Introduction

Unique Learning System and News-2-You maintain alignment with state standards through instructional targets. These targets are the bridge between the general content standards adopted by a state, and relevant curriculum content for students with significant disabilities. The n2y Instructional Targets for science have been aligned with the Next Generation Science Standards and to a rigorous national search for grade level and extended standard science content.

For students with significant cognitive disabilities, access and participation in the state's adopted content standards are generally addressed through extended standards, which may be reduced in the depth and breadth of the adapted standards. An area of this alignment document provides a means for a district to input these extended standards. Lesson plans within Unique and News-2-You ensure the most rigorous alignment possible.

The chart below describes the sections of this alignment document. Each instructional target is addressed in one or more of the unit lessons. Additionally, differentiated task descriptors are provided to define how students with diverse abilities will have access to essential content of the standards.

<table>
<tr><th colspan="2">Standards (Earth and Space Science, Life Science, Physical Science or Scientific Inquiry)</th><th>Grade Band</th></tr>
<tr><td>Next Generation Science Standards</td><td colspan="2">Your State's Extended Standards</td></tr>
<tr><td></td><td colspan="2">Each district may input the extended standards in this section.</td></tr>
<tr><td>n2y Instructional Targets</td><td>n2y Grade Band Units</td><td>n2y Supporting Activities</td></tr>
<tr><td rowspan="4">Instructional Targets reflect the essential content of grade level standards.</td><td rowspan="4">Unique's units focus on a Science or Social Studies topic each month. All areas of Science are addressed in the three-year cycle.</td><td>Unique</td></tr>
<tr><td>Unique's supporting tools and guides supplement the unit lessons. Pertinent supports include the online library, supplemental science lessons and core activities.</td></tr>
<tr><td>News-2-You</td></tr>
<tr><td>Supporting activities and lessons, which provide practice for Instructional Targets, are listed in this column.</td></tr>
<tr><td colspan="3">n2y Differentiated Tasks
Differentiated task descriptors ensure that students with a wide variety of learning abilities and needs are able to access, participate in and make progress through the standards-based activities.
Differentiated tasks descriptors are written in student performance terminology.</td></tr>
<tr><td>Level 3</td><td>Level 2</td><td>Level 1</td></tr>
<tr><td>• Students at this level are expected to reach the highest level of independence.</td><td>• Students at this level likely will require support in all learning activities.</td><td>• Students at this level require maximum support in learning. Increasing participation is the primary goal.</td></tr>
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Earth and Space Science	Grades K–2
Next Generation Science Standards	Your State's Extended Standards
Kindergarten Earth's Systems K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time. [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [*Assessment Boundary: Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.*] K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.] Earth and Human Activity K-ESS3-1. Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live. [Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight so they often grow in meadows. Plants, animals, and their surroundings make up a system.] K-ESS3-2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. * [Clarification Statement: Emphasis is on local forms of severe weather.] K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. * [Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.] *Grade 1* Earth's Place in the Universe 1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted. [Clarification Statement: Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky, and set; and stars other than our sun are visible at night but not during the day.] [Assessment Boundary: Assessment of star patterns is limited to stars being seen at night and not during the day.]	

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1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year. [Clarification Statement: Emphasis is on relative comparisons of the amount of daylight in the winter to the amount in the spring or fall.] [Assessment Boundary: Assessment is limited to relative amounts of daylight, not quantifying the hours or time of daylight.] *Grade 2* Earth's Place in the Universe 2-ESS1-1. Use information from several sources to provide evidence that Earth events can occur quickly or slowly. [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.] [Assessment Boundary: Assessment does not include quantitative measurements of timescales.] Earth's Systems 2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. * [Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.] 2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area. [Assessment Boundary: Assessment does not include quantitative scaling in models.] 2-ESS2-3 Obtain information to identify where water is found on Earth and that it can be solid or liquid. ** The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.*		
n2y Instructional Targets	**n2y Elementary Grade Band Unit**	**n2y Supporting Activities**
• Observe and describe daily and seasonal changes in the weather. • Identify properties of air (temperature, wind speed, etc.). • Identify forms of water in the air (clouds, steam, fog, rain, snow, etc.). • Observe and describe the Sun, moon and stars in relation to day and night. • Recognize the Sun as a source of energy that gives light and heat. • Determine the speed of an Earth event. (earthquake, volcano eruption, rock erosion). • Identify ways to prevent land erosion (plant trees, dams, etc.). • Recognize areas of land and water on Earth's surface (ocean, lake, mountain, desert, etc.). • Observe and identify water and the ways it can change (ice, rain, snow, etc.).	May, 2015 - 2016 November, 2016 - 2017 March, 2017 - 2018	Core Materials: Weather Report n2y Library/Science Books ULS Monthly Lessons: Supplemental Science Lessons Standards Connection

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n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will identify four seasons with associated weather and nature changes. • Students will record daily weather conditions to describe patterns and changes. • Students will identify various forms of water related to weather conditions (clouds, steam, fog, rain, snow, etc.). • Students will explain that the Sun is found in the sky during the day and that the Moon is found in the sky at night. • Students will recognize that the Sun provides light and heat. • Students will determine if an event happened quickly or slowly (earthquake, volcano eruption, rock erosion, etc.). • Students will describe ways to prevent land erosion. • Students will describe differences between areas of land and water (a mountain is high, a field is flat, an ocean is big, a pond is small, etc.). • Students will describe how water can change forms (ice, rain, snow, etc.).	• Students will match pictures of a season with a typical weather condition or activity. • Students will identify weather conditions for the day (sunny, cloudy, rainy, snowy, windy, etc.). • Students will identify weather conditions that involve forms of water (rain, snow, fog, clouds). • Students will identify the Sun and Moon as objects in the sky. • Students will recognize that light and heat come from the Sun. • Students will identify Earth events (earthquake, rock erosion). • Students will identify ways to prevent land erosion. • Students will sort pictures representing areas of land or water (ocean, lake, mountain, field, etc.). • Students will identify water in various forms (ice, rain, snow, etc.).	• Students will select a picture associated a given season of the year. • Students will select a picture representing the weather of the day. • Students will identify rain. • Students will identify day and night through various activities. • Students will identify the Sun. • Students will observe Earth events (earthquake, volcano eruption, rock erosion). • Students will choose a way to prevent land erosion. • Students will identify a picture of water and land in various forms (ocean, lake, mountain, field, etc.). • Students will observe and experience water in various forms (ice, rain, snow, etc.).

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Life Science	Grades K–2
Next Generation Science Standards	Your State's Extended Standards
Kindergarten From Molecules to Organisms: Structure and Process K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and that all living things need water.] *Grade 1* From Molecules to Organisms: Structure and Process 1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs. [Clarification Statement: Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking animal tails and roots on plants; keeping out intruders by mimicking thorns on branches and animal quills; and, detecting intruders by mimicking eyes and ears.] 1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. [Clarification Statement: Examples of patterns of behaviors could include the signals that offspring make (such as crying, cheeping, and other vocalizations) and the responses of the parents (such as feeding, comforting, and protecting the offspring).] Heredity: Inheritance and Variation of Traits 1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. [Clarification Statement: Examples of patterns could include features plants or animals share. Examples of observations could include leaves from the same kind of plant are the same shape but can differ in size; and, a particular breed of dog looks like its parents but is not exactly the same.] [Assessment Boundary: Assessment does not include inheritance or animals that undergo metamorphosis or hybrids.] *Grade 2* Ecosystems: Interactions, Energy and Dynamics 2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow. [Assessment Boundary: Assessment is limited to testing one variable at a time.] 2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*	

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Biological Evolution: Unity and Diversity 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.] ** The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.*		
n2y Instructional Targets	Elementary Grade Band Unit	n2y Supporting Activities
• Identify basic needs of plants and animals. • Identify traits that help living things survive. • Observe in what ways an offspring resembles its parents. • Identify animals and their environment.	October, 2015 - 2016 May, 2016 - 2017 January, 2017 -2 018 May, 2017 - 2018	n2y Library/Science Books ULS Monthly Lessons: Supplemental Science Lessons Standards Connection
n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will explain why plants and animals need food, water, air and sunlight to grow. • Students will describe the basic function of the parts of an animal or plant and how each helps the animal or plant grow (e.g., roots take in water). • Students will describe ways offspring resemble its parents. • Students will identify plants and animals that live in different habitats.	• Students will identify elements needed for plants and animals to survive and grow (food, water, air etc.) • Students will identify parts of an animal: head, eyes, ears, mouth and/or plant: seed, root, stem, leaf, flower and function of each. • Students will match like features of offspring and their parents. • Students will match plants and animals to corresponding habitat.	• Students will identify basic needs (food, water, air etc.). • Students will locate and explore the function of parts of the body and/or plant with assistance. • Students will match animal babies to parent animal. • Students will match plants and animals to habitat.

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Physical Science	Grades K–2
Next Generation Science Standards	Your State's Extended Standards
Kindergarten Motion and Stability: Forces and Interactions K-PS2-1. Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. [Clarification Statement: Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.] [Assessment Boundary: Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include non-contact pushes or pulls such as those produced by magnets.] K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull. * [Clarification Statement: Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn.] [Assessment Boundary: Assessment does not include friction as a mechanism for change in speed.] Energy K-PS3-1. Make observations to determine the effect of sunlight on Earth's surface. [Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water.] [*Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.*] K-PS3-2. Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area. * [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.] *Grade 1* Waves and Their Applications in Technologies for Information Transfer 1-PS4-1. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. [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.] 1-PS4-2. Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated. [Clarification Statement: Examples of observations could include those made in a completely dark room, a pinhole box, and a video of a cave explorer with a flashlight. Illumination could be from an external light source or by an object giving off its own light.]	

