

ELEMENTARY SCIENCE CURRICULUM | 5TH GRADE

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Course Information - K-12 Science

Fifth Grade Science

CURRICULUM/CONTENT AREA	COURSE LENGTH
Science	1 year
GRADE LEVEL	DATE LAST REVIEWED
5th	2023
PREREQUISITE(s) <i>if applicable</i>	BOARD APPROVAL DATE
NA	02/2024
PRIMARY RESOURCE <i>if applicable</i>	
Carolina Building Blocks of Science	

Desired Results

COURSE DESCRIPTION AND PURPOSE		
<p>Elmbrook's elementary science programming is designed to introduce students to the basic principles and concepts of science. It provides a foundation for scientific thinking and inquiry by exploring various scientific disciplines such as physical, life, and earth and space sciences. Overall, our elementary science programming aims to instill a love for science, nurture critical thinking skills, and lay the groundwork for further scientific study as students progress through their education. It provides a solid foundation for understanding the natural world and fosters a scientific mindset that can be applied to various aspects of life.</p>		
ENDURING UNDERSTANDINGS		ESSENTIAL QUESTIONS
CC1: Patterns	SCI.CC1.3-5 Students identify similarities and differences in order to sort and classify natural objects and designed products. They identify patterns related to time, including simple rates of change and cycles, and use these patterns to make predictions.	<ul style="list-style-type: none"> • Why does matter matter? • What are biotic and abiotic factors? • What do we know about
CC2: Cause and	SCI.CC2.3-5 Students routinely identify and test causal relationships and use these relationships to explain change. They understand events that occur together with regularity may or may not signify a cause-and-effect	

Effect	relationship.	Earth and space systems?
CC3: Scale, Proportion, and Quantity	SCI.CC3.3-5 Students recognize natural objects and observable phenomena exist from the very small to the immensely large. They use standard units to measure and describe physical quantities such as mass, time, temperature, and volume	
CC4: Systems and System Models	SCI.CC4.3-5 Students understand a system is a group of related parts that make up a whole and can carry out functions its individual parts cannot. They also describe a system in terms of its components and their interactions.	
CC5: Energy and Matter	SCI.CC5.3-5 Students understand matter is made of particles and energy can be transferred in various ways and between objects. Students observe the conservation of matter by tracking matter flows and cycles before and after processes, recognizing the total mass of substances does not change. Note: In this grade band, students are not expected to be able to differentiate between mass and weight.	
CC6: Structure and Function	SCI.CC6.3-5 Students understand different materials have different substructures, which can sometimes be observed, and substructures have shapes and parts that serve functions.	
CC7: Stability and Change	SCI.CC7.3-5 Students measure change in terms of differences over time and observe that change may occur at different rates. They understand some systems appear stable, but over long periods of time they will eventually change.	

Kindergarten			First Grade			Second Grade			Third Grade			Fourth Grade			Fifth Grade		
UNIT 1 Push, Pull, Go	UNIT 2 Living Things and Their Needs	UNIT 3 Weather and Sky	UNIT 1 Light and Sound Waves	UNIT 2 Exploring Organisms	UNIT 3 Sky Watchers	UNIT 1 Matter	UNIT 2 Ecosystem Diversity	UNIT 3 Earth Materials	UNIT 1 Forces and Interactions	UNIT 2 Life and Ecosystems	UNIT 3 Weather and Climate Patterns	UNIT 1 Energy Works	UNIT 2 Plant and Animal Structures	UNIT 3 Changing Earth	UNIT 1 Structures and Properties of Matter	UNIT 2 Matter and Energy in Ecosystems	UNIT 3 Earth and Space Systems

Science Standards by Unit and Grade Level Band														Grade Band	Unit 1	Unit 2	Unit 3
Cross Cutting Concepts																	
Standard SCI.CC1 - Patterns														K-2	1, 2	K, 1	K-2
Students use science and engineering practices, disciplinary core ideas, and patterns to make sense of phenomena and solve problems														3-5	3, 4	3, 5	3-5
Standard SCI.CC2 - Cause and Effect														K-2	K-2	K, 2	K
Students use science and engineering practices, disciplinary core ideas, and cause and effect relationships to make sense of phenomena and solve problems.														3-5	3-5	3-5	3-5
Standard SCI.CC3 - Scale, Proportion, and Quantity														K-2			K, 1
Students use science and engineering practices, disciplinary core ideas, and an understanding of scale, proportion, and quantity to make sense of phenomena and solve problems.														3-5	5	3	5
Standard SCI.CC4 - Systems and System Models														K-2		K	
Students use science and engineering practices, disciplinary core ideas, and an understanding of systems and system models to make sense of phenomena and solve problems.														3-5		3-5	5
Standard SCI.CC5 - Energy and Matter														K-2	2		
Students use science and engineering practices, disciplinary core ideas, and an understanding of energy and matter to make sense of phenomena and solve problems.														3-5	4	5	
Standard SCI.CC6 - Structure and Function														K-2		1, 2	
Students use science and engineering practices, disciplinary core ideas, and an understanding of structure and function to make sense of phenomena and solve problems.														3-5		3	
Standard SCI.CC7 - Stability and Change														K-2			2
Students use science and engineering practices, disciplinary core ideas, and an understanding of stability and change to make sense of phenomena and solve problems.														3-5			3
Science and Engineering Practices																	
Standard SCI.SEP1 - Asking Questions and Defining Problems														K-2	K		K
Students ask questions and define problems, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.														3-5	3-5	5	
Standard SCI.SEP2 - Developing and Using Models														K-2		K-2	K, 2
Students develop and use models, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.														3-5	3-5	3-5	4, 5

