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# Science Curriculum Map Grade Pre-K

| | Standard | Major Understandings | Smithsonian Unit |
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| **Earth and Space Sciences** | **P-ESS1-1** Observe and describe the apparent motions of the Sun, moon, and stars to recognize predictable patterns. | Pattern examples include the Sun and moon appear to move across the sky in a predictable pathway, day and night follow predictable patterns, seasons change in a cyclical pattern, the moon's shape appears to change in a cyclical pattern, and stars other than the Sun can be visible at night. | N/A |
| | **P-ESS2-1** Ask questions, make observations, and collect and record data using simple instruments to recognize patterns about how local weather conditions change daily and seasonally. | How daily local weather conditions impact what clothes children wear. Weather conditions include cloud cover (cloudy, clear), precipitation (sunny, rain, snow), wind (no wind, windy), and temperature (hot, warm, cold). | |
| | **P-PS3-3** Plan and conduct an investigation to determine the effect of sunlight on Earth's surface. | Effects could include illumination, shadows casted, and the warming effect on living organisms and nonliving things. | |
| **Physical Sciences** | **P-PS1-1** Ask questions and use observations to test the claim that different kinds of matter exist as either solid or liquid. | Emphasis should be on observing and describing similarities and differences between solids and liquids based on their physical properties. | N/A |
| | **P-PS2-1** Use tools and materials to design and build a device that | Investigate forces (pushes and pulls). Examples include pulling a | |

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| | causes an object to move faster with a push or a pull.<br><br>**P-PS4-1** Plan and conduct investigations to provide evidence that sound is produced by vibrating materials. | string attached to an object or a ramp to increase the speed of an object (slower, faster).<br><br>Vibrating materials could include percussion, string, or wind instruments and audio speakers. | |
| **Life Sciences** | **P-LS1-1** Observe familiar plants and animals (including humans) and describe what they need to survive.<br><br>**P-LS1-2** Plan and conduct an investigation to determine how familiar plants and/or animals use their external parts to help them survive in the environment.<br><br>**P-LS3-1** Develop a model to describe that some young plants and animals are similar to, but not exactly like, their parents. | Determine what a variety of living things need to live and grow.<br><br>Understand the relationship between the physical and living environment. Examples of external parts could include roots, stems, and leaves for plants and eyes, ears, mouth, arms, and legs for animals.<br><br>Emphasis is on observation and pictorial representations of familiar plants and animals. | N/A |

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# Science Curriculum Map Grade K

| September to Mid-November | | | |
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| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** |
| **Weather and Climate** | **K-ESS2-1** Use and share observations of local weather conditions to describe patterns over time.<br><br>**K-ESS3-2** Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.<br><br>**K-PS3-1** Make observations to determine the effect of sunlight on Earth's surface. | Qualitative observations could include descriptions of weather (sunny, cloudy, rainy, warm) and quantitative observations could include numbers of sunny or windy days in a month. Patterns could include the number of warmer/cooler days in different months.<br><br>Emphasis is on local forms of severe weather and local resources available for preparedness measures.<br><br>Earth's surface could include sand, soil, rocks, and water. Limited to relative measures such as warmer/cooler. | Earth and Space:<br>How Can We Be Ready for the Weather?<br><br>10 lessons |
| **Mid-November to January** | | | |
| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** |
| **Forces and Interactions: Pushes and Pulls** | **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.<br><br>**K-PS2-2** Analyze data to determine if a design solution works as intended to change the speed or direction of an | 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.<br><br>Examples of problems could include having a marble or other object move a certain distance, follow a particular | Physical:<br>How Can We Change an Object's Motion?<br><br>10 lessons |

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| | object with a push or a pull. | path, and knock down other objects. 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. | |
| **K-2 Engineering Design** | **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. | | |
| **February to Mid-April** | | | |
| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** |
| **Interdependent Relationships Ecosystems: Animals, Plants, and Their Environment** | **K-LS1-1** Use observations to describe patterns of what plants and animals (including humans) need to survive. | 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 and other materials to live, grow, and thrive. | Life:<br>What Do Plants and Animals Need to Live?<br><br>10 lessons |
| | **K-ESS2-2** Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. | Examples could include a squirrel digging a hole in the ground to hide its food and tree roots breaking concrete as they grow. | |
| | **K-ESS3-1** Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. | Examples of relationships could include that deer eat buds and leaves so they usually live in forested areas and grasses need sunlight so they often grow in meadows and fields. | |
| | **K-ESS3-3** Communicate solutions that will reduce the impact of humans on living organisms and nonliving things in | Examples of human impact on the environment (land, water, air, plants, and animals) could include cutting down trees | |

