

Core Knowledge Science Program—Domain Map

Science Content

Habitats

- Living things live in environments to which they are particularly suited
- Specific habitats and what lives there, for example:
 - Forest [oak trees, squirrels, raccoons, snails, mice]
 - Meadow and prairie [wildflowers, grasses, prairie dogs]
 - Underground [fungi, moles, worms]
 - Desert [cacti, lizards, scorpions]
 - Water [fish, oysters, starfish]
- The food chain and food webs—a way of picturing the relationships between living things:
 - Animals: big animals eat little ones, big animals die and are eaten by little ones
 - Plants: nutrients, water, soil, air, sunlight

Oceans & Undersea Life

- Most of the earth is covered with water
- Locate oceans: Pacific, Atlantic, Indian, Arctic, Southern
- Oceans are salt water (unlike freshwater rivers and lakes)
- Coast, shore, waves, tides (high and low)
- Currents, the Gulf Stream
- Landscape of the ocean floor: mountain peaks and deep valleys (trenches)
- Diversity of ocean life: from organisms too small for the eye to see (plankton), to giant whales
- Dangers to ocean life (for example, overfishing, pollution, oil spills)

Environmental Change & Habitat Destruction

- Environments are constantly changing, and this can sometimes pose dangers to specific habitats, for example:
 - Effects of population and development
 - Rainforest clearing, pollution, litter
- A biography of Rachel Carson

Specific Classifications of Animals

- Herbivores: plant-eaters (e.g., elephants, cows, deer)
- Carnivores: flesh-eaters (e.g., lions, tigers, canines)
- Omnivores: plant and animal-eaters (e.g., bears, humans)
- Extinct animals (e.g., dinosaurs)

This unit contributes to meeting or exceeding the following Next Generation Science Standards:

1-LS3-1. Make observations to construct an evidence-based account that **young plants and animals are like, but not exactly like, their parents.**

Rationale:

This unit will extend previous learning from Kindergarten (Unit 2 *Animals & Their Needs* and Unit 3 *Plants & Farms*) as well as the Grade 1 Unit 1 *Human Body Systems*. Specifically, this unit will provide students the opportunity to deepen their learning about early progressions of [LS3.A](#) and [LS3.B](#). As students build knowledge of special classifications of animals (e.g., carnivores) they will be asked to connect their understanding to early ideas of inheritance and variation in animals. For example, canines have a characteristic pattern of teeth, owing to their shared inheritance, but not all canines look exactly alike. When discussing habitats, students will be asked to describe that a habitat is made up of many different plants, including groups in which individuals look very similar, but not exactly alike.

1-LS1-2. Read texts and use media to **determine patterns in behavior of parents and offspring that help offspring survive.**

This unit will build from the foundations laid in earlier units to prepare students for **1-LS1-2**. The core idea central to this standard, [LS1.B](#), will be explored in this unit with examples and patterns of how animal parents care for their offspring as students explore different habitats and what lives there.

This unit offers the opportunity to foreshadow learning that will support the following Next Generation Science Standards:

Grade 2 Topic: [Interdependent Relationships in Ecosystems](#)

Rationale:

More so than any Grade 1 standard in the NGSS, this unit most directly serves this Grade 2 topic. It introduces examples, models, and concepts central to the core ideas of [LS2.A](#) (Interdependent Relationships) and [LS4.D](#) (Biodiversity) as students explore each of the subtopics within this domain-based unit (e.g., developing and using models in the form of food chains/webs in order to discuss cause and effect relationships within an ecosystem). This topic will be addressed and extended again in Grade 2 Unit 6 *Ecosystems*.

