

Glendale Elementary School District
Science Pacing Guide
2020-2021



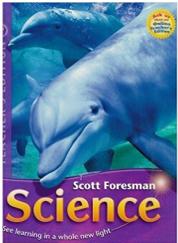
3rd Grade

Focus on Systems and System Models; Structure and Function

By the end of third grade, students will gain an understanding of how the Sun provides energy for life on Earth. Students apply their understanding of light and sound waves, how they travel, are detected, and transfer energy. Students learn that organisms have different structures and functions which increase their chances of survival. Student investigations focus on collecting and making sense of observational data and simple measurements using the science and engineering practices: ask questions and define problems, develop and use models, plan and carry out investigations, analyze and interpret data, use mathematics and computational thinking, construct explanations and design solutions, engage in argument from evidence, and obtain, evaluate, and communicate information. While individual lessons may include connections to any of the crosscutting concepts, the standards in third grade focus on helping students understand phenomena through systems and system models and structure and function.

Text Resources:

Scott Foresman Ready Gen



Digital Resources:

World Book



Mystery Science



Core Ideas for Knowing Science:

Physical Science

- P1: All matter in the Universe is made of very small particles.
- P2: Objects can affect other objects at a distance.
- P3: Changing the movement of an object requires a net force to be acting on it.
- P4: The total amount of energy in a closed system is always the same but can be transferred from one energy store to another during an event.

Earth and Space Science

- E1: The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth’s surface and its climate.
- E2: The Earth and our solar system are a very small part of one of many galaxies within the Universe.

Life Science

- L1: Organisms are organized on a cellular basis and have a finite life span.
- L2: Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.
- L3: Genetic information is passed down from one generation of organisms to another.
- L4: The unity and diversity of organisms, living and extinct, is the result of evolution

Core Ideas for using Science:

- U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised.
- U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.
- U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.

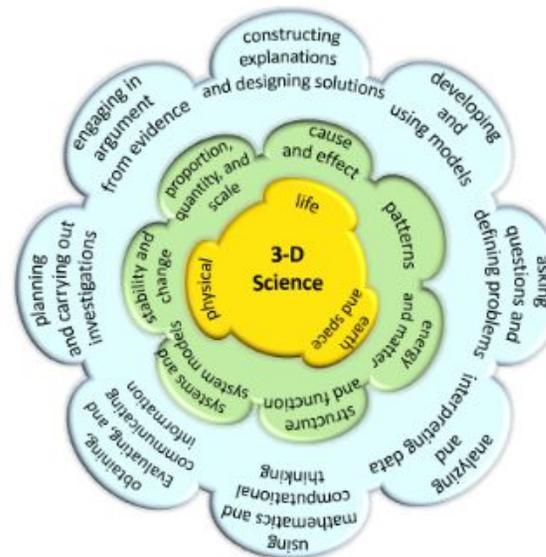
Science and Engineering Practices:

- ask questions and define problems
- develop and use models
- plan and carry out investigations
- analyze and interpret data
- use mathematics and computational thinking
- construct explanations and design solutions
- engage in argument for evidence
- obtain, evaluate, and communicate information

Crosscutting Concepts:

- Patterns
- Cause and Effect
- Scale, Proportion, and Quantity
- Systems and System Models
- Energy and Matter
- Structure and Function
- Stability and Change

Bold concepts are a focus for this grade level. Go to <http://bit.ly/CrossCutk8> for detailed information about crosscutting concepts.



Year Snapshot -Units by Quarters

QUARTER 1 <u>Sun’s Energy</u> 3.E1U1.4	QUARTER 2 <u>Plants & Animals</u> 3.L1U1.5 3.L2U1.6	QUARTER 3 <u>Sun’s Energy & Organisms</u> 3.L2U1.7 3.L2U1.8	QUARTER 4 <u>Lights & Sound Waves</u> 3.P2U1.1 3.P2U1.2 3.P4U1.3
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Disciplinary Literacy in Science

Disciplinary literacy in science focuses on how reading, writing, speaking, and listening are used to develop sense-making in science. It emphasizes content knowledge, experiences and skills, and ability to acquire new knowledge that experts within science disciplines use to apply and generate new knowledge.