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| | the local environment. | to make paper. Solutions could include recycling paper and planting new trees. | |
| **Mid-April to June** | | | |
| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** |
| **Weather and Climate**<br><br>**K-2 Engineering Design** | **K-PS3-1** Make observations to determine the effect of sunlight on Earth's surface.<br><br>**K-PS3-2** Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.<br><br>**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.<br><br>**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.<br><br>**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. | Earth's surface could include sand, soil, rocks, and water. Limited to relative measures such as warmer/cooler.<br><br>Examples of structures could include umbrellas, canopies, and tents to minimize the warming effect of the sun. | Engineering Design: How Can We Stay Cool in the Sun?<br><br>10 lessons |
| **Matter and Its Interactions** | **K-PS1-1** Plan and conduct an investigation to test the claim that different kinds of matter exist as either solid or liquid, depending on temperature. | A solid may be a liquid at higher temperatures and a liquid may be a solid at lower temperatures. | Not addressed in Smithsonian units - will need to supplement |

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# Science Curriculum Map Grade 1

| September to Mid-November | | | |
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| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** |
| **Structure, Function, and Information Processing** | **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. | Examples include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells and animal scales or keeping out intruders by mimicking thorns on branches and animal quills. | Life:<br>How Do Living Things Stay Safe and Grow?<br><br>10 lessons |
| | **1-LS1-2** Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. | Examples of patterns of behaviors could include the signals that offspring make (crying, cheeping) and the responses of the parents (feeding, comforting, protecting). | |
| | **1-LS3-1** Make observations to construct an evidence-based account that some young plants and animals are similar to, but not exactly like, their parents. | Leaves from the same kind of plant are the same shape but can differ in size or a particular breed of dog looks like its parents, but is not exactly the same. | |
| **K-2 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. | | |
| **Mid-November to January** | | | |
| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** |
| **Space Systems:** | **1-ESS1-1** Use observations of the | Sun and moon appear to rise in the east, | Earth and Space: |

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| **Patterns and Cycles** | Sun, moon, and stars to describe patterns that can be predicted.<br><br>**1-ESS1-2** Make observations at different times of the year to relate the amount of daylight to the time of year.<br><br>**1-PS4-2** Make observations (firsthand or from media) to construct an evidence-based account that objects can be seen only when illuminated. | move in a pathway across the sky and set in the west. Stars other than the Sun are visible at night but not during the day.<br><br>More daylight in the summer than in the winter.<br><br>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. | How Can We Predict When the Sky Will Be Dark?<br><br>10 lessons |
| **Waves: Light and Sound** | | | |
| **February to Mid-April** | | | |
| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** |
| **Waves: Light and Sound** | **1-PS4-2** Make observations (firsthand or from media) to construct an evidence-based account that objects can be seen only when illuminated.<br><br>**1-PS4-3** Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. | 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.<br><br>Materials could include transparent (clear plastic), translucent (wax paper), opaque (cardboard), or reflective (mirror). | Physical:<br>How Can We Light Our Way in the Dark?<br><br>10 lessons |
| **Structure, Function, and Information Processing** | **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. | Examples include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells and animal scales or keeping out intruders by mimicking thorns on branches and animal quills. | |
| **K-2 Engineering Design** | **K-2-ETS1-1** Ask questions, make observations, and gather information about a situation people want to change | | |

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| | to define a simple problem that can be solved through the development of a new or improved object or tool. | | |
| **Mid-April to June** | | | |
| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** |
| **Waves: Light and Sound**<br><br>**K-2 Engineering Design** | **1-PS4-1** Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.<br><br>**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.<br><br>**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.<br><br>**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.<br><br>**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. | Vibrating materials could include tuning forks and plucking a stretched string. How sound can make matter vibrate could include holding paper near a speaker making sound and holding an object near a vibrating tuning fork.<br><br>Examples of devices could include a light source to send signals, paper cup and string "telephones", and a pattern of drum beats. | Engineering Design: How Can We Send a Message Using Sound?<br><br>10 lessons |

