



Science Department Grade 1 Curriculum

Developed By: Amanda Cruz and Dana SanGiacomo

Supported by: Mrs. Carly Johnson, K-12 Science Coordinator and Mrs. Janine Hess-Loconsolo, Director of Curriculum, Instruction and Assessment K-5

Last Updated: July 2019, Revised June 2021 Climate Change

Standards in Action: Climate Change Earth's climate is now changing faster than at any point in the history of modern civilization, primarily as a result of human activities. Global climate change has already resulted in a wide range of impacts across New Jersey and in many sectors of its economy. The addition of academic standards that focus on climate change is important so that all students will have a basic understanding of the climate system, including the natural and human-caused factors that affect it. The underpinnings of climate change span across physical, life, as well as Earth and space sciences. The goal is for students to understand climate science as a way to inform decisions that improve quality of life for themselves, their community, and globally and to know how engineering solutions can allow us to mitigate impacts, adapt practices, and build resilient systems. The topic of climate change can easily be integrated into science classes. At each grade level in which systems thinking, managing uncertainty, and building arguments based on multiple lines of data are included, there are opportunities for students to develop essential knowledge and skills that will help them understand the impacts of climate change on humans, animals, and the environment. For example, in the earlier grades, students can use data from first hand investigations of the school-yard habitat to justify recommendations for design improvements to the school-yard habitat for plants, animals, and humans. In the middle grades, students use resources from New Jersey Department of Environmental Protection, the National Oceanic and Atmospheric Administration (NOAA), and National Aeronautics and Space Administration (NASA), to inform their actions as they engage in designing, testing, and modifying an engineered solution to mitigate the impact of climate change on their community. In high school, students can construct models they develop of a proposed solution to mitigate the negative health effects of unusually high summer temperatures resulting from heat islands in cities across the globe and share in the appropriate setting. (NJDOE, Standards Draft Approval, 2020)

Scope and Sequence

Grade 1

Throughout the unit, Mystery Science will direct that some units are "optional" or for "extension purposes". For our curriculum programming and pacing, all activities, even those indicated as "optional" are mandated parts of the curriculum for coverage. In the event of an emergency situation, where a long period of curricular time is lost due to unforeseen circumstances, the activities noted by Mystery Science as "optional" would be the first activities to eliminate from coverage.

Unit 1: Plant & Animal Superpowers (6-9 weeks) *Climate Change Connection	Unit 2: Lights & Sound (6-9 weeks)	Unit 3: Spinning Sky (6-9 weeks)
Mystery 1: Why do birds have beaks? (1-LS1-1)	Mystery 1: How do they make silly sounds in cartoons? (1-PS4-1)	Mystery 1: Could a statue's shadow move? (1-ESS1-1)
Mystery 2 Read Along: Why do baby ducks follow their mother? (1-LS1-2)	Mystery 2 Read Along: Where do sounds come from? (1-PS4-1)	Mystery 2 Read Along: What does your shadow do when you're not looking? (1-ESS1-1)
Mystery 3: Why are polar bears white? (1-LS1-1)	Mystery 3: What if there were no windows? (1-PS4-3)	Mystery 3: How can the sun help you if you're lost? (1-ESS1-1)
Mystery 4 Read Along: Why do family members look alike? (1-LS3-1)	Mystery 4 Read Along: Can you see in the dark? (1-PS4-2)	Mystery 4 Read Along: Why do you have to go to bed early in the summer? (1-ESS1-2)
Mystery 5: Why don't trees blow down in the wind? (1-LS1-1, K-2-ETS1-2, K-2-ETS1-3)	Mystery 5: How could you send a secret message to someone far away? (1-PS4-4, K-2-ETS1-2)	Mystery 5: Why do the stars come out at night? (1-ESS1-1)
Read Along Mystery 6: What do sunflowers do when you're not looking? (1-LS1-1)	Read Along Mystery 6: How do boats find their way in the fog? (1-PS4-4)	Mystery 6 Read Along: How can stars help you if you get lost? (1-ESS1-1)

Plant & Animal Superpowers (6-9 weeks)

Parts, Survival, and Growth

Profound Perspective: This unit will help students develop the idea that, like a superhero has special powers, every animal and plant has special parts and behaviors that help them to grow and meet their needs.

Climate Change Connection: Grade-level appropriate discussion of how animals and plants may need to change if climate change caused a change to their habitat.

