Shelby County Schools Science Vision

Shelby County Schools' vision of science education is to ensure that from early childhood to the end of the 12th grade, all students have heightened curiosity and an increased wonder of science; possess sufficient knowledge of science and engineering to engage in discussions; are able to learn and apply scientific and technological information in their everyday lives; and have the skills such as critical thinking, problem solving, and communication to enter careers of their choice, while having access to connections to science, engineering, and technology.

To achieve this, Shelby County Schools has employed The Tennessee Academic Standards for Science to craft meaningful curricula that is innovative and provide a myriad of learning opportunities that extend beyond mastery of basic scientific principles.

Introduction

In 2014, the Shelby County Schools Board of Education adopted a set of ambitious, yet attainable goals for school and student performance. The District is committed to these goals, as further described in our strategic plan, Destination 2025. In order to achieve these ambitious goals, we must collectively work to provide our students with high quality standards aligned instruction. The Tennessee Academic Standards for Science provide a common set of expectations for what students will know and be able to do at the end of each grade, can be located in the Tennessee Science Standards Reference. Tennessee Academic Standards for Science are rooted in the knowledge and skills that students need to succeed in post-secondary study or careers. While the academic standards establish desired learning outcomes, the curricula provide instructional planning designed to help students reach these outcomes. The curriculum maps contain components to ensure that instruction focuses students toward college and career readiness. Educators will use this guide and the standards as a roadmap for curriculum and instruction. The sequence of learning is strategically positioned so that necessary foundational skills are spiraled in order to facilitate student mastery of the standards.

Our collective goal is to ensure our students graduate ready for college and career. Being College and Career Ready entails, many aspects of teaching and learning. We want our students to apply their scientific learning in the classroom and beyond. These valuable experiences include students being facilitators of their own learning through problem solving and thinking critically. The Science and Engineering Practices are valuable tools used by students to engage in understanding how scientific knowledge develops. These practices rest on important "processes and proficiencies" with longstanding importance in science education. The science maps contain components to ensure that instruction focuses students toward understanding how science and engineering can contribute to meeting many of the major challenges that confront society today. The maps are centered around five basic components: the Tennessee Academic Standards for Science, Science and Engineering Practices, Disciplinary Core Ideas, Crosscutting Concepts, and Phenomena.

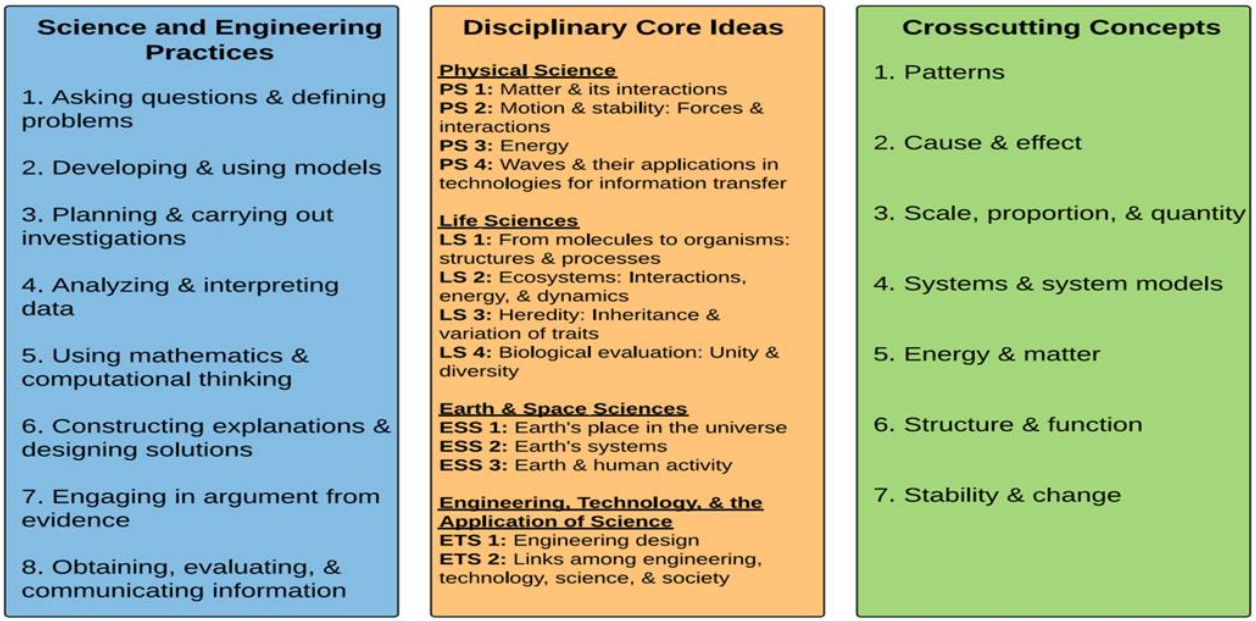
The Tennessee Academic Standards for Science were developed using the National Research Council's 2012 publication, A Framework for K-12 Science Education as their foundation. The framework presents a new model for science instruction that is a stark contrast to what has come to be the norm in science classrooms. Thinking about science had become memorizing concepts and solving mathematical formulae. Practicing science had become prescribed lab situations with predetermined outcomes. The framework proposes a three-dimensional approach to science education that capitalizes on a child's natural curiosity. The Science Framework for K-12 Science Education provides the blueprint for developing the effective science practices. The *Framework* expresses a vision in science education that requires students to operate at the nexus of three dimensions of learning: Science and Engineering Practices, Crosscutting Concepts, and Disciplinary Core Ideas. The *Framework* identified a small number of disciplinary core ideas that all students should learn with increasing depth and sophistication, from Kindergarten through grade twelve. Key to the vision expressed in the *Framework* is for students to learn these disciplinary core ideas in the context of science and engineering practices. The importance of combining Science and Engineering Practices, Crosscutting Concepts and Disciplinary Core Ideas is stated in the *Framework* as follows:

