



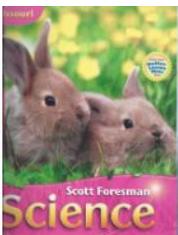
Focus on Patterns; Structure and Function

By the end of Kindergarten, students learn to use their senses to help them make observations and predictions about the world around them. In this grade level, students will investigate how the senses detect light and sound, observe weather patterns and their influences on plants and animals, and differentiate between systems and structures of living and non-living things. 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, use evidence, and obtain, evaluate, and communicate information. While individual lessons may include connections to any of the crosscutting concepts, the standards in Kindergarten focus on helping students understand phenomena through the crosscutting concepts of patterns and structure and function.

Text Resources:

Scott Foresman

ReadyGEN



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.

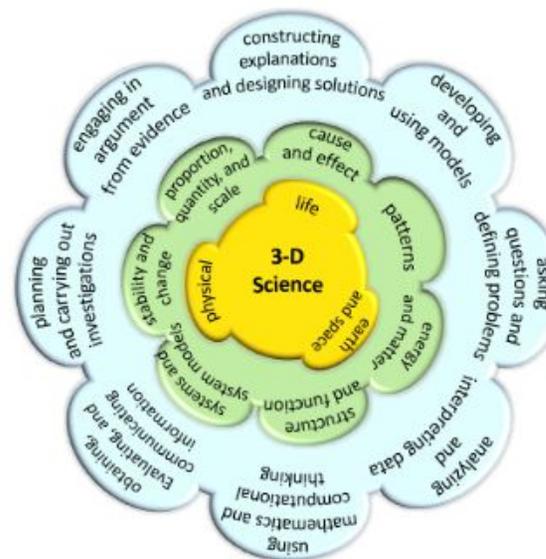
Science and Engineering Practices:

- 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>Our Senses</u> K.P2U1.1 K.P2U2.2	QUARTER 2 <u>Weather</u> K.E1U1.3 K.E1U1.4	QUARTER 3 <u>Living Things</u> K.L1U1.6 K.L1U1.7 K.L2U1.8	QUARTER 4 <u>Sun, Moon, & Stars</u> K.E2.U1.5
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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 the 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 combine more than 1 source of information (evidence from text) that can be used to support their reasoning as they develop basic 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"> • Use text to find answers to relevant science questions or problems. • Follow a written lab protocol or sequence of steps. • Connect formation from text to background knowledge. • Determine which information is important to answering scientific questions. • Pay attention to details in text and when reading/collecting data from scientific instruments. • Describe how specific images (e.g., a diagram showing how a machine works) support a scientific or engineering idea. • Interpret and evaluate data, evidence, and scientific reasoning. • Provide an accurate and objective summary or conclusion.
These ELA standards help students use scientific language during investigations, observations of science phenomena, reading texts, and classroom discussions. 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, data, images, captions, and non-linguistic representations 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) 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 different structures within a text (headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text. • Identify information in pictures, diagrams and other visual representations; explain why the author used them instead of paragraph text. • Identify when an author is making a scientific claim, and the evidence and reasoning used to support their claim. • Use the information in text to answer questions, and support reasoning and conclusions.
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 information from multiple sources, including lab investigations, to answer a scientific question. • Use multiple sources or formats of information related to the same science concept and explain whether these representations provide similar levels of detail. • Locate the claim, evidence, and reasoning in scientific explanations and arguments. • Identify explanations and arguments that are supported by evidence and determine why some evidence is relevant to a scientific question and some is not. • Distinguish between explanations that account for all gathered evidence and those that do not. • Explain how specific images (e.g., a diagram showing how a machine works or a labeled drawing of animal parts) contribute to and clarify a text.
†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 passive/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. Identify arguments that are supported by evidence and determine why some evidence is relevant to a scientific question and some is not. Distinguish between explanations that account for all gathered evidence and those that do not. Construct an explanation with evidence to support a claim and distinguish between opinions and evidence in one's own explanations. Write formal or informal texts. The product may include notebook entries, observations, functional text, or visual displays of data. Produce science writing in a voice appropriate for the type of writing and the audience. 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. Communicate information, solutions, or design ideas with others using models, drawings, writing, or numbers that provide detail about scientific ideas, practices, or design ideas
<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 (keyboarding skills) to interact and collaborate with others as a way of sharing ideas. Integrate drawings 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 passive/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"> Participate in shared research and writing projects (e.g., read books on a single topic to produce a report; record science observations). Use and combine information from multiple sources to construct claims, evidence, and explanations. Gather relevant information from a variety of credible print and digital sources to answer a question. Recall information from experiences or gather information from provided sources to answer a question. 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.
<p>These ELA standards help students engage in scientific conversations to gather and evaluate information. Engaging in scientific discourse communities to collaborate and build comprehension is a fundamental practice of science and engineering.</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. Listen actively to others' explanations or arguments to indicate agreement or disagreement based on evidence, and/or to retell the main points. Distinguish between opinions and evidence in the speaker's explanations or arguments. Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. Ask and answer questions about what a speaker says to clarify comprehension, gather additional information, or deepen understanding of a science topic or issue.
<p>These ELA standards help students engage in scientific conversations to informally share ideas and develop understanding of scientific phenomena and provide a formal way to present information</p>	<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"> Discuss science questions, information, results, and supporting evidence with a partner or small group; speak clearly and in a sequence so listeners can follow the line of thinking and reasoning. Make a claim about the effectiveness of an object, tool, or solution that is supported by relevant evidence and listen actively to

