

# Grade 1 Science

Unit Title: Light and Sound Waves: September/October (MP 1)				
Big Idea: Introduction to concepts underlying light and sound and how they can be used to communicate.				
Investigation Questions	NGSS/ PA Core Standards	Objectives/ Lab Activities	Key Vocabulary	Reading Wonders Connection
<p><b>LESSON 1: Light and Sound Waves</b></p> <p>What do we know about light and sound?</p> <p>What do vibrations and waves have to do with it?</p> <p>Do we need light to see objects?</p>	<p><b>1-PS4-1:</b> Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.</p> <p><b>1-PS4-2:</b> Make observations to construct an evidence-based account that objects can be seen only when illuminated.</p> <p><b>1-PS4-3:</b> Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.</p> <p><b>1-PS4-4:</b> Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.</p>	<p>Develop a chart to share their ideas about light and sound.</p> <p>Make observations to show that vibrations cause waves and sound</p> <p>Observe that objects need to be illuminated to be seen</p>	<ul style="list-style-type: none"> <li>● Artificial light source</li> <li>● Illuminate</li> <li>● Light</li> <li>● Natural light source</li> <li>● Sound</li> <li>● Vibrate</li> <li>● Vibration</li> <li>● Wave</li> </ul>	Unit 5 Week 4
<p><b>LESSON 2: Sound Off</b></p> <p>Can you see vibrations?</p> <p>How does the speed of vibrations affect sound?</p> <p>Can you change sound?</p>	<p><b>K-2-ETS1-1:</b> 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.</p> <p><b>K-2-ETS1-2:</b> 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.</p> <p><b>3.1.1.B6</b> Recognize that light from the sun is an important source of energy for living and nonliving systems.</p> <p><b>3.2.1.B5</b> Compare and contrast how light travels through different materials. Explore how mirrors and prisms can be used to redirect a light beam.</p> <p><b>3.2.3.B5</b> Recognize that light travels in a straight line until it strikes an object or travels from one material to another.</p> <p><b>3.2.4.B5</b> Demonstrate how light can be reflected, refracted, or absorbed by an object.</p> <p><b>3.2.4.B5</b> Demonstrate how vibrating objects make sound and sound can make things vibrate.</p>	<p>Plan an investigation with a drum and a pencil to explain how sound makes vibrations</p> <p>Use a ruler to observe how the speed of vibrations can affect a sound's pitch</p> <p>Plan and build a rubber-band box to investigate how to change the volume and pitch of sound</p>	<ul style="list-style-type: none"> <li>● Pitch</li> <li>● Volume</li> </ul>	

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<p style="text-align: center;"><b>LESSON 3: Traveling Sound</b></p> <p>How does sound travel to our ears?</p> <p>Can sound travel through solids?</p>	<p><b>3.4.4.C2</b> Describe the engineering design process: Define a problem. Generate ideas. Select a solution and test it. Make the item. Evaluate the item.</p> <p><b>S.K-2.A.1.1.1</b> Identify a scientific fact as something that can be observed using the five senses.</p> <p><b>S.K-2.A.2.1.1</b> Understand that making a change to an investigation may change the outcome(s) of the investigation.</p> <p><b>S.K-2.A.2.1.2</b> Describe outcomes of an investigation.</p>	<p>Plan an investigation using a spoon, a pencil, and a string to explore that sound needs a material to travel through</p> <p>Use a string phone to further investigate how sound travels and to communicate a message</p>	<ul style="list-style-type: none"> <li>• Communicate</li> </ul>	
<p style="text-align: center;"><b>LESSON 4: Light it Up</b></p> <p>Do objects need light to be seen?</p>	<p><b>S.K-2.A.2.2.1</b> Identify simple tools that can be used in an investigation (e.g., measuring cup, hand lens, ruler, balance scale, thermometer).</p> <p><b>S3.C.2.1.3</b> Identify characteristics of sound (i.e., pitch, and loudness).</p> <p><b>3.2.K.A6</b> Constructing Explanations and Designing Solutions CCC Cause and Effect 3.2.K.A6 Planning and Carrying Out Investigations; Analyzing and Interpreting Data CCC Patterns; Cause and Effect 3.2.K.A6 Planning and Carrying Out Investigations; Analyzing and Interpreting Data CCC Patterns; Cause and Effect</p>	<p>Use a pinhole box to investigate whether objects need to be illuminated by a light source to be seen</p>	<ul style="list-style-type: none"> <li>• Line</li> <li>• Ray</li> <li>• Reflect</li> </ul>	