QUESTIONING Example: If the North Pole's glaciers and snow melted, due to climate change, what would polar bears need to have changed to survive?

Grade 1 Life Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 1 Why do birds have beaks?	1-LS1-1	Structure & Survival	All living things have body parts that help them survive and grow. Each kind of animal has special body parts that help them get the food they need to survive. Some animals use their hands, mouth, beaks, trunks, or tongues to eat their food. The shape of the body part they use to get food is best suited for the type of food the animal eats. DCIs: LS1.A	Students model how different bird beaks are well suited for eating different kinds of foods. Students conduct an investigation to figure out how much food (straw pieces) they can pick up using each beak. Analyzing these results , students construct arguments using their evidence about which beak would help the birds survive in different environments.	Students consider the relationship between the shape of a bird's beak (structure), and the food it eats (function). They begin to observe the pattern that all animals have structures that help them accomplish unique functions.
Mystery 2 Read Along Why do baby ducks follow their mother?	1-LS1-2	Parenting & Offspring Survival	Offspring, the children of living things, need to get their needs met in order to survive. All offspring need food, shelter, protection, and comfort. They also need to learn how to survive on their own. Animal parents (including humans) have the important job of teaching their offspring how to survive before they grows up. Offspring learn from their parents and rely on them to meet their survival needs when they are young. DCIs: LS1.B	Students obtain information about different animal mothers engaging in behavior to help their offspring survive. They evaluate and communicate the information by discussing why each animal mother does each behavior for her offspring.	Students consider the patterns in the behavior of parents and offspring that help offspring survive.
Mystery 3 Why are polar bears white?	1-LS1-1	Structure & Survival	This Mystery continues the exploration that animals have body parts to help them survive and grow. Animals have different behaviors and body parts that help protect themselves from danger. The color of an animal's fur, feathers, skin, or scales can help them blend in with their habitat. Camouflage helps both prey and predators survive! DCIs: LS1.A	Students model how camouflage helps moths survive by carrying out an investigation with differently patterned paper moths and trees. They see how many moths they can find in the paper forest. Moths that match the pattern of the tree will be harder to see, while moths that are patterned differently than the tree will be much more visible. Students make an argument about which moths a hungry bird would eat first based on evidence from their investigation. Next, they choose a place in the classroom and design their own moth that will camouflage into the area.	Students consider the relationship between the color of an animal's fur, feathers, or skin (structure), and how this helps it survive in its habitat (function). They begin to observe the pattern that all animals have structures that help them survive.

Grade 1 Life Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 4 Read Along Why do family members look alike?	1-LS3-1	Inheritance & Variation of Traits	All living things share similar characteristics with their parents. For example, a baby duckling looks like a duck, not a cow! You'll notice that young animals and plants look similar to their parents, but not identical. DCIs: LS3.A, LS3.B	Students use observations of animal parents and their offspring to construct an explanation about young plants and animals being similar, but not identical, to their parents. They play the game MatchUp, between mother and baby animals, using their knowledge of similar characteristics.	Students consider shared characteristics between parents and their offspring as a pattern .

Mystery 5 Why don't trees blow down in the wind?	1-LS1-1 K-2-ETS1-2 K-2-ETS1-3	Plants & Engineering	All living things have structures, or external parts. Animals use their body parts to help them survive, grow, and communicate. Plants also have external parts that help them to survive. Humans can mimic the structure and function of an animal or plant's external parts to design solutions to their problems. DCIs: LS1.A, ETS1.A, ETS1.B, ETS1.C	Students develop a model of an umbrella and conduct an investigation to test wind's effect on it. Students design a solution to solve the problem of needing a shade structure that won't blow over in the wind, by mimicking a tree's external part.	Students observe the relationship between a tree's roots and leaves (structure) and how they help the tree stand in the wind (function). They apply this relationship in a natural object to a designed object.
Mystery 6 Read Along What do sunflowers do when you're not looking?	1-LS1-1	Plant Survival	Sunflowers move throughout the day so that they are always facing the sun! Their stem bends so that the sunflower always gets as much sun as possible to help it grow. The flower starts the day facing east, where the sun rises, and ends the day facing west, where the sun sets. DCIs: LS1.A, LS1.D	Students conduct an investigation to test how plants respond to light. They observe how the direction a plant grows depends on the position of the light.	Students observe the relationship between a sunflower's flower and stem (structure) and how the flower parts bend to get as much sun as possible throughout the day (function). This response to the environment helps sunflowers grow.