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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. [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).] [Assessment Boundary: Assessment does not include the speed of light.] 1-PS4-4. Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance. * [Clarification Statement: Examples of devices could include a light source to send signals, paper cup and string "telephones," and a pattern of drum beats.] [Assessment Boundary: Assessment does not include technological details for how communication devices work.]	
Grade 2 Matter and Its Interactions 2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.] 2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. * [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.] 2-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.] 2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.] * *The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.*	

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n2y Instructional Targets	n2y Elementary Grade Band Unit	n2y Supporting Activities
• Explore the way things move (fast or slow, in a straight line, etc.). • Observe how heat and cold can change some materials (water to ice; ice to water, etc.). • Explore sounds and how they are made. • Identify how changes in light affect the appearance of an object. • Sort and describe objects and materials according to recognizable properties.	January, 2016 - 2017 March, 2016 - 2017 March, 2017 - 2018 October, 2017 - 2018	n2y Library/Science Books ULS Monthly Lessons: Supplemental Science Lessons Standards Connection
n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will describe the motion of an object. • Students will explain how objects change when they are heated or cooled. • Student will explain how sound is made and amplified. • Students will explain how light affects the appearance of an object. • Students will describe objects by touch, smell, taste, sound and sight (five senses).	• Students will identify ways objects can move. • Students will identify changes in an object that has been heated or cooled. • Students will identify the source of a sound and how that sound can be amplified. • Students will identify visible changes in objects, due to light. • Students will identify an object after using senses (touch, taste, smell, sound and sight) to investigate.	• Students will identify an object that is moving. • Students will identify objects that are hot and cold. • Students will participate in making and amplifying a sound. • Students will identify light and dark. • Students will use a descriptive word to describe an object that has been observed through the senses (hot, cold, fast, slow, etc.).

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Scientific Inquiry/Engineering, Technology, and Applications of Science		Grades K–2
Next Generation Science Standards		Your State's Extended Standards
Kindergarten Engineering Design K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.		
n2y Instructional Targets	n2y Elementary Grade Band Unit	n2y Supporting Activities
• Observe and ask questions about the natural environment. • Make simple observations and participate in simple investigations. • Use senses to learn about the natural environment. • Use simple tools to gather data. • Communicate with others about observations and investigations.	October, 2016 - 2017	Unique n2y Library/Science Books ULS Monthly Lessons: Supplemental Science Lessons
	n2y Monthly Lessons	News-2-You
	Lesson 28: Science Experiment	Activities: Science Experiment
n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will follow steps of a scientific process related to grades K–2 science topics.	• With support, students will follow steps of a scientific process related to grades K–2 science topics.	• Students will actively participate in a scientific process related to grades K–2 science topics.

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Earth and Space Science	Grades 3–5
Next Generation Science Standards	Your State's Extended Standards
Grade 3 Earth's Systems 3-ESS2-1. Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. [Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction.] [Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.] 3-ESS2-2. Obtain and combine information to describe climates in different regions of the world. Earth and Human Activity 3-ESS3-1. Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. [Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.] *Grade 4* Earth's Place in the Universe 4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. [Clarification Statement: Examples of evidence from patterns could include rock layers with marine shell fossils above rock layers with plant fossils and no shells, indicating a change from land to water over time; and, a canyon with different rock layers in the walls and a river in the bottom, indicating that over time a river cut through the rock.] [Assessment Boundary: Assessment does not include specific knowledge of the mechanism of rock formation or memorization of specific rock formations and layers. Assessment is limited to relative time.] Earth's Systems 4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. [Clarification Statement: Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.] [Assessment Boundary: Assessment is limited to a single form of weathering or erosion.] 4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features. [Clarification Statement: Maps can include topographic maps of Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes.] Earth and Human Activity 4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. [Clarification Statement: Examples of renewable energy resources could include wind energy, water behind dams, and sunlight;	

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non-renewable energy resources are fossil fuels and fissile materials. Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning of fossil fuels.] 4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. * [Clarification Statement: Examples of solutions could include designing an earthquake resistant building and improving monitoring of volcanic activity.] [*Assessment Boundary: Assessment is limited to earthquakes, floods, tsunamis, and volcanic eruptions.*	
Grade 5 Earth's Place in the Universe 5-ESS1-1. Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. [Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, and stage).] 5-ESS1-2. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. [Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.] [Assessment Boundary: Assessment does not include causes of seasons.] Earth's Systems 5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. [Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [Assessment Boundary: Assessment is limited to the interactions of two systems at a time.]	

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5-ESS2-2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. [Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.] Earth and Human Activity 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. ** The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.*		
n2y Instructional Targets	**n2y Intermediate Grade Band Unit**	**n2y Supporting Activities**
• Recognize weather conditions and temperatures as the result of changes in Earth's cycles. • Identify Earth's renewable energy resources (air, water, Sun) and nonrenewable resources (oil, coal). • Identify ways to conserve (reduce and recycle) Earth's resources. • Identify and explore the relationship between Earth and the Sun. • Identify the Sun as one of many stars in the universe. • Recognize the relationship between day and night and identify the seasons by referring to Earth's movement around the Sun. • Observe ways that soil can hold water and support plant life. • Identify the effects of weather/erosion on Earth's surface. • Recognize areas of land and water on the Earth's surface (ocean, lake, mountain, desert, etc.).	May, 2015 - 2016 November, 2016 - 2017 March, 2017 - 2018	n2y Library/Science Books Core Materials: Weather Report ULS Monthly Lessons: Supplemental Science Lessons Standards Connection

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n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will identify patterns in weather and temperature in relation to the seasons of an area. • Students will identify and describe renewable and nonrenewable resources. • Students will describe and participate in ways to reduce and recycle Earth's resources. • Students will identify the interactions between Earth and the Sun (e.g., Earth rotates on its axis and moves around the Sun). • Students will describe a basic understanding of the changes in day and night, and seasons based on the position and movement of the Earth and the sun. • Students will describe various soil conditions and their effect in holding water and supporting plant life. • Students will describe the effects of water, ice or wind erosion on the Earth's surface. • Students will describe differences between areas of land and water (A mountain is high, a field is flat, an ocean is big, a pond is small, etc.).	• Students will describe weather in terms of temperature and conditions. • Students will identify renewable or nonrenewable resources. • Students will sort like objects that can be recycled. • Students will recognize the relationship of Earth and Sun (e.g., Humans live on Earth; the Sun gives Earth heat and light). • Students will match day and night or four seasons with positions Earth's position. • Students will identify soil conditions that are suitable for holding water and supporting plant life. • Students will identify conditions/ elements that can cause erosion (water, ice, wind etc.) • Students will sort pictures representing areas of land or water (ocean, lake, mountain, field, etc.).	• Students will identify weather conditions for the day (sunny, cloudy, rainy, snowy, windy, etc.). • Students will identify common renewable or nonrenewable resources. • Students will participate in sorting recyclable items. • Students will identify Earth and the Sun as part of the solar system. • Students will match pictures of a season with a typical weather condition or activity. • Students will identify soil and water as things plants need. • Students will observe the effects of erosion on the Earth. • Students will identify land or water in various forms (island, plane, lake, river etc.).

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Life Science	Grades 3–5
Next Generation Science Standards	Your State's Extended Standards
Grade 3 From Molecules to Organisms: Structures and Processes 3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. [Clarification Statement: Changes organisms go through during their life form a pattern.] [Assessment Boundary: Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.] Ecosystems: Interactions, Energy, and Dynamics 3-LS2-1. Construct an argument that some animals form groups that help members survive. Heredity: Inheritance and Variation of Traits 3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. [Clarification Statement: Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans.] [Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.] 3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment. [Clarification Statement: Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; and, a pet dog that is given too much food and little exercise may become overweight.] Biological Evolution: Unity and Diversity 3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. [Clarification Statement: Examples of data could include type, size, and distributions of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms.] [Assessment Boundary: Assessment does not include identification of specific fossils or present plants and animals. Assessment is limited to major fossil types and relative ages.] 3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. [Clarification Statement: Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators; and, animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.] 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.]	

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3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change. * [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.]	
Grade 4 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.] [Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.] 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. [Clarification Statement: Emphasis is on systems of information transfer. [Assessment Boundary: Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.] *Grade 5* From Molecules to Organisms: Structures and Processes 5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water. [Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.] Ecosystems: Interactions, Energy, and Dynamics 5-LS2-2. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. [Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.] ** The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.*	

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n2y Instructional Targets	n2y Intermediate Grade Band Unit	n2y Supporting Activities
• Demonstrate an understanding of the life cycles of plants and animals. • Identify how structures of living things help plants and animals survive (leaves on a plant, wings on a bird, etc.). • Identify how animals receive information (senses). • Recognize how a plant uses energy from sunlight. • Understand food webs and chains as interactions between producers and consumers. • Observe in what ways an offspring resembles its parents. • Identify environmental changes that affect plants and animals (natural disasters, seasons, etc.). • Recognize that fossils reveal information about plants and animals that lived long ago.	October, 2015 - 2016 May, 2016 - 2017 January, 2017 - 2018 May, 2017 - 2018	n2y Library/Science Books ULS Monthly Lessons: Supplemental Science Lessons Standards Connection
n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will explain the life cycle of a plant (e.g., seed to flower, fruit or vegetable) and conditions that affect growth. • Students will explain the basic life cycle of an animal. • Students will identify physical and behavioral traits that help animals live and survive in their environment (a bird's wings: flight; a fish's gills: breathing, etc.). • Students will describe items using various senses • Students will describe a basic food chain involving plants and animals. • Students will describe ways an offspring resembles its parents. • Students will explain how changes in the environment affect plants and animals. • Student will identify fossils as proof of animals and plants that lived long ago.	• Students will sequence the process of a plant's growth from seed to flower, fruit or vegetable. • Students will sequence the life cycle of an animal from egg to adult. • Students will match a feature of an animal with its function (beak to eat, wings to fly, etc.). • Students will identify objects using the five senses • Students will match an animal to its food source (lions and meat, rabbits and plants, etc.). • Students will match like features of plants or animals with their parents. • Students will sequence the affect of environmental change on plants and animals. • Students will match a fossil to the organism from which it came.	• Students will actively participate in the creation of a model life cycle. • Students will identify parts of a plant: seed, root, stem, leaf, flower. • Students will identify parts of an animal (legs, tail, etc.). • Students will actively explore items using various senses • Students will identify food from plants and animals that humans eat. • Students will match animal babies to the parent animals. • Students will identify an environmental change (natural disaster, season, etc.) that affects plants and animals. • Students will identify animals and plants that lived long ago.