<p style="text-align: center;"><b>LESSON 5: Light on the Move</b></p> <p>How do different materials affect the way light travels?</p> <p>Can you bend a ray of light?</p>	<p><b>3.2.K.A6</b> Planning and Carrying Out Investigations; Constructing Explanations and Designing Solutions CCC Cause and Effect</p> <p><b>3.2.K.A6</b> Planning and Carrying Out Investigations; Analyzing and Interpreting Data; Constructing Explanations and Designing Solutions</p> <p><b>3.2.K.A6</b> Developing and Using Models; Constructing Explanations and Designing Solutions CCC Patterns; Cause and Effect</p>	<p>Use a flashlight and a variety of objects to investigate how different materials change the path of light</p> <p>Design and test a plan to bend light using mirrors and a flashlight</p>	<ul style="list-style-type: none"> <li>• Angle</li> <li>• Opaque</li> <li>• Shadow</li> <li>• Transparent</li> <li>• Translucent</li> </ul>	

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<p><b>LESSON 6:</b> <b>Communicating with Light and Sound</b></p> <p>How do we communicate with light and sound?</p> <p>Can you design a device to communicate with light or sound?</p> <p>What have we learned about light and sound?</p>		<p>Develop a chart to share what they know about communicating with light and sound</p> <p>Learn about the engineering design process and work with a partner to create a device that communicates with light or sound</p> <p>Evaluate what they have learned throughout the unit</p>	<ul style="list-style-type: none"><li>• Code</li><li>• Receiver</li><li>• Transmitter</li></ul>	
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Unit Title: Exploring Organisms: March/April (MP 3/4)				
Big Idea: Our world is composed of living and nonliving things that are in constant interaction. We will learn about how organisms meet their needs in the environment.				
Investigation Questions	NGSS/ PA Core Standards	Objectives/ Lab Activities	Key Vocabulary	Reading Wonders Connection
<p><b>LESSON 1: Needs for Survival</b></p> <p>How can you tell if something is living or nonliving?</p> <p>How does a seed grow into a bean plant?</p> <p>What do living things need to survive?</p> <p>How do living things need to survive?</p>	<p><b>1-LS1-1:</b> 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.</p> <p><b>1-LS1-2:</b> Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.</p> <p><b>1-LS3-1:</b> Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.</p> <p><b>K-2-ETS1-2:</b> 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.</p> <p><b>3.1.1.A1:</b> Categorize living and nonliving things by external characteristics.</p> <p><b>3.1.1.A2:</b> Investigate the dependence of living things on the sun's energy, water, food/nutrients, air, living space, and shelter.</p> <p><b>3.1.1.A5:</b> Identify and describe plant parts and their function.</p> <p><b>3.1.1.B1:</b> Grow plants from seed and describe how they grow and change. Compare to adult plants.</p>	<p>Distinguish between living and nonliving things in the environment. n Identify the needs of living things.</p> <p>Draw connections between body structures and their functions to explain how they are used to meet an organism's needs.</p> <p>Recognize patterns in structures and their functions.</p> <p>Set up an environment and make predictions about the growth of a bean plant</p>	<ul style="list-style-type: none"> <li>● Animal</li> <li>● Body part</li> <li>● Breathe</li> <li>● Characteristic</li> <li>● Dead</li> <li>● Energy</li> <li>● Environment</li> <li>● Food</li> <li>● Living</li> <li>● Move</li> <li>● Needs</li> <li>● Nonliving</li> <li>● Organism</li> <li>● Plant</li> <li>● Reproduce</li> <li>● Seed</li> <li>● Structure</li> <li>● Survive</li> <li>● Trait</li> </ul>	<p><b>Unit 4</b></p>
<p><b>LESSON 2: Structure and Functions for Survival?</b></p> <p>Are insects more similar to plants or to animals?</p> <p>What is an adaptation?</p> <p>How do human structures compare to other animals' structures?</p>	<p><b>3.1.2.A5:</b> Explain how different parts of a plant work together to make the organism function.</p> <p><b>3.1.2.C2:</b> Explain that living things can only survive if their needs are being met.</p> <p><b>3.4.4.C2:</b> Describe the engineering design process: Define a problem. Generate ideas. Select a solution and test it. Make the item. Evaluate the item.</p> <p><b>S.K-2.B.3.1.1:</b> Distinguish between living and nonliving things</p> <p><b>S.K-2.B.3.1.2:</b> Identify plants and animals as living things.</p> <p><b>S4.B.2.2:</b> Identify that characteristics are inherited and, thus, offspring closely resemble their parents.</p>	<p>Draw conclusions about insects based on their observable structures.</p> <p>Identify plant and animal adaptations and how they are influenced by the environment.</p> <p>Mimic organisms' structures to explain their adaptations.</p>	<ul style="list-style-type: none"> <li>● Adaptation</li> <li>● Compare</li> <li>● Flower</li> <li>● Observe</li> <li>● Protect</li> <li>● Structure</li> <li>● Survive</li> </ul>	<p><b>Unit 4</b></p>