Standards and performance expectations that are aligned to the framework must take into account that students cannot fully understand scientific and engineering ideas without engaging in the practices of inquiry and the discourses by which such ideas are developed and refined. At the same time, they cannot learn or show competence in practices except in the context of specific content. (NRC Framework, 2012, p. 218)

To develop the skills and dispositions to use scientific and engineering practices needed to further their learning and to solve problems, students need to experience instruction in which they use multiple practices in developing a particular core idea and apply each practice in the context of multiple core ideas. We use the term "practices" instead of a term such as "skills" to emphasize that engaging in scientific investigation requires not only skill but also knowledge that is specific to each practice. Students in grades K-12 should engage in all eight practices over each grade band**.** Crosscutting concepts have application across all domains of science. As such, they are a way of linking the different domains of science. Crosscutting concepts have value because they provide students with connections and intellectual tools that are related across the differing areas of disciplinary content and can enrich their application of practices and their understanding of core ideas. There are seven crosscutting concepts that bridge disciplinary boundaries, uniting core ideas throughout the fields of science and engineering. Their purpose is to help students deepen their understanding of the disciplinary core ideas and develop a coherent and scientifically based view of the world.

The map is meant to support effective planning and instruction to rigorous standards. It is *not* meant to replace teacher planning, prescribe pacing or instructional practice. In fact, our goal is not to merely "cover the curriculum," but rather to "uncover" it by developing students' deep understanding of the content and mastery of the standards. Teachers who are knowledgeable about and intentionally align the learning target (standards and objectives), topic, text(s), task, and needs (and assessment) of the learners are best-positioned to make decisions about how to support student learning toward such mastery. Teachers are therefore expected--with the support of their colleagues, coaches, leaders, and other

support providers--to exercise their professional judgment aligned to our shared vision of effective instruction, the Teacher Effectiveness Measure (TEM) and related best practices. However, while the framework allows for flexibility and encourages each teacher/teacher team to make it their own, our expectations for student learning are non-negotiable. We must ensure all of our children have access to rigor—high-quality teaching and learning to grade level specific standards, including purposeful support of literacy and language learning across the content areas.



Learning Progression

At the end of the elementary science experience, students can observe and measure phenomena using appropriate tools. They are able to organize objects and ideas into broad concepts first by single properties and later by multiple properties. They can create and interpret graphs and models that explain phenomena. Students can keep notebooks to

record sequential observations and identify simple patterns. They are able to design and conduct investigations, analyze results, and communicate the results to others. Students will carry their curiosity, interest and enjoyment of the scientific world view, scientific inquiry, and the scientific enterprise into middle school.

At the end of the middle school science experience, students can discover relationships by making observations and by the systematic gathering of data. They can identify relevant evidence and valid arguments. Their focus has shifted from the general to the specific and from the simple to the complex. They use scientific information to make wise decision related to conservation of the natural world. They recognize that there are both negative and positive implications to new technologies.

As an SCS graduate, former students should be literate in science, understand key science ideas, aware that science and technology are interdependent human enterprises with strengths and limitations, familiar with the natural world and recognizes both its diversity and unity, and able to apply scientific knowledge and ways of thinking for individual and social purposes.

Structure of the Standards

- Grade Level/Course Overview: An overview that describes that specific content and themes for each grade level or high school course.
- Disciplinary Core Idea: Scientific and foundational ideas that permeate all grades and connect common themes that bridge scientific disciplines.
- Standard: Statements of what students can do to demonstrate knowledge of the conceptual understanding. Each performance indicator includes a specific science and engineering practice paired with the content knowledge and skills that students should demonstrate to meet the grade level or high school course standards.