Lights & Sounds (6-9 weeks)

Properties of light and sound

Profound Perspective: This unit will develop the idea that by exploring the properties of light and sound, human beings create fun and useful things.

Grade 1 Physical Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 1 How do they make silly sounds in cartoons?	1-PS4-1	Sounds, Vibrations	There are so many different types of sounds! Some are loud, soft, high, low, or even silly. People are capable of making a lot of different sounds. Each sound is made with a back and forth movement, called a vibration. Different vibrations make different sounds. DCIs: PS4.A	Students carry out investigations exploring how to make different sounds. First, they use their hands and feet to make the sounds of a rain storm. Next, they use the vibration of a ruler to create a 'boing' sound as the soundtrack to a bouncing ball animation. Students construct the explanation that objects vibrate when they make a sound, and if the vibration stops, the sound stops as well.	Students consider the relationship between vibrations (cause) and sound (effect).
Mystery 2 Read Along Where do sounds come from?	1-PS4-1	Sounds, Vibrations	Sounds are caused by an object vibrating. If a vibration stops, then the sound will stop too. Musical instruments make many unique and interesting sounds! When an instrument makes music, it comes from a part of the instrument vibrating. DCIs: PS4.A	Students carry out investigations to explore different sounds and how they are created. They create three different sound makers and construct an explanation about where the vibrations are happening in each sound experiment.	Students consider the relationship between vibrations (cause) and sound (effect).

Mystery 3 What if there were no windows?	1-PS4-3	Light, Materials, Transparent & Opaque	Glass is a transparent material, it is see-through and light can pass through it. Imagine what life would have been like with no glass. There would have been no windows, no eyeglasses, and even no windshields in a car! There are also materials that are <i>somewhat</i> see-through (some light can pass through) called translucent materials. Materials that are not see-through at all (no light can pass through) are called opaque materials. DCIs: PS4.B	Students investigate the difference between transparent, translucent, and opaque materials by sorting them. They determine whether a material is transparent, translucent or opaque. Students then create a stained glass window using tissue paper. In this activity, they construct an argument to answer what happens to tissue paper when it is layered.	Students reason about the cause and effect relationship between the type of material (cause) and the amount of light that can pass through it (effect).
---	---------	--	--	--	--

Grade 1 Physical Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 4 Read Along Can you see in the dark?	1-PS4-2	Illumination	If you've ever been in a completely dark space, you know you can't see anything! Even the slightest bit of light helps us see our surroundings. In a dark room there is often light from the hallway coming in through the crack under the door. The night sky is full of bright stars, and roads have street lights. Objects can only be seen if they are illuminated or give off their own light. DCIs: PS4.B	Students carry out an investigation using a Mystery Box. They look inside the completely dark box to see if they can see the shape of the object inside. They allow more light in through peepholes to illuminate the object and allow them to see it. Students use their observations to construct the explanation that objects need light to be seen.	Students consider the cause and effect relationship between light (cause) and being able to see objects (effect).
Mystery 5 How could you send a secret message to someone far away?	1-PS4-4 K-2-ETS1-2	Engineering & Communication	People use many different devices to communicate over long distances. Cell phones and iPads help us communicate with people far away, but they had to be invented. People don't just communicate with sound, we can also use light. A great example is a traffic light which tells cars to go, slow down, or stop using light signals. DCIs: PS4.C, ETS1.B	Students are presented with the problem that they need to send a message at night, without using noise. They design a solution with a partner by correlating light colors to a specific message. Using their secret code, partners take turns communicating information across the room with light signals.	Students consider light signals and their understood meaning as a pattern .
Mystery 6 Read Along How do boats find their way in the fog?	1-PS4-4	Lights, Sounds, & Communication	Colors, lights, and sounds help us communicate over long distances. Sounds can even help us communicate when it is difficult to see. People who drive cars and boats use colors, lights, and sounds to help them find their way around the road or sea. DCIs: PS4.C	Students obtain information about light and sound signals. They play red light/green light to practice responding to common signals. Students conduct an investigation of different sounds. They find their 'sound partner'--the student who has the same sound object in their cup. Students analyze different sounds with their eyes closed. They determine which type of sound they heard.	Students consider that different light and sound signals form a pattern used for communication.