Standard	ELA	Rationale
These ELA standards help students gather and analyze sources and information (evidence from text) that can be used to support their reasoning as they develop conceptual understanding of science phenomena. Being able to read and interpret scientific and technical text is a fundamental practice of science and engineering.	RI.1 RI.2 RI.3	Key Ideas and Details standards can be applied to help students: <ul style="list-style-type: none"> • Find answers to relevant science questions or problems. • Understand and follow a written lab protocol, scientific process, or procedure. • Connect new understandings with background knowledge. • Determine which information is important to answering scientific questions. • Pay attention to details, accuracy, and precision when reading/collecting data from scientific instruments. • Interpret diagrams, pictures, charts, graphs, and data to gather information. • Interpret and evaluate quality and quantity of data, evidence, and scientific reasoning. • Determine the credibility of information, including sample size and visual representations of data and findings.
These ELA standards help students navigate the norms and conventions of science text. Scientific and technical text often contains a variety of text structures, visual representations, and vocabulary that has a very specific meaning. Reading text structures that embed bullets, graphs, data, images, captions, and non-linguistic representations of information is a fundamental practice of science and engineering.	RI.4 RI.5 RI.6	Craft and Structure standards can be applied to help students: <ul style="list-style-type: none"> • Use strategies (context clues, restatement, examples, contrast, glossary, etc.) to determine the meaning of words and phrases in the text. • Use context to determine meanings of words and compare how vocabulary may be used differently in a science context compared to non-science contexts. • Identify structures within a text (headings, sub-headings, bold words, pictures, graphs, data tables, and paragraphs) and explain how they build on information in the paragraph text. • Explain how key terms relate to each other or to broader science concepts and general understanding. • Use information to answer questions and support reasoning and conclusions. • Make meaning out of mathematical symbols and equations; diagrams, or other visual representations and explain why the author used them instead of paragraph text.
These ELA standards help students integrate scientific knowledge and ideas when obtaining, evaluating, and communicating information. Students integrate information to evaluate the validity and reliability of ideas, methods, claims, and designs. They use this knowledge to generate their own questions about scientific phenomena or to identify solutions to design problems.	RI.7 RI.8 RI.9	Integration of Knowledge and Ideas standards can be applied to help students: <ul style="list-style-type: none"> • Use data and information from multiple sources, including lab investigations, to support a scientific explanation or solve a scientific problem. • Use multiple sources or formats of information related to the same science concept and explain whether these sources provide similar levels of detail or whether the information supports or contradicts each other. • Locate the claim, evidence, and reasoning in scientific explanations and arguments. • Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, and/or computation • Convert visual representations (graph, chart, picture, etc.) of information into words; convert words into visual representations. • Evaluate whether an author’s claim is supported by the evidence provided and whether that evidence is relevant to the reasoning of the claim or argument.
This ELA standard requires that students engage	RI.10	Implementation strategies for this standard are embedded in the previous reading examples.