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Physical Science	Grades 3–5
Next Generation Science Standards	Your State's Extended Standards
Grade 3 Motion and Stability: Forces and Interactions 3-PS2-1. Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. [Clarification Statement: Examples could include an unbalanced force on one side of a ball can make it start moving; and, balanced forces pushing on a box from both sides will not produce any motion at all.] [Assessment Boundary: Assessment is limited to one variable at a time: number, size, or direction of forces. Assessment does not include quantitative force size, only qualitative and relative. Assessment is limited to gravity being addressed as a force that pulls objects down.] 3-PS2-2. Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion. [Clarification Statement: Examples of motion with a predictable pattern could include a child swinging in a swing, a ball rolling back and forth in a bowl, and two children on a see-saw.] [Assessment Boundary: Assessment does not include technical terms such as period and frequency.] 3-PS2-3. Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other. [Clarification Statement: Examples of an electric force could include the force on hair from an electrically charged balloon and the electrical forces between a charged rod and pieces of paper; examples of a magnetic force could include the force between two permanent magnets, the force between an electromagnet and steel paperclips, and the force exerted by one magnet versus the force exerted by two magnets. Examples of cause and effect relationships could include how the distance between objects affects strength of the force and how the orientation of magnets affects the direction of the magnetic force.] [Assessment Boundary: Assessment is limited to forces produced by objects that can be manipulated by students, and electrical interactions are limited to static electricity.] 3-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets. * [Clarification Statement: Examples of problems could include constructing a latch to keep a door shut and creating a device to keep two moving objects from touching each other.] *Grade 4* Energy 4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object. [Assessment Boundary: Assessment does not include quantitative measures of changes in the speed of an object or on any precise or quantitative definition of energy.] 4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. [Assessment Boundary: Assessment does not include quantitative measurements of energy.]	

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4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide. [Clarification Statement: Emphasis is on the change in the energy due to the change in speed, not on the forces, as objects interact.] [Assessment Boundary: Assessment does not include quantitative measurements of energy.] 4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another. * [Clarification Statement: Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound; and, a passive solar heater that converts light into heat. Examples of constraints could include the materials, cost, or time to design the device.] [Assessment Boundary: Devices should be limited to those that convert motion energy to electric energy or use stored energy to cause motion or produce light or sound.]	
Waves and Their Applications in Technologies for Information Transfer 4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move. [Clarification Statement: Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves.] [Assessment Boundary: Assessment does not include interference effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength.] 4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. [Assessment Boundary: Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works.] 4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information. * [Clarification Statement: Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, and using Morse code to send text.] *Grade 5* Matter and Its Interactions 5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen. [Clarification Statement: Examples of evidence could include adding air to expand a basketball, compressing air in a syringe, dissolving sugar in water, and evaporating salt water.] [Assessment Boundary: Assessment does not include the atomic-scale mechanism of evaporation and condensation or defining the unseen particles.] 5-PS1-2. Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved. [Clarification Statement: Examples of reactions or changes could include phase changes, dissolving, and mixing that form new substances.] [Assessment Boundary: Assessment does not include distinguishing mass and weight.]	

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5-PS1-3. Make observations and measurements to identify materials based on their properties. [Clarification Statement: Examples of materials to be identified could include baking soda and other powders, metals, minerals, and liquids. Examples of properties could include color, hardness, reflectivity, electrical conductivity, thermal conductivity, response to magnetic forces, and solubility; density is not intended as an identifiable property.] [Assessment Boundary: Assessment does not include density or distinguishing mass and weight.] 5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances. Motion and Stability: Forces and Interactions 5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down. [Clarification Statement: "Down" is a local description of the direction that points toward the center of the spherical Earth.] [*Assessment Boundary: Assessment does not include mathematical representation of gravitational force.*] Energy 5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. [Clarification Statement: Examples of models could include diagrams, and flow charts.] ** The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.*	

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n2y Instructional Targets	n2y Intermediate Grade Band Unit	n2y Supporting Activities
• Describe the effect of a force on an object. • Describe the motion of objects (force, speed, etc.). • Observe and identify common forms of energy (heat, light, sound; electric and magnetic sources). • Observe ways that electricity transfers to make things work. • Recognize sources of sound and light. • Recognize states of matter: liquid, solid, gas. • Observe simple physical changes (melting, freezing, etc.).	January, 2015 - 2016 March, 2015 - 2016 March, 2016 - 2017 October, 2017 - 2018	n2y Library/Science Books ULS Monthly Lessons: Supplemental Science Lessons Standards Connection

n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will describe the effect of force such as gravity on an object. • Students will identify the motion of an object (throwing a ball, pulling a wagon, etc.) and describe that motion in terms of a push/pull force. • Students will identify common forms of energy. • Students will describe ways that electricity, as a source of energy, contributes to daily life (light for reading, heat or cooling for comfort, etc.). • Students will describe how sound travels to the ears. • Students will describe how light allows objects to been seen. • Students will classify and define matter as solid, liquid or gas.	• Student will identify the effects of forces such as gravity on an object. • Students will describe the movement of an object as fast or slow. • Students will demonstrate how common forms of energy can be used. • Students will identify appliances and tools that need electricity to work (refrigerator, drill, etc.). • Students will identify objects that make sound. • Students will identify sources of light and the effect of light on objects • Students will sort common objects and materials as solid, liquid or gas.	• Students will participate in the demonstration of force such as gravity on an object. • Students will identify the patterned movement of an object. • Students will participate in the demonstration of energy use. • Students will identify electrical appliances that provide light or sound (lamp, CD player, etc.). • Students will participate in the demonstration of sound creation. • Students will participate in the demonstration of the effect of light on an object. • Students will identify an item as a solid or a liquid.

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<tr><td colspan="3">Grades 3-5
Engineering Design
3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</td></tr>
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• Plan and conduct simple investigations.
• Use tools to gather data.
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• Communicate with others about investigations.</td><td rowspan="2">October, 2016 - 2017</td><td>Unique</td></tr>
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<tr><td>• Students will follow steps of a scientific process related to grades 3–5 science topics.</td><td>• With support, students will follow steps of a scientific process related to grades 3–5 science topics.</td><td>• Students will actively participate in a scientific process related to grades 3–5 science topics.</td></tr>
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Earth and Space Science	Grades 6–8
Next Generation Science Standards	Your State's Extended Standards
Grades 6-8 Earth's Place in the Universe MS-ESS1-1. Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. [Clarification Statement: Examples of models can be physical, graphical, or conceptual.] MS-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. [Clarification Statement: Emphasis for the model is on gravity as the force that holds together the solar system and Milky Way galaxy and controls orbital motions within them. Examples of models can be physical (such as the analogy of distance along a football field or computer visualizations of elliptical orbits) or conceptual (such as mathematical proportions relative to the size of familiar objects such as students' school or state).] [Assessment Boundary: Assessment does not include Kepler's Laws of orbital motion or the apparent retrograde motion of the planets as viewed from Earth.] MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system. [Clarification Statement: Emphasis is on the analysis of data from Earth-based instruments, space-based telescopes, and spacecraft to determine similarities and differences among solar system objects. Examples of scale properties include the sizes of an object's layers (such as crust and atmosphere), surface features (such as volcanoes), and orbital radius. Examples of data include statistical information, drawings and photographs, and models.] [Assessment Boundary: Assessment does not include recalling facts about properties of the planets and other solar system bodies.] MS-ESS1-4. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history. [Clarification Statement: Emphasis is on how analyses of rock formations and the fossils they contain are used to establish relative ages of major events in Earth's history. Examples of Earth's major events could range from being very recent (such as the last Ice Age or the earliest fossils of Homo sapiens) to very old (such as the formation of Earth or the earliest evidence of life). Examples can include the formation of mountain chains and ocean basins, the evolution or extinction of particular living organisms, or significant volcanic eruptions.] [*Assessment Boundary: Assessment does not include recalling the names of specific periods or epochs and events within them.*]	

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Earth's Systems MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. [Clarification Statement: Emphasis is on the processes of melting, crystallization, weathering, deformation, and sedimentation, which act together to form minerals and rocks through the cycling of Earth's materials.] [Assessment Boundary: Assessment does not include the identification and naming of minerals.] MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. [Clarification Statement: Emphasis is on how processes change Earth's surface at time and spatial scales that can be large (such as slow plate motions or the uplift of large mountain ranges) or small (such as rapid landslides or microscopic geochemical reactions), and how many geoscience processes (such as earthquakes, volcanoes, and meteor impacts) usually behave gradually but are punctuated by catastrophic events. Examples of geoscience processes include surface weathering and deposition by the movements of water, ice, and wind. Emphasis is on geoscience processes that shape local geographic features, where appropriate.] MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. [Clarification Statement: Examples of data include similarities of rock and fossil types on different continents, the shapes of the continents (including continental shelves), and the locations of ocean structures (such as ridges, fracture zones, and trenches).] [*Assessment Boundary: Paleomagnetic anomalies in oceanic and continental crust are not assessed.*]	
MS-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. [Clarification Statement: Emphasis is on the ways water changes its state as it moves through the multiple pathways of the hydrologic cycle. Examples of models can be conceptual or physical.] [Assessment Boundary: A quantitative understanding of the latent heats of vaporization and fusion is not assessed.] MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. [Clarification Statement: Emphasis is on how air masses flow from regions of high pressure to low pressure, causing weather (defined by temperature, pressure, humidity, precipitation, and wind) at a fixed location to change over time, and how sudden changes in weather can result when different air masses collide. Emphasis is on how weather can be predicted within probabilistic ranges. Examples of data can be provided to students (such as weather maps, diagrams, and visualizations) or obtained through laboratory experiments (such as with condensation).] [*Assessment Boundary: Assessment does not include recalling the names of cloud types or weather symbols used on weather maps or the reported diagrams from weather stations.*]	

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MS-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates. [Clarification Statement: Emphasis is on how patterns vary by latitude, altitude, and geographic land distribution. Emphasis of atmospheric circulation is on the sunlight-driven latitudinal banding, the Coriolis Effect, and resulting prevailing winds; emphasis of ocean circulation is on the transfer of heat by the global ocean convection cycle, which is constrained by the Coriolis Effect and the outlines of continents. Examples of models can be diagrams, maps and globes, or digital representations.] [Assessment Boundary: Assessment does not include the dynamics of the Coriolis Effect.]	
Earth and Human Activity MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. [Clarification Statement: Emphasis is on how these resources are limited and typically non-renewable, and how their distributions are significantly changing as a result of removal by humans. Examples of uneven distributions of resources as a result of past processes include but are not limited to petroleum (locations of the burial of organic marine sediments and subsequent geologic traps), metal ores (locations of past volcanic and hydrothermal activity associated with subduction zones), and soil (locations of active weathering and/or deposition of rock).	
MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. [Clarification Statement: Emphasis is on how some natural hazards, such as volcanic eruptions and severe weather, are preceded by phenomena that allow for reliable predictions, but others, such as earthquakes, occur suddenly and with no notice, and thus are not yet predictable. Examples of natural hazards can be taken from interior processes (such as earthquakes and volcanic eruptions), surface processes (such as mass wasting and tsunamis), or severe weather events (such as hurricanes, tornadoes, and floods). Examples of data can include the locations, magnitudes, and frequencies of the natural hazards. Examples of technologies can be global (such as satellite systems to monitor hurricanes or forest fires) or local (such as building basements in tornado-prone regions or reservoirs to mitigate droughts).]	
MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. * [Clarification Statement: Examples of the design process include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce that impact. Examples of human impacts can include water usage (such as the withdrawal of water from streams and aquifers or the construction of dams and levees), land usage (such as urban development, agriculture, or the removal of wetlands), and pollution (such as of the air, water, or land).]	

