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 provides 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.

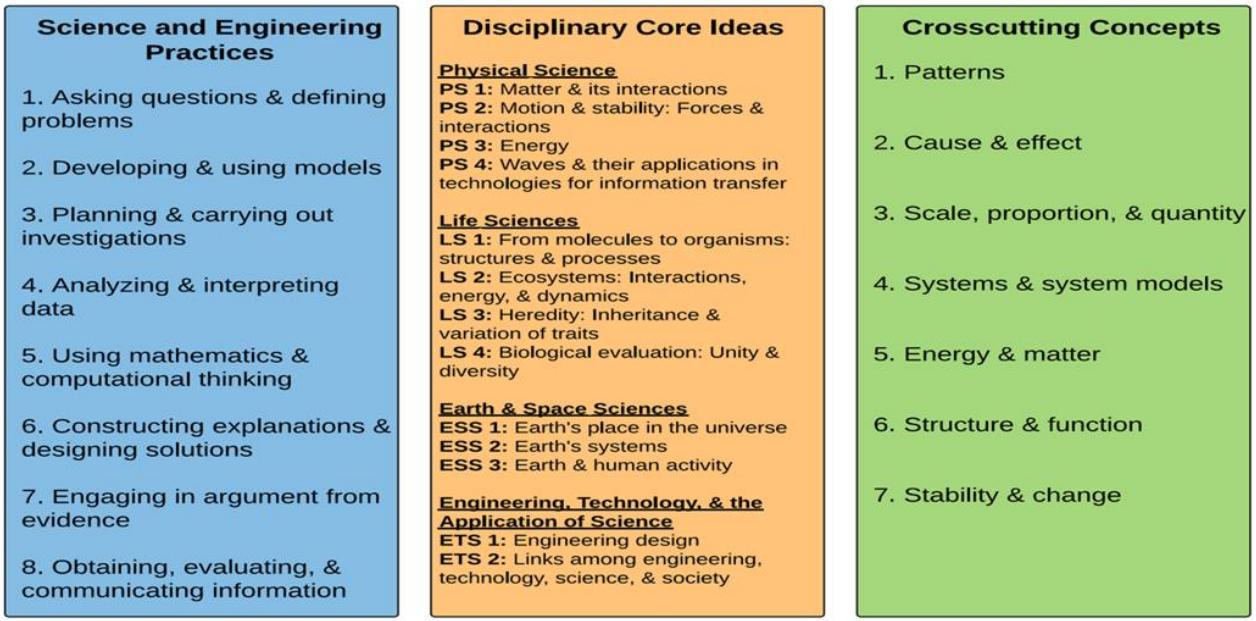
The Tennessee Academic Standards for Science were developed using the National Research Council's 2012 publication, A Framework for K-12 Science Education as their foundation. The framework presents a new model for science instruction that is a stark contrast to what has come to be the norm in science 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.

Kindergarten Quarter 3 Curriculum Map Quarter 3 Curriculum Map Feedback					
Quarter 1			Quarter 2	**Quarter 3**	Quarter 4
Structure and Routine	Unit1 Matter	Unit 2 Classifying Information	Unit 3 Weather	**Unit 4 Plants and Animals**	Unit 5 Protecting Our Earth
1 week	5 weeks	3 weeks	9 weeks	**9 weeks**	9 weeks

UNIT 4: Plants and Animals (9 weeks)			
Overarching Question(s)			
How do Earth's surface processes and human activities affect each other?			
Unit 4: Lesson 1	**Lesson Length**	**Essential Question**	**Vocabulary**
Plant and Animal Needs	2 weeks	What do plants and animals need to live?	air, light, need, nutrient, shelter, soil, survive

Standards and Related Background Information	**Instructional Focus**	**Instructional Resources**
DCI(s) K.ESS3: Heredity: Inheritance and Variation of Traits K.ETS1: Engineering Design **Standard(s)** K.ESS3.1: Use a model to represent the relationship between the basic needs (shelter, food, water) of different plants and animals (including humans) and the places they live. K.ETS1.1: Ask and answer questions about the scientific world and gather information using the senses. **Explanation and Support of Standard** K.ESS3.1	**Learning Outcomes** Students will use evidence to explain what plants and animals need to live. **Suggested Phenomena** *Click on the phenomenon picture to view the video.*  Chipmunk Eating Nuts Phenomenon Explanation:	**Curricular Resources** Engage Inspire Science TE, p. 47-48 Science in My World (Phenomenon) TE p. 47 Essential Question TE, p. 48 Science and Engineering Practices TE, p. 48 Explore Inspire Science TE, pp. 48-51 *(LAB)* Be a Scientist Notebook, Inquiry Activity, p. 22: Plant Needs Science Paired Read Aloud/eBOOK: Growing Up