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<p>with different lengths, structures, types, and complexities of science text, appropriate for their grade level. Reading science texts requires a set of discipline-specific skills and strategies. Science texts use scientific vocabulary and present information in multiple formats.</p>		<p>Students in science classrooms often read at different levels of proficiency, and even the same student may read at different levels based on text structures or format. Teachers should understand the complexity of the text provided to students and implement appropriate strategies to support student conceptual understanding of science phenomena.</p>
<p>These ELA standards help students write in formats that are typically found in science contexts or may be specific for their content area. Typically, only formal science writing is written in third person voice. In science, focus is shifted from stating personal opinions to using evidence to support an explanation or scientific argument. Students use evidence and reasoning to defend scientific claims and explanations, or methods for collecting data and evidence. It is critical that students know how to incorporate appropriate visual representations to support the scientific explanations and arguments they write.</p>	<p>W.1 W.2 W.3</p>	<p>Text Types and Purposes standards can be applied to help students:</p> <ul style="list-style-type: none"> Record thoughts, ideas, sketches, or collected data in science notebooks to be used as evidence or to support reasoning. Write a claim, evidence-based argument, or explanation that includes logical reasoning, accurate science content, and relevant and sufficient evidence to support the claim. Claims are created with effective word choice, appropriate use of science vocabulary, and writing style. Write formal or informal texts. The product may include notebook entries, research papers, laboratory notes or reports, functional text, or visual displays of data. Produce science writing in a voice appropriate for the type of writing and the audience. Objective or academic voice in science is used when a writer wants to deliver information in a neutral, factual, and unbiased way. Write step-by-step procedures for experiments that are detailed enough that others would be able to repeat the procedure and achieve the same results. Produce texts that include charts, graphs, timelines, photographs, videos, maps, flowcharts, diagrams, models, or tables to supplement or support the text.
<p>These ELA standards help students develop scientific writing appropriate for task, purpose and audience.</p>	<p>W.4 W.5 W.6</p>	<p>Production and Distribution of Writing standards can be applied to help students:</p> <ul style="list-style-type: none"> Develop and strengthen writing; focus on purpose and audience. Incorporate peer or adult feedback of drafts into writing; the writing process and review of drafts can be used for any writing assignments within the science classroom. Use technology (Internet, keyboarding skills, formatting, storing) to create a published piece where information and ideas are connected and presented clearly and efficiently. Use technology (blogs, wikis, smartboards, apps) to support collaborative brainstorming and writing. Integrate graphs, data tables, drawings or illustrations, or other visual representations of information to support text.
<p>These ELA standards help students synthesize multiple texts, observations, or experiments to answer questions, gather information, reason about the evidence, and communicate findings or conclusions. Final communication products typically follow a formal writing style (documenting or publishing procedures, investigation designs, explanations of models, and research) and are written in academic or third person voice.</p>	<p>W.7 W.8</p>	<p>Research to Build and Present Knowledge standards can be applied to help students:</p> <ul style="list-style-type: none"> Conduct research projects or experimental investigations of differing lengths to provide enough information to construct claims, evidence, and explanations that answer scientific questions or solve a problem. Integrate information from a variety of credible print and digital sources, taking care to use a consistent voice and avoid plagiarism. Use evidence from informational texts (e.g., encyclopedias, credible web sites, experts, news articles, textbooks, trade books) to support claims, analyses, reflections, and/or research. Convert informal writing in drafts while still making sense of information and developing claims, to a formal academic voice when publishing formal writing of claims.
<p>This ELA standard requires that students produce informal, formal, and persuasive scientific writing across multiple delivery formats and topics, for different purposes and audiences.</p>	<p>W.10</p>	<p>Implementation strategies for this standard are embedded in the previous writing examples.</p> <ul style="list-style-type: none"> Writing assignments should be of varying lengths (field or research notes, one paragraph responses, multiple paragraph essays, lab reports or presentations, extended research). Scientific writing often includes pictures, diagrams, charts, thinking maps, data, or statistics; these can be integrated with text or presented with minimal text.
<p>These ELA standards help students engage in scientific discourse to gather and evaluate information. Engaging in scientific discourse communities to collaborate and build comprehension is a fundamental practice of</p>	<p>SL.1 SL.2 SL.3</p>	<p>Comprehension and Collaboration standards can be applied to help students:</p> <ul style="list-style-type: none"> Initiate and participate effectively in a range of collaborative discussions (one-on-one, small groups, teacher-led, digitally) to express their own ideas clearly and build on others' ideas. Integrate multiple sources of information presented in diverse media or formats (visually, quantitatively, orally), and explain how the information supports a claim, data analysis, reasoning, or conclusion.

science and engineering.	<ul style="list-style-type: none"> • Collaboratively plan or conduct investigations; determine whether the data is collected with appropriate tools, in a safe and ethical manner, and is consistent with other groups' findings. • Respectfully provide and receive criticism from peers about a proposed procedure, explanation, or model by citing relevant evidence and posing specific questions. • Refine explanations, arguments, or other science ideas based on feedback.
These ELA standards help students engage in scientific discourse to informally share ideas and develop understanding of scientific phenomena and provide a formal way to present information appropriate to the audience and task. Engaging in scientific discourse communities to communicate understanding and findings is a fundamental practice of science and engineering.	<p>SL.4 SL.5 SL.6</p> <p>Presentation of Knowledge and Ideas standards can be applied to help students:</p> <ul style="list-style-type: none"> • Engage in science discourse with a partner or small group by discussing questions, information, results, and supporting evidence. Speak clearly and in a sequence so listeners can follow the line of thinking and reasoning. • Engage in formal presentations to small or large groups of students to share findings and supporting evidence. Presentation should be clear, concise, and logically organized; content and presentation style are appropriate to purpose, audience, and task. • Use digital media (graphics, images, music, sound, visual displays, or interactive elements) in presentations to clarify science content and to add interest. • Communicate scientific information orally, using various forms of media, tables, diagrams, and charts.