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<p><b>LESSON 3: Raising Young</b></p> <p>How do parents care for their babies?</p>	<p><b>S.K-2.A.1.1.1:</b> Identify a scientific fact as something that can be observed using the five senses.</p> <p><b>S.K-2.A.2.1.1:</b> Understand that making a change to an investigation may change the outcome(s) of the investigation.</p> <p><b>S.K-2.A.2.1.2:</b> Describe outcomes of an investigation.</p> <p><b>S.K-2.A.2.2.1:</b> Identify simple tools that can be used in an investigation (e.g., measuring cup, hand lens, ruler, balance scale, thermometer).</p> <p><b>3.2.K.A6:</b> Constructing Explanations and Designing Solutions; Engaging in Argument From Evidence CCC Patterns; Structure and Function</p> <p><b>3.2.K.A6:</b> Developing and Using Models; Constructing Explanations and Designing Solutions; Engaging in Argument from Evidence CCC Structure and Function</p> <p><b>3.2.K.A6:</b> Obtaining, Evaluating and Communicating Information CCC Patterns</p> <p><b>3.2.K.A6:</b> Engaging in Argument from Evidence; Obtaining, Evaluating and Communicating Information CCC Patterns</p> <p><b>3.2.K.A6:</b> Constructing Explanations and Designing Solutions; Engaging in Argument From Evidence CCC Patterns; Structure and Function</p>	<p>Identify the ways parents care for their young.</p> <p>Recognize that some but not all organisms require assistance from their parents during development.</p> <p>Use text and media to determine patterns in the animal kingdom between parents and their offspring that provide offspring with a better chance at survival.</p> <p>Use oral and written communication skills to explain that organisms develop at different rates and that some animal parents need to care for their offspring longer than others.</p>	<ul style="list-style-type: none"> <li>● Adult</li> <li>● Baby</li> <li>● Communicate</li> <li>● Feeding</li> <li>● Parent</li> </ul>	<p><b>Unit 4</b></p>
<p><b>LESSON 4: Comparing Parents and Their Young</b></p> <p>Why do children look different from their parents?</p> <p>How do animal babies compare to their family members?</p> <p>How do young plants compare to their parents?</p>	<p>Compare similarities and differences between oneself and one's parents.</p> <p>Use patterns to explain how traits are inherited, or passed, from parents to offspring.</p> <p>Identify similarities and differences between animal offspring and their parents.</p> <p>Observe a bean plant to collect evidence of the similarities and</p>	<p>Compare similarities and differences between oneself and one's parents.</p> <p>Use patterns to explain how traits are inherited, or passed, from parents to offspring.</p> <p>Identify similarities and differences between animal offspring and their parents.</p> <p>Observe a bean plant to collect evidence of the similarities and</p>	<ul style="list-style-type: none"> <li>● Child</li> <li>● Leaves</li> <li>● Life Cycle</li> <li>● Roots</li> <li>● Stem</li> <li>● Trait</li> </ul>	<p><b>Unit 4</b></p>

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		<p>differences between plant parents and plant offspring.</p> <p>Construct an evidence-based account that young plants and animals are similar but not identical to their parents.</p>		
<p><b>LESSON 5: Solving Human Problems with Organisms' Structures</b></p> <p>How do organisms' structures help them survive in their environment?</p> <p>How do plants' structures help them survive?</p> <p>How can animal and plant structures be used to solve human problems?</p>		<p>Draw and label plant structures from a bean plant and describe their functions.</p> <p>Identify specific adaptations of organisms and how they help the organism survive in its specific environment. Design a solution to a human problem by mimicking how plants and/or animals use their external structures to help them survive.</p> <p>Evaluate learning from throughout the unit about organisms, and compare that knowledge to initial ideas from the beginning of the unit.</p>	<ul style="list-style-type: none"> <li>• No new words</li> </ul>	<p><b>Unit 4</b></p>
<p><b>LESSON 6:</b></p>				

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Unit Title: Sky Watchers: May/June (MP 4)				
Big Idea: Students will make observations of patterns in the sky and connect to concepts in Earth and space science.				