Organisms will live in places that give them access to the materials that are needed to meet their basic needs. Humans utilize natural resources in everything they do. The focus of this standard is only on basic needs for survival, not modern conveniences. Examples of relationships may include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight, so they often grow in meadows. Plants, animals, and their surroundings make up a system. Humans use soil and water to grow food, wood to burn to provide heat or build shelters, and materials such as iron or copper extracted from Earth to make cooking pans. Life is far more abundant near water sources. Examples of humans using natural resources should be limited to processes where the resources are used in a nearly raw form. This standard might pair well with design challenges asking students to evaluate potential habitation sites. (It is important to note that this standard should focus on availability of resources in the places where organisms live, but could be paired with K.LSS1.1 to also address the organisms themselves.) K.ETS1.1 Engineering leads to improvements in our daily lives and must begin by understanding the problem to be improved by a solution. Students can be presented with a design task related to a different standard, such as a designing a device to reduce human impacts on the environment (K.ESS3.3). Entering a design process is important that students brainstorm questions that	The chipmunk is getting nutrients from the peanuts. Water and nutrients are basic needs both animals and plants have in common. Water is necessary for all life as it makes up about 70 percent of cells and allows chemical reactions to take place in cells. Nutrients are the essential compounds and elements needed for energy and to carry out life processes.	Explain Inspire Science TE, pp. 51-56 Vocabulary, TE, pp. 51 TE, p. 52, Inquiry Activity: Picture Cards Simulation: Rabbit Health Science Paired Read Aloud/eBook, TE, p. 54: Plant and Animal Needs Video: Plant Parts Elaborate Inspire Science TE, p. 57 *(LAB)* TE, p. 57, Inquiry Activity: What Animals Eat Evaluate Inspire Science TE, pp. 58-59 *(LAB)* Be A Scientist Notebook, Performance Task, p. 25: Create a Survival Graph **Additional Resources** Lesson: Do Plants Need Soil? Lesson: What Do Plants Need? Video: 4 Basic Needs of Living Things Video: How Do Plants Grow? Video & Song: What a Plant Needs to Stay Alive Video & Song: The Needs of an Animal **ESL Supports and Scaffolds**

would have to be answered in order to develop the best possible solution. Students should begin to explore how the understandings gained by asking the right questions will impact design solutions for an engineering problem. **Suggested Science and Engineering Practice(s)** Developing and Using Models **Suggested Crosscutting Concept(s)** Systems and System Models **Teacher Overview** Living things can grow, change, and reproduce. For living things such as plants and animals to grow and change, they need water, air, food, and space to grow. Animals also need shelter, and plants need light. Different living things need different kinds of air and obtain food differently. Plants use water, carbon dioxide from the air, and energy from light to make food in their leaves through a process called photosynthesis. Animals must find food to eat. Different types of animals need to eat different kinds of food in order to survive. For example, carnivores are animals that eat only meat. Herbivores only eat plants, and omnivores eat both plants and animals for food. One way to find out what a plant or animal needs is to observe its habitat, which will provide evidence about what the living thing needs. **Misconceptions**		The Language of Science WIDA Standard 4 To support students in speaking refer to this resource: WIDA Doing and Talking Science When applicable- use Home Language do build vocabulary in concepts. Spanish Cognates Interactive Science Dictionary with visuals Provide sentence stems to support speaking and writing in science: Plants and animals need…..in order to survive. To survive, both plants and animals need… Many plants and animals live near water because…

Some students may think that plants do not breathe or need air. Air is a gas. Plants do need air, but they need a different gas than animals. Animals need oxygen to live, and plants need carbon dioxide. Both gases are found in air. Some students may think that all plants and animals need the same things in order to survive. Students may not understand the connection between habitat and needs. Tell students that a habitat is a place where plants and animals live and that a habitat has everything that a plant or an animal needs. Plants and animals cannot survive in a habitat that does not meet their needs. Clarify that some basic needs may be similar but that a habitat can provide evidence of what a plant or animal needs based on how it is surviving in the habitat.		