<p>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>	<p>others' comments that indicate agreement or disagreement based on evidence.</p> <ul style="list-style-type: none"> • 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 should be appropriate to purpose, audience, and task. • Communicate scientific information orally, using various forms of print or digital media, pictures, and charts.
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Quarter 1			
AZ State Standards	Background Information and Learning Targets	Vocabulary	Curricular Resources
<p>Unit Title: Our Senses</p> <p><i>Physical Sciences: Students explore how their senses can detect light, sound, and vibration and how technology can be used to extend their senses.</i></p>			
<p>K.P2U1.1 Investigate how senses can detect light, sound, and vibrations even when they come from far away; use the collected evidence to develop and support an explanation.</p> <p>K.P2U2.2 Design and evaluate a tool that helps people extend their senses</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: People use their senses to learn about the world around them. Their eyes detect light, their ears detect sound, and they can feel vibrations by touch. People also use a variety of devices to communicate (send and receive information) over long distances. 4 (p. 137) Objects can have an effect on other objects even when they are not in contact with them. For instance, light affects the objects it reaches, including 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) Designs can be conveyed through sketches, drawings, or physical models.4 (p. 207) Because there is always more than one possible solution to a problem, it is useful to compare designs, test them, and discuss their strengths and weaknesses.4 (p. 209)</p> <p>GESD Context and Application of Standards:</p> <ul style="list-style-type: none"> • I can tell you my 5 senses. • I can tell you what my 5 senses are for. • I can tell and show you how the things around me affect my senses. • I can make a tool that makes mine and other people's senses better. 	<p>senses eyes ears Touch Taste smell light reflect sound vibrate sketches drawings physical models compare test discuss strengths weaknesses patterns structure function</p>	<p><i>Scott Foresman:</i></p> <ul style="list-style-type: none"> • Chapter 7; Guided Inquiry <p><i>ReadyGEN:</i></p> <ul style="list-style-type: none"> • Leveled Reader: In the Dry Desert • Leveled Reader: Who Lives Here? • U4MB Making Music <p><i>Mystery Science:</i></p> <ul style="list-style-type: none"> • Five Senses <p><i>World Book:</i></p> <ul style="list-style-type: none"> • Senses • Sight • Hearing • Touch • Taste • Smell <p>Connects with Civics in Social Studies Students can make tools to help people with different abilities. Polar Bear, Polar Bear, What Do You Hear? by: Bill Martin, Jr.</p>

			<p><i>Do you have a recommendation for curriculum materials that support teaching these concepts? Please email them to jmoritz@gesd40.org</i></p>
Quarter 2			
AZ State Standards	Background Information and Learning Targets	Vocabulary	Curricular Resources
<p>Unit Title: Weather <i>Earth and Space Sciences: Students develop an understanding of patterns to understand changes in local weather, seasonal cycles, and daylight.</i></p>			
<p>K.E1U1.3 Observe, record, and ask questions about temperature, precipitation, and other weather data to identify patterns or changes in local weather.</p> <p>K.E1U1.4 Observe, describe, ask questions, and predict seasonal weather patterns; and how those patterns impact plants and animals (including humans).</p>	<p>Background Information: There is air all around the Earth’s surface, but there is less and less further away from the surface (higher in the sky). Weather is determined by the conditions and movement of the air. The temperature, pressure, direction, speed of movement and the amount of water vapor in the air combine to create the weather. Measuring these properties over time enables patterns to be found that can be used to predict the weather a short time ahead.2 (p. 24)</p> <p>GESD Context and Application of Standards:</p> <ul style="list-style-type: none"> ● I can tell and show you what the weather cycle is. ● I can tell you what temperature is. ● I can track and record data of temperature and weather. ● I can tell you how the weather and temperature affects people, animals, and plants. 	<p>weather temperature pressure direction speed water vapor predict patterns</p>	<p><i>Scott Foresman:</i></p> <ul style="list-style-type: none"> ● Chapter 5 <p><i>Ready Gen:</i> Leveled Readers:</p> <ul style="list-style-type: none"> ● Checking the Weather ● Snow Cover ● All Kinds of Weather ● The Four Seasons ● What Should We Wear? ● It’s Raining ● In the Winter ● What Will the Weather Be? ● What is the Weather? ● Winter is Coming ● Rain <ul style="list-style-type: none"> ● U2MA Four Seasons Make a Year ● U2MA Come On, Rain! ● U2MA The Snowy Day ● U2MB What Will the Weather Be? ● U2MB Weather Words and What They Mean <p><i>Mystery Science:</i></p> <ul style="list-style-type: none"> ● Weather Watching Unit

