 RL.1.2 RL.1.10 W.1.7
2 days	Students will be able to describe physical traits of themselves.	Discuss what traits are (characteristics of people, plants, animals that tell about what they look like). Show the shortyoutube clip (1:35) about puppy traits. Students draw a picture of themselves and label it with traits (blue eyes, brown hair, freckles,	Self portrait/labeling completion *See resources	1-LS1-1 1-LS1-2 RL.1.1

		etc.). Turn and talk with a neighbor. Share if they have anything in common with their parents and/or siblings. Longer video (10 min) about traits		RL.1.2 RL.1.10 W.1.7
2 days	Students will be able to match animal babies to their parents.	Choose a book from the Epic! book collection about heredity (or any other book about animal babies/parents). Discuss how animal babies and their parents share traits. Studentsplay a matching game (in resources) to match animal babies to their parents. Fill in a sentence frame together (see right) and students complete one alone. Animal adult/baby song	Students draw a picture of a baby/adult animal pairing and write a sentence about it. An adult _____ is called a ____ and its baby is called a _____.	1-LS1-1 1-LS1-2 RL.1.1 RL.1.2 RL.1.10 W.1.7
3 days	Students will be able to tell the stages in the life cycle of an animal.	Remind students that animals and plants have certain traits that their parents have. Tell how they grow to become adults. Read a book about animal life cycles (Raz collection- shared, Epic!) or watch a Discovery Education video (14:00) about different life cycles. Create alife cycle mini book (there are four choices) or use the worksheet template to make one for a chosen animal Introduce the chicken coop kits to students. Chart what they observe about the eggs. Add to the chart for each new stage of life.	Life cycle mini book or diagram (resources in resource section) Chick life cycle wheel (in resources) **ongoing- Chicken Life Cycle journal (in resources)	1-LS1-1 1-LS1-2 RL.1.1 RL.1.2 RL.1.10 W.1.7

Standards

LA.RI.1.5	Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.
LA.RI.1.6	Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.
LA.RI.1.7	Use the illustrations and details in a text to describe its key ideas.
SCI.1-LS3-1	Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.
SCI.1.LS3.A	Inheritance of Traits

SCI.1.LS3.B	Variation of Traits
LA.RI.1	Reading Informational Text

Suggested Modifications for Special Education, ELL and Gifted Students

Mystery Science assessments

Science journal and/or writing samples

Lesson participation/observation

Lesson assignments/writing samples

Suggested Technological Innovations/Use

Mystery Science

Discovery Education

YouTube (links in the lessons)

Raz-Plus (book list shared)

Epic! collection (linked in lessons)

Optional Literature “Are You My Mother?” “Is Your Mama a Llama?”

Pebble, Go!

Lakeshore Science kits- Plants

Cross Curricular/21st Century Connections

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• Engage in systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned;

• Conduct investigations, solve problems, and engage in discussions;

• Discuss open-ended questions that focus on the strength of the evidence used to generate claims;

• Read and evaluate multiple sources, including science-related magazine and journal articles and web-based resources to gain knowledge about current and past science problems and solutions and develop well reasoned claims;

• Communicate ideas through journal articles, reports, posters, and media presentations that explain and argue.

- 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). (1-ESS1-1), (1-ESS1-2) •
- W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-ESS1-1), (1-ESS1-2) Connections to NJSLS – Mathematics •
- MP.2 Reason abstractly and quantitatively. (1-ESS1-2) • MP.4 Model with mathematics. (1-ESS1-2) •
- MP.5 Use appropriate tools strategically. (1-ESS1-2) • 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-ESS1-2)

- SOC.6.1.2.CivicsPD.1: Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.

- SEL.PK-12.1: Self Awareness: Recognize one’s feelings and thoughts; personal traits, strengths, and limitations.

- SEL.PK-12.2.2: Self Management: Recognize the skills needed to establish and achieve personal and educational goals

- SEL.PK-12.5: Relationship Skills: Utilize positive communication and social skills to interact effectively with others; Identify who, when, where, or how to seek help for oneself or others when needed

Unit 4: Waves and their Application in Tech for Info Transfer

Content Area: **Science**
Course(s):
Time Period: **3rd Trimester**
Length: **12 days**
Status: **Published**

Summary of the Unit

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. 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.

Enduring Understandings

- Sound is the movement of energy caused by vibrations.
- People communicate messages over distances using light and sound.

Essential Questions

- How is sound created?
- How can people communicate over distance?

Summative Assessment and/or Summative Criteria

Mystery Science assessments

Science journal and/or writing samples

Lesson participation/observation

Lesson assignments/writing samples

Resources

Mystery Science

Discovery Education

YouTube (links in the lessons)

Epic! collection (linked in lessons)

Pebble, Go! (light)

Pebble, GO! (sound)