Kindergarten Quarter 3 Curriculum Map Quarter 3 Curriculum Map Feedback					
Quarter 1			Quarter 2	**Quarter 3**	Quarter 4
Structure and Routine	Unit 1 Matter	Unit 2 Classifying Information	Unit 3 Weather	**Unit 4** **Plants and Animals**	Unit 5 Protecting Our Earth
1 week	5 weeks	3 weeks	9 weeks	**9 weeks**	9 weeks

UNIT 4: Plants and Animals (9 weeks)

Overarching Question(s)

How do Earth's surface processes and human activities affect each other?

Unit 4: Lesson 2	Lesson Length	Essential Question	Vocabulary
Places Plants Grow	2 weeks	Where do different kinds of plants grow?	Arctic, climate, desert, forest, pond

Standards and Related Background Information	Instructional Focus	Instructional Resources
DCI(s) K.ESS3: Heredity: Inheritance and Variation of Traits K.ETS1: Engineering Design **Standard(s)** K.ESS3.1: Use a model to represent the relationship between the basic needs (shelter, food, water) of different plants and animals (including humans) and the places they live. K.ETS1.1 Ask and answer questions about the scientific world and gather information using the senses. **Explanation and Support of Standard** K.ESS3.1	**Learning Outcomes** Students will use a model to show that plants live in places that have the things they need. **Suggested Phenomena** *Click on the phenomenon picture to view the video.*  Phenomenon Explanation:	**Curricular Resources** Engage Inspire Science TE, pp. 61-62 Science in My World (Phenomenon) TE p. 61 Essential Question TE, p. 62 Science and Engineering Practices TE, p. 62 Explore Inspire Science TE, pp. 62-64 *(LAB)* Be a Scientist Notebook, Inquiry Activity, p.27: Where Do Plants Grow? Explain Inspire Science TE, pp. 64-70 Vocabulary, TE, pp. 64

Organisms will live in places that give them access to the materials that are needed to meet their basic needs. Humans utilize natural resources in everything they do. The focus of this standard is only on basic needs for survival, not modern conveniences. Examples of relationships may include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight, so they often grow in meadows. Plants, animals, and their surroundings make up a system. Humans use soil and water to grow food, wood to burn to provide heat or build shelters, and materials such as iron or copper extracted from Earth to make cooking pans. Life is far more abundant near water sources. Examples of humans using natural resources should be limited to processes where the resources are used in a nearly raw form. This standard might pair well with design challenges asking students to evaluate potential habitation sites. (It is important to note that this standard should focus on availability of resources in the places where organisms live, but could be paired with K.LSS1.1 to also address the organisms themselves.) K.ETS1.1 Engineering leads to improvements in our daily lives and must begin by understanding the problem to be improved by a solution. Students can be presented with a design task related to a different standard, such as a designing a device to reduce human impacts on the environment (K.ESS3.3). Entering a design process is important that students brainstorm questions that	Plants grow on land and in water. Plants can live anywhere as long as their basic needs for water, nutrients, and light are met.	Video: Where Do Plants Grow? Digital Interactive: Plants in Different Climates *(LAB)* Be A Scientist Notebook, p. 29, Inquiry Activity: Desert or Rainforest Plants Digital Interactive: Match the Plant to the Climate <u>Elaborate</u> Inspire Science TE, pp. 70-71 TE, p. 70, Inquiry Activity: Perky Plants <u>Evaluate</u> Inspire Science TE, pp. 72-73 *(LAB)* Be A Scientist Notebook, Performance, p. 30, Task: Perfect Plant eAssessment **Additional Resources** Lesson: Tree-riffic-Tree Travels! Lesson: Treeriffic-Uno, Dos, Trees! Video: Plants Live in Many Places Video: Different Plant Habitats **ESL Supports and Scaffolds** <u>WIDA Standard 4</u> To support students in speaking refer to this resource: <u>WIDA Doing and Talking Science</u>