<p>Grade 3 Topic: Interdependent Relationships in Ecosystems: Environmental Impacts on Organisms</p>	<p>Rationale:</p> <p>Similar to this Grade 3 topic, this unit “bundles” the core ideas of LS2.C, LS4.A, LS4.C, LS4.D to provide a rich learning experience that will be extended across Grades 1–3 and beyond. These core ideas will be coherently addressed in this unit, as well as within Grade 2 Units 1 and 2—<i>Cycles in Nature</i> and <i>Insects</i>—and within Grade 3 Units 1 and 6—<i>Introduction to Classification</i> and <i>Ecology</i>.</p> <p>For example, the study of DCIs LS2.C and LS4.D in this early grade will help prepare students to meet or exceed 3-LS4-4 as students compare and discuss possible solutions to problems when a habitat changes.</p>
<p>Grade 5 Topic, Matter and Energy in Ecosystems</p> <p>5-ESS2-1. <i>Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.</i></p>	<p>This unit offers the opportunity to foreshadow the NGSS Grade 5 topic, Matter and Energy in Ecosystems. This topic coherently progresses the core ideas already listed above by connecting these to other, related DCIs, including LS1.C (Energy Flow in Organisms), LS2.B (Cycles of Matter & Energy Flow in Ecosystems), and the early progression of PS3.D (Energy in Everyday Life). The early introduction of food chains and food webs within the context of deep study about habitats/ecosystems offers an excellent opportunity to introduce key vocabulary. This early introduction will ensure that students are adequately prepared with the language tools necessary to deeply study these ideas in later grades.</p> <p>This unit provides an opportunity to extend knowledge of ESS2.A (Earth’s Materials & Systems), which is central to 5-ESS2-1 and first introduced during Grade 1 Unit 3 <i>Introduction to Geology</i>. The Grade 5 endpoint for this core idea states that students should understand, “The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate.” (Framework, page 181) This core idea will be further extended in Grade 4 Unit 4 <i>Geology</i>, Unit 5 <i>Meteorology</i>, and Grade 5 Unit 7 <i>Matter & Change</i>.</p>

Potential Skills & Cross-Curricular Integrations

The connections listed below are intended as ideas for possible integration across this unit. Finding connections in math, in language arts, and in works of poetry, art, and music, may help you as you create meaningful learning experiences for your students. Connections such as these can help your students make links between various disciplines and deepen the understanding of this domain.

POTENTIAL CCSS Math Connections

MP.2 Reason abstractly and quantitatively. (1-LS3-1)

MP.5 Use appropriate tools strategically. (1-LS3-1)

1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-LS3-1)

POTENTIAL CCSS ELA Connections

RI.1.1 Ask and answer questions about key details in a text. (1-LS3-1 & 1-LS1-2)

RI.1.2 Identify the main topic and retell key details of a text. (1-LS1-2)

RI.1.10 With prompting and support, read informational texts appropriately complex for grade. (1-LS1-2)

W.1.7 Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions). (1-LS3-1)

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-LS3-1)

POTENTIAL Cross-Curricular Connections

Potential Links:

ELA: Poetry—“I Know All the Sounds That the Animals Make” by Jack Prelutski

Fiction—“Why the Owl Has Big Eyes” (An Iroquois legend)

Sayings and Phrases—“Fish out of water,” “There’s no place like home”

Geography: Spatial Sense—Working with maps, globes, and other geographic tools (*with regards to locating oceans, describing the landscape of the ocean floor, etc.*)

Prior Knowledge

Core Knowledge Kindergarten Sequence

- What plants need to grow: sufficient warmth, light, and water
- Basic parts of plants: seed, root, stem, branch, leaf
- Flowers and seeds: seeds as food for plants and animals (for example, rice, nuts, wheat, corn)
- Two kinds of plants: deciduous and evergreen
- Animals, like plants, need food, water, and space to live and grow
- Plants make their own food, but animals get food from eating plants or other living things
- Offspring are very much (but not exactly) like their parents
- Most animal babies need to be fed and cared for by their parents; human babies are especially in need of care when young
- Conservation: Some natural resources are limited, so people must be careful not to use too much of them (example: logging and reforestation)
- Pollution (for example, littering, smog, water pollution) can be harmful, but if people are careful they can help reduce pollution