Quarter 1			
AZ State Standards	Background Information and Learning Targets	Vocabulary	Curricular Resources
<p>Unit Title: Sun's Energy</p> <p><i>Earth and Space Sciences: Students develop an understanding of how the Sun provides light and energy for Earth systems.</i></p>			
<p>3.E1U1.4 Construct an explanation describing how the Sun is the primary source of energy impacting Earth systems.</p> <p>Crosscutting Concepts: Patterns, Cause and Effect, Scale, Proportion and Quantity; Systems and System Models; Energy and Matter; Structure and Function; Stability and Change</p>	<p>Background Information: All Earth processes are the result of energy flowing and matter cycling within and among Earth's systems. This energy originates from the sun and from Earth's interior. 4 (179-180) Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes.4 (181)</p> <p>GESD Context and Application of Standards:</p> <ul style="list-style-type: none"> • I can explain that all earth processes are the result of energy flowing and matter cycling within and among Earth's systems, and that this energy originates from the sun and from Earth's interior. • I can explain ways that the geosphere, biosphere, hydrosphere, and/or atmosphere interact. I can describe the relevant components, including features of the following systems: <ol style="list-style-type: none"> Geosphere (i.e., solid and molten rock, soil, sediment, continents, mountains). Hydrosphere (i.e., water and ice in the form of rivers, lakes, glaciers). Atmosphere (i.e., wind, oxygen). 	<p>earth processes sun geosphere hydrosphere atmosphere</p>	<p><i>Scott Foresman:</i></p> <ul style="list-style-type: none"> • Chapter 4 Lesson 2 How do living things get energy? • Chapter 5 Lesson 2 How do forms of water change? • Chapter 6 Weather • Chapter 8 Changes on Earth <p><i>ReadyGEN:</i></p> <ul style="list-style-type: none"> • About Earth (Unit 1) • It's All in the Soil (Unit 1 leveled text) • These Birds Can't Fly! (Unit 1 leveled text) • Deep Down and Other Extreme Places to Live (Unit 2) • Weather (Unit 3) • Living Through a Natural Disaster? (Unit 3) • When the Earth Shakes (Unit 3 leveled text) • When a Storm Comes (Unit 3 leveled text)

	<p>d. Biosphere (i.e., plants, animals [including humans]).</p> <ul style="list-style-type: none"> I can explain relationships (interactions) within and between the parts of the Earth systems (e.g., the atmosphere and the hydrosphere interact by exchanging water through evaporation and precipitation; the hydrosphere and atmosphere interact through air temperature changes, which lead to the formation or melting of ice). 		<ul style="list-style-type: none"> How Big? How Strong? Hurricanes and Earthquakes (Unit 3 leveled text) Dangerous Storms (Unit 3 leveled text) Watch Out for Hurricanes! (Unit 3 leveled text) <p><i>Mystery Science:</i></p> <ul style="list-style-type: none"> Watery Planet Mystery 3: Water Cycle Watery Planet Mystery 4: Natural Disasters & Engineering Web of Life Mystery 6: Why did dinosaurs go extinct? <p><i>World Book:</i></p> <ul style="list-style-type: none"> Energy Solar Energy <p><i>World Book Student links:</i></p> <ul style="list-style-type: none"> Energy Atmosphere Hydrosphere Earth (Earth's Spheres) Water Cycle Hydrology Water (Nature's water cycle) Carbon Cycle Phosphorus Cycle
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Quarter 2

AZ State Standards	Background Information and Learning Targets	Vocabulary	Curricular Resources
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Unit Title: Plants & Animals

Life Sciences: Students develop an understanding of the flow of energy in a system beginning with the Sun to and among organisms They also understand that plants and animals (including humans) have specialized internal and external structures and can respond to stimuli to increase survival.

