

Science

Unit	Waves and their Applications in Technologies for Information Transfer
Unit Duration	6 weeks
Unit Goals	
NJSLS	<ul style="list-style-type: none"> ● 1-PS4-1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. <i>[Clarification Statement: Examples of vibrating materials that make sound could include tuning forks and plucking a stretched string. Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making sound and holding an object near a vibrating tuning fork.]</i> ● 1-PS4-2 Make observations to construct an evidence-based account that objects can be seen only when illuminated. <i>[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.]</i> ● 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. <i>[Clarification Statement: Examples of materials could include those that are transparent (such as clear plastic), translucent (such as wax paper), opaque (such as cardboard), and reflective (such as a mirror). 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.] [Assessment Boundary: Assessment does not include the speed of light.]</i> ● 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. <i>[Clarification Statement: Examples of devices could include a light source to send signals, paper cup and string “telephones,” and a pattern of drumbeats.] [Assessment Boundary: Assessment does not include technological details for how communication devices work.]</i>
Science & Engineering Practices	<ul style="list-style-type: none"> ● Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question. (1-PS4-1),(1-PS4-3) ● Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1-PS4-2) ● Use tools and materials provided to design a device that solves a specific problem. (1-PS4-4).
Disciplinary Core Ideas	<p>PS4.A: Wave Properties</p> <ul style="list-style-type: none"> ● Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1) <p>PS4.B: Electromagnetic Radiation</p>

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	<ul style="list-style-type: none"> • Objects can be seen if light is available to illuminate them or if they give off their own light. (1- PS4-2) • 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. (1- PS4-3) <p>PS4.C: Information Technologies and Instrumentation</p> <ul style="list-style-type: none"> • People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4)
<p>Cross Cutting Concepts</p>	<p>Connections to Nature of Science</p> <p>Scientific Investigations Use a Variety of Methods</p> <ul style="list-style-type: none"> • Science investigations begin with a question. (1-PS4-1) • Scientists use different ways to study the world. (1-PS4-1)
<p>Connections to NJSL – English Language Arts</p>	<ul style="list-style-type: none"> ● 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. (1-PS4-2) ● 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-PS4- 1), (1-PS4-2), (1-PS4-3), (1-PS4-4) ● W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-PS4-1), (1-PS4-2), (1- PS4-3) ● 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. (1-PS4-1),(1-PS4-2),(1- PS4-3)
<p>Connections to NJSL – Mathematics</p>	<ul style="list-style-type: none"> ● MP.5 Use appropriate tools strategically. (1-PS4-4) ● 1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-PS4-4) ● 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 units that span it with no gaps or overlaps. (1-PS4-4).
<p>21st Century and Career Integration</p>	<ul style="list-style-type: none"> ● Simple tests can be designed to gather evidence to support or refute student ideas about causes. (1-PS4-1),(1-PS4-2),(1-PS4-3)
<p>Resources and Technology Integration</p>	

- Mystery Science – Light, Sound & Communication
- Brain Pop Jr.
- <https://www.openscienced.org/curriculum/elementary-school/explore-the-curriculum/>

Assessments

- Ask questions
- Define problems
- Develop and use models
- Plan and carry out investigations
- Analyze and interpret data
- Formative assessment
- Teacher observation
- Class discussion
- Venn diagram

Unit	Plant Traits & Survival, Animal Traits & Survival
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Unit Duration	12 weeks
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Unit Goals

NJSLS	<ul style="list-style-type: none"> ● 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. <i>[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.]</i> ● 1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. <i>[Clarification Statement: Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping, and other vocalizations s) and the responses of the parents (such as feeding, comforting, and protecting the offspring).]</i>
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	<ul style="list-style-type: none"> ● 1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. <i>[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.]</i>
<p>Science & Engineering Practices</p>	<ul style="list-style-type: none"> ● Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1) ● Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world. (1-LS1-2)
<p>Disciplinary Core Ideas</p>	<p>LS1.A: Structure and Function</p> <ul style="list-style-type: none"> ● All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1) <p>LS1.B: Growth and Development of Organisms</p> <ul style="list-style-type: none"> ● Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2) <p>LS1.D: Information Processing</p> <ul style="list-style-type: none"> ● Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1) <p>LS3.A: Inheritance of Traits</p> <ul style="list-style-type: none"> ● Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents. (1-LS3-1) <p>LS3.B: Variation of Traits</p> <ul style="list-style-type: none"> ● Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1)
<p>Cross Cutting Concepts</p>	<p>Patterns</p> <ul style="list-style-type: none"> ● Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.(1-LS1-2) <p>Structure and Function</p> <ul style="list-style-type: none"> ● The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)