would have to be answered in order to develop the best possible solution. Students should begin to explore how the understandings gained by asking the right questions will impact design solutions for an engineering problem. **Suggested Science and Engineering Practice(s)** Developing and Using Models **Suggested Crosscutting Concept(s)** Systems and System Models **Teacher Overview** Plants live in many different places on Earth. The climate and available resources dictate what types of plants can live in a given place. Plants need certain amounts of light and water, a certain temperature range, nutrients, and air to grow. Differences among plants help them survive in different climates. In a rainforest, trees are very tall, reaching up to expose their leaves to sunlight. Because it rains frequently, the roots of the trees do not need go deep into the ground. Instead, the roots are exposed and form a wide base for the tree. Desert plants, such as cacti, have shallow root systems that spread away from the plant over a large area. This helps them take in as much water as possible during infrequent periods of rain. Many cacti have a thick body, or stem, where they store water. **Misconceptions**		When applicable- use Home Language do build vocabulary in concepts. Spanish Cognates Interactive Science Dictionary with visuals Provide sentence stems to support speaking and writing in science: Plants and animals need…..in order to survive. To survive, both plants and animals need… Many plants and animals live near water because… *Visuals for habitats* Use the visuals to support ELs in understanding how different places on earth help plant and animals Model answering the questions "How do living things depend on …. to meet their needs?" Partner students to answer the questions. Create triads as needed.

Some students may not understand that plants are different, depending on the climate in which they grow. Sometimes the same type of plant that grows in a different climate can have different appearances. For instance, an oak tree growing in a drier area may be shorter than one that grows in an area with regular rainfall. Students may also think that all plants need the same amount of water and light. Plants with large, dark, glossy leaves absorb heat. As a result, they require more water. Some plants thrive in low or indirect light. Others, such as the herb rosemary or the purple coneflower, thrive in full, direct light.		

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UNIT 4: Plants and Animals (9 weeks)			
Overarching Question(s)			
How do Earth's surface processes and human activities affect each other?			
Unit 4: Lesson 3	**Lesson Length**	**Essential Question**	**Vocabulary**
Places Animals Live	2 weeks	Where do different kinds of animals live?	ecosystem, habitat

Standards and Related Background Information	**Instructional Focus**	**Instructional Resources**
DCI(s) K.ESS3: Earth and Human Activity K.ETS1: Engineering Design **Standard(s)** K.ESS3.1: Use a model to represent the relationship between the basic needs (shelter, food, water) of different plants and animals (including humans) and the places they live. K.ETS1.1: Ask and answer questions about the scientific world and gather information using the senses. K.ETS1.2: Describe objects accurately by drawing and/or labeling pictures.	**Learning Outcomes** Students will use a model to explain that animals live in places that have the things they need. **Suggested Phenomena** *Click on the phenomenon picture to view the video.*  Phenomenon Explanation:	**Curricular Resources** Engage Inspire Science TE, p. 75-76 Science in My World (Phenomenon) TE p. 75 Essential Question TE, p. 76 Science and Engineering Practices TE, p. 76 Explore Inspire Science TE, pp. 76-78 *(LAB)* Be a Scientist Notebook, Inquiry Activity, p. 32: Animal Homes Science Paired Read Aloud/eBook: Iggy Iguana Explain

Explanation and Support of Standard K.ESS3.1 Organisms will live in places that give them access to the materials that are needed to meet their basic needs. Humans utilize natural resources in everything they do. The focus of this standard is only on basic needs for survival, not modern conveniences. Examples of relationships may include that deer eat buds and leaves, therefore, they usually live in forested areas; and, grasses need sunlight, so they often grow in meadows. Plants, animals, and their surroundings make up a system. Humans use soil and water to grow food, wood to burn to provide heat or build shelters, and materials such as iron or copper extracted from Earth to make cooking pans. Life is far more abundant near water sources. Examples of humans using natural resources should be limited to processes where the resources are used in a nearly raw form. This standard might pair well with design challenges asking students to evaluate potential habitation sites. (It is important to note that this standard should focus on availability of resources in the places where organisms live, but could be paired with K.LSS1.1 to also address the organisms themselves.) K.ETS1.1 Engineering leads to improvements in our daily lives and must begin by understanding the problem to be improved by a solution. Students can be presented with a design task related to a different standard, such as a	Animals live on land and in water. Animals can live anywhere as long as their basic needs are met.	Inspire Science TE, pp. 78-82 Vocabulary, TE, pp. 78 Science Paired Read Aloud/eBook: Animal and Plant Habitats Video: Where Do Animals Live? *(LAB)* Be A Scientist Notebook, p. 33, Inquiry Activity: Rainforest and Desert Animals <u>Elaborate</u> Inspire Science TE, pp. 83-84 TE, p. 83, Inquiry Activity: Things Humans Need <u>Evaluate</u> Inspire Science TE, pp. 84-85 *(LAB)* Be A Scientist Notebook, Performance Task, p. 36, Task: Habitat Model eAssessment **Additional Resources** Lesson: What's a Habitat Anyway? Lesson: The Heat Is On! Desert Habitat Lesson: Pondering Pond Lesson: Oh, to Live in the Ocean! Lesson: Ain't the Arctic Cool? Video: Different Animal Habitats Video: Animal Habitat Video & Song: Animal Habitats