Purpose of Science Curriculum Maps

This map is a guide to help teachers and their support providers (e.g., coaches, leaders) on their path to effective, college and career ready (CCR) aligned instruction and our pursuit of Destination 2025. It is a resource for organizing instruction around the Tennessee Academic Standards for Science, which define what to teach and what students need to learn at each grade level. The map is designed to reinforce the grade/course-specific standards and content (scope) and provides *suggested* sequencing, pacing, time frames, and aligned resources. Our hope is that by curating and organizing a variety of standards-aligned resources, teachers will be able to spend less time wondering what to teach and searching for quality materials (though they may both select from and/or supplement those included here) and have more time to plan, teach, assess, and reflect with colleagues to continuously improve practice and best meet the needs of their students.

The map is meant to support effective planning and instruction to rigorous standards. It is *not* meant to replace teacher planning, prescribe pacing or instructional practice. In fact, our goal is not to merely "cover the curriculum," but rather to "uncover" it by developing students' deep understanding of the content and mastery of the standards. Teachers who are knowledgeable about and intentionally align the learning target (standards and objectives), topic, text(s), task, and needs (and assessment) of the learners are best-positioned to make decisions about how to support student learning toward such mastery. Teachers are therefore expected--with the support of their colleagues, coaches, leaders, and other support providers--to exercise their professional judgment aligned to our shared vision of effective instruction, the Teacher Effectiveness Measure (TEM) and related best practices. However, while the framework allows for flexibility and encourages each teacher/teacher team to make it their own, our expectations for student learning are non-negotiable. We must ensure all of our children have access to rigor—high-quality teaching and learning to grade level specific standards, including purposeful support of literacy and language learning across the content areas.

1st Grade Quarter 1 Curriculum Map Quarter 1 Curriculum Map Feedback					
Quarter 1			Quarter 2	Quarter 3	Quarter 4
Structure and Routine	**Unit 1 Earth and Space**	Unit 2 Seasons	Unit 3 Light Energy	Unit 4 Plants	Unit 5 Plant Environment
1 week	**5 weeks**	3 weeks	9 weeks	9 weeks	9 weeks

UNIT 1: Earth and Space (5 weeks)			
Overarching Question(s)			
What is the universe, and what is Earth's place in it?			
Unit 1: Lesson 1	**Lesson Length**	**Essential Question**	**Vocabulary**
Day and Night	1.5 weeks	What causes the pattern of day and night?	Sun, daytime, nighttime, rotate, planet

Standards and Related Background Information	**Instructional Focus**	**Instructional Resources**
DCI(s) ESS1: Earth's Place in the Universe **Standard(s)** 1.ESS1.1: Use observations or models of the sun, moon, and stars to describe patterns that can be predicted. 1.ESS1.3: Analyze data to predict patterns between sunrise and sunset and the change of seasons. **Explanation and Support of Standard** 1.ESS1.1 The objective of this standard is for students to record and describe patterns that can be used for prediction, but not to explain the cause for these	**Learning Outcomes** Students will be able to explain what causes the pattern of day and night. **Suggested Phenomenon** *Click on the phenomenon picture to view the video.* 	**Curricular Resources** Engage Inspire Science TE, p. 117, Science in My World: Phenomenon TE, p. 118, Essential Question TE, p. 118, Science and Engineering Practices Explore TE, pp. 118-120 *(LAB)* Be a Scientist Notebook, p. 108, Inquiry Activity: Shadows Explain TE, pp. 120-121

patterns. This is the first point in their education where students will consider events in space. This strand of content should lead students to appreciate not only the beauty of space, and to processes in stars that form the elements we find in nature in later grades. The focus should be on making observations that show that things in space change over time in predicable ways. Examples of patterns may include the sun and moon appearing to rise in one part of the sky move across the sky and set, the number of daylight hours in different seasons, the shape and presence of the moon changing in a manner different than the sun, stars twinkling, and stars other than the sun are visible at night but not the day. *(Students should focus on patterns for the shapes of the moon, rather than rote memorization of the names of lunar phases.)* 1.ESS1.3: The emphasis of this standard should be on a relative comparison of the length of daylight hours in each season. Students can collect this data on an on-going basis. This can be accomplished through direct observation during some parts of the year, or through daily news publications. It is important that students observe, describe, and use their observations to predict based on patterns. (In first grade, students	Phenomenon Explanation: Day and Night form a regular pattern that can be observed. This video helps the students to identify visible patterns of the sun rising in one part of the sky and moving to set.	Be A Scientist Notebook, p. 111: Vocabulary Video: Day and Night *(LAB)* Be a Scientist Notebook, p. 108, Inquiry Activity: The Sun and Earth eBook: Earth's Sky Changes Digital Interactive: Earth Rotates <u>Elaborate</u> TE, pp. 127-129 *(LAB)* Be a Scientist Notebook, p. 116, Inquiry Activity: Measuring Your Shadow <u>Evaluate</u> TE, pp. 129-131 *(LAB)* Be A Scientist Notebook, p. 119, Performance Task: The Sun During the Day eAssessment **Additional Resources** Lesson: <u>Sun up Sun Down Lesson Plan</u> Video: How To Catch A Star by Oliver Jeffers Simulation: Simulation of day and night