Unit Plan

Topic/Selection Timeframe	General Objectives	Instructional Activities	Benchmarks/Assessments	Standards
1 day	Students will be able to identify the connection of light and sound as forms of energy.	Explain to students that they will be learning about energy. Energy is the ability to do work. Tell them that light and sound are types of energy. Students sort energy sources into light/sound.	Light and Sound sort *See resources	1-PS4-1 1- PS4-2 1- PS4-3 1- PS4-4 NJSLSA.R1 NJSLSA.R7. RI.1.5 NJSLSA.W2
2 days	Students will be able to distinguish the difference between natural and man-made sounds.	Guess the Sounds "game" on YouTube. Stop and discuss what the students think the sounds are. Sort the sounds. Ask them why they were sorted the way they were (natural vs manmade). Mystery Science "How do they make silly sounds in cartoons?" Complete the activity and assessment.	Mystery Science activity and assessment *See resources	1-PS4-1 1- PS4-2 1- PS4-3 1- PS4-4 NJSLSA.R1 NJSLSA.R7. RI.1.5 NJSLSA.W2
2 days	Students will be able to categorize objects that make sound.	Watch the BrainPop Jr. movie about sound. Discuss things that make sound and things that don't.	Sort (*See resources)	1-PS4-1 1- PS4-2 1- PS4-3

		Sort sound energy and not sound energy. Discuss the reasons why we have certain sounds. Mystery Science "Where do sounds come from?"		1- PS4-4 NJSLSA.R1 NJSLSA.R7. RI.1.5 NJSLSA.W2
1 day	Students will be able to investigate how loud sounds can make other objects move.	How can we see sound? experiment. (Experiment #1 on the link)	Students write about what happens when loud sounds are near the rice.	1-PS4-1 1- PS4-2 1- PS4-3 1- PS4-4 NJSLSA.R1 NJSLSA.R7. RI.1.5 NJSLSA.W2
4 days	Students will be able to explore ways sound and light are used to communicate.	Mystery Science - How could you send a secret message to someone far away? Make paper cup/string "telephones" and students use them to talk. If available, use flashlights (or the classroom lights) to flicker a message (i.e. one flicker - yes, two times- no). Ask simple questions and have students "answer" by flicking the light. Share morse code if desired. Students experiment with different variables when using their cup phones. (page 20 in the file)	Mystery Science assessment Cup string experiment "I am a Scientist" page 20 *See resources	K-2-ETS1-1 K-2-ETS1-2 1-PS4-1 1- PS4-2 1- PS4-3 1- PS4-4 NJSLSA.R1 NJSLSA.R7. RI.1.5 NJSLSA.W2
2 days	Students will be able to explain the purpose of different lights and sounds.	Students will complete a Light energy sort. Discuss each light source and what it is used for. As students already completed the sound one, review why people use sounds if necessary. Discuss how lights/sounds can be used to communicate when there are emergencies. Students write about how an ambulance uses light and sound to communicate.	Sort (in resources) Ambulance sheet (in resources)	1-PS4-1 1- PS4-2 1- PS4-3 1- PS4-4 NJSLSA.R1 NJSLSA.R7. RI.1.5 NJSLSA.W2

Standards

SCI.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.

LA.RI.1.1	Ask and answer questions about key details in a text.
LA.RI.1.2	Identify the main topic and retell key details of a text.
LA.RI.1.4	Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.
SCI.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.
LA.RI.1.5	Know and use various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text.
LA.RI.1.6	Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.
SCI.1.PS4.A	Wave Properties
SCI.1-PS4	Waves and their Applications in Technologies for Information Transfer
SCI.1-PS4-1	Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
	Planning and Carrying Out Investigations
	Planning and Carrying Out Investigations
LA.RI.1	Reading Informational Text

Suggested Modifications for Special Education, ELL and Gifted Students

Mystery Science assessments

Science journal and/or writing samples

Lesson participation/observation

Lesson assignments/writing samples

Suggested Technological Innovations/Use

Mystery Science

Discovery Education

YouTube (links in the lessons)

Raz-Plus (book list shared)

Epic! collection (linked in lessons)

Optional Literature “Are You My Mother?” “Is Your Mama a Llama?”

Pebble, Go!

Lakeshore Science kits- Plants

Cross Curricular/21st Century Connections

All students will possess an understanding of scientific concepts and processes required for personal decision making, participation in civic life, and preparation for careers in STEM fields (for those that chose).

Prepare students to become scientifically literate individuals who can effectively:

• Apply scientific thinking, skills, and understanding to real-world phenomena and problems;

• Engage in systems thinking and modeling to explain phenomena and to give a context for the ideas to be learned;

• Conduct investigations, solve problems, and engage in discussions;

• Discuss open-ended questions that focus on the strength of the evidence used to generate claims;

• Read and evaluate multiple sources, including science-related magazine and journal articles and web-based resources to gain knowledge about current and past science problems and solutions and develop well reasoned claims;

• Communicate ideas through journal articles, reports, posters, and media presentations that explain and argue.

- 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). (1-ESS1-1), (1-ESS1-2) •
- W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-ESS1-1), (1-ESS1-2) Connections to NJSLS – Mathematics •
- MP.2 Reason abstractly and quantitatively. (1-ESS1-2) • MP.4 Model with mathematics. (1-ESS1-2) •
- MP.5 Use appropriate tools strategically. (1-ESS1-2) • 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-ESS1-2)

- SOC.6.1.2.CivicsPD.1: Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.

- SEL.PK-12.1: Self Awareness: Recognize one’s feelings and thoughts; personal traits, strengths, and limitations.

- SEL.PK-12.2.2: Self Management: Recognize the skills needed to establish and achieve personal and educational goals

- SEL.PK-12.5: Relationship Skills: Utilize positive communication and social skills to interact effectively with others; Identify who, when, where, or how to seek help for oneself or others when needed