Standard SCI.SEP3 - Planning and Conducting Investigations Students plan and conduct investigations, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.	K-2	K-2	2	K-2
	3-5	3, 4	5	4
Standard SCI.SEP4 - Analyze and Interpret Data Students analyze and interpret data, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.	K-2	K-2	K	K, 1
	3-5	5	3, 5	3-5
Standard SCI.SEP5 - Mathematics and Computational Thinking Students use mathematics and computational thinking, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.	K-2		K	
	3-5	3, 5		5
Standard SCI.SEP6 - Construct Explanations and Design Solutions Students construct explanations and design solutions, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomena and solve problems.	K-2	1,2	1	K, 2
	3-5	3, 4	3-5	3, 4, 5
Standard SCI.SEP7 - Engage in Arguments Students engage in argument from evidence, in conjunction with using crosscutting concepts and disciplinary core ideas, to make sense of phenomenon and solve problems.	K-2	2	K-2	
	3-5	5	3-5	3, 5
Standard SCI.SEP8 - Obtain, evaluate, and Communication Information Students obtain, evaluate, and communicate information, in conjunction with using cross cutting concepts and disciplinary core ideas, to make sense of phenomenon and solve problems.	K-2		K-2	1, 2
	3-5	3, 4		5
Disciplinary Core Ideas				
Life Science				
Standard SCI.LS1 Students use science and engineering practices, crosscutting concepts, and an understanding of structures and processes (on a scale from molecules to organisms) to make sense of phenomena and solve problems.	K-2		K-2	
	3-5		3-5	
Standard SCI.LS2 Students use science and engineering practices, crosscutting concepts, and an understanding of interactions, energy, and dynamics within ecosystems to make sense of phenomena and solve problems.	K-2		K, 2	
	3-5		3, 5	
Standard SCI.LS3 Students use science and engineering practices, crosscutting concepts, and an understanding of heredity to make sense of phenomena and solve problems.	K-2		1	
	3-5		3, 5	
Standard SCI.LS4 Students use science and engineering practices, crosscutting concepts, and an understanding of biological evolution to make sense of phenomena and solve problems.	K-2		K, 2	
	3-5		3	
Physical Science				
Standard SCI.PS1 Students use science and engineering practices, crosscutting concepts, and an understanding of matter and its interactions to make sense of phenomena and solve problems.	K-2	2		2
	3-5	5		
Standard SCI.PS2 Students use science and engineering practices, crosscutting concepts, and an understanding of forces, interactions, motion, and stability to make sense of phenomena and solve problems.	K-2	K		
	3-5	3		5

Standard SCI.PS3 Students use science and engineering practices, crosscutting concepts, and an understanding of energy to make sense of phenomena and solve problems.	K-2	K		
	3-5	3, 4		
Standard SCI.PS4 Students use science and engineering practices, crosscutting concepts, and an understanding of waves and their applications in technologies for information transfer to make sense of phenomena and solve problems.	K-2	1		
	3-5	4	4	
Earth and Space Science				
Standard SCI.ESS1 Students use science and engineering practices, crosscutting concepts, and an understanding of earth's place in the universe to make sense of phenomena and solve problems.	K-2			1, 2
	3-5			4, 5
Standard SCI.ESS2 Students use science and engineering practices, crosscutting concepts, and an understanding of earth's systems to make sense of phenomena and solve problems.	K-2		K	K, 2
	3-5		5	3-5
Standard SCI.ESS3 Students use science and engineering practices, crosscutting concepts, and an understanding of earth and human activity to make sense of phenomena and solve problems.	K-2		K	K
	3-5	4	5	3-5
Engineering and Technical Science				
Standard SCI.ETS1 Students use science and engineering practices, crosscutting concepts, and an understanding of engineering design to make sense of phenomena and solve problems.	K-2	K-2	K-2	K, 2
	3-5	3-5	3-5	3, 4
Standard SCI.ETS2 Students use science and engineering practices, crosscutting concepts, and an understanding of links among engineering, technology, science, and society to make sense of phenomena and solve problems.	K-2	K-2	K-2	K-2
	3-5	3-5	4, 5	3-5
Standard: SCI.ETS3: Students use science and engineering practices, crosscutting concepts, and an understanding of the nature of science and engineering to make sense of phenomena and solve problems.	K-2	K-2	K-2	K-2
	3-5	3-5	4, 5	4, 5

Physical Science: Structures and Properties of Matter

DESIRED RESULTS

Essential Questions

Students will keep considering...

Why does matter matter?

Unit Priority Standards and Learning Targets

Students will know and be able to...