should infer that there is some cause for the patterns in their data, but discussions of a mechanism for seasonal changes in daylight hours due to the tilt of the earth's axis will be addressed in fourth grade.) **Suggested Science and Engineering Practice(s)** Analyzing and Interpreting Data Obtaining, Evaluating, and Communicating Information **Suggested Crosscutting Concept(s)** Patterns **Teacher Overview** Day and night form a regular pattern that can be observed. Earth rotates, or spins, on its axis, once every 24 hours. As Earth rotates, the side facing the Sun receives light, while the side facing away is dark. Earth's axis runs from the North Pole to the South Pole through the center of the planet. Because Earth rotates from west to east, the Sun appears to rise in the east and set in the west. **Misconceptions** Students might think that day and night are caused by the Sun revolving, or traveling in a path around Earth, or by Earth revolving around the Sun. Other students may think that night happens when clouds cover the Sun. Reinforce the patterns of day and night by demonstrating with a globe and a lamp to		**ESL Supports and Scaffolds** WIDA Standard 4: The Language of Science Provide sentence frames: **Model speaking and writing expectations for Entering Level ELs. Consider using the recommended stems to support students in their discussions and writing.** What patterns / can we observe / in the sky." Provide the sentence frame: "_____ makes night and day on earth." Provide the sentence frame: "The (sun/moon) looks like a(n) (adjective) (noun). Encourage students to use word wall, environmental print, and Adjective Construction board to complete the sentence. Invite students to create sentences with adjectives using the sentence frame: "I observe a(n) (adjective) (noun) in the sky."

represent the Sun. Spin the globe to show how the side of Earth that faces the Sun has daytime and the side that faces away from the Sun has nighttime.		Introduce and model using sentence frames when responding to another student's ideas. Provide the sentence frame: "The (sun/moon) looks like a (n) (adjective) (noun).

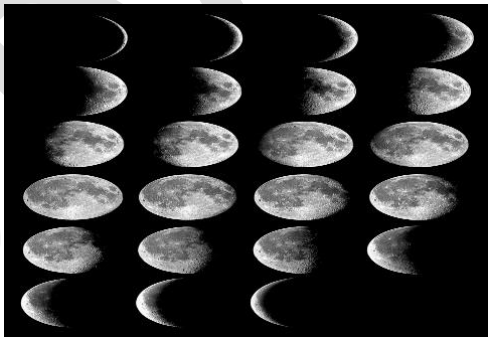
1st Grade Quarter 1 Curriculum Map Quarter 1 Curriculum Map Feedback					
Quarter 1			Quarter 2	Quarter 3	Quarter 4
Structure and Routine	**Unit 1 Earth and Space**	Unit 2 Seasons	Unit 3 Light Energy	Unit 4 Plants	Unit 5 Plant Environment
1 week	**5 weeks**	3 weeks	9 weeks	9 weeks	9 weeks

UNIT 1: Earth and Space (5 weeks)

Overarching Question(s)

How can one explain the structure, properties, and interactions of matter?

Unit 1: Lesson 2	Lesson Length	Essential Question	Vocabulary
The Moon	1.5 weeks	How does the Moon's shape change from day to day?	Moon, phases

Standards and Related Background Information	Instructional Focus	Instructional Resources
DCI(s) ESS1: Earth's Place in the Universe **Standard(s)** 1.ESS1.1: Use observations or models of the sun, moon, and stars to describe patterns that can be predicted. 1.ESS1.2: Observe natural objects in the sky that can be seen from Earth with the naked eye, and recognize that a telescope, used as a tool, can provide greater detail of objects in the sky. **Explanation and Support of Standard** 1.ESS1.1 The objective of this standard is for students to record and describe patterns that can be used for prediction, but not to explain the cause for these patterns. This is the	**Learning Outcomes** Students will be able to describe the motion of the moon. **Suggested Phenomenon** *Click on the phenomenon picture to view the video.* 	Curricular Resources Engage TE, pp. 133-134 Be a Scientist Notebook, p. 123 (Phenomenon) TE, Essential Questions, p. 134 TE, Science and Engineering Practices, p. 134 Explore TE, pp. 134-135 *(LAB)* Be a Scientist Notebook, p. 124, Inquiry Activity: How the Moon Looks Video: The Moon eBook: Earth and the Moon Digital Interactive: Moon Phases *(LAB)* Be a Scientist Notebook, p. 129, Inquiry Activity: Moon Phase Model