			<ul style="list-style-type: none"> ● Temperature <p><i>World Book:</i></p> <ul style="list-style-type: none"> ● Weather ● Temperature ● Fahrenheit Scale <p><i>Other Resources:</i> Scholastic</p> <ul style="list-style-type: none"> ● Weather Lesson ● Making a cloud experiments ● Wind <p><i>Do you have a recommendation for curriculum materials that support teaching these concepts? Please email them to jmoritz@gesd40.org</i></p>
Quarter 3			
AZ State Standards	Background Information and Learning Targets	Vocabulary	Curricular Resources
Unit Title: Living Things			
<i>Life Sciences: Students develop an understanding that the world is comprised of living and non-living things. They investigate the relationship between structure and function in living things; plants and animals use specialized parts to help them meet their needs and survive.</i>			
<p>K.L1U1.6 Obtain, evaluate, and communicate information about how organisms use different body parts for survival.</p> <p>K.L1U1.7 Observe, ask questions, and explain how specialized structures found on a variety of plants and animals (including humans) help them</p>	<p>Background Information: All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive, grow, and produce more plants. 4(p. 144) Animals have body parts that capture and convey different kinds of information needed for growth and survival—for example, eyes for light, ears for sounds, and skin for temperature or touch. Animals respond to these inputs with behaviors that help them survive (e.g., find food, run from a predator)4 (p. 149)</p> <p>GESD Context and Application of Standards:</p> <ul style="list-style-type: none"> ● I can tell you and show you the different parts of plants and animals. ● I can tell you what the functions are for different parts of animals and plants and how those functions are beneficial for survival. 	<p>organisms food water air plants roots stems leaves flowers fruits body parts growth survival eyes</p>	<p>Scott Foresman:</p> <ul style="list-style-type: none"> ● Chapter 1; Lessons 3-6 ● Chapter 3 <p>Ready Gen:</p> <ul style="list-style-type: none"> ● Leveled Reader: From Seeds to Plants ● U1MA Text Collection: A House for Hermit Crab & Where is Home, Little Pip? ● U5MA The Tiny Seed ● U5MA Jack’s Garden ● U5MB Plan Patterns

<p>sense and respond to their environment</p>	<ul style="list-style-type: none"> I can tell and show you how people, plants, and animals use their senses to survive in their environment. 	<p>ears skin respond inputs predator patterns structure function cause effect</p>	<p><i>Mystery Science:</i></p> <ul style="list-style-type: none"> Plants & Animals Needs Unit Survival Plant Life Cycle <p><i>World Book:</i></p> <ul style="list-style-type: none"> Plant Animal Seed Flower Human Body <p><i>Other Resources:</i></p> <p>Scholastic</p> <ul style="list-style-type: none"> Insect life cycle Spring favorites Pumpkin life cycle From seed to plant Roots <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>K.L2U1.8 Observe, ask questions, and explain the differences between the characteristics of living and non-living things.</p>	<p>Background Information: There is a wide variety of living things (organisms), including plants and animals. They are distinguished from non-living things by their ability to move, reproduce, and react to certain stimuli.2 (p. 26)</p> <p>GESD Context and Application of Standards:</p> <ul style="list-style-type: none"> I can tell you the characteristics of living and nonliving things. I can tell you the difference between living and nonliving things. 	<p>living non-living animals move reproduce stimuli</p>	<p><i>Scott Foresman:</i></p> <ul style="list-style-type: none"> Chapter 1; Lesson 1, 2 <p><i>Mystery Science:</i></p> <ul style="list-style-type: none"> Plant Life Cycles Animal Life Cycles Life Science <p><i>World Book:</i></p> <ul style="list-style-type: none"> Life Environment

			<p><i>Do you have a recommendation for curriculum materials that support teaching these concepts? Please email them to jmoritz@gesd40.org</i></p>
Quarter 4			
AZ State Standards	Background Information and Learning Targets	Vocabulary	Curricular Resources
<p>Unit Title: Sun, Moon and Stars <i>Earth and Space Sciences: Students develop an understanding of patterns to understand changes in local weather, seasonal cycles, and daylight.</i></p>			
<p>K.E2U1.5 Observe and ask questions about patterns of the motion of the sun, moon, and stars in the sky.</p>	<p>Background Information: Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. At night one can see the light coming from many stars with the naked eye, but telescopes make it possible to see many more and to observe them and the moon and planets in greater detail.4 (p. 174)</p> <p>GESD Context and Application of Standards:</p> <ul style="list-style-type: none"> • I can tell you about outer space. • I can tell and show you the patterns of the Earth, sun, moon and stars. 	<p>sun moon stars telescopes planets structure functions</p>	<p>Scott Foresman:</p> <ul style="list-style-type: none"> • Chapter 9 <p>Ready Gen:</p> <ul style="list-style-type: none"> • Leveled Reader: Look! <p>Mystery Science:</p> <ul style="list-style-type: none"> • Spinning Sky Unit • Outer Space <p>World Book:</p> <ul style="list-style-type: none"> • Sun • Moon • Star • Telescope • Planet • Earth <p><i>Do you have a recommendation for curriculum materials that support teaching these concepts? Please email them to jmoritz@gesd40.org</i></p>