Disciplinary Core Ideas

Learning Element	Performance Indicator	CBB Unit Connection	Learning Target
SCI.PS1.A: Structures and Properties of Matter	SCI.PS1.A.5 Matter exists as particles that are too small to see. Matter is always conserved even if it seems to disappear. Measurements of a variety of observable properties can be used to identify particular materials.	Grade 5: Energy and States of Matter	I can identify different materials by measuring observable properties and understanding that matter is conserved even though it may not be visible. SCI.PS1.A.5
SCI.PS1.B: Chemical Reactions	SCI.PS1.B.5 Chemical reactions that occur when substances are mixed can be identified by the emergence of substances with different properties. In chemical reactions the total mass remains the same. Note: At this level, students are not expected to differentiate between mass and weight.	Grade 5: Making Mixtures and Solutions	I can observe and identify chemical reactions by looking for changes in the properties of the substances involved and using the law of conservation of mass to determine if the reaction has occurred. SCI.PS1.B.5
SCI.ETS1.B: Developing Possible Solutions	SCI.ETS1.B.3-5 Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved.	Grade 5 Structure and Properties of Matter	I can test different solutions for an engineering problem; I can tell you if an idea will work, fail, or just needs improvement. SCI.ETS1.B.3-5
SCI.ETS1.C: Optimizing the Design Solution	SCI.ETS1.C.3-5 Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.	Grade 5 Structure and Properties of Matter	I can generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. SCI.ETS1.C.3-5
SCI.ETS3.A: Science and Engineering Are Human Endeavors	SCI.ETS3.A.3-5 Science and engineering knowledge have been created by many cultures. People use the tools and practices of science and engineering in many different situations (e.g. land managers, technicians,		I can recognize that different cultures have contributed to science and engineering advancements. I can recognize that people use tools and practices of science in many different professions.

	nurses and welders). Science and engineering affect everyday life.		I can understand that science and engineering impact everyday life. SCI.ETS3.A.3-5
SCI.ETS3.B: Science and Engineering Are Unique Ways of Thinking with Different Purposes	SCI.ETS3.B.3-5 Science and engineering are both bodies of knowledge and processes that add new knowledge to our understanding. Scientific findings are limited to what can be supported with evidence from the natural world. Basic laws of nature are the same everywhere in the universe (e.g. gravity, conservation of matter, energy transfer, etc.). Engineering solutions often have drawbacks as well as benefits	Conservation of Matter- Properties of Matter	I can recognize that basic laws of nature are the same everywhere in the universe. SCI.ETS3.B.3-5

Crosscutting Concepts

Learning Element	Performance Indicator	CBB Unit Connection	Learning Target
CC2: Cause and Effect	SCI.CC2.3-5 Students routinely identify and test causal relationships and use these relationships to explain change. They understand events that occur together with regularity may or may not signify a cause-and-effect relationship.	Grade 5 Structure and Properties of Matter	I can identify and test relationships and explain why these relationships caused change. SCI.CC2.3-5
CC3: Scale, Proportion, and Quantity	SCI.CC3.3-5 Students recognize natural objects and observable phenomena exist from the very small to the immensely large. They use standard units to measure and describe physical quantities such as mass, time, temperature, and volume	Grade 5 Structure and Properties of Matter	I can use standard units to measure and describe physical quantities including mass, time, temperature, and volume. SCI.CC3.3-5

Science and Engineering Practices

Learning Element	Performance Indicator	CBB Unit Connection	Learning Target
SEP1.B: Defining Problems	SCI.SEP1.B.3-5 Students use prior knowledge to describe and define simple design problems that can be solved through the development of an object, tool, process, or system. They include several criteria for success and constraints on materials, time, or cost.	Grade 5 Structure and Properties of Matter	I can use prior knowledge to solve problems through the development of objects, tools, processes or systems. SCI.SEP1.B.3-5
SEP2: Developing and Using Models	SCI.SEP2.3-5 Students build and revise simple models and use models to represent events and design solutions. This includes the following: Identify limitations of models. Collaboratively develop and/or revise a model based on evidence that shows the relationships among variables for frequent and regular occurring events. Develop a model using an analogy, example, or abstract	Grade 5 Structure and Properties of Matter	I can build and revise simple models and use them to represent events and design solutions. I can collaboratively develop or revise a model based on evidence that shows the relationship

	<p>representation to describe a scientific principle or design solution. Develop and/or use models to describe or predict phenomena. Develop a diagram or simple physical prototype to convey a proposed object, tool, or process.</p> <p>Use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system.</p>		<p>among variables.</p> <p>I can develop or use models to describe and predict phenomena. SCI.SEP2.3-5</p>
SEP4: Analyzing and Interpreting Data	<p>SCI.SEP4.3-5 Students begin to use quantitative approaches to collect data and conduct multiple trials of qualitative observations. (When possible, digital tools should be used.) This includes the following:</p> <p>Represent data in tables or various graphical displays (bar graphs, pictographs, and pie charts) to reveal patterns that indicate relationships. Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, or computation.</p> <p>Compare and contrast data collected by different groups in order to discuss similarities and differences in their findings.</p> <p>Analyze data to refine a problem statement or the design of a proposed object, tool, or process.</p> <p>Use data to evaluate and refine design solutions.</p>	Grade 5 Structure and Properties of Matter	<p>I can use quantitative approaches to collect data and represent that data in tables or various graphical displays. SCI.SEP4.3-5</p>
SEP5: Using Mathematics and Computational Thinking	<p>SCI.SEP5.3-5 Students extend quantitative measurements to a variety of physical properties, using computation and mathematics to analyze data and compare alternative design solutions. This includes the following:</p> <p>Organize simple data sets to reveal patterns that suggest relationships. Describe, measure, estimate, and/or graph quantities such as area, volume, weight, and time to address scientific and engineering questions and problems. Create and use graphs or charts generated from simple algorithms to compare alternative solutions to an engineering problem.</p>	Grade 5 Structure and Properties	<p>I can extend qualitative measurements to a variety of physical properties.</p> <p>I can organize simple data sets to reveal patterns that suggest relationships .SCI.SEP5.3-5</p>
SEP7: Arguing from Evidence	<p>SCI.SEP7.3-5 Students critique the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world. This includes the following:</p> <p>Compare and refine arguments based on an evaluation of the evidence presented.</p> <p>Distinguish among facts, reasoned judgment based on research findings, and speculation in an explanation.</p> <p>Respectfully provide and receive critiques from peers about a proposed procedure, explanation, or model by citing relevant evidence and posing specific questions.</p> <p>Construct and/or support an argument with evidence, data, or a model.</p> <p>Use data to evaluate claims about cause and effect.</p> <p>Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.</p>	Grade 5 Structure and Properties of Matter	<p>I can critique the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world. SCI.SEP7.3-5</p>
Anchoring Phenomenon			
Matter, its properties, and its interactions.			