first point in their education where students will consider events in space. This strand of content should lead students to appreciate not only the beauty of space, and to processes in stars that form the elements we find in nature in later grades. The focus should be on making observations that show that things in space change over time in predicable ways. Examples of patterns may include the sun and moon appearing to rise in one part of the sky move across the sky and set, the number of daylight hours in different seasons, the shape and presence of the moon changing in a manner different than the sun, stars twinkling, and stars other than the sun are visible at night but not the day. *(Students should focus on patterns for the shapes of the moon, rather than rote memorization of the names of lunar phases.)* 1.ESS1.2 Students should be led to the realization that observations with their naked eye are limited and that the vastness of space can be revealed to an even greater degree using a telescope. A goal of this standard is to build an appreciation for how the telescope itself shows us things in space that we may not see otherwise. Examples may include student journaling their findings by observing the night sky with their naked eye. Telescopes have two primary benefits, they allow us to distinguish light from stars that might otherwise go unnoticed with	Phenomenon Explanation: 28 Phases of the Moon Video: Patterns of Moon phases can be observed.	<u>Explain</u> TE, pp. 140 Be a Scientist Notebook, p. 131, SEP <u>Elaborate</u> TE, pp. 141-142 *(LAB)* Be a Scientist Notebook, p. 132 Inquiry Activity: Moon Observations <u>Evaluate</u> TE, pp. 142-143 *(LAB)* Be a Scientist Notebook, p. 135 Phases of the Moon eAssessment **Additional Resources** Lesson: It's a Pattern! Moon Phases Video: "Papa, Get the Moon for Me" by Eric Carle Video: The Moon by Seymour Simon Lab: *Create an example of the moon phases using cookies* 

the naked eye, and also allow us to perceive details in the surface of the moon or other celestial bodies. A field trip to an observatory or setting up a simple telescope may help students learn that a telescope will help them see objects in the sky in greater detail. **Suggested Science and Engineering Practice(s)** Developing and Using Models Obtaining, Evaluating, and Communicating Information **Suggested Crosscutting Concept(s)** Patterns **Teacher Overview** The phases of the Moon occur over a period of about 29.5 days. The side of the Moon facing the Sun is lit up. It is the lit part of the Moon that appears to change as the Moon goes through its phases. As the Moon orbits Earth, different amounts of the side of the Moon facing the Sun are visible on Earth. Changes in the amount of the lit side that can be seen result in the Moon's phases. The new moon is followed by followed by these phases: waxing crescent, first quarter (commonly referred to as a half-moon), waxing gibbous (or three-quarter moon), and full moon. After the full moon, the appearance begins to wane with the waning gibbous (three-quarter), last quarter (half-moon), and waning crescent. **Misconceptions**		**ESL Supports and Scaffolds** ESL and Alternatives: WIDA Standard 4: The Language of Science Pre-teach vocabulary: (**Consider teaching this vocabulary in addition to vocabulary addressed in the standard to support Entering Level ELs**) Phases, "naked eye"; body, followed by; Model use of the phrases "seems to" and "appears to. Provide the sentence frame: "The moon _____ move across the sky. Provide the sentence frame: "The moon is _____ the horizon." **Pacing:** during the cookie experiment, students may need additional time to label their sheet. Consider partnering students during the activity.

Students might think that the Moon gives off its own light. Others might believe that the Earth's shadow causes the Moon phases. To help students visualize the phases of the Moon and the help them understand why we see different amounts of the Moon's surface lit from Earth, use a flashlight to represent the Sun and two balls to represent Earth and the Moon. Model how the Moon revolves around Earth with the two balls while shining the flashlight on the balls to show how the amount of the Moon's surface that reflects light to Earth changes.		

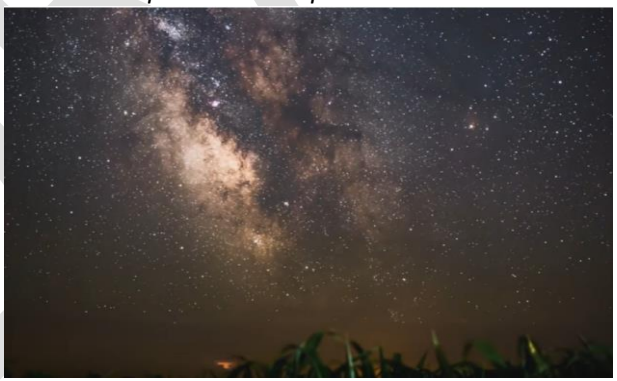
1st Grade Quarter 1 Curriculum Map Quarter 1 Curriculum Map Feedback					
Quarter 1			Quarter 2	Quarter 3	Quarter 4
Structure and Routine	**Unit 1 Earth and Space**	Unit 2 Seasons	Unit 3 Light Energy	Unit 4 Plants	Unit 5 Plant Environment
1 week	**5 weeks**	3 weeks	9 weeks	9 weeks	9 weeks

UNIT 1: Earth and Space (5 weeks)

Overarching Question(s)

How can one explain the structure, properties, and interactions of matter?