Spinning Sky (6-9 weeks)

Sun, Moon, and Stars

Profound Perspective: This unit will help students develop the idea that the Sun, Moon, and stars change position in the sky in ways that are fun to watch and predict.

Grade 1 Earth & Space Science	Performance Expectations	Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 1 Could a statue's shadow move?	1-ESS1-1	Sun, Shadows, & Daily Patterns	<p>Patterns of motion are all around us; they're even in the sky! If you observe a still object throughout the day, you'll see that its shadow changes. The Sun doesn't stay in the same place all day. It is the Sun's movement across the sky that changes the shape of an object's shadow.</p> <p>DCIs: ESS1.A</p>	<p>Students conduct two investigations. In the first, they place a gnome in the sun and trace its shadow. They observe how the shadow changes as time passes, or as the sun moves across the sky. In their second investigation, they use model gnomes to analyze how to move a light source to change the shape and length of the shadow of the gnome. Interpreting this data, they construct an explanation about what causes a shadow to move.</p>	<p>Students consider the movement of shadows to be caused by the pattern of the sun's movement across the sky.</p>
Mystery 2 Read Along What does your shadow do when you're not looking?	1-ESS1-1	Sun, Shadows, & Daily Patterns	<p>Each day, the Sun moves across the sky in an arch shape. It is low in the mornings, high in the afternoon, and low again in the evenings. When the Sun is low in the sky, it makes shadows long. When it is high in the sky, shadows are short. If you look closely, you'll notice your shadow also changes sides in the morning and evening.</p> <p>DCIs: ESS1.A</p>	<p>Students conduct an investigation to gather information about how their shadow changes throughout the day. They trace their shadow in the morning and afternoon, then analyze the data to identify differences in the shadows. Using the data, they construct an explanation about why their shadows point in different directions.</p>	<p>Students explain changes in shadows by considering the patterns in the Sun's movement across the sky. They identify the cause and effect relationship between the height of the Sun in the sky and a shadow's length and direction.</p>
Mystery 3 How can the sun help you if you're lost?	1-ESS1-1	Sun & Daily Patterns	<p>The Sun's movement across the sky is a pattern! We can use its path to help us figure out the direction we're headed. Since we know the Sun always rises in the east, moves across the sky, and sets in the west, we can use the time of day and the Sun's position to figure out which way is east and which way is west.</p> <p>DCIs: ESS1.A</p>	<p>Students develop a Sun Finder, a model of the Sun's movement across the sky. Using the model, they reason about how the sun can help guide them during the day. Since they know that they walked toward the Sun to get to their friend's house in the morning, they must use evidence to argue whether they should walk toward or away from the Sun to get home in the afternoon.</p>	<p>Students analyze the pattern of the Sun's movement across the sky each day.</p>

Grade 1 Earth & Space Science		Topics	Disciplinary Core Ideas (DCIs) (Mystery Conceptual Flow)	Scientific & Engineering Practices (SEPs)	Crosscutting Concepts (CCC)
Mystery 4 Read Along Why do you have to go to bed	1-ESS1-2	Sun & Seasonal Patterns	<p>Depending on the season, it takes different amounts of time for the Sun to move across the sky. This makes it seem like some seasons have longer days, and others have shorter days. During the summer, the Sun rises earlier and sets later - there are <i>more</i> hours of daylight. In the winter, the Sun rises later</p>	<p>Students obtain information about the seasonal patterns of sunrise and sunset through a printable student reader. Students read the text independently to determine seasonal daylight patterns.</p>	<p>Students consider the pattern that there are more hours of daylight during the summer than there are in the winter.</p>

early in the summer ?			and sets earlier - there are <i>less</i> hours of daylight. DCIs: ESS1.B		
Mystery 5 Why do the stars come out at night?	1-ESS1-1	Stars & Daily Patterns	It seems that stars only come out at night, but they are actually always there. It's just that we can only see them at night. We can't see stars during the day because the Sun is out and its brightness outshines the stars. When the Sun sets, the stars are not outshone and you can see them. It isn't just the Sun that outshines stars, this is true about any bright light. If the moon is very bright, or there are bright city lights, it will be harder to see stars. DCIs: ESS1.A	Students develop and use a model of the Big Dipper in the night sky. They carry out an investigation to determine why stars are only visible in the night sky. Students construct an explanation about the stars being outshone by the Sun in the daytime sky, and then being visible again when the Sun sets.	Students consider the pattern that the stars are only visible in the night sky. They explore the cause and effect relationship between the Sun's brightness and the visibility of the stars.
Mystery 6 Read Along How can stars help you if you get lost?	1-ESS1-1	Stars & Seasonal Patterns	There are groups of stars in the sky that form a pattern; they are called constellations. One constellation, the Big Dipper, can help us find where the North Star is! Even though the Big Dipper changes its spot in the sky in different seasons, it always points to the North Star. DCIs: ESS1.A	Students obtain, evaluate, and communicate information about the cardinal directions. They conduct an investigation to determine which direction each part of their classroom is facing.	Students consider the pattern that stars are in different places in the sky during different seasons. They consider the pattern that the Big Dipper help us find the North Star.