Assessment Evidence

Performance is evaluated in terms of...

Students will show their learning by...

Performance Expectations

- **5-PS1-1:** Develop a model to describe that matter is made of particles too small to be seen.
- **5-PS1-2:** Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
- **5-PS1-3:** Make observations and measurements to identify materials based on their properties.
- **5-PS1-4:** Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
- **3-5-ETS1-2:** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Key Feedback & Assessment Strategies:

- *Conferring/Strategy Groups: Using current evidence of standards & skills, feedback is scaffolded based on student strengths, needs & goals*
- *Assessment of Unit Skills - Examples for Targeted Data Collection*
 - ◆ *Assess unit vocabulary terms*
 - ◆ *Evaluate student investigation tasks*
 - ◆ *Assess key unit concepts (Unit summative assessment)*
- *Extensions may include:*
 - ◆ **Clean the Milwaukee River**
 - *Provide students with a container of contaminated water (rocks, oil, food coloring, pieces of paper, sand, iron filings) and a variety of filter options (mesh, coffee filter, cotton balls) to try and create the cleanest and clearest water.*

Life Science: Matter and Energy in Ecosystems

DESIRED RESULTS

Essential Questions

Students will keep considering...

What are biotic and abiotic factors?

Unit Priority Standards and Learning Targets

Students will know and be able to...

Disciplinary Core Ideas

Learning Element	Performance Indicator	CBB Unit Connection	Learning Target
SCI.LS1.B: Growth and Development of Organisms	SCI.LS1.B.3 Reproduction is essential to every kind of organism. Organisms have unique and diverse life cycles.	Grade 5	I can identify the structures in plants and animals that allow for growth, survival, behavior and reproduction. SCI.LS1.B.3
SCI.LS1.C: Organization for Matter and Energy Flow in Organisms	SCI.LS1.C.5 Food provides animals with the materials and energy they need for body repair, growth, warmth, and motion. Plants acquire material for growth chiefly from air, water, and process matter, and obtain energy from sunlight, which is used to maintain conditions necessary for survival.	Grade 5	I can explain how plants and animals obtain the materials and energy they need for survival. SCI.LS1.C.5
SCI.LS2.A: Interdependent Relationships in Ecosystems	SCI.LS2.A.5 The food of almost any animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants, while decomposers restore some materials back to the soil.	Grade 5	I can explain how the food of almost any animal can be traced back to plants, and how organisms are connected within food webs. SCI.LS2.A.5
SCI.LS2.B: Cycles of Matter and Energy Transfer in Ecosystems	SCI.LS2.B.5 Matter cycles between the air and soil and among organisms as they live and die.	Grade 5	I can explain the ways in which matter cycles between the air and soil and among organisms as they live and die. SCI.LS2.B.5
SCI.PS3.D: Energy in Chemical	SCI.PS3.D.4, 5 Plants capture energy from sunlight which can be used as fuel or	Grade 5	I can explain photosynthesis. SCI.PS3.D.4, 5

Processes and Everyday Life	food. Stored energy in food or fuel can be converted to usable energy.		
SCI.ESS2.A: Earth Materials and Systems	SCI.ESS2.A.4,5 Four major Earth systems interact. Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, organisms, and gravity break rocks, soils, and sediments into smaller pieces and move them around.	Grade 5	I can identify how the four Earth systems interact with one another. SCI.ESS2.A.4,5
SCI.ESS3.C: Human Impacts on Earth Systems	SCI.ESS3.C.5 Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.	Grade 5	I can find and use information about how societal activities have a major impact on the land, ocean, atmosphere, and space. SCI.ESS3.C.5
SCI.ETS1.B: Developing Possible Solutions	SCI.ETS1.B.3-5 Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved.	Grade 5: Matter/Ecosystem	I can test different solutions for an engineering problem; I can tell you if an idea will work, fail, or just needs improvement. SCI.ESS3.C.5
SCI.ETS3.C: Science and Engineering Use Multiple Approaches to Create New Knowledge and Solve Problems	SCI.ETS3.C.3-5 The products of science and engineering are not developed through one set "scientific method" or "engineering design process." Instead, they use a variety of approaches described in the Science and Engineering Practices. Science explanations are based on a body of evidence and multiple tests, and describe the mechanisms for natural events. Science explanations can change based on new evidence. There is no perfect design in engineering. Designs that are best in some ways (e.g. safety or ease of use) may be inferior in other ways (e.g. cost or aesthetics).	Grade 5: Matter/Ecosystem-	I can realize that science and engineering products utilize a variety of approaches to determine a solution. I can recognize that science explanations can change based on new evidence and that designs are always changing and improving. SCI.ETS3.C.3-5
SCI.ETS3.B: Science and Engineering Are Unique Ways of Thinking with	SCI.ETS3.B.3-5 Science and engineering are both bodies of knowledge and processes that add new knowledge to our understanding. Scientific findings are limited to what can be supported with	Energy Transfer-Matter/Ecosystem	I can explain that scientific findings need to be supported with evidence from the natural world. I can recognize that basic laws of nature are the same everywhere in the universe.