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MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. [Clarification Statement: Examples of evidence include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change. The consequences of increases in human populations and consumption of natural resources are described by science, but science does not make the decisions for the actions society takes.]	
MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. [Clarification Statement: Examples of factors include human activities (such as fossil fuel combustion, cement production, and agricultural activity) and natural processes (such as changes in incoming solar radiation or volcanic activity). Examples of evidence can include tables, graphs, and maps of global and regional temperatures, atmospheric levels of gases such as carbon dioxide and methane, and the rates of human activities. Emphasis is on the major role that human activities play in causing the rise in global temperatures.] ** The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.*	

n2y Instructional Targets	n2y Middle School Grade Band Unit	n2y Supporting Activities
• Explore the relationship of Earth to the Moon, Sun and planets. • Recognize that the study of rock layers and fossils tells about the age of Earth. • Observe and compare rocks and minerals. • Recognize that geological events can change the physical features of Earth's surface. • Explain the water cycle • Identify types of weather phenomena. • Explore the Earth's atmosphere, including changes in the atmosphere (air pollution, temperature, etc.). • Identify geologic processes that change the Earth's surface (earthquakes, floods, volcanoes, etc.). • Explain reasons for conservation and identify ways to reduce, reuse and recycle that will benefit the environment.	May, 2015 - 2016 November, 2016 - 2017 March, 2017 - 2018	n2y Library/Science Books Core Materials: Weather Report ULS Monthly Lessons: Supplemental Science Lessons Standards Connection

n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will create a model that shows the relationship between Earth, the Sun, Moon and planets in the solar system. • Students will explain lunar patterns. • Student will explain how rocks and fossils are used to tell the age of the Earth.	• Students will identify Earth, the Sun and Moon within the solar system. • Students will recognize phases of the Moon (full Moon, half Moon, etc.). • Students will identify fossils. • Students will identify an object made from rocks or minerals (sand in a sandbox, coins, jewelry etc.).	• Students will identify Earth as the planet humans live on. • Students will recognize that the sun can be seen from Earth by day and the moon by night • Students will actively participate in the creation of a model fossil. • Students will identify items made from rock. • Students will identify rain and snow as forms of precipitation.

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• Students will describe common minerals and rocks and their uses to human life (granite buildings, coal for heat, etc.). • Students will describe the water cycle. • Students will describe how changes in weather occur. • Students will describe ways that a geological event (earthquake, flood, etc.) change Earth's surface. • Students will recognize ways to protect Earth's resources (recycling, reducing waste, reforestation, etc.).	• Students will identify water in different forms within the water cycle. • Students will identify patterns in weather and temperature in relation to the seasons or temperature of the air in an area. • Students will identify geological processes and how they change the Earth's surface (tornado, hurricane, etc.). • Students will identify materials that can be recycled, reused or reduced.	• Students will identify weather in terms of temperature and conditions (hot and sunny, cold and snowy, etc.). • Students will identify common geological events (tornado, earthquake, floods etc.). • Students will actively participate in a community project meant to help the environment.

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Life Science	Grades 6–8
Next Generation Science Standards	Your State's Extended Standards
Grades 6-8 From Molecules to Organisms: Structures and Processes MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. [Clarification Statement: Emphasis is on developing evidence that living things are made of cells, distinguishing between living and non-living things, and understanding that living things may be made of one cell or many and varied cells.] MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. [Clarification Statement: Emphasis is on the cell functioning as a whole system and the primary role of identified parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall.] [Assessment Boundary: Assessment of organelle structure/function relationships is limited to the cell wall and cell membrane. Assessment of the function of the other organelles is limited to their relationship to the whole cell. Assessment does not include the biochemical function of cells or cell parts.] MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. [Clarification Statement: Emphasis is on the conceptual understanding that cells form tissues and tissues form organs specialized for particular body functions. Examples could include the interaction of subsystems within a system and the normal functioning of those systems.] [Assessment Boundary: Assessment does not include the mechanism of one body system independent of others. Assessment is limited to the circulatory, excretory, digestive, respiratory, muscular, and nervous systems.] MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. [Clarification Statement: Examples of behaviors that affect the probability of animal reproduction could include nest building to protect young from cold, herding of animals to protect young from predators, and vocalization of animals and colorful plumage to attract mates for breeding. Examples of animal behaviors that affect the probability of plant reproduction could include transferring pollen or seeds, and creating conditions for seed germination and growth. Examples of plant structures could include bright flowers attracting butterflies that transfer pollen, flower nectar and odors that attract insects that transfer pollen, and hard shells on nuts that squirrels bury.] MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. [Clarification Statement: Examples of local environmental conditions could include availability of food, light, space, and water. Examples of genetic factors could include large breed cattle and species of grass affecting growth of organisms. Examples of evidence could include drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, and fish growing larger in large ponds than they do in small ponds.] [Assessment Boundary: Assessment does not include genetic mechanisms, gene regulation, or biochemical processes.]	

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MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. [Clarification Statement: Emphasis is on tracing movement of matter and flow of energy.] [Assessment Boundary: Assessment does not include the biochemical mechanisms of photosynthesis.] MS-LS1-7. Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism. [Clarification Statement: Emphasis is on describing that molecules are broken apart and put back together and that in this process, energy is released.] [Assessment Boundary: Assessment does not include details of the chemical reactions for photosynthesis or respiration.] MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. [Assessment Boundary: Assessment does not include mechanisms for the transmission of this information.] Ecosystems: Interactions, Energy, and Dynamics MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. [Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.] MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. [Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.] MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. [Clarification Statement: Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems, and on defining the boundaries of the system.] [Assessment Boundary: Assessment does not include the use of chemical reactions to describe the processes.] MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. [Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes to ecosystems.]	

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MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services. * [Clarification Statement: Examples of ecosystem services could include water purification, nutrient recycling, and prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.] Heredity: Inheritance and Variation of Traits MS-LS3-1. Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. [Clarification Statement: Emphasis is on conceptual understanding that changes in genetic material may result in making different proteins.] [Assessment Boundary: Assessment does not include specific changes at the molecular level, mechanisms for protein synthesis, or specific types of mutations.] MS-LS3-2. Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. [Clarification Statement: Emphasis is on using models such as Punnett squares, diagrams, and simulations to describe the cause and effect relationship of gene transmission from parent(s) to offspring and resulting genetic variation.] Biological Evolution: Unity and Diversity MS-LS4-1. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past. [Clarification Statement: Emphasis is on finding patterns of changes in the level of complexity of anatomical structures in organisms and the chronological order of fossil appearance in the rock layers.] [Assessment Boundary: Assessment does not include the names of individual species or geological eras in the fossil record.] MS-LS4-2. Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. [Clarification Statement: Emphasis is on explanations of the evolutionary relationships among organisms in terms of similarity or differences of the gross appearance of anatomical structures.] MS-LS4-3. Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. [Clarification Statement: Emphasis is on inferring general patterns of relatedness among embryos of different organisms by comparing the macroscopic appearance of diagrams or pictures.] [Assessment Boundary: Assessment of comparisons is limited to gross appearance of anatomical structures in embryological development.]	

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MS-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. [Clarification Statement: Emphasis is on using simple probability statements and proportional reasoning to construct explanations MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms. [Clarification Statement: Emphasis is on synthesizing information from reliable sources about the influence of humans on genetic outcomes in artificial selection (such as genetic modification, animal husbandry, gene therapy); and, on the impacts these technologies have on society as well as the technologies leading to these scientific discoveries.] MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. [Clarification Statement: Emphasis is on using mathematical models, probability statements, and proportional reasoning to support explanations of trends in changes to populations over time.] [Assessment Boundary: Assessment does not include Hardy Weinberg calculations. ** The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.*	

n2y Instructional Targets	n2y Middle School Grade Band Unit	n2y Supporting Activities
• Recognize that living things are made of cells. • Recognize that living things are made of cells that have a function: Cells make up tissues and organs. • Recognize that living things are made of cells that have a function: plant structures. • Understand basic reproduction processes for plants and animals. • Explain how plants and animals use behaviors and structures to attract mates (birds dance, colorful flowers etc.) • Observe the interdependence among people, plants and animals through a simple food chain. • Identify the basic process that plants use to make food (photosynthesis). • Identify characteristics of different biomes. • Identify traits inherited through genes (DNA). • Recognize that animals and plants evolve.	October, 2015 - 2016 May, 2016 - 2017 January, 2017 - 2018 May, 2017 - 2018	n2y Library/Science Books ULS Monthly Lessons: Supplemental Science Lessons Standards Connection

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n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will identify things that contain cells by indicating whether they are living or nonliving. • Students will describe the function of various body systems (circulatory, excretory, digestive, respiratory, muscular, and nervous system.) • Students will describe the function of various structures of a plant (stem, leaves, etc.) • Students will describe the basic process of reproduction in plants and animals. • Students will identify behaviors and structures used by plants and animals to attract others. • Students will describe a simple food chain that shows the interdependence of people, plants and animals. • Students will explain the basic process of photosynthesis describing how plants make their food. • Students will describe different biomes of the world, including basic characteristics and plants and animals of the biome. • Students will describe how traits are inherited from parents through genes. • Students will explain the similarities and differences between plants and animals long ago and today.	• Students will identify living and nonliving things. • Students will match various body systems to their function. • Students will match various plant structures to their function. • Students will identify basic reproduction processes in plants and animals by identifying how they deliver their young (birds lay eggs, mammals carry their young, plants have seeds, etc.). • Students will identify behaviors and structures in plants or animals used to attract others. • Students will identify items in a simple food chain. • Students will understand that plants need sunlight to make their food. • Students will match plants and animals to a specific biome. • Students will identify traits inherited from parents (eye color, hair color, etc.). • Students will match traits from plants and animals long ago to those of today.	• Students will identify things that are living. • Students will identify basic body parts that make up a system (heart, lungs, stomach, etc.) • Students will identify the flower or seed of a plant. • Students will identify seeds, eggs, and various other ways plants and animals reproduce. • Students will identify an animal behavior used to attract a mate. • Students will select items that belong in a simple food chain. • Students will identify parts of a plant and their functions. • Students will select animals or plants that live in a specific biome. • Students will identify their own inherited traits (eye color, hair color, etc.). • Students will identify plants and animals that lived long ago.