Investigation Questions	NGSS/ PA Core Standards	Objectives/ Lab Activities	Key Vocabulary	Reading Wonders Connection
<p><b>LESSON 1: Objects in the Sky</b></p> <p>What do we know about objects in the sky?</p> <p>Can I observe shadows to learn about the sun's position in the sky?</p> <p>Can I compare patterns between daytime and nighttime objects?</p>	<p><b>1-ESS1-1:</b> Use observations of the sun, moon, and stars to describe patterns that can be predicted.</p> <p><b>1-ESS1-2:</b> Make observations at different times of year to relate the amount of daylight to the time of year.</p> <p><b>S.K-2.D.1.1.1:</b> Identify different types of Earth materials (e.g., rock, soil, sand, pebbles).</p> <p><b>S.K-2.D.1.3.1:</b> Identify features on Earth's surface (e.g., lakes, rivers, oceans, mountains, plains, volcanoes).</p> <p><b>S.K-2.D.1.3.2:</b> Describe natural events that alter Earth's surface (e.g., volcanic eruptions, floods, hurricanes, earthquakes).</p> <p><b>S3.A.3.2.1:</b> Identify what models represent (e.g., simple maps showing mountains, valleys, lakes, and rivers; dioramas).</p>	<p>Develop a chart to share their ideas about objects in the sky</p> <p>Investigate patterns in the sun's position using shadow measurements taken over the course of the day.</p> <p>Discuss what they observed in the daytime and nighttime skies and compare patterns.</p>	<ul style="list-style-type: none"> <li>● Daytime</li> <li>● Light</li> <li>● Moon</li> <li>● Nighttime</li> <li>● Noon</li> <li>● Planet</li> <li>● Shadow</li> <li>● Sky</li> <li>● Star</li> <li>● Sun</li> </ul>	Unit 5 Week 2
<p><b>LESSON 2: Day and Night</b></p> <p>What does it mean to rotate?</p> <p>How can I model the pattern of day and night?</p>	<p><b>3.3.2.A4:</b> Explore and describe that water exists in solid (ice) and liquid (water) form. Explain and illustrate evaporation and condensation</p> <p><b>S3.C.1.1.4:</b> Recognize and identify how water goes through phase changes (i.e., evaporation, condensation, freezing, and melting).</p> <p><b>S3.D.1.1.1:</b> Recognize that rock is composed of different kinds of minerals.</p> <p><b>S3.D.1.1.2:</b> Describe the composition of soil as weathered rock and decomposed organic material.</p>	<p>Discuss what they know about the pattern of day and night and learn about how objects can rotate.</p> <p>Use models to investigate Earth's rotation to learn more about the pattern of day and night.</p>	<ul style="list-style-type: none"> <li>● Axis</li> <li>● Earth</li> <li>● Equator</li> <li>● Hemisphere</li> <li>● Model</li> <li>● Poles</li> <li>● Rotate</li> </ul>	
<p><b>LESSON 3: Sunrise, Sunset and Seasons</b></p> <p>What are seasons and what causes them?</p> <p>How does daylight change during the year?</p>	<p><b>S3.D.1.2.3:</b> Describe the ways living things benefit from the uses of water resources.</p> <p><b>S3.D.1.3.1:</b> Identify ways that cause Earth's surface to be constantly changing (e.g., wind and water erosion, contraction and expansion of surfaces).</p> <p><b>S3.D.1.3.2:</b> Distinguish between ways that tear down the surface of Earth and those that build up the surface (e.g., erosion, weathering, volcanic activity, earthquakes).</p> <p><b>S3.D.1.3.3:</b> Distinguish between slow and rapid changes to Earth's surface (i.e., rapid [earthquakes, volcanic activity]; slow [weathering, erosion]).