Unit 1: Lesson 3	Lesson Length	Essential Question	Vocabulary
The Sun and Stars	2 weeks	How can you describe the Sun and other Stars?	star

Standards and Related Background Information	Instructional Focus	Instructional Resources
DCI(s) ESS1: Earth's Place in the Universe **Standard(s)** 1.ESS1.1: Use observations or models of the sun, moon, and stars to describe patterns that can be predicted. 1.ESS1.2: Observe natural objects in the sky that can be seen from Earth with the naked eye, and recognize that a telescope, used as a tool, can provide greater detail of objects in the sky. 1.ESS1.3: Analyze data to predict patterns between sunrise and sunset and the change of seasons. **Explanation and Support of Standard**	**Learning Outcomes** Students will be able to use observations to describe the Sun and stars. **Suggested Phenomenon** *Click on the phenomenon picture to view the video.* 	**Curricular Resources** Engage TE, pp. 145-146 TE, p. 145 (Phenomenon) Essential Questions, p. 146 Science and Engineering Practices, p. 146 Explore TE, pp. 146-148 *(LAB)* Be a Scientist Notebook, p. 140 Inquiry Activity: Sun and Temperature eBook: Another Sun Explain TE, pp. 149-152 Be a Scientist notebook, p. 143: Vocabulary Video: The Sun and Stars

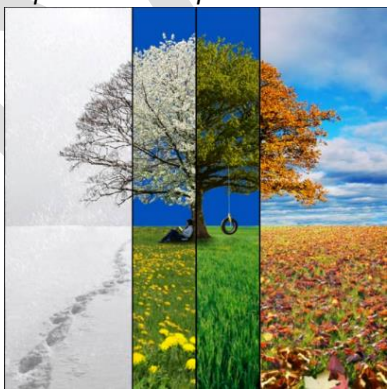
1.ESS1.1 The objective of this standard is for students to record and describe patterns that can be used for prediction, but not to explain the cause for these patterns. This is the first point in their education where students will consider events in space. This strand of content should lead students to appreciate not only the beauty of space, and to processes in stars that form the elements we find in nature in later grades. The focus should be on making observations that show that things in space change over time in predicable ways. Examples of patterns may include the sun and moon appearing to rise in one part of the sky move across the sky and set, the number of daylight hours in different seasons, the shape and presence of the moon changing in a manner different than the sun, stars twinkling, and stars other than the sun are visible at night but not the day. *(Students should focus on patterns for the shapes of the moon, rather than rote memorization of the names of lunar phases.)* 1.ESS1.2 Students should be led to the realization that observations with their naked eye are limited and that the vastness of space can be revealed to an even greater degree using a telescope. A goal of this standard is to build an appreciation for how the telescope itself shows us things in space that we may not see otherwise. Examples may	Phenomenon Explanation: Student can identify and describe observable features of the night's sky.	Science Paired Read Aloud/Science File: Lights in the Sky Digital Interactive: The Sun in the Sky <u>Elaborate</u> TE, pp. 153-155 *(LAB)* Be a Scientist Notebook, p. 147 Inquiry Activity: Near and Far <u>Evaluate</u> TE, pp. 155 *(LAB)* Be a Scientist Notebook, p. 149, Performance Task: Observe the Night Sky eAssessment **Additional Resources** Lesson: Predictable Patterns of the Sun and Seasons Lesson Plan Lesson: Observing the Sun Video: Seasons and the Sun Website: Tree House Weather Kids **ESL Supports and Scaffolds** ESL and Alternatives: WIDA Standard 4: The Language of Science Consider reviewing vocabulary from previous lessons to support Entering Level ELs.

include student journaling their findings by observing the night sky with their naked eye. Telescopes have two primary benefits, they allow us to distinguish light from stars that might otherwise go unnoticed with the naked eye, and also allow us to perceive details in the surface of the moon or other celestial bodies. A field trip to an observatory or setting up a simple telescope may help students learn that a telescope will help them see objects in the sky in greater detail. 1.ESS1.3 The emphasis of this standard should be on a relative comparison of the length of daylight hours in each season. Students can collect this data on an on-going basis. This can be accomplished through direct observation during some parts of the year, or through daily news publications. It is important that students observe, describe, and use their observations to predict based on patterns. *(In first grade, students should infer that there is some cause for the patterns in their data, but discussions of a mechanism for seasonal changes in daylight hours due to the tilt of the earth's axis will be addressed in fourth grade.)* **Suggested Science and Engineering Practice(s)** Planning and Carrying Out Controlled Investigations **Suggested Crosscutting Concept(s)** Patterns		Consider color coding sentence parts to emphasize prepositions when describing how the sun moves during the day. Model use of the phrases "seems to" and "appears to. Provide the sentence frame: "The sun moves across the sky because_____. Provide the sentence frame: "At __ (time of day) the sun is _____ the horizon."

Teacher Overview A liquid is a substance that flows to fill the shape of its container but has a definite volume. The particles that make up a liquid are less tightly packed than the particles that make up a solid, which gives a liquid may change depending on its container, but its volume does not change unless evaporation takes place (the liquid changes to a gas). Volume is simply a measure of space, such as the capacity of a container. **Misconceptions** Students may think that the volume of a liquid changes when it is poured from one container to another because the liquid changes shape. Explain that a certain amount of liquid will have the same volume, regardless of the container it is in. The volume only appears to be lesser or greater because of the shape of the container.		