3.L1U1.5 Develop and use models to explain that plants	Background Information: Animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (Boundary: Stress at this grade	internal external growth	<i>Scott Foresman:</i> <ul style="list-style-type: none"> Chapter 1 Lesson 1 What are the main parts of a plant?
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<p>and animals (including humans) have internal and external structures that serve various functions that aid in growth, survival, behavior, and reproduction.</p> <p>Crosscutting Concepts: Patterns, Cause and Effect, Scale, Proportion and Quantity; Systems and System Models; Energy and Matter; Structure and Function; Stability and Change</p>	<p>level focus is on understanding the macroscale systems and their function, not microscopic processes.) 4 (p. 144)</p> <p>GESD Context and Application of Standards:</p> <ul style="list-style-type: none"> ● I can explain that plants and animals have internal and external structures that function together as part of a system to support survival, growth, behavior, and reproduction. ● I can describe the internal and external structures of selected plants and animals and the primary functions of those structures. ● I can use reasoning to connect the relevant and appropriate evidence and construct an explanation that includes the idea that plants and animals have structures that, together, support survival, growth, behavior, and/or reproduction. ● I can describe a chain of reasoning that includes: <ul style="list-style-type: none"> ○ Internal and external structures serve specific functions within plants and animals (e.g., the heart pumps blood to the body, thorns discourage predators). ○ The functions of internal and external structures can support survival, growth, behavior, and/or reproduction in plants and animals (e.g., the heart pumps blood throughout the body, which allows the entire body access to oxygen and nutrients; thorns prevent predation, which allows the plant to grow and reproduce). ○ Different structures work together as part of a system to support survival, growth, behavior, and/or reproduction (e.g., the heart works with the lungs to carry oxygenated blood throughout the system; thorns protect the plant, allowing reproduction via stamens and pollen to occur). 	<p>survival behavior reproduction</p>	<ul style="list-style-type: none"> ● Chapter 1 Lesson 2 Why do plants need roots and stems? ● Chapter 2 Lesson 2 How do animals grow and change? <p><i>Mystery Science:</i></p> <ul style="list-style-type: none"> ● Human Machine ● Mystery 1: Muscles & Skeleton ● Mystery 2: Eyes & Vision ● Mystery 3: How Eyes Work ● Mystery 4: Brain & Nerves ● Power of Flowers Plant Life Cycle and Hereditary ● Mini Lesson: How Does Your Heart Pump Blood? ● Mini-Lesson: Why do our skeletons have so many bones? ● Mini-Lesson: Why do we get goosebumps? ● Mini-Lesson: Why can't fish breathe on land? <p><i>World Book Kids links:</i></p> <ul style="list-style-type: none"> ● Human Body ● Plant
<p>3.L2U1.6 Plan and carry out investigations to demonstrate ways plants and animals react to stimuli.</p>	<ul style="list-style-type: none"> ● I can identify and describe the relevant components for testing interactions concerning the functioning of a given natural system, including: <ul style="list-style-type: none"> ○ Different types of information about the surroundings (e.g., sound, light, odor, temperature). ○ Sense receptors able to detect different types of information from the environment. ○ Brain. ○ Animals' actions. ● I can describe different types of sense receptors that detect specific types of information within the environment. 	<p>sense receptors instinctive</p>	<p><i>World Book Student links:</i></p> <ul style="list-style-type: none"> ● Perception ● Senses ● Remote Sensing ● Muscle Sense ● Instinct <p><i>Do you have a recommendation for curriculum materials that support teaching these concepts? Please email them to jmoritz@gesd40.org</i></p>

	<ul style="list-style-type: none"> ● I can describe sense receptors that send information about the surroundings to the brain. ● I can describe information that is transmitted to the brain by sense receptors that can be processed immediately as perception of the environment and/or stored as memories. ● I can describe immediate perceptions or memories processed by the brain that influence an animal’s action or responses to features in the environment. ● I can explain information in the environment that interacts with animal behavioral output via interactions mediated by the brain. ● I can explain how different types of sensory information are relayed to the brain via different sensory receptors. ● I can explain sensory input, the brain, and behavioral output are all parts of a system that allow animals to engage in appropriate behaviors. ● I can use the model to test interactions involving sensory perception and its influence on animal behavior within a natural system, including interactions between: <ul style="list-style-type: none"> ○ Information in the environment. ○ Different types of sense receptors. ○ Perception and memory of sensory information. ○ Animal behavior. 		
Quarter 3			
AZ State Standards	Background Information and Learning Targets	Vocabulary	Curricular Resources
<p>Unit Title: Sun’s Energy & Organisms</p> <p><i>Life Sciences: Students develop an understanding of the flow of energy in a system beginning with the Sun to and among organisms They also understand that plants and animals (including humans) have specialized internal and external structures and can respond to stimuli to increase survival.</i></p>			
<p>3.L2U1.7 Develop and use system models to describe the flow of energy from the Sun to and among living organisms.</p> <p>Crosscutting Concepts:</p>	<p>Background Information: The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants. Either way, they are “consumers.” Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil for plants to use. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.4 (p. 151) Matter cycles between the air and soil and among</p>	<p>plants energy transferred motion minerals body repair body growth</p>	<p><i>Scott Foresman:</i></p> <ul style="list-style-type: none"> ● Chapter 4 Lesson 1 How do living things interact? ● Chapter 4 Lesson 2 How do living things get energy? ● Chapter 4 Lesson 3 How do living things compete? <p><i>Mystery Science:</i></p> <ul style="list-style-type: none"> ● Web of Life: Ecosystems & Food Web