Unit 1	
Plant and Animal Superpowers	
Summary and Rationale	
This unit about plant and animal survival helps students develop the idea that, just like a superhero has special powers, every animal and plant has special parts and behaviors that help them to grow and meet their needs.	
Recommended Pacing	
6-9 weeks	
Standards	
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.

1-LS1-2	Read texts and use media to determine patterns in the behavior of parents and offspring that help offspring survive.
1-LS3-1	Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.
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.
Interdisciplinary Connections	
RI.1.1	Ask and answer questions about key details in a text. (1-LS1-2),(1-LS3-1)
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. (1-LS1-1),(1-LS3-1)
W.1.8	With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-LS3-1)
MP.2	Reason abstractly and quantitatively. (1-LS3-1)
MP.5	Use appropriate tools strategically. (1-LS3-1)
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 used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. (1-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)
1.MD.A.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-LS3-1)
Integration of Technology	

8.1.2.A.1	Identify the basic features of a digital device and explain its purpose.
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
Career Readiness, Life Literacies and Key Skills	
9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
9.4.2.IML.3	Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).
Objectives (SLO)	
<p>Students will know:</p> <p>All living things have body parts that help them survive and grow. Each kind of animal has special body parts that help them get the food they need to survive. Some animals use their hands, mouth, beaks, trunks, or tongues to eat their food. The shape of the body part they use to get food is best suited for the type of food the animal eats</p> <p>Offspring, the children of living things, need to get their needs met in order to survive. All offspring need food, shelter, protection, and comfort. They also need to learn how to survive on their own. Animal parents (including humans) have the important job of teaching their offspring how to survive before they grow up. Offspring learn from their parents and rely on them to meet their survival needs when they are young.</p> <p>This Mystery continues the exploration that animals have body parts to help them survive and grow. Animals have different behaviors and body parts that help protect themselves from danger. The color of an animal's fur, feathers, skin, or scales can help them blend in with their habitat. Camouflage helps both prey and predators survive!</p> <p>All living things share similar characteristics with their parents. For example, a baby duckling looks like a duck, not a cow! You'll notice that young animals and plants look similar to their parents, but not identical.</p>	<p>Students will be able to:</p> <p>Investigate the relationship between the shape of a bird's beak (structure) and the food it eats (function).</p> <p>Construct an argument using evidence about which beak would help birds survive in their environment.</p> <p>Recognize that all animals have specific structures for their needs.</p> <p>Articulate how the behaviors of animal mothers help their offspring survive.</p> <p>Investigate camouflage (color of fur, feathers, and skin) and its ability to help some animals survive in a habitat.</p> <p>Design an animal that camouflages into a specific area.</p> <p>Differentiate between the terms "similar" and "identical" as they relate to parents and offspring.</p> <p>Articulate that parents and their offspring share some, but not all, characteristics.</p> <p>Compare an object blowing in the wind to a tree blowing in the wind.</p> <p>Explain that a tree's external parts (roots and leaves) help the tree stand in the wind.</p> <p>Test how plants respond to light.</p> <p>Articulate that the external parts of a sunflower (flower and stem) help it grow in its environment by bending towards the sunlight.</p>

All living things have structures, or external parts. Animals use their body parts to help them survive, grow, and communicate. Plants also have external parts that help them to survive. Humans can mimic the structure and function of an animal or plant's external parts to design solutions to their problems. Sunflowers move throughout the day so that they are always facing the sun! Their stem bends so that the sunflower always gets as much sun as possible to help it grow. The flower starts the day facing east, where the sun rises, and ends the day facing west, where the sun sets.