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Physical Science	Grades 6–8
Next Generation Science Standards	Your State's Extended Standards
Grades 6-8 Matter and its Interactions MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures. [Clarification Statement: Emphasis is on developing models of molecules that vary in complexity. Examples of simple molecules could include ammonia and methanol. Examples of extended structures could include sodium chloride or diamonds. Examples of molecular-level models could include drawings, 3D ball and stick structures, or computer representations showing different molecules with different types of atoms.] [Assessment Boundary: Assessment does not include valence electrons and bonding energy, discussing the ionic nature of subunits of complex structures, or a complete depiction of all individual atoms in a complex molecule or extended structure is not required.] MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. [Clarification Statement: Examples of reactions could include burning sugar or steel wool, fat reacting with sodium hydroxide, and mixing zinc with hydrogen chloride.] [Assessment Boundary: Assessment is limited to analysis of the following properties: density, melting point, boiling point, solubility, flammability, and odor.] MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. [Clarification Statement: Emphasis is on natural resources that undergo a chemical process to form the synthetic material. Examples of new materials could include new medicine, foods, and alternative fuels.] [Assessment Boundary: Assessment is limited to qualitative information.] MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed. [Clarification Statement: Emphasis is on qualitative molecular-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of state occurs. Examples of models could include drawings and diagrams. Examples of particles could include molecules or inert atoms. Examples of pure substances could include water, carbon dioxide, and helium.] MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. [Clarification Statement: Emphasis is on law of conservation of matter and on physical models or drawings, including digital forms that represent atoms.] [Assessment Boundary: Assessment does not include the use of atomic masses, balancing symbolic equations, or intermolecular forces.] MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes. * [Clarification Statement: Emphasis is on the design, controlling the transfer of energy to the environment, and modification of a device using factors such as type and concentration of a substance. Examples of designs could involve chemical reactions such as dissolving ammonium chloride or calcium chloride.] [Assessment Boundary: Assessment is limited to the criteria of amount, time, and temperature of substance in testing the device.]	

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Motion and Stability: Forces and Interactions MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. * [Clarification Statement: Examples of practical problems could include the impact of collisions between two cars, between a car and stationary objects, and between a meteor and a space vehicle.] [Assessment Boundary: Assessment is limited to vertical or horizontal interactions in one dimension.] MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. [Clarification Statement: Emphasis is on balanced (Newton's First Law) and unbalanced forces in a system, qualitative comparisons of forces, mass and changes in motion (Newton's Second Law), frame of reference, and specification of units.] [Assessment Boundary: Assessment is limited to forces and changes in motion in one-dimension in an inertial reference frame and to change in one variable at a time. Assessment does not include the use of trigonometry.] MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. [Clarification Statement: Examples of devices that use electric and magnetic forces could include electromagnets, electric motors, or generators. Examples of data could include the effect of the number of turns of wire on the strength of an electromagnet, or the effect of increasing the number or strength of magnets on the speed of an electric motor.] [Assessment Boundary: Assessment about questions that require quantitative answers is limited to proportional reasoning and algebraic thinking.] MS-PS2-4. Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. [Clarification Statement: Examples of evidence for arguments could include data generated from simulations or digital tools; and charts displaying mass, strength of interaction, distance from the Sun, and orbital periods of objects within the solar system.] [Assessment Boundary: Assessment does not include Newton's Law of Gravitation or Kepler's Laws.] MS-PS2-5. Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact. [Clarification Statement: Examples of this phenomenon could include the interactions of magnets, electrically-charged strips of tape, and electrically-charged pith balls. Examples of investigations could include first-hand experiences or simulations.] [Assessment Boundary: Assessment is limited to electric and magnetic fields, and is limited to qualitative evidence for the existence of fields.] Energy MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object. [Clarification Statement: Emphasis is on descriptive relationships between kinetic energy and mass separately from kinetic energy and speed. Examples could include riding a bicycle at different speeds, rolling different sizes of rocks downhill, and getting hit by a whiffle ball versus a tennis ball.] MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system. [Clarification Statement: Emphasis is on relative amounts of potential energy, not on calculations of potential energy. Examples of objects within systems interacting at varying distances could include: The Earth and either a roller coaster cart at varying positions on a hill or objects at varying heights on shelves, changing the direction/orientation of a magnet, and a balloon with	

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static electrical charge being brought closer to a classmate's hair. Examples of models could include representations, diagrams, pictures, and written descriptions of systems.] [Assessment Boundary: Assessment is limited to two objects and electric, magnetic, and gravitational interactions.]

MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. [Clarification Statement: Examples of devices could include an insulated box, a solar cooker, and a Styrofoam cup.] [Assessment Boundary: Assessment does not include calculating the total amount of thermal energy transferred.]

MS-PS3-4. Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. [Clarification Statement: Examples of experiments could include comparing final water temperatures after different masses of ice melted in the same volume of water with the same initial temperature, the temperature change of samples of different materials with the same mass as they cool or heat in the environment, or the same material with different masses when a specific amount of energy is added.] [Assessment Boundary: Assessment does not include calculating the total amount of thermal energy transferred.]

MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. [Clarification Statement: Examples of empirical evidence used in arguments could include an inventory or other representation of the energy before and after the transfer in the form of temperature changes or motion of object.] [Assessment Boundary: Assessment does not include calculations of energy.]

Waves and their Applications in Technologies for Information Transfer

MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. [Clarification Statement: Emphasis is on describing waves with both qualitative and quantitative thinking.] [Assessment Boundary: Assessment does not include electromagnetic waves and is limited to standard repeating waves.]

MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. [Clarification Statement: Emphasis is on both light and mechanical waves. Examples of models could include drawings, simulations, and written descriptions.] [Assessment Boundary: Assessment is limited to qualitative applications pertaining to light and mechanical waves.

MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals. [Clarification Statement: Emphasis is on a basic understanding that waves can be used for communication purposes. Examples could include using fiber optic cable to transmit light pulses, radio wave pulses in Wi-Fi devices, and conversion of stored binary patterns to make sound or text on a computer screen.] [Assessment Boundary: Assessment does not include binary counting. Assessment does not include the specific mechanism of any given device.]

** The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea*

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n2y Instructional Targets	n2y Middle School Grade Band Unit	n2y Supporting Activities
• Explore applications of state of matter, including physical, chemical changes and observation of mixtures and compounds in real-world situations. • Explore the motion of objects with variables, such as speed, distance and height. • Recognize common elements from the Periodic Table of Elements (including metals and nonmetals). • Explore electrical, gravitational and magnetic forces. • Explore kinetic and potential energy. • Identify ways that energy is transferred that results in a change of temperature. • Explore waves (light and sound) and their interaction with various materials (reflected, absorbed or transmitted) • Explore technology and ways in which it influences quality of life.	January, 2015 - 2016 March, 2015 - 2016 March, 2016 - 2017 October, 2017 - 2018	n2y Library/Science Books ULS Monthly Lessons: Supplemental Science Lessons Standards Connection
n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will describe changes in matter within real-world situations, including physical changes (size, shape, state, or appearance) and chemical changes (transformation to a different kind of matter). • Students will describe the motion of objects. • Students will identify common metal and nonmetal elements with typical uses for these elements. • Students will describe how motion, distance and speed of an object are effected by gravitational and magnetic forces. • Students will identify and explore kinetic and potential energy of various objects. • Students will explore the transfer of energy that results in heating or cooling. • Students will describe the energy transfer of waves. • Students will explore ways that electrical energy to a computer provides ways to work, play and communicate.	• Students will identify the cause for a change in a state of matter (water freezing into ice cubes, paper being cut into shapes, etc.). • Students will identify the motion of an object. • Students will match objects made of metal with each object's use (pan for cooking, folding chair for sitting, etc.). • Students will identify changes in the location and motion of an object caused by a gravitational or magnetic force. • Students will sort pictures of objects or identify real objects as having kinetic and potential energy. • Students will identify a change in temperature from hot to cold and from cold to hot. • Students will identify objects, tools or instruments that make sound or light. • Students will identify tasks that can be completed on a computer because of an energy transfer (email, games, learning, etc.).	• Students will identify the state of matter before and after a change in that matter. • Students will identify the movement of an object as fast or slow. • Students will identify commonly used objects made of metal. • Students will demonstrate the effects of gravitational or magnetic force on an object. • Students will demonstrate kinetic energy by setting an object in motion and demonstrate potential energy by displaying an object at rest. • Students will identify an object as being hot or cold. • Students will identify objects, tools or instruments that make sound or light. • Students will participate in tasks performed on a computer.

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Scientific Inquiry/Engineering, Technology, and Applications of Science		Grades 6–8
Next Generation Science Standards		Your State's Extended Standards
Grades 6-8 Engineering Design MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.		
n2y Instructional Targets	n2y Middle School Grade Band Unit	n2y Supporting Activities
• Identify questions that can be asked about the natural environment. • Conduct simple scientific investigations. • Use tools to gather data and information. • Analyze and interpret data. • Communicate procedures and explanations about an investigation.	October, 2016 - 2017	Unique n2y Library/Science Books ULS Monthly Lessons: Supplemental Science Lessons
	n2y Monthly Lessons	News-2-You
	Lesson 28: Science Experiment	Activities: Science Experiment
n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will follow steps of a scientific process related to grades 6–8 science topics.	• With support, students will follow steps of a scientific process related to grades 6–8 science topics.	• Students will actively participate in a scientific process related to grades 6–8 science topics.