<p>Patterns, Cause and Effect, Scale, Proportion and Quantity; Systems and System Models; Energy and Matter; Structure and Function; Stability and Change</p>	<p>plants, animals, and microbes as these organisms live and die. Organisms obtain gases, water, and minerals from the environment and release waste matter (gas, liquid, or solid) back into the environment. 4 (p. 153)</p> <p>GESD Context and Application of Standards:</p> <ul style="list-style-type: none"> ● I can describe the relationships between energy from the sun and animals' needs for energy. ● I can use models to describe a phenomenon that includes the idea that energy in animals' food was once energy from the sun. I can identify and describe the components of the model that are relevant for describing the phenomenon, including energy, the sun, plants, and animals. ● I can identify and describe the relevant relationships between components like: <ul style="list-style-type: none"> ○ plants and the energy they get from sunlight to produce food. ○ food and the energy and materials that animals require for bodily functions (e.g., body repair, growth, motion, body warmth maintenance). ○ animals and the food they eat, which is either other animals or plants (or both), to obtain energy for bodily functions and materials for growth and repair. 		<ul style="list-style-type: none"> ● Mystery 2: Plants Need Air and Water ● Mystery 3: Decomposers and Matter Cycle ● Mystery 4: Decomposers, Nutrients, & Matter Cycle ● Mystery 5: Ecosystems and Matter Cycle ● Mystery 6: Food Webs and Flow of Energy <p><i>World Book Kids links:</i></p> <ul style="list-style-type: none"> ● Food Chain ● Ecosystem ● Decomposer ● Consumer ● Producer ● Leaf <p><i>World Book Student links:</i></p> <ul style="list-style-type: none"> ● Food Chain ● Ecosystem ● Decomposer ● Consumer ● Producer ● Leaf ● Photosynthesis <p><i>Do you have a recommendation for curriculum materials that support teaching these concepts? Please email them to jmoritz@gesd40.org</i></p>
<p>3.L2U1.8 Construct an argument from evidence that organisms are interdependent.</p> <p>Crosscutting Concepts: Patterns, Cause and Effect, Scale, Proportion and</p>	<p>Background Information: Animals and plants alike generally need to take in air and water, animals must take in food, and plants need light and minerals; anaerobic life, such as bacteria in the gut, functions without air. Food provides animals with the materials they need for body repair and growth and is digested to release the energy they need to maintain body warmth and for motion. Plants acquire their material for growth chiefly from air and water and process matter they have formed to maintain their internal conditions (e.g., at night). 4 (p. 148) Animals need food that they can break down, which comes either directly by eating plants (herbivores) or by eating animals (carnivores) which have eaten plants or other animals. Animals are ultimately dependent on plants for their survival. The relationships among organisms can be represented as food chains and food webs. Some animals are dependent on plants in other ways as well as for food,</p>	<p>animals plants minerals anaerobic bacteria body repair growth digested energy internal conditions carnivores herbivores</p>	<p><i>Scott Foresman:</i></p> <ul style="list-style-type: none"> ● Chapter 3 Lesson 1 What are ecosystems? ● Chapter 4 Lesson 5 What is a healthy environment for people? ● Chapter 4 Lesson 6 How can people stay healthy? ● 2nd Grade Chapter 3 Lesson 5 How do plants and animals help each other? <p><i>ReadyGEN:</i></p> <ul style="list-style-type: none"> ● Mini Microbes (Unit 1 leveled text)