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# Science Curriculum Map Grade 2

| September to Mid-November | | | |
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| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** |
| **Structure and Properties of Matter** | **2-PS1-1** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. | Observations could include color, texture, hardness, and flexibility. | Physical<br>How Can We Change Solids and Liquids?<br><br>10 lessons |
| | **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. | Properties could include strength, flexibility, hardness, texture, and absorbency. | |
| | **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. | 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. | An example of a reversible change could include freezing and melting. An irreversible change could include cooking an egg. | |
| **K-2 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. | | |
| **Mid-November to January** | | | |

| | Learning Standards | Major Understandings | Smithsonian Unit |
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| **Earth's Systems: Processes that Shape the Earth**<br><br>**K-2 Engineering Design** | **2-ESS1-1** Use information from several sources to provide evidence that Earth events can occur quickly or slowly.<br><br>**2-ESS2-1** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.<br><br>**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.<br><br>**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.<br><br>**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. | Volcanic explosions and earthquakes happen quickly and weathering and erosion of rocks may occur slowly.<br><br>Solutions could include different designs for using rocks, shrubs, grass, and trees to hold back wind, water, and land. | Engineering Design:<br>How Can We Stop Soil From Washing Away?<br><br>10 lessons |
| **February to Mid-April** | | | |
| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** |
| **Earth's Systems: Processes that Shape the Earth** | **2-ESS2-2** Develop a model to represent the shapes and kinds of land and bodies of water in an area.<br><br>**2-ESS2-3** Obtain information to | | Earth and Space:<br>What Can Maps Tell Us About Land and Water on Earth? |

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| | identify where water is found on Earth and that it can be solid or liquid.<br><br>**2-PS1-1** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. | Observations could include color, texture, hardness, and flexibility. | 10 lessons |
| **Structure and Properties of Matter** | | | |
| **Mid-April to June** | | | |
| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** |
| **Interdependent Relationships in Ecosystems** | **2-LS2-1** Plan and conduct an investigation to determine whether plants need sunlight and water to grow.<br><br>**2-LS2-2** Develop a simple model that illustrates how plants and animals depend on each other for survival.<br><br>**2-LS4-1** Make observations of plants and animals to compare the diversity of life in different habitats. | Examples could include animals dispersing seeds or pollinating plants, and plants providing food, shelter, and other materials for animals.<br><br>Emphasis is on the diversity of living things in each of a variety of different habitats. | Life:<br>How Can We Find the Best Place for a Plant to Grow?<br><br>10 lessons |
| **K-2 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. | | |

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# Science Curriculum Map Grade 3

| September to Mid-November | | | | |
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| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** | **NYS Investigations** |
| **Structure and Properties of Matter**<br><br>**3-5 Engineering Design** | **3-ESS2-1** Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.<br><br>**3-ESS2-2** Obtain and combine information to describe climates in different regions of the world.<br><br>**3-ESS3-1** Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.<br><br>**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. | Examples of data could include average temperature, precipitation, and wind direction depicted in pictographs and bar graphs.<br><br>Emphasis should be on various climates in different regions rather than on localized weather conditions.<br><br>Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods. | Earth and Space How Do Weather and Climate Affect Our Lives?<br><br>15 lessons | Cloud in a Bottle at the end of the unit. |
| **Weather and Climate** | **3-ESS2-3** Plan and conduct an investigation to determine the connections between weather and water processes in Earth systems. | Emphasis should be on the processes that connect the water cycle and weather patterns. | Not addressed in Smithsonian units - will need to supplement | |

| Mid-November to January | | | | |
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| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** | **NYS Investigations** |
| **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. | Examples could include an unbalanced force on one side of an object can make it start moving, and balanced forces acting on a stationary object from both sides will not produce any motion at all. | Physical:<br>How Can We Predict Patterns of Motion?<br><br>15 lessons | |
| | **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. | 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. | | |
| | **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. | Force on hair from an electrically charged balloon, force between two magnets, force between an electromagnet and steel paper clips. | | |
| | **3-PS2-4** Define a simple design problem that can be solved by applying scientific ideas about magnets. | 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. | | |
| **K-2 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. | | | |

| February to Mid-April | | | | |
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| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** | |
| **Inheritance and Variation of Traits: Life Cycles and Traits** | **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. | Changes organisms go through during their life form a pattern. | Life: What Explains Similarities and Differences Between Organisms?<br><br>15 lessons | Circle of Life after lesson 10. |
| | **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. | Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Focus is on organisms other than humans. | | |
| | **3-LS3-2** Use evidence to support the explanation that traits can be influenced by the environment. | Examples include normally tall plants grown with insufficient water are stunted and a pet dog that is overfed and has little exercise may become overweight. | | |
| | **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. | Plants that have larger thorns than other plants may be less likely to be eaten by predators. Animals that have better camouflage coloration than other animals may be more likely to survive and reproduce. | | |
| **Weather and Climate** | **3-ESS2-2** Obtain and combine information to describe climates in different regions of the world. | Emphasis should be on various climates in different regions rather than on localized weather conditions. | | |
| **Mid-April to June** | | | | |