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Earth and Space Science (Environmental Science)	Grades 9–12
Next Generation Science Standards	Your State's Extended Standards
Grades 9-12 Earth's Place in the Universe HS-ESS1-1. Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy in the form of radiation. [Clarification Statement: Emphasis is on the energy transfer mechanisms that allow energy from nuclear fusion in the sun's core to reach Earth. Examples of evidence for the model include observations of the masses and lifetimes of other stars, as well as the ways that the sun's radiation varies due to sudden solar flares ("space weather"), the 11- year sunspot cycle, and non-cyclic variations over centuries.] [Assessment Boundary: Assessment does not include details of the atomic and sub-atomic processes involved with the sun's nuclear fusion.] HS-ESS1-2. Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe. [Clarification Statement: Emphasis is on the astronomical evidence of the red shift of light from galaxies as an indication that the universe is currently expanding, the cosmic microwave background as the remnant radiation from the Big Bang, and the observed composition of ordinary matter of the universe, primarily found in stars and interstellar gases (from the spectra of electromagnetic radiation from stars), which matches that predicted by the Big Bang theory (3/4 hydrogen and 1/4 helium).] HS-ESS1-3. Communicate scientific ideas about the way stars, over their life cycle, produce elements. [Clarification Statement: Emphasis is on the way nucleosynthesis, and therefore the different elements created, varies as a function of the mass of a star and the stage of its lifetime.] [Assessment Boundary: Details of the many different nucleosynthesis pathways for stars of differing masses are not assessed.] HS-ESS1-4. Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. [Clarification Statement: Emphasis is on Newtonian gravitational laws governing orbital motions, which apply to human-made satellites as well as planets and moons.] [Assessment Boundary: Mathematical representations for the gravitational attraction of bodies and Kepler's Laws of orbital motions should not deal with more than two bodies, nor involve calculus.] HS-ESS1-5. Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks. [Clarification Statement: Emphasis is on the ability of plate tectonics to explain the ages of crustal rocks. Examples include evidence of the ages oceanic crust increasing with distance from mid-ocean ridges (a result of plate spreading) and the ages of North American continental crust increasing with distance away from a central ancient core (a result of past plate interactions).] HS-ESS1-6. Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history. [Clarification Statement: Emphasis is on using available evidence within the solar system to reconstruct the early history of Earth, which formed along with the rest of the solar system 4.6 billion years ago. Examples of evidence include the absolute ages of ancient materials (obtained by radiometric dating of meteorites, moon rocks, and Earth's oldest minerals), the sizes and compositions of solar system objects, and the impact cratering record of planetary surfaces.]	

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Earth's Systems HS-ESS2-1. Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. [Clarification Statement: Emphasis is on how the appearance of land features (such as mountains, valleys, and plateaus) and sea-floor features (such as trenches, ridges, and seamounts) are a result of both constructive forces (such as volcanism, tectonic uplift, and orogeny) and destructive mechanisms (such as weathering, mass wasting, and coastal erosion).] [Assessment Boundary: Assessment does not include memorization of the details of the formation of specific geographic features of Earth's surface.] HS-ESS2-2. Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems. [Clarification Statement: Examples should include climate feedbacks, such as how an increase in greenhouse gases causes a rise in global temperatures that melts glacial ice, which reduces the amount of sunlight reflected from Earth's surface, increasing surface temperatures and further reducing the amount of ice. Examples could also be taken from other system interactions, such as how the loss of ground vegetation causes an increase in water runoff and soil erosion; how dammed rivers increase groundwater recharge, decrease sediment transport, and increase coastal erosion; or how the loss of wetlands causes a decrease in local humidity that further reduces the wetland extent.] HS-ESS2-3. Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection. [Clarification Statement: Emphasis is on both a one-dimensional model of Earth, with radial layers determined by density, and a three-dimensional model, which is controlled by mantle convection and the resulting plate tectonics. Examples of evidence include maps of Earth's three-dimensional structure obtained from seismic waves, records of the rate of change of Earth's magnetic field (as constraints on convection in the outer core), and identification of the composition of Earth's layers from high-pressure laboratory experiments.] HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. [Clarification Statement: Examples of the causes of climate change differ by timescale, over 1-10 years: large volcanic eruption, ocean circulation; 10-100s of years: changes in human activity, ocean circulation, solar output; 10-100s of thousands of years: changes to Earth's orbit and the orientation of its axis; and 10-100s of millions of years: long-term changes in atmospheric composition.] [Assessment Boundary: Assessment of the results of changes in climate is limited to changes in surface temperatures, precipitation patterns, glacial ice volumes, sea levels, and biosphere distribution.] HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. [Clarification Statement: Emphasis is on mechanical and chemical investigations with water and a variety of solid materials to provide the evidence for connections between the hydrologic cycle and system interactions commonly known as the rock cycle. Examples of mechanical investigations include stream transportation and deposition using a stream table, erosion using variations in soil moisture content, or frost wedging by the expansion of water as it freezes. Examples of chemical investigations include chemical weathering and recrystallization (by testing the solubility of different materials) or melt generation (by examining how water lowers the melting temperature of most solids).] HS-ESS2-6. Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. [Clarification Statement: Emphasis is on modeling biogeochemical cycles that include the cycling of carbon through the ocean, atmosphere, soil, and biosphere (including humans), providing the foundation for living organisms.]	

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HS-ESS2-7. Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth. [Clarification Statement: Emphasis is on the dynamic causes, effects, and feedbacks between the biosphere and Earth's other systems, whereby geoscience factors control the evolution of life, which in turn continuously alters Earth's surface. Examples of include how photosynthetic life altered the atmosphere through the production of oxygen, which in turn increased weathering rates and allowed for the evolution of animal life; how microbial life on land increased the formation of soil, which in turn allowed for the evolution of land plants; or how the evolution of corals created reefs that altered patterns of erosion and deposition along coastlines and provided habitats for the evolution of new life forms.] [Assessment Boundary: Assessment does not include a comprehensive understanding of the mechanisms of how the biosphere interacts with all of Earth's other systems.]	
Earth and Human Activity HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. [Clarification Statement: Examples of key natural resources include access to fresh water (such as rivers, lakes, and groundwater), regions of fertile soils such as river deltas, and high concentrations of minerals and fossil fuels. Examples of natural hazards can be from interior processes (such as volcanic eruptions and earthquakes), surface processes (such as tsunamis, mass wasting and soil erosion), and severe weather (such as hurricanes, floods, and droughts). Examples of the results of changes in climate that can affect populations or drive mass migrations include changes to sea level, regional patterns of temperature and precipitation, and the types of crops and livestock that can be raised.] HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. * [Clarification Statement: Emphasis is on the conservation, recycling, and reuse of resources (such as minerals and metals) where possible, and on minimizing impacts where it is not. Examples include developing best practices for agricultural soil use, mining (for coal, tar sands, and oil shales), and pumping (for petroleum and natural gas). Science knowledge indicates what can happen in natural systems—not what should happen.] HS-ESS3-3. Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity. [Clarification Statement: Examples of factors that affect the management of natural resources include costs of resource extraction and waste management, per-capita consumption, and the development of new technologies. Examples of factors that affect human sustainability include agricultural efficiency, levels of conservation, and urban planning.] [Assessment Boundary: Assessment for computational simulations is limited to using provided multi-parameter programs or constructing simplified spreadsheet calculations.] HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. * [Clarification Statement: Examples of data on the impacts of human activities could include the quantities and types of pollutants released, changes to biomass and species diversity, or areal changes in land surface use (such as for urban development, agriculture and livestock, or surface mining). Examples for limiting future impacts could range from local efforts (such as reducing, reusing, and recycling resources) to large-scale geoengineering design solutions (such as altering global temperatures by making large changes to the atmosphere or ocean).]	

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HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems. [Clarification Statement: Examples of evidence, for both data and climate model outputs, are for climate changes (such as precipitation and temperature) and their associated impacts (such as on sea level, glacial ice volumes, or atmosphere and ocean composition).] [Assessment Boundary: Assessment is limited to one example of a climate change and its associated impacts.] HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. [Clarification Statement: Examples of Earth systems to be considered are the hydrosphere, atmosphere, cryosphere, geosphere, and/or biosphere. An example of the far-reaching impacts from a human activity is how an increase in atmospheric carbon dioxide results in an increase in photosynthetic biomass on land and an increase in ocean acidification, with resulting impacts on sea organism health and marine populations.] [Assessment Boundary: Assessment does not include running computational representations but is limited to using the published results of scientific computational models.] ** The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.*	

n2y Instructional Targets	n2y High School Grade Band Unit	n2y Supporting Activities
Environmental Science • Explore the relationship and motion of the solar system. • Investigate the impact of geological events that impact the Earth's surface (earthquakes, hurricanes, fires, etc.). • Identify Earth's layers. • Identify types, causes and consequences of land, water and air pollution. • Explore scientific ways to measure, predict and report weather conditions. • Identify and describe ways that humans have changed the environment (deforestation, waste management, etc.). • Participate in ways to reduce, reuse and recycle in order to save resources. • Identify and describe benefits of alternative energy.	May, 2015 - 2016 November, 2016 - 2017 March, 2017 - 2018	n2y Library/Science Books Core Materials: Weather Report ULS Monthly Lessons: Science Lessons Standards Connection
n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will describe the motion of planets in the solar system. • Students will identify and describe geological events (tornado, hurricane, flood, etc.) and the effects of those events on the environment and human life.	• Students will identify Earth, the Sun and the Moon within the solar system. • Students will match geological events to their effect on the environment and human life. • Students will identify that Earth is made of 3 major layers.	• Students will identify Earth. • Students will identify common types of geological events in the local area. • Students will identify the Earth's crust as the layer we live on. • Students will actively participate in a project to clean up local

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• Students will identify the layers of Earth's crust. • Students will describe causes of pollution and the effects of pollution on air, water and land. • Students will identify tools and methods that scientists use to measure and predict weather. • Students will identify ways to reduce, reuse and recycle resources. • Students will identify sources of alternative energy and the benefits to the environment of using those resources.	• Students will identify ways to help prevent air, water or land pollution. • Students will apply weather report information to daily activities. • Students will sort recyclable goods in to corresponding bins. • Students will identify sources of alternative energy.	land areas. • Students will actively participate in the recycling of objects. • Students will identify weather conditions and temperatures related to the day or season.