Different Purposes	<p>evidence from the natural world.</p> <p>Basic laws of nature are the same everywhere in the universe (e.g. gravity, conservation of matter, energy transfer, etc.).</p> <p>Engineering solutions often have drawbacks as well as benefits</p>		I can understand that engineering solutions can have drawbacks and benefits. SCI.ETS3.B.3-5
SCI.ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World	<p>SCI.ETS2.B.3-5</p> <p>People's needs and wants change over time, as do their demands for new and improved technologies.</p> <p>Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.</p> <p>When new technologies become available, they can bring about changes in the way people live and interact with one another.</p>	Grade 5: Matter/Ecosystem	I can define a simple design problem reflecting a need or a want that includes specific criteria for success. SCI.ETS2.B.3-5
SCI.ETS2.A: Interdependence of Science, Engineering, and Technology	<p>SCI.ETS2.A.3-5</p> <p>Science and technology support each other.</p> <p>Tools and instruments are used to answer scientific questions, while scientific discoveries lead to the development of new technologies.</p>	Grade 5: Matter/Ecosystem	I can explain how science and technology support each other. SCI.ETS2.A.3-5
SCI.ETS2.A: Interdependence of Science, Engineering, and Technology	<p>SCI.ETS2.A.3-5</p> <p>Science and technology support each other.</p> <p>Tools and instruments are used to answer scientific questions, while scientific discoveries lead to the development of new technologies.</p>	Grade 5: Matter/Ecosystem	I can explain how science and technology support each other. SCI.ETS2.A.3-5
SCI.ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World	<p>SCI.ETS2.B.3-5</p> <p>People's needs and wants change over time, as do their demands for new and improved technologies.</p> <p>Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.</p> <p>When new technologies become available, they can bring about changes in the way people live and interact with one another.</p>	Grade 5: Matter/Ecosystem	I can define a simple design problem reflecting a need or a want that includes specific criteria for success. SCI.ETS2.B.3-5

SCI.ETS3.A: Science and Engineering Are Human Endeavors	<p>SCI.ETS3.A.3-5 Science and engineering knowledge have been created by many cultures.</p> <p>People use the tools and practices of science and engineering in many different situations (e.g. land managers, technicians, nurses and welders).</p> <p>Science and engineering affect everyday life.</p>	Grade 5: Matter/Ecosystem	<p>I can recognize that different cultures have contributed to science and engineering advancements.</p> <p>I can recognize that people use tools and practices of science in many different professions.</p> <p>I can understand that science and engineering impact everyday life. SCI.ETS3.A.3-5</p>
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Crosscutting Concepts

Learning Element	Performance Indicator	CBB Unit Connection	Learning Target
CC1: Patterns	SCI.CC1.3-5 Students identify similarities and differences in order to sort and classify natural objects and designed products. They identify patterns related to time, including simple rates of change and cycles, and use these patterns to make predictions.	Grade 5: Matter/Ecosystem	I can identify similarities and differences in order to sort and classify natural objects and designed products. SCI.CC1.3-5
CC2: Cause and Effect	SCI.CC2.3-5 Students routinely identify and test causal relationships and use these relationships to explain change. They understand events that occur together with regularity may or may not signify a cause-and-effect relationship.	Grade 5: Matter/Ecosystem	I can identify and test causal relationships and use them to explain a cause and effect relationship. SCI.CC2.3-5
CC4: Systems and System Models	SCI.CC4.3-5 Students understand a system is a group of related parts that make up a whole and can carry out functions its individual parts cannot. They also describe a system in terms of its components and their interactions.	Grade 5: Matter/Ecosystem	I can understand a system is a group of related parts that make up a whole and can carry out functions that its individual parts cannot. SCI.CC4.3-5
CC5: Energy and Matter	SCI.CC5.3-5 Students understand matter is made of particles and energy can be transferred in various ways and between objects. Students observe the conservation of matter by tracking matter flows and cycles before and after processes, recognizing the total mass of substances does not change. Note: In this grade band, students are not expected to be able to differentiate between mass and weight.	Grade 5: Matter/Ecosystem	I can understand matter is made of particles and energy can be transferred in various ways between objects. SCI.CC5.3-5

Science and Engineering Practices

Learning Element	Performance Indicator	CBB Unit Connection	Learning Target
SEP3: Planning and Conducting	SCI.SEP3.3-5 Students plan and carry out investigations that control variables and provide evidence to support explanations or design solutions. This includes the following:	Grade 5: Matter/Ecosystem	I can plan and carry out an investigation that controls variables and provides evidence to support explanations or design solutions.