CKLA Kindergarten

Domain Anthology, *Farms*

- Identify needs of farm animals: food, water, and space to live and grow
- Describe how farm animal babies need to be fed and cared for by their parents or by people
- Identify foods that come from animals
- Explain why farmers grow crops
- Identify crops as plants grown on farms for use as food
- Describe how some food comes from farms as crops
- Sequence the seasonal rhythm of planting, growing, and harvesting
- Describe how farmers protect their crops from drought and pests

Domain Anthology, *Plants*

- Explain that different kinds of plants grow in different environments
- Explain that plants are living things
- Describe what plants need to live and grow: food, water, air, and light
- Explain that the plant makes its food in its leaves
- Explain the basic life cycle of plants
- Explain that some plants produce fruit to hold seeds
- Compare and contrast the fruits and seeds of different plants
- Identify the parts of specific plants that are eaten by people
- Describe how bees collect nectar and pollen
- Describe how bees make and use honey
- Describe the important role bees play in plant pollination
- Compare and contrast deciduous and evergreen trees

Domain Anthology, *Plants (continued)*

- Explain that deciduous trees belong to types of plants that lose their leaves in the fall and become dormant in the winter
- Explain that evergreen trees belong to types of plants that stay green all year and do not become dormant in the winter
- Identify how deciduous trees are important to people and nature
- Identify things that plants provide to people: oxygen, food, and important products
- Describe the life and scientific achievements of George Washington Carver

Domain Anthology, *Taking Care of the Earth*

- Explain why people have a special responsibility to take care of the earth
- Explain that Earth is composed of natural resources (land, water, and air) and that humans, plants, and animals depend on Earth's natural resources to live
- Explain different types of pollution, including litter, air pollution, and water pollution, and how most types of pollution are caused by people
- Explain what happens to garbage from its creation to being dumped in the landfill; to recyclable materials from home to a recycling factory; to discarded food from the table to the compost pile to the garden; and the water cycle
- Identify possible solutions for the problems of garbage, litter, pollution, and the conservation of natural resources

Core Knowledge Science (Previously taught units in the CK Science program)**Kindergarten Unit 2 *Animals & Their Needs***

- Classify living things and nonliving things
- Compare and contrast humans and other animals
- Identify at least three basic needs of animals
- Describe how animals use specific body parts to meet their needs
- Describe at least two ways that animals protect themselves from other animals
- Describe how animals care for their young offspring
- Describe similar (and different) ways animals and humans take care of their young offspring
- Identify how scientists can learn about animal characteristics and behaviors
- State two defining characteristics of mammals
- Describe at least one difference between fish and mammals
- State two defining characteristics of birds
- Describe at least one difference between birds and insects
- Categorize pictures of birds, fish, insects, and mammals
- Describe animals' characteristics or behaviors that allow them to survive in the wild
- Describe the meaning of the term "habitat"
- Identify animals that can live in ocean, woodland, desert, and savanna habitats
- Describe how animals can change their habitats in order to meet their needs
- Categorize pictures of animals into groups (herbivores, carnivores, or omnivores) based on examples of food that they eat

Kindergarten Unit 3 *Plants & Farms*

- Describe how plants get and store energy
- Describe how plants grow
- Sequence the life cycle of a plant
- Identify characteristics of deciduous and evergreen plants
- Classify plants as deciduous or evergreen
- Identify what plants need in order to live and grow
- Compare and contrast plants' basic needs to the needs of animals and human beings
- Infer how plants may change their habitat in order to meet their needs
- Describe how George Washington Carver used plants to meet people's needs
- Identify the needs of crops on a farm
- Describe how farmers use natural resources to take care of their crops
- Identify common livestock that can live on a farm
- Describe how plants help livestock meet their needs
- Describe the process harvesting crops to people purchasing produce to consume
- Identify ways in which we can keep food fresh