designing a device to reduce human impacts on the environment (K.ESS3.3). Entering a design process is important that students brainstorm questions that would have to be answered in order to develop the best possible solution. Students should begin to explore how the understandings gained by asking the right questions will impact design solutions for an engineering problem. K.ETS1.2 In early stages, the design process involves actively developing solutions in brainstorming sessions. To participate in collaborative settings, students must be able to make a physical representation of their ideas early in the design process in order to receive feedback from others. In later grades, students will transition from such preliminary drawings to the creation of detailed models and prototypes. The process of labeling such images allows students to recognize that their device consists of a number of smaller parts whose interactions must be considered and planned. **Suggested Science and Engineering Practice(s)** Developing and Using Models **Suggested Crosscutting Concept(s)** Systems and System Models **Teacher Overview** Different animals live in different places. Animals need basic things such as food, water, air, and shelter. But		**ESL Supports and Scaffolds** WIDA Standard 4 To support students in speaking refer to this resource: WIDA Doing and Talking Science When applicable- use Home Language do build vocabulary in concepts. Spanish Cognates Interactive Science Dictionary with visuals Provide sentence stems to support speaking and writing in science: Plants and animals need…..in order to survive. To survive, both plants and animals need… Many plants and animals live near water because… *Visuals for habitats* Use the visuals to support ELs in understanding how different places on earth help plant and animals Model answering the questions “How do living things depend on …. to meet their needs?”

they may need different amounts of water or different types of food or shelter. The place an animal lives that provides these necessities is called its habitat. A habitat offers the kind of climate, shelter, food, and water source that an animal that lives there needs. For example, some parrots fly from tree to tree in a rainforest habitat, where they find the leaves, nuts, berries, and fruit they need to live. An environment is all of the things that surround an organism and is made up of a larger area than a habitat. An environment may have many different habitats. An ecosystem is made up of all of the living things and nonliving things in an environment interacting. An ecosystem can be large, such as an ocean or a continent, or small, such as a puddle. **Misconceptions** Some students may think that an animal can live anywhere. Tell students that there are connections between where animals live, their body parts, and their needs. For example, a polar bear has thick fur for warmth and lives in the cold, icy habitat of the Arctic. Some students may think that the animals in a given environment are not dependent on each other. Remind students of what they learned about animals eating other animals. Tell them that some animals, such as birds, use animal parts, such as feathers and fur, to build their nests. Students may also think that all animals need the same amounts of some things, such as water. However, some animals drink very little, if any, water,		Partner students to answer the questions. Create triads as needed. Provide a word bank with picture cues to support writing. Place students in heterogeneous pairs to support beginning level Ls.

and some drink a lot of water. Desert animals, for example, typically get all the water they need from the leaves of cactus plants.		

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UNIT 4: Plants and Animals (9 weeks)

Overarching Question(s)

How do Earth's surface processes and human activities affect each other?