Suggested Resources/Technology Tools

<https://mysteryscience.com/powers/plant-animal-structures-and-survival/activity-prep>

<https://www.sustainablejerseyschools.com/resources/resource-library/climate-change-curriculum/>

https://www.teachengineering.org/lessons/view/duk_sunflower_mary_less

https://www.teachengineering.org/activities/view/duk_sunflower_mary_act

<https://jr.brainpop.com/>

- Videos about animals
- Camouflage
- Parts of a Plant
- Plant adaptations
- Trees

Epic!

- Living Things
- Raccoons
- White Animals
- Hidden in Plain Sight: Animal Camouflage
- Woodpeckers: Backyard Wildlife
- Plants Are Alive!
- Plant Secrets
- Plants Make Their Own Food
- National Geographic Readers: Seed to Plant

Tier 1 Modifications and Accommodations

Including special education students, Multilingual Language Learners (MLLs), students at risk of school failure, gifted and talented students, and students with 504 plans;

Teachers can choose from any of the suggested modifications that follow based upon teaching style, instructional method and needs of individual students.

General Modifications for students struggling to learn -

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.
- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

MLL -

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow MLL students to hear the sentence and try to comprehend it.
- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE “Take a stab at it.” Ensure students understand what is meant.
- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

Gifted and Talented -

Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP -

Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe
- Adjustable tables and lab equipment within reach
- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models
- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals
- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

Career Readiness, Life Literacies, and Key Skills NJSLs

Please select all standards that apply to this unit of study:

- Act as a responsible and contributing citizen and employee.
- Apply appropriate academic and technical skills.
- Attend to personal health and financial well being.

- Communicate clearly and effectively and with reason.
- Consider the environmental social and economic impacts of decisions.
- Demonstrate creativity and innovation.
- Employ valid and reliable research strategies.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Model integrity, ethical leadership, and effective management.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity.
- Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: <https://www.nj.gov/education/standards/clicks/>

LINKS TO CAREERS:

<https://easyscienceforkids.com/what-is-a-zoologist-video-for-kids/>

Unit 2	
Lights and Sounds	
Summary and Rationale	
This unit will develop the idea that by exploring the properties of light and sound, human beings create fun and useful things.	
Recommended Pacing	
6-9 weeks	
Standards	
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.
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.
Interdisciplinary Connections	
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)
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-PS4-2),(1-PS4-3)
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 length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps. (1-PS4-4)
Integration of Technology	
8.1.2.A.1	Identify the basic features of a digital device and explain its purpose.
8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
Career Readiness, Life Literacies and Key Skills	
9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

9.4.2.IM
L.3

Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).

Students will know:

There are so many different types of sounds! Some are loud, soft, high, low, or even silly. People are capable of making a lot of different sounds. Each sound is made with a back and forth movement, called a vibration. Different vibrations make different sounds.

Sounds are caused by an object vibrating. If a vibration stops, then the sound will stop too. Musical instruments make many unique and interesting sounds! When an instrument makes music, it comes from a part of the instrument vibrating.

Glass is a transparent material, it is see-through and light can pass through it. Imagine what life would have been like with no glass. There would have been no windows, no eyeglasses, and even no windshields in a car! There are also materials that are somewhat see-through (some light can pass through) called translucent materials. Materials that are not see-through at all (no light can pass through) are called opaque materials.

If you've ever been in a completely dark space, you know you can't see anything! Even the slightest bit of light helps us see our surroundings. In a dark room there is often light from the hallway coming in through the crack under the door. The night sky is full of bright stars, and roads have street lights. Objects can only be seen if they are illuminated or give off their own light.

People use many different devices to communicate over long distances. Cell phones and iPads help us communicate with people far away, but they had to be invented. People don't just communicate with sound, we can also use light. A great example is a traffic light which tells cars to go, slow down, or stop using light signals.

Colors, lights, and sounds help us communicate over long distances. Sounds can even help us communicate when it is difficult to see. People who drive cars and boats use colors, lights, and sounds to help them find their way around the road or sea.

Students will be able to:

Create different sounds using their body.

Investigate how vibrations create sound.

Explain that objects vibrate when they make a sound and that the sound stops when the vibration stops.

Define "transparent", "translucent", and "opaque" as they relate to light.

Classify transparent, translucent, and opaque materials.

Determine that light (cause) illuminates objects (effect).

Understand that messages can be sent through light.

Communicate with a partner using light and sound signals.

Use and respond to common light and sound signals.