Investigations	<p>Collaboratively plan and conduct an investigation to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.</p> <p>Evaluate appropriate methods and tools for collecting data.</p> <p>Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.</p> <p>Make predictions about what would happen if a variable changes.</p> <p>Test two different models of the same proposed object, tool, or process to determine which better meets criteria for success.</p>		SCI.SEP3.3-5
SEP1.A: Asking Questions	<p>SCI.SEP1.A.3-5 Students ask questions that specify qualitative relationships. This includes the following:</p> <p>Ask questions about what would happen if a variable is changed. Identify scientific (testable) and non-scientific (non testable) questions.</p> <p>Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.</p>	Grade 5: Matter/Ecosystem	<p>I can ask questions that specify qualitative relationships including questions about what would happen if a variable is changed.</p> <p>SCI.SEP1.A.3-5</p>
SEP2: Developing and Using Models	<p>SCI.SEP2.3-5 Students build and revise simple models and use models to represent events and design solutions. This includes the following:</p> <p>Identify limitations of models.</p> <p>Collaboratively develop and/or revise a model based on evidence that shows the relationships among variables for frequent and regular occurring events. Develop a model using an analogy, example, or abstract representation to describe a scientific principle or design solution.</p> <p>Develop and/or use models to describe or predict phenomena.</p> <p>Develop a diagram or simple physical prototype to convey a proposed object, tool, or process.</p> <p>Use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system.</p>	Grade 5 Matter and Energy in Ecosystems	<p>I can build and revise simple models and use models to represent events and design solutions.</p> <p>SCI.SEP2.3-5</p>
SEP4: Analyzing and Interpreting Data	<p>SCI.SEP4.3-5 Students begin to use quantitative approaches to collect data and conduct multiple trials of qualitative observations. (When possible, digital tools should be used.) This includes the following:</p> <p>Represent data in tables or various graphical displays (bar graphs, pictographs, and pie charts) to reveal patterns that indicate relationships.</p> <p>Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, or computation.</p> <p>Compare and contrast data collected by different groups in order to discuss similarities and differences in their findings.</p> <p>Analyze data to refine a problem statement or the design of a proposed object, tool, or process.</p> <p>Use data to evaluate and refine design solutions.</p>	Grade 5 Matter and Energy in Ecosystems	<p>I can analyze and interpret data to make sense of phenomena using logical reasoning and compare and contrast data collected in order to discuss similarities and differences in my findings.</p> <p>SCI.SEP4.3-5</p>
SEP6.A: Constructing an Explanation	<p>SCI.SEP6.A.3-5 Students use evidence to construct explanations that specify variables that describe and predict phenomena. This includes the following:</p> <p>Construct an explanation of observed relationships (e.g., the distribution of plants in the back yard).</p>	Grade 5 Matter and Energy in Ecosystems	<p>I can use evidence to construct explanations that specify variables that describe and predict phenomena. SCI.SEP6.A.3-5</p>

	Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation. Identify the evidence that supports particular points in an explanation.		
SEP6.B: Designing Solutions	SCI.SEP6.B.3-5 Students use evidence to create multiple solutions to design problems. This includes the following: Apply scientific ideas to solve design problems. Generate multiple solutions to a problem and compare how well they meet the criteria and constraints.	Grade 5 Matter and Energy in Ecosystems	I can use evidence to create multiple solutions to design problems. SCI.SEP6.B.3-5
SEP7: Arguing from Evidence	SCI.SEP7.3-5 Students critique the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world. This includes the following: Compare and refine arguments based on an evaluation of the evidence presented. Distinguish among facts, reasoned judgment based on research findings, and speculation in an explanation. Respectfully provide and receive critiques from peers about a proposed procedure, explanation, or model by citing relevant evidence and posing specific questions. Construct and/or support an argument with evidence, data, or a model. Use data to evaluate claims about cause and effect. Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.	Grade 5 Matter and Energy in Ecosystems	I can critique the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world. SCI.SEP7.3-

Anchoring Phenomenon

Identifying the ways in which living things obtain energy and how they use that energy.

Assessment Evidence

Performance is evaluated in terms of...

Students will show their learning by...

Performance Expectations

- **5-LS1-1:** Support an argument that plants get the materials they need for growth chiefly from air and water.
- **5-LS2-1:** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- **5-PS3-1:** Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.
- **5-ESS2-1:** Develop a model using an example to describe the ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- **5-ESS3-1:** Obtain and combine information about ways individual communities use science ideas to protect the earth's resources and environment
- **3-5-ETS1-3:** Generate and compare multiple solutions to a problem based on how well each is likely to meet the criteria and constraints of a problem

Key Feedback & Assessment Strategies:

- *Conferring/Strategy Groups: Using current evidence of standards & skills, feedback is scaffolded based on student strengths, needs & goals*
- *Assessment of Unit Skills - Examples for Targeted Data Collection*
 - ◆ *Assess unit vocabulary terms*

- ◆ *Evaluate student investigation tasks*
- ◆ *Assess key unit concepts (Unit summative assessment)*

→ *Extensions may include:*



Earth and Space Science: Earth and Space Systems

DESIRED RESULTS

Essential Questions

Students will keep considering...

What do we know about Earth and space systems?

Unit Priority Standards and Learning Targets

Students will know and be able to...