| | Learning Standards | Major Understandings | Smithsonian Unit | NYS Investigations |
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| **Interdependent Relationships in Ecosystems**<br><br>**K-2 Engineering Design** | **3-LS2-1** Construct an argument that some animals form groups that help members survive.<br><br>**3-LS4-1** Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.<br><br>**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.<br><br>**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.<br><br>**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.<br><br>**3-5-ETS1-2** Generate and compare multiple possible | Examples of data could include type, size and distributions of fossil organisms. Environments could include marine fossils found on dry land and tropical plant fossils found in Arctic areas.<br><br>Examples of evidence could include needs and characteristics of the organisms and habitats involved.<br><br>Examples of environmental changes could include both natural and human-influenced changes in land characteristics, water distribution, temperature, food, and other organisms. | Engineering Design:<br>How Can We Protect Animals When Their Habitat Changes?<br><br>15 lessons | |

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| | solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.<br><br>**3-5-ETS1-3** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of the model or prototype that can be improved. | | | |

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# Science Curriculum Map Grade 4

| September to Mid-November | | | | |
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| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** | **NYS Investigations** |
| **Earth's Systems: Processes that Shape the Earth** | **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. | Examples of evidence 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 or tilted rock layers indicating past crustal movement. | Earth and Space<br>What is Our Evidence that We Live on Changing Earth?<br><br>15 lessons | |
| | **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. | | | |
| | **4-ESS2-2** Analyze and interpret data from maps to describe patterns of Earth's features. | Maps can include topographic maps of Earth's land and ocean floor, locations of mountains, continental boundaries, volcanoes, and earthquakes. | | |
| | **4-ESS3-2** Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans. | Examples of solutions could include designing an earthquake resistant building and improving monitoring of volcanic activity. | | |
| **Waves: Waves and Information** | **4-PS4-1** Develop a model of waves to describe patterns in terms of amplitude and | Examples of models could include diagrams, analogies, and physical models using wire to illustrate | | |

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| | wavelength and that waves can cause objects to move.<br><br>**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. | wavelength and amplitude of waves. | | |
| **Mid-November to January** | | | | |
| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** | **NYS Investigations** |
| **Energy**<br><br><br><br><br><br><br><br><br><br>**Structure, Function, and Information Processing**<br><br><br><br>**K-2 Engineering** | **4-PS3-1** Use evidence to construct an explanation relating the speed of an object to the energy of that object.<br><br>**4-PS3-2** Make observations to provide evidence that energy is conserved as it is transferred and/or converted from one form to another.<br><br>**4-PS3-3** Ask questions and predict outcomes about the changes in energy that occur when objects collide.<br><br>**4-LS1-1** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.<br><br>**3-5-ETS1-1** Define a simple | Forms of energy include sound, light, heat, and electrical.<br><br>Emphasis is on the change in energy due to the change in speed, not on the forces, as objects interact.<br><br>Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin. | Physical:<br>How Does Motion Energy Change in Collision?<br><br>15 lessons | |

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| **Design** | design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. | | | |
| **February to Mid-April** | | | | |
| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** | |
| **Structure, Function, and Information Processing** | **4-LS1-1** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.<br><br>**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.<br><br>**4-PS4-2** Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. | Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin.<br><br>Emphasis is on systems of information transfer. | Life:<br>How Can Animals Use Their Senses to Communicate?<br><br>15 lessons | |
| **Waves: Waves and Information** | **4-PS4-3** Generate and compare multiple solutions that use patterns to transfer information. | Examples 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. | | |

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| **K-2 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. | | | |
| **Mid-April to June** | | | | |
| | **Learning Standards** | **Major Understandings** | **Smithsonian Unit** | **NYS Investigations** |
| **Energy**<br><br>**K-2 Engineering Design** | **4-PS3-2** Make observations to provide evidence that energy is conserved as it is transferred and/or converted from one form to another.<br><br>**4-PS3-4** Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.<br><br>**4-ESS3-1** Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.<br><br>**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.<br><br>**3-5-ETS1-2** Generate and compare multiple possible | Forms of energy include sound, light, heat, and electrical.<br><br>Examples of devices could include electric circuits that convert electrical energy into energy of motion of a vehicle, light, or sound.<br><br>Examples of energy resources include wind, water, sunlight, and fossil fuels. Environmental effects include loss of habitat and pollution. | Engineering Design:<br>How Can We Provide Energy to People's Homes?<br><br>15 lessons | Light It Up after lesson 11 or 12. |

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| | solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.<br><br>**3-5-ETS1-3** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of the model or prototype that can be improved. | | | |