</p> <p><b>S4.C.1.1.2:</b> Categorize/group objects using physical characteristics</p>	<p>Model and discuss the predictable pattern of Earth's revolution around the Sun and how it relates to seasonal patterns</p> <p>Plan and carry out an investigation to study patterns in sunrise and sunset at different times of the year and relate the amount of daylight to the time of year.</p>	<ul style="list-style-type: none"> <li>● Orbit</li> <li>● Revolve</li> <li>● Season</li> <li>● Sunrise</li> <li>● Sunset</li> <li>● Tilt</li> </ul>	

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<p><b>LESSON 4: The Moon and its patterns</b></p> <p>How does the moon appear to change?</p> <p>Can I describe the patterns of the moon?</p>	<p><b>S.K-2.A.1.1.1:</b> Identify a scientific fact as something that can be observed using the five senses.</p> <p><b>S4.A.1.1.1</b> Distinguish between a scientific fact and an opinion, providing clear explanations that connect observations and results (e.g., a scientific fact can be supported by making observations).</p> <p><b>S.K-2.A.2.1.1:</b> Understand that making a change to an investigation may change the outcome(s) of the investigation</p> <p><b>S.K-2.A.2.1.2:</b> Describe outcomes of an investigation.</p>	<p>Investigate how the Moon revolves around Earth and how the Moon appears to change in the sky.</p> <p>Work in pairs to investigate how the Moon appears to have a repeating pattern of phases.</p>	<ul style="list-style-type: none"> <li>● Crescent moon</li> <li>● Full moon</li> <li>● Illuminated</li> <li>● New moon</li> <li>● Quarter moon</li> <li>● Solar system</li> </ul>	
<p><b>LESSON 5: Our place in Space</b></p> <p>Can I describe the Sun-Earth- Moon connection?</p> <p>What have I learned about objects in the sky?</p>	<p><b>S.K-2.A.2.2.1:</b> Identify simple tools that can be used in an investigation (e.g., measuring cup, hand lens, ruler, balance scale, thermometer).</p> <p><b>S.K-2.A.3.1.1:</b> Describe a system as being made of multiple parts that work together.</p> <p><b>3.4.4.C2:</b> Describe the engineering design process: Define a problem. Generate ideas. Select a solution and test it. Make the item. Evaluate the item.</p> <p><b>3.2.K.A6:</b> Developing and Using Models; Obtaining, Evaluating, and Communicating Information CCC Patterns</p>	<p>Make a model to demonstrate the relationship of the Sun-Earth- Moon system.</p> <p>Compare class charts from Lesson 1 to their new chart titled "What we know about objects in the sky"</p>	<ul style="list-style-type: none"> <li>● All vocabulary from previous lessons.</li> </ul>	
<p><b>LESSON 6:</b></p>	<p><b>3.2.K.A6:</b> Planning and Carrying Out Investigations; Constructing Explanations and Designing Solutions CCC Patterns; Stability and Change</p> <p><b>3.2.K.A6:</b> Constructing Explanations and Designing Solutions CCC Cause and Effect; Stability and Change</p> <p><b>3.2.K.A6:</b> Constructing Explanations and Designing Solutions; Obtaining, Evaluating, and Communicating Information CCC Patterns; Stability and Change</p> <p><b>3.2.K.A6:</b> Constructing Explanations and Designing Solutions; Developing and Using Models; Obtaining, Evaluating, and Communicating Information CCC Patterns; Stability and Change</p>			