Unit 4: Lesson 4	Lesson Length	Essential Question	Vocabulary
Plants and Animals and Their Parents	3 weeks	How are young plants and animals alike and different from their parents?	adult, young

Standards and Related Background Information	Instructional Focus	Instructional Resources
DCI(s) K.LS3: Heredity: Inheritance and Variation of Traits K.ETS1: Engineering Design **Standard(s)** K.LS3.1: Make observations to describe that young plants and animals resemble their parents. K.ETS1.1: Ask and answer questions about the scientific world and gather information using the senses. K.ETS1.2: Describe objects accurately by drawing and/or labeling pictures.	**Learning Outcomes** Students will observe and describe how young plants and animals resemble their parents. **Suggested Phenomena** *Click on the phenomenon picture to view the video.*  Phenomenon Explanation:	**Curricular Resources** Engage Inspire Science TE, p. 87-88 Science in My World (Phenomenon) TE p. 87 Essential Question TE, p. 88 Science and Engineering Practices TE, p. 88 Explore Inspire Science TE, pp. 89-90 *(LAB)* Be a Scientist Notebook, Inquiry Activity, p. 38: Animals and Their Young Science Paired Read Aloud/eBook: Daisy's Ducks

Explanation and Support of Standard K.LS3.1 This standard provides an opportunity for students to begin to compile observations that living organisms resemble their parents. It is important to note that the offspring will not look identical to their parents, but will have similarities. Observations might resemble comparisons of different leaf arrangements in species of beech tree vs walnut tree, or comparing notable difference in bark types in beech, sycamore, or pine trees similar activities in which student look for small differences in otherwise similar organisms. K.ETS1.1 Engineering leads to improvements in our daily lives and must begin by understanding the problem to be improved by a solution. Students can be presented with a design task related to a different standard, such as a designing a device to reduce human impacts on the environment (K.ESS3.3). Entering a design process is important that students brainstorm questions that would have to be answered in order to develop the best possible solution. Students should begin to explore how the understandings gained by asking the right questions will impact design solutions for an engineering problem. K.ETS1.2 In early stages, the design process involves actively developing solutions in brainstorming sessions. To participate in collaborative settings, students must be	Offspring of sexually reproduced organisms look similar to their parents but may have some differences in traits.	<u>Explain</u> Inspire Science TE, pp. 91-95 Vocabulary, TE, pp. 91 Video: Animals and Their Parents Digital Interactive: Animals and Their Young Science Paired Read Aloud/eBook: Families Are Similar, But Different Video: Plants and Their Parents Digital Interactive: Plants and Their Offspring Are Alike and Different <u>Elaborate</u> Inspire Science TE, pp. 96-97 *(LAB)* TE, p. 96, Inquiry Activity: Plants and Their Offspring <u>Evaluate</u> Inspire Science TE, pp. 97-99 *(LAB)* Be A Scientist Notebook, Performance, p. 41, Task: Animal Parents and Their Young eAssessment **Additional Resources** Lesson: Who Do You Look Like? Lesson: Who's Your Animal Parents? Video: What is Heredity? Video: Animals and Their Babies

able to make a physical representation of their ideas early in the design process in order to receive feedback from others. In later grades, students will transition from such preliminary drawings to the creation of detailed models and prototypes. The process of labeling such images allows students to recognize that their device consists of a number of smaller parts whose interactions must be considered and planned. **Suggested Science and Engineering Practice(s)** Obtaining, Communicating, and Evaluating Information **Suggested Crosscutting Concept(s)** Patterns **Teacher Overview** Parent plants and animals and their offspring are both alike and different. Some baby animals, especially fish and reptiles, look exactly like their parents. Other babies, like birds and mammals, often look very different. Baby animals will often look like their parents in shape, but many times they have different colored fur or feathers or spots or other markings that fade away as they age. Young plants grow from seeds and are sometimes much smaller than their parent plants. **Misconceptions** Some students may think babies will look exactly like their parents. Help students understand that parents		Video: Animals and Their Babies Video: Animal Moms Protecting Their Babies Video & Song: Animals and Their Young Ones **ESL Supports and Scaffolds** WIDA Standard 4 To support students in speaking refer to this resource: WIDA Doing and Talking Science When applicable- use Home Language do build vocabulary in concepts. Spanish Cognates Interactive Science Dictionary with visuals Provide sentence stems to support speaking and writing in science: Animals resemble their parents because… The baby is similar to the parent because… Partner students to answer the question. Create triads as needed. Provide a word bank with picture cues to support writing. Place students in heterogeneous pairs to support beginning level Ls.

pass traits on to their young. Some students may not understand that plants also have young. Help them understand that adult plants produce seeds, and young plants grow from these seeds. Young plants will have some traits, like leaf shape, in common with their parents, but they will often be much smaller than their parents.		