	<p>Influence of Engineering, Technology, and Science on Society and the Natural World</p> <ul style="list-style-type: none"> ● Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. (1-LS1-1)
<p>Connections to NJSL – English Language Arts</p>	<ul style="list-style-type: none"> ● RI.1.1 Ask and answer questions about key details in a text. (1-LS1-2) ● RI.1.2 Identify the main topic and retell key details of a text. (1-LS1-2) ● RI.1.10 With prompting and support, read informational texts appropriately complex for grade. (1-LS1-2) ● 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-LS1- 1)
<p>Connections to NJSL – Mathematics</p>	<ul style="list-style-type: none"> ● 1.NBT.B.3 Compare two two-digit numbers based on the meanings of the tens and one digits, recording the results of comparisons with the symbols $>$, $=$, and $<$. (1-LS1-2) ● 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 uses. 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- LS1-2) ● 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-LS1-2) ● 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. (1-LS1-2)
<p>21st Century and Career Integration</p>	<ul style="list-style-type: none"> ● Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS1-2) ● The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)

Resources and Technology Integration

- Mystery Science – Animal Traits & Survival, Plant Traits & Survival
- Brain Pop Jr.
- <https://www.openscienced.org/curriculum/elementary-school/explore-the-curriculum/>

Assessments

- Ask questions
- Define problems
- Develop and use models
- Plan and carry out investigations
- Analyze and interpret data
- Formative assessment
- Teacher observation
- Class discussion
- Venn diagram

Unit	Earth’s Place in the Universe
Unit Duration	12 weeks
Unit Goals	
NJSLS	<ul style="list-style-type: none"> ● 1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted. <i>[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.]</i> ● 1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year <i>[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.]</i>
Science & Engineering Practices	<ul style="list-style-type: none"> ● Make observations (firsthand or from media) to collect data that can be used to make comparisons. (1-ESS1- 2) ● Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (1-ESS1-1)
Disciplinary Core Ideas	<p>ESS1.A: The Universe and its Stars</p> <ul style="list-style-type: none"> ● Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) <p>ESS1.B: Earth and the Solar System</p> <ul style="list-style-type: none"> ● Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (1-ESS1-2)

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<p>Cross Cutting Concepts</p>	<p>Patterns</p> <ul style="list-style-type: none"> • Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1) (1-ESS1-2) <p>Connections to Nature of Science Scientific Knowledge Assumes an Order and Consistency in Natural Systems</p> <ul style="list-style-type: none"> • Science assumes natural events happen today as they happened in the past. (1-ESS1-1) • Many events are repeated. (1-ESS1-1) • Scientists look for patterns and order when making observations about the world. (K-LS1-1)
<p>Connections to NJSL – English Language Arts</p>	<ul style="list-style-type: none"> ● 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)
<p>Connections to NJSL - Mathematics</p>	<ul style="list-style-type: none"> ● 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) ● 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. (1-ESS1-2) Patterns ● Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1), (1-ESS1-2)
<p>21st Century and Career Integration</p>	<ul style="list-style-type: none"> ● Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1), (1-ESS1-2)
<p>Resources and Technology Integration</p>	

- Mystery Science – Day Patterns, Night Patterns
- Brain Pop Jr.
- <https://www.openscienced.org/curriculum/elementary-school/explore-the-curriculum/>

Assessments

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Unit	Engineering Design
Unit Duration	6 weeks
Unit Goals	
NJSLS	<ul style="list-style-type: none"> ● K-2-ETS1-1 Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool. ● K-2-ETS1-2 Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. ● K-2-ETS1-3 Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
Science & Engineering	<ul style="list-style-type: none"> ● Ask questions based on observations to find more information about the natural and/or designed world(s).