1st Grade Quarter 1 Curriculum Map Quarter 1 Curriculum Map Feedback					
Quarter 1			Quarter 2	Quarter 3	Quarter 4
Structure and Routine	Unit 1 Earth and Space	**Unit 2 Seasons**	Unit 3 Light Energy	Unit 4 Plants	Unit 5 Plant Environment
1 week	5 weeks	**3 weeks**	9 weeks	9 weeks	9 weeks

UNIT 2: Seasons (3 weeks)			
Overarching Question(s)			
How can one explain the structure, properties, and interactions of matter?			
Unit 2: Lesson 1	**Lesson Length**	**Essential Question**	**Vocabulary**
Spring and Summer	1.5 weeks	What causes changes in spring and summer?	freeze, melt

Standards and Related Background Information	**Instructional Focus**	**Instructional Resources**
DCI(s) ESS1: Earth's Place in the Universe **Standard(s)** 1.ESS1.1: Use observations or models of the sun, moon, and stars to describe patterns that can be predicted. 1.ESS1.3: Analyze data to predict patterns between sunrise and sunset and the change of seasons. **Explanation and Support of Standard** 1.ESS1.1 The objective of this standard is for students to record and describe patterns that can be used for prediction, but not to explain the cause for these patterns. This is the first point in their education where students will consider events in space. This strand of content should lead	**Learning Outcomes** Students will be able to describe sunrise and sunset patterns for spring and summer. **Suggested Phenomenon** *Click on the phenomenon picture to view the video.* 	**Curricular Resources** Engage TE, pp. 163-164 TE, Science in My World, p. 163 (Phenomenon) Essential Questions, p. 164 Science and Engineering Practices, p. 164 Explore TE, pp. 164-165 *(LAB)* Be a Scientist Notebook, p. 165 Inquiry Activity: Daylight and Plants Explain TE, pp. 166-170 Science File: Make Something New Be a Scientist Notebook, p. 160: Vocabulary Video: Seasons Change

students to appreciate not only the beauty of space, and to processes in stars that form the elements we find in nature in later grades. The focus should be on making observations that show that things in space change over time in predicable ways. Examples of patterns may include the sun and moon appearing to rise in one part of the sky move across the sky and set, the number of daylight hours in different seasons, the shape and presence of the moon changing in a manner different than the sun, stars twinkling, and stars other than the sun are visible at night but not the day. *(Students should focus on patterns for the shapes of the moon, rather than rote memorization of the names of lunar phases.)* 1.ESS1.3 The emphasis of this standard should be on a relative comparison of the length of daylight hours in each season. Students can collect this data on an on-going basis. This can be accomplished through direct observation during some parts of the year, or through daily news publications. It is important that students observe, describe, and use their observations to predict based on patterns. *(In first grade, students should infer that there is some cause for the patterns in their data, but discussions of a mechanism for seasonal changes in daylight hours due to the tilt of the earth's axis will be addressed in fourth grade.)*	Phenomenon Explanation: The tilt of the Earth toward the Sun causes recognizable changes on Earth (seasons).	eBook: The Four Seasons <u>Elaborate</u> TE, pp. 170 *(LAB)* Be a Scientist Notebook, p. 164: How Earth Moves <u>Evaluate</u> TE, pp. 171-173 *(LAB)* Be a Scientist Notebook, p. 171, Performance Task: Spring and Summer Art eAssessment **Additional Resources** Lesson: Predictable Patterns of the Sun and Seasons Lesson Plan Website: Tree House Weather Kids Lesson: Observing the Sun Video: Seasons and the Sun **ESL Supports and Scaffolds** ESL and Alternatives: WIDA Standard 4: The Language of Science Model the use of the phrases: "The seasons change because…." Use visuals to help students understand the 4 seasons: Seasons flashcards

Suggested Science and Engineering Practice(s) Planning and Carrying Out Controlled Investigations **Suggested Crosscutting Concept(s)** Scale, Proportion, and Quantity **Teacher Overview** A physical change occurs when matter changes in size, shape, or state, but the type of matter itself does not change. Matter can be put together and broken apart. Mass is the amount of matter an object contains. The mass of matter remains the same, even though the shape of matter may change. For example, the total mass of a board will remain the same if the board is cut into two pieces. The mass of a lump of clay stays the same even if the shape of the clay changes. **Misconceptions** Students may confuse mass and weight or think they are the same. An object's mass is a measure of the amount of matter in the object, whereas weight is a measure of the pull of gravity on the object. Mass is generally measured in grams or kilograms, while weight is measured in the customary units of ounces or pounds. For the purposes of the activities in Kindergarten, gram cubes are used to measure, but students are never introduced or asked to use the terms "mass" or "gram," they are only asked to count the number of cubes in a pan balance.		Provide visuals/icons for the various adjectives the students will use in discussing the four seasons. Provide the sentence frames: "Seasons change because the _____."