Kindergarten Unit 5 *Taking Care of the Earth*

- Explain what a "natural resource" is and give at least three examples
- Identify everyday objects that are made from natural resources
- Describe how humans use the earth's natural resources
- Identify common resources that are limited and nonrenewable
- Classify resources as renewable or nonrenewable
- Describe how humans have changed the environment around them in order to meet their needs
- Identify examples of garbage produced by humans
- Describe why landfills pose a problem for humans, animals, and plants
- Identify different forms of pollution
- Describe why pollution poses a problem for humans, animals, and plants
- Describe why humans have a special responsibility to take care of the earth
- Describe how humans can reduce the pollution in their environment
- Identify items that can be used over and over again
- Identify materials that can be recycled
- Classify objects as recyclable or as garbage
- Compare and contrast the process of composting with the process of recycling
- Identify how we can conserve energy and resources
- Describe the significance of Earth Day
- Develop solutions that can protect Earth's natural resources

CKLA Grade 1 Objectives

The following objectives are addressed through the Core Knowledge Language Arts program (CKLA), which builds students' background knowledge in certain domains of literature, science, and history. To learn more about how and why the Listening & Learning Strand of CKLA approaches science content through read-alouds and ELA instruction, [read more about the CKLA program](#).

Domain Anthology, *Animals & Habitats*

- Explain what a habitat is
- Explain why living things live in habitats to which they are particularly suited
- Identify the characteristics of the Arctic tundra habitat
- Identify the characteristics of the Arctic Ocean habitat
- Explain how Arctic animals have adapted to the Arctic tundra and Arctic Ocean habitats
- Identify the characteristics of the desert habitat
- Explain how desert animals have adapted to the desert habitat
- Classify animals on the basis of the types of food that they eat (herbivore, carnivore, omnivore)
- Identify the characteristics of the grassland habitat
- Explain how grassland animals have adapted to the grassland habitat
- Match specific plants and animals to their habitats
- Identify the characteristics of the temperate deciduous forest habitat
- Explain how temperate deciduous forest animals have adapted to the temperate deciduous forest habitat
- Identify the characteristics of the tropical rainforest habitat
- Explain how tropical rainforest animals have adapted to the tropical rainforest habitat
- Classify water habitats as either freshwater or saltwater habitats
- Identify the characteristics of the freshwater habitat
- Explain that salt water covers most of Earth and is found in oceans
- Identify and locate the oceans of the world on a globe: Arctic, Pacific, Atlantic, Indian, Southern
- Describe the landscape of the ocean floor
- Describe ocean life as very diverse
- Match saltwater plants and animals to the saltwater habitat
- Identify the characteristics of the bald eagles' habitat
- Explain why and how habitat destruction can cause extinction

What Students Will Learn in Future Grades

Core Knowledge Sequence

Grade 2 Cycles in Nature

- Seasonal Cycles
- Life Cycles of Plants and Animals
- The Water Cycle

Grade 3

Introduction to the Classification of Animals

- Scientists classify animals according to the characteristics they share, for example:
 Cold-blooded or warm-blooded
 Vertebrates (have backbones and internal skeletons) or invertebrates (do not have backbones or internal skeletons; for example, insects)
- Different classes of vertebrates, including fish, amphibians, reptiles, birds, and mammals

Ecology

- Habitats, interdependence of organisms and their environment
- The concept of a “balance of nature” (constantly changing, not a static condition)
- The food chain or food web: producers, consumers, decomposers
- Ecosystems: how they can be affected by changes in environment (for example, rainfall, food supply, etc.), and by human use of resources
- Human impact on the environment
- Air pollution: emissions, smog
- Water pollution: industrial waste, runoff from farming
- Measures we can take to protect the environment (for example, conservation, recycling)

Core Vocabulary

*The following list contains the core vocabulary words suggested for purposeful integration across this Grade 1 unit. **Boldfaced** terms could be introduced to and/or reviewed with students using a Word Work activity, as modeled by the [Core Knowledge Language Arts program](#) (CKLA). The inclusion of the words on this list does not mean that students are immediately expected to be able to use all of these words on their own. However, through repeated exposure across the lessons, students should acquire a good understanding of most of these words and begin to use some in conversation.*