Suggested Resources/Technology Tools

<https://mysteryscience.com/light/properties-of-light-sound/activity-prep>

https://www.teachengineering.org/activities/view/colors_absorb_heat_better

<https://jr.brainpop.com/>

- Light
- Sound

- Musical Instruments
- Colors

Epic!

- The Light Bulb
- Light
- Ears
- Sound

Tier 1 Modifications and Accommodations

Including special education students, Multilingual Language Learners (MLLs), students at risk of school failure, gifted and talented students, and students with 504 plans;

Teachers can choose from any of the suggested modifications that follow based upon teaching style, instructional method and needs of individual students.

General Modifications for students struggling to learn -

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.
- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

MLL -

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow MLL students to hear the sentence and try to comprehend it.
- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE "Take a stab at it." Ensure students understand what is meant.
- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

Gifted and Talented -

Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP -

Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe

- Adjustable tables and lab equipment within reach
- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models
- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals
- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

Career Readiness, Life Literacies, and Key Skills NJSL

Please select all standards that apply to this unit of study:

- Act as a responsible and contributing citizen and employee.
- Apply appropriate academic and technical skills.
- Attend to personal health and financial well being.
- Communicate clearly and effectively and with reason.
- Consider the environmental social and economic impacts of decisions.
- Demonstrate creativity and innovation.
- Employ valid and reliable research strategies.
- Utilize critical thinking to make sense of problems and persevere in solving them.
- Model integrity, ethical leadership, and effective management.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity.
- Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: <https://www.nj.gov/education/standards/clicks/>

LINKS TO CAREERS:

<https://www.careersinmusic.com/lighting-technician>

Unit 3

Spinning Sky

Summary and Rationale

This unit will help students develop the idea that the Sun, Moon, and stars change position in the sky in ways that are fun to watch and predict.

Recommended Pacing

6-9 weeks

Standards

Grade 1

1-ESS1-1.	Use observations of the sun, moon, and stars to describe patterns that can be predicted.
-----------	--

1-ESS1-2.	Make observations at different times of year to relate the amount of daylight to the time of year.
-----------	--

Interdisciplinary Connections

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)
-------	--

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)
----------	---

Integration of Technology

8.1.2.A.1	Identify the basic features of a digital device and explain its purpose.
-----------	--

8.1.2.A.4	Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
-----------	--

Career Readiness, Life Literacies and Key Skills	
9.4.2.CI.1	Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
9.4.2.CT.1	Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
9.4.2.CT.2	Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
9.4.2.CT.3	Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
9.4.2.IML.3	Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).
Objectives (SLO)	
<p>Students will know:</p> <p>Patterns of motion are all around us; they're even in the sky! If you observe a still object throughout the day, you'll see that its shadow changes. The Sun doesn't stay in the same place all day. It is the Sun's movement across the sky that changes the shape of an object's shadow.</p> <p>Each day, the Sun moves across the sky in an arch shape. It is low in the mornings, high in the afternoon, and low again in the evenings. When the Sun is low in the sky, it makes shadows long. When it is high in the sky, shadows are short. If you look closely, you'll notice your shadow also changes sides in the morning and evening.</p> <p>The Sun's movement across the sky is a pattern! We can use its path to help us figure out the direction we're headed. Since we know the Sun always rises in the east, moves across the sky, and sets in the west, we can use the time of day and the Sun's position to figure out which way is east and which way is west. Depending on the season, it takes different amounts of time for the Sun to move across the sky. This makes it seem like some seasons have longer days, and others have shorter days. During the summer, the Sun rises earlier and sets later - there are more hours of daylight. In the winter, the Sun rises later and sets earlier - there are less hours of daylight.</p> <p>It seems that stars only come out at night, but they are actually always there. It's just that we can only see them at night. We can't see stars during the day because the Sun is out and its brightness outshines the stars. When the Sun sets, the stars are not outshone and you can see them. It isn't just the Sun that outshines stars, this is true about any bright light.</p>	<p>Students will be able to:</p> <p>Observe changes to a shadow during the day.</p> <p>Move a light source change the shape and length of a shadow.</p> <p>Analyze the pattern of the sun's movement throughout the day.</p> <p>Explain that the sun's height and movement change the shape, length, and direction of a shadow.</p> <p>Construct an argument about direction based on the sun's position.</p> <p>Differentiate between sunrise and sunset.</p> <p>Understand that there are more hours of light in the summer than the winter because the sun stays in the sky for longer.</p> <p>Articulate that stars are only visible at night because the sun outshines them during the day.</p> <p>Identify and use the cardinal directions.</p>

If the moon is very bright, or there are bright city lights, it will be harder to see the stars. There are groups of stars in the sky that form a pattern; they are called constellations. One constellation, the Big Dipper, can help us find where the North Star is! Even though the Big Dipper changes its spot in the sky in different seasons, it always points to the North Star.