Disciplinary Core Ideas

Learning Element	Performance Indicator	CBB Unit Connection	Learning Target
SCI.ESS1.A: The Universe and Its Stars	SCI.ESS1.A.5 Stars range greatly in size and distance from Earth, and this can explain their relative brightness	Grade 5 Earth and Space Systems	I can use the size and distance of stars from Earth to explain why some stars appear brighter than others. SCI.ESS1.A.5
SCI.ESS1.B: Earth and the Solar System	SCI.ESS1.B.5 The Earth's orbit and rotation, and the orbit of the moon around the Earth cause observable patterns.	Grade 5 Earth and Space Systems	I can explain how the Earth's orbit and rotation, and the orbit of the moon around the Earth, create observable patterns over time. SCI.ESS1.B.5
SCI.ESS2.A: Earth Materials and Systems	SCI.ESS2.A.4,5 Four major Earth systems interact. Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, organisms, and gravity break rocks, soils, and sediments into smaller pieces and move them around.	Grade 5 Earth and Space Systems	I can model weathering and erosion by water, ice, wind, and other organisms. SCI.ESS2.A.4,5
SCI.ESS2.C: The Roles of Water in Earth's Surface Processes	SCI.ESS2.C.5 Most of Earth's water is in the ocean, and much of the Earth's freshwater is in glaciers or underground.	Grade 5 Earth and Space Systems	I can describe how most of Earth's water is in the oceans and much of the Earth's freshwater is in glaciers or underground. SCI.ESS2.C.5
SCI.ESS3.C: Human Impacts on Earth Systems	SCI.ESS3.C.5 Societal activities have had major effects on the land, ocean, atmosphere, and even outer space. Societal activities can also help protect Earth's resources and environments.	Grade 5 Earth and Space Systems	I can find and use information about how communities protect the Earth's resources and environment. SCI.ESS3.C.5
SCI.PS2.B: Types of	SCI.PS2.B.5 The gravitational force of Earth acting on an object near Earth's	Grade 5 Earth and Space Systems	I can explain how the gravitational force of Earth pulls objects toward its center. SCI.PS2.B.5

Interactions	surface pulls that object toward the planet's center.		
SCI.ETS3.B: Science and Engineering Are Unique Ways of Thinking with Different Purposes	<p>SCI.ETS3.B.3-5 Science and engineering are both bodies of knowledge and processes that add new knowledge to our understanding.</p> <p>Scientific findings are limited to what can be supported with evidence from the natural world.</p> <p>Basic laws of nature are the same everywhere in the universe (e.g. gravity, conservation of matter, energy transfer, etc.).</p> <p>Engineering solutions often have drawbacks as well as benefits</p>	Gravity-Earth/Space	I can recognize that basic laws of nature are the same everywhere in the universe. SCI.ETS3.B.3-5
SCI.ETS2.A: Interdependence of Science, Engineering, and Technology	<p>SCI.ETS2.A.3-5 Science and technology support each other.</p> <p>Tools and instruments are used to answer scientific questions, while scientific discoveries lead to the development of new technologies.</p>	Grade 5 Earth and Space Systems	I can explain how science and technology support each other using tools and instruments to answer scientific questions. SCI.ETS2.A.3-5
SCI.ETS3.B: Science and Engineering Are Unique Ways of Thinking with Different Purposes	<p>SCI.ETS3.B.3-5 Science and engineering are both bodies of knowledge and processes that add new knowledge to our understanding.</p> <p>Scientific findings are limited to what can be supported with evidence from the natural world.</p> <p>Basic laws of nature are the same everywhere in the universe (e.g. gravity, conservation of matter, energy transfer, etc.).</p> <p>Engineering solutions often have drawbacks as well as benefits</p>	Grade 5 Earth and Space Systems	<p>I can explain that scientific findings need to be supported with evidence from the natural world.</p> <p>I can recognize that basic laws of nature are the same everywhere in the universe. SCI.ETS3.B.3-5</p>
SCI.ETS3.C: Science and Engineering Use Multiple Approaches to Create New Knowledge and Solve Problems	<p>SCI.ETS3.C.3-5 The products of science and engineering are not developed through one set "scientific method" or "engineering design process." Instead, they use a variety of approaches described in the Science and Engineering Practices.</p> <p>Science explanations are based on a body of evidence and multiple tests, and describe the mechanisms for natural events. Science explanations can change based on new evidence.</p> <p>There is no perfect design in engineering. Designs that are best in some ways (e.g. safety or ease of use) may be inferior in other ways (e.g. cost or aesthetics).</p>	Grade 5 Earth and Space Systems	<p>I can realize that science and engineering products utilize a variety of approaches to determine a solution.</p> <p>I can recognize that science explanations can change based on new evidence and that designs are always changing and improving. CI.ETS3.C.3-5</p>

Crosscutting Concepts

Learning Element	Performance Indicator	CBB Unit Connection	Learning Target
CC1: Patterns	SCI.CC1.3-5 Students identify similarities and differences in order to sort and classify natural objects and designed products. They identify patterns related to time, including simple rates of change and cycles, and use these patterns to make predictions.	Grade 5 Earth and Space Systems	I can identify similarities and differences in order to sort and classify natural objects and designed products.SCI.CC1.3-5
CC2: Cause and Effect	SCI.CC2.3-5 Students routinely identify and test causal relationships and use these relationships to explain change. They understand events that occur together with regularity may or may not signify a cause-and-effect relationship.	Grade 5 Earth and Space Systems	I can identify and test causal relationships and use these relationships to explain change through cause and effect relationships. SCI.CC2.3-5
CC3: Scale, Proportion, and Quantity	SCI.CC3.3-5 Students recognize natural objects and observable phenomena exist from the very small to the immensely large. They use standard units to measure and describe physical quantities such as mass, time, temperature, and volume	Grade 5 Earth and Space Systems	I can recognize natural objects and observable phenomena exist from the very small to the immensely large in regards to scale and proportion. SCI.CC3.3-5
CC4: Systems and System Models	SCI.CC4.3-5 Students understand a system is a group of related parts that make up a whole and can carry out functions its individual parts cannot. They also describe a system in terms of its components and their interactions.	Grade 5 Earth and Space Systems	I can understand a system is a group of related parts that make up a whole and can carry out functions its individual parts cannot. CI.CC4.3-5