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Practices	<ul style="list-style-type: none"> ● Define a simple problem that can be solved through the development of a new or improved object or tool. ● Develop a simple model based on evidence to represent a proposed object or tool. ● Analyze data from tests of an object or tool to determine if it works as intended.
Disciplinary Core Ideas	<p>ETS1.A: Defining and Delimiting Engineering Problems</p> <ul style="list-style-type: none"> ● A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1) ● Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1) ● Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) <p>ETS1.B: Developing Possible Solutions</p> <ul style="list-style-type: none"> ● Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions, such as climate change, to other people. (K-2-ETS1-2) <p>ETS1.C: Optimizing the Design Solution</p> <ul style="list-style-type: none"> ● Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)
Cross Cutting Concepts	<p>Structure and Function</p> <ul style="list-style-type: none"> ● The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)
Connections to NJSL – English Language Arts	<ul style="list-style-type: none"> ● RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. ● W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. ● W.2.8 Recall information from experiences or gather information from provided sources to answer a question. 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.
Connections to NJSL – Mathematics	<ul style="list-style-type: none"> ● MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1),(K-2-ETS1-3) ● MP.4 Model with mathematics. (K-2-ETS1-1),(K-2-ETS1-3) ● MP.5 Use appropriate tools strategically. (K-2-ETS1-1),(K-2-ETS1-3) 2. ● MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set
21st Century and Career Integration	<ul style="list-style-type: none"> ● 9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Resources and Technology Integration

- WT Maker Space Curriculum
- <https://fun-a-day.com/14-fun-engineering-activities-for-kids/>
- <https://thekindergartenconnection.com/awesome-engineering-activities-kids/>

Assessments

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- Class discussion
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Curriculum Modifications

Special Education and 504 Students

General Modifications

- Allow outlining, instead of writing for an essay or major project
- Computerized spell-check support
- Word bank of choices for answers to test questions
- Provision of calculator and/or number line for math tests
- Film or video supplements in place of reading text
- Reworded questions in simpler language
- Projects instead of written reports
- Highlighting important words or phrases in reading assignments
- Modified workload or length of assignments/tests
- Modified time demands
- Pass/no pass option
- Modified grades based on IEP

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	<p style="text-align: center;"><u>Behavioral Modifications</u></p> <ul style="list-style-type: none"> ● Breaks between tasks ● Cue expected behavior ● Daily feedback to student ● Use de-escalating strategies ● Use positive reinforcement ● Use proximity/touch control ● Use peer supports and mentoring ● Model expected behavior by adults ● Have parent sign homework/behavior chart ● Set and post class rules ● Chart progress and maintain data
<p>Students At Risk of School Failure - Students or groups of students who are considered to have a higher probability of failing academically or dropping out of school.</p>	<ul style="list-style-type: none"> ● Maximize use of community resources ● Connect family to school and school activities ● Support through transition ● Help develop compensating strategies ● Increase opportunity for positive peer group influences ● Supplemental courses ● Placement in small and interactive groups
<p>English Language Learner Students (ELL)</p>	<ul style="list-style-type: none"> ● Alternate Responses ● Notes in Advance ● Extended Time ● Simplified Instruction (written and verbal) ● Online Dictionary ● Use lots of visuals ● Use physical activity; model, role-play ● Repeat/Rephrase often ● Use lower level materials when appropriate
<p>Gifted & Talented Students (G&T)</p>	<p style="text-align: center;"><u>Inclusion, infusion and differentiated instruction across the curriculum meets the individual needs of gifted and talented students. Gifted and talented services include:</u></p> <ul style="list-style-type: none"> ● Differentiated curriculum for the gifted learner. ● Regular classroom curricula and instruction that is adapted, modified, or replaced. ● Educational opportunities consist of a continuum of differentiated curricular options, instructional approaches and materials. ● Integrated G&T programming into the general education school day. ● Flexible groupings of students to facilitate differentiated instruction and curriculum. <p style="text-align: center;"><u>Learning Environments:</u></p>

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	<ul style="list-style-type: none">● Extensive outside reading● Active classroom discussion● Innovative oral and written presentations● Deductive and inductive reasoning● Independent writing and research● Divergent thinking● Challenging problem solving situations● Interactive, independent and interdisciplinary activities
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