Suggested Resources/Technology Tools

<https://mysteryscience.com/sky/sun-moon-stars/activity-prep>

<https://jr.brainpop.com/>

- Sun
- Light
- Seasons
- Earth
- Summer
- Moon

Epic!

- Me and My Shadow
- Sun
- Does the Sun Sleep?
- Destination Space: Stars
- The Reasons for Seasons

Tier 1 Modifications and Accommodations

Including special education students, Multilingual Language Learners (MLLs), students at risk of school failure, gifted and talented students, and students with 504 plans;

Teachers can choose from any of the suggested modifications that follow based upon teaching style, instructional method and needs of individual students.

General Modifications for students struggling to learn -

- Focus on building relationships in the classroom.
- Control the stressors for the student and manage alternate pathways for completion of assignments.
- Provide feedback utilizing a growth mindset and praise what is done correctly based upon effort, attitude and strategy.
- Boost engagement with material by providing opportunities of differentiation, group work and alternative assignments/assessments where appropriate.

MLL -

- Provide additional wait time for student responses to questions to allow students the ability to undergo the process of translation between languages, composition of response and attempted response.
- Simplification of sentence structure and repetition of questions/sentences exactly as stated before trying to rephrase to allow MLL students to hear the sentence and try to comprehend it.
- Rephrase idioms and teach their meanings as when learning a new language, translations are often very literal. IE "Take a stab at it." Ensure students understand what is meant.

- Use directed reading activities. Ensure preview of text before assigned/read, provide pre-reading questions about the main idea and offer help utilizing key words.
- Allow the use of Google Translate where appropriate.
- Utilize bilingual reading texts provided by the STC program.

Gifted and Talented -

Utilize differentiation in the areas of acceleration, enrichment, and grouping. Examples include, but are not limited to:

- interdisciplinary and problem-based assignments with planned scope and sequence
- advance, accelerated, or compacted content
- abstract and advanced higher-level thinking
- allowance for individual student interests
- assignments geared to development in areas of affect, creativity, cognition, and research skills
- complex, in-depth assignments
- diverse enrichment that broadens learning
- variety in types of resources
- internships, mentorships and independent study where applicable

504/IEP -

Modifications and accommodations must be aligned to stated plan and uphold expectations of the plan lawfully. Every student requires a different set of accommodations based upon need. Examples specific to science practice include, but are not limited to:

- Note taker or lab assistant
- Group lab assignments
- Use of scribe
- Adjustable tables and lab equipment within reach
- Classrooms, labs and field trips in accessible locations
- Additional time and separate room for test taking
- Additional time for in-class assignments
- Additional time in lab
- Visual and tactile instructional demonstrations
- Computer with voice output, spelling and grammar checker
- Seating in the front of the class
- Tactile drawings and graphs, and three-dimensional models
- Assignments in electronic format
- Large-print handouts, lab signs and equipment labels
- TV monitor connected to microscope to enlarge images
- Computer equipped to enlarge screen characters and images
- Auditory lab warning signals
- Adaptive lab equipment (talking calculators, talking thermometers, light probes, tactile timers)
- Staples on sticks to indicate units of measurement
- Visual warning system for lab emergencies

Career Readiness, Life Literacies, and Key Skills NJSL

Please select all standards that apply to this unit of study:

- Act as a responsible and contributing citizen and employee.
- Apply appropriate academic and technical skills.
- Attend to personal health and financial well being.
- Communicate clearly and effectively and with reason.
- Consider the environmental social and economic impacts of decisions.
- Demonstrate creativity and innovation.
- Employ valid and reliable research strategies.

- Utilize critical thinking to make sense of problems and persevere in solving them.
- Model integrity, ethical leadership, and effective management.
- Plan education and career paths aligned to personal goals.
- Use technology to enhance productivity.
- Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: <https://www.nj.gov/education/standards/clicks/>

LINKS TO CAREERS:

<http://www.jobsforastronomers.com/careers>