Science and Engineering Practices

Learning Element	Performance Indicator	CBB Unit Connection	Learning Target
SEP2: Developing and Using Models	SCI.SEP2.3-5 Students build and revise simple models and use models to represent events and design solutions. This includes the following: Identify limitations of models. Collaboratively develop and/or revise a model based on evidence that shows the relationships among variables for frequent and regular occurring events. Develop a model using an analogy, example, or abstract representation to describe a scientific principle or design solution. Develop and/or use models to describe or predict phenomena. Develop a diagram or simple physical prototype to convey a proposed object, tool, or process. Use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system.	Grade 5 Earth and Space Systems	I can build and revise simple models and use them to describe a scientific principle or design solution. SCI.SEP2.3-5
SEP4: Analyzing and Interpreting Data	SCI.SEP4.3-5 Students begin to use quantitative approaches to collect data and conduct multiple trials of qualitative observations. (When possible, digital tools should be used.) This includes the following: Represent data in tables or various graphical displays (bar graphs, pictographs, and pie charts) to reveal patterns that indicate relationships.	Grade 5 Earth and Space Systems	I can use quantitative approaches to collect data and conduct multiple trials of qualitative observations. SCI.SEP4.3-5

	<p>Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, or computation.</p> <p>Compare and contrast data collected by different groups in order to discuss similarities and differences in their findings.</p> <p>Analyze data to refine a problem statement or the design of a proposed object, tool, or process.</p> <p>Use data to evaluate and refine design solutions.</p>		
SEP5: Using Mathematics and Computational Thinking	<p>SCI.SEP5.3-5 Students extend quantitative measurements to a variety of physical properties, using computation and mathematics to analyze data and compare alternative design solutions. This includes the following:</p> <p>Organize simple data sets to reveal patterns that suggest relationships.</p> <p>Describe, measure, estimate, and/or graph quantities such as area, volume, weight, and time to address scientific and engineering questions and problems. Create and use graphs or charts generated from simple algorithms to compare alternative solutions to an engineering problem.</p>	Grade 5 Earth and Space Systems	I can extend quantitative measurements to a variety of physical properties, using computation and mathematics to analyze data and compare alternative design solutions. SCI.SEP5.3-5
SEP6.A: Constructing an Explanation	<p>SCI.SEP6.A.3-5 Students use evidence to construct explanations that specify variables that describe and predict phenomena. This includes the following:</p> <p>Construct an explanation of observed relationships (e.g., the distribution of plants in the back yard).</p> <p>Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation.</p> <p>Identify the evidence that supports particular points in an explanation.</p>	Grade 5 Earth and Space Systems	I can use evidence to construct explanations that specify variables that describe and predict phenomena. SCI.SEP6.A.3-5
SEP7: Arguing from Evidence	<p>SCI.SEP7.3-5 Students critique the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world. This includes the following:</p> <p>Compare and refine arguments based on an evaluation of the evidence presented.</p> <p>Distinguish among facts, reasoned judgment based on research findings, and speculation in an explanation.</p> <p>Respectfully provide and receive critiques from peers about a proposed procedure, explanation, or model by citing relevant evidence and posing specific questions.</p> <p>Construct and/or support an argument with evidence, data, or a model.</p> <p>Use data to evaluate claims about cause and effect.</p> <p>Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.</p>	Grade 5 Earth and Space Systems	I can critique scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world. SCI.SEP7.3-5
SEP8: Obtaining, Evaluating, and Communicating Information	<p>SCI.SEP8.3-5 Students evaluate the merit and accuracy of ideas and methods. This includes the following:</p> <p>Read and comprehend grade-appropriate complex texts and other reliable media to summarize and obtain scientific and technical ideas, and describe how they are supported by evidence.</p> <p>Compare and/or combine information across complex texts and other reliable media to support the engagement in scientific and engineering practices.</p>	Grade 5 Earth and Space Systems	I can evaluate the merit and accuracy of ideas and methods when reading and comprehending complex texts. SCI.SEP8.3-5

	Combine information in written text with that contained in corresponding tables, diagrams, or charts to support the engagement in other scientific and engineering practices. Obtain and combine information from books or other reliable media to explain phenomena or solutions to a design problem. Communicate scientific and technical information orally or in written formats, including various forms of media, which may include tables, diagrams, and charts.		
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Anchoring Phenomenon

Interaction between earth's systems and its role as part of larger systems in space.

Assessment Evidence

Performance is evaluated in terms of...

Students will show their learning by...

Performance Expectations

- **5-ESS1-1:** Support an argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth.
- **5-ESS1-2:** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.
- **5-ESS2-1:** Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- **5-ESS2-2:** Describe and graph the amounts of saltwater and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.
- **5-ESS3-1:** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- **5-PS2-1:** Support an argument that the gravitational force exerted by Earth on objects is directed down.
- **3-5-ETS1-2:** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Key Feedback & Assessment Strategies:

- *Conferring/Strategy Groups: Using current evidence of standards & skills, feedback is scaffolded based on student strengths, needs & goals*
- *Assessment of Unit Skills - Examples for Targeted Data Collection*
 - ◆ *Assess unit vocabulary terms*
 - ◆ *Evaluate student investigation tasks*
 - ◆ *Assess key unit concepts (Unit summative assessment)*
- *Extensions may include:*
 - ◆ **Constellation Research [Project](#)**
 - *Students use marshmallows and toothpicks to create a constellation*
 - *Students write up a paragraph about their constellation*