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Life Science (Biology)	Grades 9–12
Next Generation Science Standards	Your State's Extended Standards
Grades 9-12 From Molecules to Organisms: Structures and Processes HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells. [Assessment Boundary: Assessment does not include identification of specific cell or tissue types, whole body systems, specific protein structures and functions, or the biochemistry of protein synthesis.] HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. [Clarification Statement: Emphasis is on functions at the organism system level such as nutrient uptake, water delivery, and organism movement in response to neural stimuli. An example of an interacting system could be an artery depending on the proper function of elastic tissue and smooth muscle to regulate and deliver the proper amount of blood within the circulatory system.] [Assessment Boundary: Assessment does not include interactions and functions at the molecular or chemical reaction level.] HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. [Clarification Statement: Examples of investigations could include heart rate response to exercise, stomate response to moisture and temperature, and root development in response to water levels.] [Assessment Boundary: Assessment does not include the cellular processes involved in the feedback mechanism.] HS-LS1-4. Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms. [Assessment Boundary: Assessment does not include specific gene control mechanisms or rote memorization of the steps of mitosis.] HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. [Clarification Statement: Emphasis is on illustrating inputs and outputs of matter and the transfer and transformation of energy in photosynthesis by plants and other photosynthesizing organisms. Examples of models could include diagrams, chemical equations, and conceptual models.] [Assessment Boundary: Assessment does not include specific biochemical steps.] HS-LS1-6. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules. [Clarification Statement: Emphasis is on using evidence from models and simulations to support explanations.] [Assessment Boundary: Assessment does not include the details of the specific chemical reactions or identification of macromolecules.] HS-LS1-7. Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy. [Clarification Statement: Emphasis is on the conceptual understanding of the inputs and outputs of the process of cellular respiration.] [Assessment Boundary: Assessment should not include identification of the steps or specific processes involved in cellular respiration.]	

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Ecosystems: Interactions, Energy, and Dynamics HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. [Clarification Statement: Emphasis is on quantitative analysis and comparison of the relationships among interdependent factors including boundaries, resources, climate and competition. Examples of mathematical comparisons could include graphs, charts, histograms, and population changes gathered from simulations or historical data sets.] [Assessment Boundary: Assessment does not include deriving mathematical equations to make comparisons.] HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. [Clarification Statement: Examples of mathematical representations include finding the average, determining trends, and using graphical comparisons of multiple sets of data.] [Assessment Boundary: Assessment is limited to provided data.] HS-LS2-3. Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions. [Clarification Statement: Emphasis is on conceptual understanding of the role of aerobic and anaerobic respiration in different environments.] [Assessment Boundary: Assessment does not include the specific chemical processes of either aerobic or anaerobic respiration.] HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. [Clarification Statement: Emphasis is on using a mathematical model of stored energy in biomass to describe the transfer of energy from one trophic level to another and that matter and energy are conserved as matter cycles and energy flows through ecosystems. Emphasis is on atoms and molecules such as carbon, oxygen, hydrogen and nitrogen being conserved as they move through an ecosystem.] [Assessment Boundary: Assessment is limited to proportional reasoning to describe the cycling of matter and flow of energy.] HS-LS2-5. Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere. [Clarification Statement: Examples of models could include simulations and mathematical models.] [Assessment Boundary: Assessment does not include the specific chemical steps of photosynthesis and respiration.] HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. [Clarification Statement: Examples of changes in ecosystem conditions could include modest biological or physical changes, such as moderate hunting or a seasonal flood; and extreme changes, such as volcanic eruption or sea level rise.] HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. * [Clarification Statement: Examples of human activities can include urbanization, building dams, and dissemination of invasive species.]	

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HS-LS2-8. Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce. [Clarification Statement: Emphasis is on: (1) distinguishing between group and individual behavior, (2) identifying evidence supporting the outcomes of group behavior, and (3) developing logical and reasonable arguments based on evidence. Examples of group behaviors could include flocking, schooling, herding, and cooperative behaviors such as hunting, migrating, and swarming.] Heredity: Inheritance and Variation of Traits HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. [Assessment Boundary: Assessment does not include the phases of meiosis or the biochemical mechanism of specific steps in the process.] HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors. [Clarification Statement: Emphasis is on using data to support arguments for the way variation occurs.] [Assessment Boundary: Assessment does not include the phases of meiosis or the biochemical mechanism of specific steps in the process.] HS-LS3-3. Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population. [Clarification Statement: Emphasis is on the use of mathematics to describe the probability of traits as it relates to genetic and environmental factors in the expression of traits.] [Assessment Boundary: Assessment does not include Hardy-Weinberg calculations.]	
Biological Evolution: Unity and Diversity HS-LS4-1. Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. [Clarification Statement: Emphasis is on a conceptual understanding of the role each line of evidence has relating to common ancestry and biological evolution. Examples of evidence could include similarities in DNA sequences, anatomical structures, and order of appearance of structures in embryological development.] HS-LS4-2. Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment. [Clarification Statement: Emphasis is on using evidence to explain the influence each of the four factors has on number of organisms, behaviors, morphology, or physiology in terms of ability to compete for limited resources and subsequent survival of individuals and adaptation of species. Examples of evidence could include mathematical models such as simple distribution graphs and proportional reasoning.] [Assessment Boundary: Assessment does not include other mechanisms of evolution, such as genetic drift, gene flow through migration, and co-evolution.] HS-LS4-3. Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait. [Clarification Statement: Emphasis is on analyzing shifts in numerical distribution of traits and using these shifts as evidence to support explanations.] [Assessment Boundary: Assessment is limited to basic statistical and graphical analysis. Assessment does not include allele frequency calculations.]	

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HS-LS4-4. Construct an explanation based on evidence for how natural selection leads to adaptation of populations. [Clarification Statement: Emphasis is on using data to provide evidence for how specific biotic and abiotic differences in ecosystems (such as ranges of seasonal temperature, long-term climate change, acidity, light, geographic barriers, or evolution of other organisms) contribute to a change in gene frequency over time, leading to adaptation of populations.] HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species. [Clarification Statement: Emphasis is on determining cause and effect relationships for how changes to the environment such as deforestation, fishing, application of fertilizers, drought, flood, and the rate of change of the environment affect distribution or disappearance of traits in species.] HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity. * [Clarification Statement: Emphasis is on designing solutions for a proposed problem related to threatened or endangered species, or to genetic variation of organisms for multiple species.] ** The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.*	

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n2y Instructional Targets	n2y High School Grade Band Unit	Unique Supporting Activities
Biology • Investigate basic body organs and systems and recognize the function of each. • Identify the basic process that plants use to make food (photosynthesis). • Recognize the diversity of organisms by sorting plants and animals according to their classification. • Recognize the interdependence of plants and animals and changes over time. • Identify how plants and animals adapt to their environment. • Explore how food provides energy to humans. • Explore DNA as the blueprint for traits passed from parent to offspring: characteristics, tendencies for certain diseases and so on.	October, 2015 - 2016 May, 2016 - 2017 January, 2017 - 2018 May, 2017 - 2018	n2y Library/Science Books ULS Monthly Lessons: Science Lessons Standards Connection

n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will identify basic organs and systems of the human body with connections to functions (heart, respiratory system, etc.). • Students will explain the basic process of photosynthesis describing how plants make their food. • Students will classify plants and animals into major categories. • Students will describe how animals and plants survive in an environment. • Students will describe an ecosystem and the natural and human factors that may help or hurt the balance of nature. • Students will describe the components of a balanced diet and the impact that diet can have. • Students will describe the basic structure of a DNA code and the code's implications for inherited traits and tendencies.	• Students will identify basic organs of the body and explain how these work to sustain life (heart, lungs, stomach, brain, etc.). • Students will understand that plants need sunlight to make their food. • Students will identify various plants and animals as belonging to a specific classification or category. • Students will match plants and animals with characteristics that aid in survival. • Students will identify plants and animals that share a biome and how these organisms meet one another's needs. • Students will identify basic food groups that contribute to a balanced diet. • Students will design a simple DNA chart that shows basic connections of inherited traits.	• Students will match body parts with functions. • Students will identify parts of a plant. • Students will sort plants and animals. • Students will select a characteristic of a plant or animal that aids in survival. • Students will match plants and animals to a specific biome. • Students will identify plants and animals that contribute to a healthful diet. • Students will identify traits inherited from parents (eye color, hair color, etc.).

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Physical Science (Physics and Chemistry)	Grades 9–12
Next Generation Science Standards	Your State's Extended Standards
Grades 9-12 Matter and its Interactions HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms. [Clarification Statement: Examples of properties that could be predicted from patterns could include reactivity of metals, types of bonds formed, numbers of bonds formed, and reactions with oxygen.] [Assessment Boundary: Assessment is limited to main group elements. Assessment does not include quantitative understanding of ionization energy beyond relative trends.] HS-PS1-2. Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties. [Clarification Statement: Examples of chemical reactions could include the reaction of sodium and chlorine, of carbon and oxygen, or of carbon and hydrogen.] [Assessment Boundary: Assessment is limited to chemical reactions involving main group elements and combustion reactions.] HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles. [Clarification Statement: Emphasis is on understanding the strengths of forces between particles, not on naming specific intermolecular forces (such as dipole-dipole). Examples of particles could include ions, atoms, molecules, and networked materials (such as graphite). Examples of bulk properties of substances could include the melting point and boiling point, vapor pressure, and surface tension.] [Assessment Boundary: Assessment does not include Raoult's law calculations of vapor pressure.] HS-PS1-4. Develop a model to illustrate that the release or absorption of energy from a chemical reaction system depends upon the changes in total bond energy. [Clarification Statement: Emphasis is on the idea that a chemical reaction is a system that affects the energy change. Examples of models could include molecular-level drawings and diagrams of reactions, graphs showing the relative energies of reactants and products, and representations showing energy is conserved.] [Assessment Boundary: Assessment does not include calculating the total bond energy changes during a chemical reaction from the bond energies of reactants and products.] HS-PS1-5. Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs. [Clarification Statement: Emphasis is on student reasoning that focuses on the number and energy of collisions between molecules.] [Assessment Boundary: Assessment is limited to simple reactions in which there are only two reactants; evidence from temperature, concentration, and rate data; and qualitative relationships between rate and temperature.] HS-PS1-6. Refine the design of a chemical system by specifying a change in conditions that would produce increased amounts of products at equilibrium. * [Clarification Statement: Emphasis is on the application of Le Chatelier's Principle and on refining designs of chemical reaction systems, including descriptions of the connection between changes made at the macroscopic level and what happens at the molecular level. Examples of designs could include different ways to increase product formation including adding reactants or removing products.] [Assessment Boundary: Assessment is limited to specifying the change in only one variable at a time. Assessment does not include calculating equilibrium constants and concentrations.]	