<p>Quantity; Systems and System Models; Energy and Matter; Structure and Function; Stability and Change</p>	<p>for example for shelter and, in the case of human beings, for clothing and fuel. Plants also depend on animals in various ways. For example, many flowering plants depend on insects for pollination and on other animals for dispersing their seeds.2 (p. 27)</p> <p>GESD Context and Application of Standards:</p> <ul style="list-style-type: none"> ● I can describe claims that organisms are independent. Examples include:: <ul style="list-style-type: none"> ○ Plant growth over time. ○ Changes in the weight of soil and water within a closed system with a plant, indicating: <ul style="list-style-type: none"> ▪ Soil does not provide most of the material for plant growth (e.g., changes in weight of soil and a plant in a pot over time, hydroponic growth of plants). ▪ Plants’ inability to grow without water. ○ Plants’ inability to grow without air. ○ Air is matter (e.g., empty object vs. air filled object). ● I can use reasoning to connect the evidence supporting a claim with my argument. 		<p><i>Mystery Science:</i></p> <ul style="list-style-type: none"> ● Web of Life: Ecosystems & Food Web ● Mystery 1: Food Chains, Predators, Herbivores, and Carnivores <p><i>World Book Kids links:</i></p> <ul style="list-style-type: none"> ● Food Chain ● Carnivore ● Digestive System <p><i>World Book Student links:</i></p> <ul style="list-style-type: none"> ● Food Chain ● Carnivore ● Omnivore ● Herbivore ● Digestive System <p><i>Do you have a recommendation for curriculum materials that support teaching these concepts? Please email them to jmoritz@gesd40.org</i></p>
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Quarter 4

AZ State Standards	Background Information and Learning Targets	Vocabulary	Curricular Resources
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Unit Title: Light & Sound Waves

Physical Sciences: Students develop an understanding of the sources, properties, and characteristics of energy along with the relationship between energy transfer and the human body.

<p>3.P2U1.1 Ask questions and investigate the relationship between light, objects, and the human eye.</p> <p>Crosscutting Concepts: Patterns, Cause and Effect, Scale,</p>	<p>Background Information: Light is seen because it affects the objects it reaches, including our eyes. Sources give out light, which travels from them in various directions and is detected when it reaches and enters our eyes. Objects that are seen either give out or reflect light that human eyes can detect. Sound comes from things that vibrate and can be detected at a distance from the source because the air or other material around is made to vibrate. Sounds are heard when the vibrations in the air enter our ears. 2 (p 21). An object can be seen when light reflected from its surface enters the eyes; the color people see depends on the color of the available light sources as well as the properties of the surface. Because lenses bend light beams, they can be used, singly or in combination, to provide magnified images of objects too small or too far away to be seen with the naked eye.4 (p. 135) Waves of the same type can differ in amplitude (height of the</p>	<p>light eye give out reflect detect sound ears vibrate magnified</p>	<p><i>Scott Foresman:</i></p> <ul style="list-style-type: none"> ● Chapter 13 Lesson 4 What is light energy? ● 2nd grade Chapter 9 Lesson 4 How does light move? ● 2nd grade Chapter 9 Guided Inquiry-How can you change light? <p><i>Mystery Science:</i></p> <ul style="list-style-type: none"> ● Human Machine ● Mystery 2: Light, Eyes, and Vision ● Mystery 3: Structure and Function of Eyes <p><i>World Book Kids links:</i></p> <ul style="list-style-type: none"> ● Light
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<p>Proportion and Quantity; Systems and System Models; Energy and Matter; Structure and Function; Stability and Change</p>	<p>wave) and wavelength (spacing between wave peaks). Waves can add or cancel one another as they cross, depending on their relative phase (i.e., relative position of peaks and troughs of the waves), but they emerge unaffected by each other. (Boundary: The discussion at this grade level is qualitative only; it can be based on the fact that two different sounds can pass a location in different directions without getting mixed up.) 4 (p. 132)</p> <p>GESD Context and Application of Standards:</p> <ul style="list-style-type: none"> ● I can describe the relationship between light and reflection and visibility of objects. ● I can describe relationships between: <ul style="list-style-type: none"> ○ Light enters the eye, allowing objects to be seen. ○ Light reflects off of objects, and then can travel and enter the eye. ○ Objects can be seen only if light follows a path between a light source, the object, and the eye. ● I can describe that in order to see objects that do not produce their own light, light must reflect off the object and into the eye. ● I can describe the effects of the following on seeing an object: <ul style="list-style-type: none"> ○ Removing, blocking, or changing the light source (e.g., a dimmer light). ○ Closing the eye. ○ Changing the path of the light. 		<p><i>World Book Student links:</i></p> <ul style="list-style-type: none"> ● Eye ● Light ● Sky <p><i>Do you have a recommendation for curriculum materials that support teaching these concepts? Please email them to jmoritz@gesd40.org</i></p>
<p>3.P2U1.2 Plan and carry out an investigation to explore how sound waves affect objects at varying distances.</p>	<ul style="list-style-type: none"> ● I can plan and carry out an investigation to make sense of a phenomenon that involves wave behavior. I can describe the relevant components, including: <ul style="list-style-type: none"> ○ Waves. ○ Wave amplitude. ○ Wavelength. ○ Motion of objects ● I can identify and describe the relevant relationships between: <ul style="list-style-type: none"> ○ Waves can be described in terms of patterns of repeating amplitude and wavelength (e.g., in a water wave there is a repeating pattern of water being higher and then lower than the baseline level of the water). ○ Waves can cause an object to move. ○ The motion of objects varies with the amplitude and wavelength of the wave carrying it. 	<p>light eye give out reflect detect sound ears vibrate magnified</p>	<p><i>Scott Foresman:</i></p> <ul style="list-style-type: none"> ● Chapter 14 Sound Lesson 1 What causes sounds? ● Chapter 14 Lesson 2 How does sound travel? ● Chapter 14 Guided Inquiry How well does sound travel through different materials? <p><i>Mystery Science</i></p> <ul style="list-style-type: none"> ● Waves of Sound: Sound, Waves, & Communication <p><i>World Book Kids links:</i></p> <ul style="list-style-type: none"> ● Sound <p><i>World Book Student links:</i></p> <ul style="list-style-type: none"> ● Sound