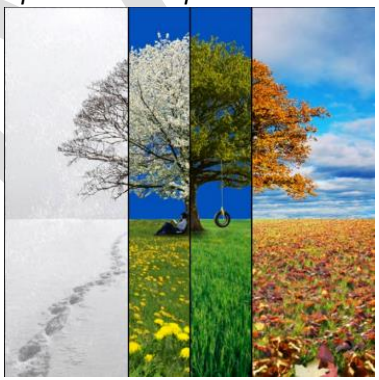
1st Grade Quarter 1 Curriculum Map Quarter 1 Curriculum Map Feedback					
Quarter 1			Quarter 2	Quarter 3	Quarter 4
Structure and Routine	Unit 1 Earth and Space	**Unit 2 Seasons**	Unit 3 Light Energy	Unit 4 Plants	Unit 5 Plant Environment
1 week	5 weeks	**3 weeks**	9 weeks	9 weeks	9 weeks

UNIT 2: Seasons (3 weeks)

Overarching Question(s)

How do the structures of organisms enable life's functions?

Unit 2: Lesson 2	Lesson Length	Essential Question	Vocabulary
Fall and Winter	1.5 weeks	What causes changes in fall and winter?	fall, winter

Standards and Related Background Information	Instructional Focus	Instructional Resources
DCI(s) ESS1: Earth's Place in the Universe **Standard(s)** 1.ESS1.1: Use observations or models of the sun, moon, and stars to describe patterns that can be predicted. 1.ESS1.3: Analyze data to predict patterns between sunrise and sunset and the change of seasons. **Explanation and Support of Standard** 1.ESS1.1 The objective of this standard is for students to record and describe patterns that can be used for prediction, but not to explain the cause for these patterns. This is the first point in their education where students will consider events in space. This strand of content should lead	**Learning Outcomes** Students will be able to describe sunrise and sunset patterns for fall and winter. **Suggested Phenomenon** *Click on the phenomenon picture to view the video.* 	**Curricular Resources** Engage TE, pp. 175-176 TE, Science in My World, p. 175 (Phenomenon) Essential Question, p. 176 Science and Engineering Practice, p. 176 Explore TE, pp. 176-178 *(LAB)* Be a Scientist Notebook, pp. 170 Inquiry Activity: Sunlight Explain TE, pp. 178-182 Be a Scientist Notebook, p. 173: Vocabulary eBook: The Four Seasons

students to appreciate not only the beauty of space, and to processes in stars that form the elements we find in nature in later grades. The focus should be on making observations that show that things in space change over time in predicable ways. Examples of patterns may include the sun and moon appearing to rise in one part of the sky move across the sky and set, the number of daylight hours in different seasons, the shape and presence of the moon changing in a manner different than the sun, stars twinkling, and stars other than the sun are visible at night but not the day. *(Students should focus on patterns for the shapes of the moon, rather than rote memorization of the names of lunar phases.)* 1.ESS1.3 The emphasis of this standard should be on a relative comparison of the length of daylight hours in each season. Students can collect this data on an on-going basis. This can be accomplished through direct observation during some parts of the year, or through daily news publications. It is important that students observe, describe, and use their observations to predict based on patterns. *(In first grade, students should infer that there is some cause for the patterns in their data, but discussions of a mechanism for seasonal changes in daylight hours due to the tilt of the earth's axis will be addressed in fourth grade.)*	Phenomenon Explanation: The tilt of the Earth toward the Sun causes recognizable changes on Earth (seasons).	Digital Interactive: Seasons Song: The Big Chill Elaborate TE, p. 183 *(LAB)* Be a Scientist Notebook, p. 177 Inquiry Activity: Look at the Facts Evaluate TE, pp. 184-185 *(LAB)* Be a Scientist Notebook, p. 179, Performance Task: Fall and Winter Art **Additional Resources** Lesson: Observing the Sun Video: Seasons and the Sun Lesson: Predictable Patterns of the Sun and Seasons Lesson Plan Website: Tree House Weather Kids **ESL Supports and Scaffolds** ESL and Alternatives: WIDA Standard 4: The Language of Science Consider reviewing vocabulary from previous lessons to support Entering Level ELs. Consider color coding sentence parts to emphasize adjectives as students describe the different seasons.

Suggested Science and Engineering Practice(s) Constructing Explanations and Designing Solutions **Suggested Crosscutting Concept(s)** Structure and Function **Teacher Overview** The five senses are sight, hearing, taste, touch, and smell. Each one gives us different information we can use to learn about out world. For example, sight helps us see what something is made of, its color, shape, and size. Smell can help identify something before we see it. Touch can tell us if a thing is hard or soft. Each sense is important when making scientific finding, gathering information, and learning about the world around us. **Misconceptions** Students may not realize they can learn things from senses like smell or taste. Help students understand that all our senses are ways to gather information about color, size, texture, how things smell, what they are made of, and what they do.		Model the use of the phrases: "The seasons change because…." Use visuals to help students understand the 4 seasons: Seasons flashcards Provide visuals/icons for the various adjectives the students will use in discussing the four seasons. Provide the sentence frames: "Seasons change because the _____." Consider creating a word wall with topic vocabulary that you would like students to use in speaking and writing.