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HS-PS1-7. Use mathematical representations to support the claim that atoms, and therefore mass, are conserved during a chemical reaction. [Clarification Statement: Emphasis is on using mathematical ideas to communicate the proportional relationships between masses of atoms in the reactants and the products, and the translation of these relationships to the macroscopic scale using the mole as the conversion from the atomic to the macroscopic scale. Emphasis is on assessing students' use of mathematical thinking and not on memorization and rote application of problem-solving techniques.] [Assessment Boundary: Assessment does not include complex chemical reactions.] HS-PS1-8. Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes of fission, fusion, and radioactive decay. [Clarification Statement: Emphasis is on simple qualitative models, such as pictures or diagrams, and on the scale of energy released in nuclear processes relative to other kinds of transformations.] [Assessment Boundary: Assessment does not include quantitative calculation of energy released. Assessment is limited to alpha, beta, and gamma radioactive decays.]	
Motion and Stability: Force and Interactions HS-PS2-1. Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration. [Clarification Statement: Examples of data could include tables or graphs of position or velocity as a function of time for objects subject to a net unbalanced force, such as a falling object, an object rolling down a ramp, or a moving object being pulled by a constant force.] [Assessment Boundary: Assessment is limited to one-dimensional motion and to macroscopic objects moving at non-relativistic speeds.] HS-PS2-2. Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system. [Clarification Statement: Emphasis is on the quantitative conservation of momentum in interactions and the qualitative meaning of this principle.] [Assessment Boundary: Assessment is limited to systems of two macroscopic bodies moving in one dimension.] HS-PS2-3. Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision. * [Clarification Statement: Examples of evaluation and refinement could include determining the success of the device at protecting an object from damage and modifying the design to improve it. Examples of a device could include a football helmet or a parachute.] [Assessment Boundary: Assessment is limited to qualitative evaluations and/or algebraic manipulations.] HS-PS2-4. Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects. [Clarification Statement: Emphasis is on both quantitative and conceptual descriptions of gravitational and electric fields.] [Assessment Boundary: Assessment is limited to systems with two objects.] HS-PS2-5. Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current. [Assessment Boundary: Assessment is limited to designing and conducting investigations with provided materials and tools.]	

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HS-PS2-6. Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials. * [Clarification Statement: Emphasis is on the attractive and repulsive forces that determine the functioning of the material. Examples could include why electrically conductive materials are often made of metal, flexible but durable materials are made up of long chained molecules, and pharmaceuticals are designed to interact with specific receptors.] [Assessment Boundary: Assessment is limited to provide molecular structures of specific designed materials.] Energy HS-PS3-1. Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known. [Clarification Statement: Emphasis is on explaining the meaning of mathematical expressions used in the model.] [Assessment Boundary: Assessment is limited to basic algebraic expressions or computations; to systems of two or three components; and to thermal energy, kinetic energy, and/or the energies in gravitational, magnetic, or electric fields.] HS-PS3-2. Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects). [Clarification Statement: Examples of phenomena at the macroscopic scale could include the conversion of kinetic energy to thermal energy, the energy stored due to position of an object above the earth, and the energy stored between two electrically-charged plates. Examples of models could include diagrams, drawings, descriptions, and computer simulations.] HS-PS3-3. Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. * [Clarification Statement: Emphasis is on both qualitative and quantitative evaluations of devices. Examples of devices could include Rube Goldberg devices, wind turbines, solar cells, solar ovens, and generators. Examples of constraints could include use of renewable energy forms and efficiency.] [Assessment Boundary: Assessment for quantitative evaluations is limited to total output for a given input. Assessment is limited to devices constructed with materials provided to students.]	
HS-PS3-4. Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics). [Clarification Statement: Emphasis is on analyzing data from student investigations and using mathematical thinking to describe the energy changes both quantitatively and conceptually. Examples of investigations could include mixing liquids at different initial temperatures or adding objects at different temperatures to water.] [Assessment Boundary: Assessment is limited to investigations based on materials and tools provided to students.] HS-PS3-5. Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction. [Clarification Statement: Examples of models could include drawings, diagrams, and texts, such as drawings of what happens when two charges of opposite polarity are near each other.] [Assessment Boundary: Assessment is limited to systems containing two objects.	

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Waves and their Applications in Technologies for Information Transfer HS-PS4-1. Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media. [Clarification Statement: Examples of data could include electromagnetic radiation traveling in a vacuum and glass, sound waves traveling through air and water, and seismic waves traveling through the Earth.] [Assessment Boundary: Assessment is limited to algebraic relationships and describing those relationships qualitatively.] HS-PS4-2. Evaluate questions about the advantages of using a digital transmission and storage of information. [Clarification Statement: Examples of advantages could include that digital information is stable because it can be stored reliably in computer memory, transferred easily, and copied and shared rapidly. Disadvantages could include issues of easy deletion, security, and theft.] HS-PS4-3. Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other. [Clarification Statement: Emphasis is on how the experimental evidence supports the claim and how a theory is generally modified in light of new evidence. Examples of a phenomenon could include resonance, interference, diffraction, and photoelectric effect.] [Assessment Boundary: Assessment does not include using quantum theory.] HS-PS4-4. Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter. [Clarification Statement: Emphasis is on the idea that photons associated with different frequencies of light have different energies, and the damage to living tissue from electromagnetic radiation depends on the energy of the radiation. Examples of published materials could include trade books, magazines, web resources, videos, and other passages that may reflect bias.] [Assessment Boundary: Assessment is limited to qualitative descriptions.] HS-PS4-5. Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy. * [Clarification Statement: Examples could include solar cells capturing light and converting it to electricity; medical imaging; and communications technology.] [Assessment Boundary: Assessments are limited to qualitative information. Assessments do not include band theory.] ** The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea.*	

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n2y Instructional Targets	n2y High School Grade Band Unit	n2y Supporting Activities
Physical Science • Identify and investigate entries in the Periodic Table of Elements in relation to real-world product uses (gold in jewelry, aluminum in foil wrap, etc.). • Recognize and investigate real-world examples of physical and chemical changes to matter. • Identify and investigate objects in motion in terms of distance, speed, position, acceleration and time. • Describe and investigate examples of energy and energy transfers in daily life (light bulb, car engine, sound in a radio, etc.). • Investigate the effects of change in frequency, wavelength or speed on light and sound. • Identify technologies in everyday life that meet human needs.	January, 2015 - 2016 March, 2015 - 2016 March, 2016 - 2017 October, 2017 - 2018	n2y Library/Science Books ULS Monthly Lessons: Science Lessons Standards Connection
n2y Differentiated Tasks		
Level 3	*Level 2*	*Level 1*
• Students will identify common metal and nonmetal elements with typical uses for these elements. • Students will describe changes in matter within real-world situations, including physical changes (size, shape, state, or appearance) and chemical changes (transformation to a different kind of matter). • Students will describe the motion of an object. • Students will explore, identify and describe the variety of ways that energy impacts daily life. • Students will describe changes in light or sound when frequency, wavelength or speed is altered. • Students will describe how technology (computers, smartphones) use waves to transmit and capture information.	• Students will match objects made of metal with each object's use (pan for cooking, folding chair for sitting, etc.). • Students will identify the cause of a chemical or physical change in a state of matter (water freezing into ice cubes, paper being cut into shapes, baking a cake etc.). • Students will match a description to identify the motion of an object (speed, path and pattern). • Students will identify energy sources and describe their use in daily life. • Students will identify changes in light or sound. • Students will match technology to the information it sends and receives through waves.	• Students will identify common objects made of metal. • Students will identify states of matter before and after changes in that matter. • Students will identify the motion of an object as being fast or slow. • Students will demonstrate the proper use of an energy source (turning on the radio, using a solar powered calculator, etc.) • Students will actively participate in activities that result in a change to sound or light. • Students will identify common technology that use waves to transmit and capture information (smart phone, computer, etc.).

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<table>
<tr><th colspan="3">Scientific Inquiry — Grades 9–12</th></tr>
<tr><td colspan="2">Next Generation Science Standards</td><td>Your State's Extended Standards</td></tr>
<tr><td colspan="2">• HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
• HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
• HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
• HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem</td><td></td></tr>
<tr><td>n2y Instructional Targets</td><td>n2y High School Grade Band Unit</td><td>n2y Supporting Activities</td></tr>
<tr><td rowspan="3">• Identify questions to guide scientific investigations.
• Conduct simple scientific investigations.
• Use tools to gather data and information.
• Analyze and interpret data.
• Communicate and support findings.</td><td>October, 2016 - 2017</td><td>Unique
n2y Library/Science Books
ULS Monthly Lessons: Science Lessons</td></tr>
<tr><td>n2y Monthly Lessons</td><td>News-2-You</td></tr>
<tr><td>Lesson 28: Science Experiment</td><td>Activities: Science Experiment</td></tr>
<tr><td colspan="3">n2y Differentiated Tasks</td></tr>
<tr><td>Level 3</td><td>Level 2</td><td>Level 1</td></tr>
<tr><td>• Students will follow steps of a scientific process related to grades 9–12 science topics.</td><td>• With support, students will follow steps of a scientific process related to grades 9–12 science topics.</td><td>• Students will actively participate in a scientific process related to grades 9–12 science topics.</td></tr>
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