	<ul style="list-style-type: none"> • I can describe the patterns in the relationships between a wave passing, the net motion of the wave, and the motion of an object caused by the wave as it passes. • I can describe how waves may be initiated (e.g., by disturbing surface water or shaking a rope or spring). • I can describe how repeating pattern produced as a wave is propagated. • I can describe that waves of the same type can vary in terms of amplitude and wavelength and describe how this might affect the motion, caused by a wave, of an object. • I can identify similarities and differences in patterns underlying waves and use these patterns to describe simple relationships involving wave amplitude, wavelength, and the motion of an object (e.g., when the amplitude increases, the object moves more). 		<p><i>Other:</i></p> <ul style="list-style-type: none"> • Wave Characteristics, Reflections, and Speed of Sound experiments http://www.west.net/~science/sound.htm <p><i>Do you have a recommendation for curriculum materials that support teaching these concepts? Please email them to jmoritz@gesd40.org</i></p>
<p>3.P4U1.3 Develop and use models to describe how light and sound waves transfer energy.</p> <p>Crosscutting Concepts: Patterns, Cause and Effect, Scale, Proportion and Quantity; Systems and System Models; Energy and Matter; Structure and Function; Stability and Change</p>	<p>Background Information: The faster a given object is moving, the more energy it possesses. Energy can be moved from place to place by moving objects or through sound or light. (Boundary: At this grade level, no attempt is made to give a precise or complete definition of energy.)⁴ (p. 122) Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. Light also transfers energy from place to place. For example, energy radiated from the sun is transferred to Earth by light. When this light is absorbed, it warms Earth’s land, air, and water and facilitates plant growth.⁴(p.125)</p> <p>GESD Context and Application of Standards:</p> <ul style="list-style-type: none"> • I can describe the transfer of energy, including light traveling from one place to another and sound traveling from one place to another. • I can describe the idea that energy can be transferred from place to place by sound and light. 	<p>energy sound light heat collide transfer</p>	<p><i>Scott Foresman:</i></p> <ul style="list-style-type: none"> • Chapter 13 Lesson 1 What is energy? • Chapter 13 Lesson 2 How does energy change form? • Chapter 13 Lesson 3 What is heat energy? <p><i>Mystery Science:</i></p> <ul style="list-style-type: none"> • Energizing Everything Mystery 6: Electrical Energy • Mini-Lesson: How do things glow in the dark? • Mini-Lesson: How is a rainbow made? <p><i>Other:</i></p> <ul style="list-style-type: none"> • Light Waves Experiments • NatGeoKids Your Amazing Eyes! • Sound Experiments - “See the Sound” and “Experimenting with Sound” <p><i>Do you have a recommendation for curriculum materials that support teaching these concepts? Please email them to jmoritz@gesd40.org</i></p>