Habitats

*environment, **habitat**, ecosystem, region, territory, zone, **climate**, tropical, temperate, arctic, living, survive, needs, adapted, characteristic, pattern, **trait**, parent, child(ren), offspring, species, organism, population, community, flora, fauna, (bio)diversity, coexist, protect, **camouflage**, shelter, hunt, feed, **predator**, prey, producer, decomposer, food chain/web, forest, oak, squirrel, raccoon, snail, mice, rainforest, canopy, grassland, meadow, prairie, wildflowers, grass, prairie dogs, underground, fungus, mole, worm, desert, cactus, lizard, scorpion, water, underwater, fish, oysters, starfish, [other things that live in the various habitats studied]*

Oceans and Undersea Life

*ocean, **aquatic**, sea, water, **saltwater**, **freshwater**, Pacific, Atlantic, Indian, Arctic, Southern Oceans, river, lake, pond, **coast**, **shore**, wave, tide, **current**, Gulf Stream, **landscape**, mountain, peak, valley, trench, diversity, danger, fishing, pollution, oil spills, creature, animal, life, fish, whale, shark, squid, octopus, coral, reef, plankton, [other names of ocean life], life zone*

Special classifications of animals

***herbivore**, **carnivore**, **omnivore**, teeth, feed, food, eat, chew, consume, extinct(ion), **fossil**, dinosaur, [other examples of extinct species], remains, preserve, impression, rock, stone, mineral, **paleontologist**, excavate, fossil record*

Environmental Change

resource, (non-)renewable, change, **impact**, consequence, global, world, **cause**, **effect**, long-term, short-term, **system**, cycle, interact, conserve, sustain, reduce, lessen, save, help, clean, preserve, protect, aware(ness), careful, practical, **effective**, responsible, reminder, positive, negative, pollution, waste, garbage

Potential Misconceptions

Students have been shown to learn significantly more science when their teachers demonstrate strong knowledge of potential student errors, and when the teacher plans accordingly (Sadler & Sonnert, 2016). The following incorrect statements serve as a sampling of the “intuitive theories” or “alternative conceptions” that students and teachers may actively use to describe their thinking, and which might interfere with the process of learning. The details following each statement are not intended to imply the scope of instruction for this grade, but instead provide a clearer sense of what students (of all ages) often misunderstand and/or overgeneralize when investigating and describing scientific ideas.

Misconception: “Different kinds of organisms (species) do not compete for the same natural resources.”

Students may conclude that *different species* use different resource “stores” to meet their needs of food, water, space, and/or light. This may be reinforced by oversimplified representations of food chains/webs without special instruction to uncover and address this misconception.

Misconception: “Organisms of the same species do not compete with each other for natural resources.”

Similar to above, students may conclude that organisms of the *same species (or in similar groups or classes)* use different resource “stores” to meet their needs. For example, some students describe that plants do not compete with other plants for light, water, and space. This may be reinforced by simplified representations of food chains/webs without special instruction to uncover and address this misconception.

Misconception: “Organisms at the ‘top of the food chain’ are better, or ‘better adapted’ to their environment.”

Common phrases in everyday language, such as “bottom of the food chain,” may influence student descriptions of the interactions between organisms. Teachers should be mindful of their descriptions of how each organism in an environment (small or large, predator or prey) plays a critical role in maintaining the health and balance within an ecosystem.

Misconception: “The food chain has a beginning and an end.”

Food chain diagrams are useful to illustrate how energy and matter flow between organisms, however the linear representation can also lead to this misconception. Teachers should probe for students’ thinking and understanding about the limitations of food chains as a model.

Key points for instruction:

“Students of all ages... may have the tendency to imagine that all environmentally friendly actions help to solve all environmental problems (for example, the use of unleaded petrol reduces the risk of global warming)” (*Atlas of Science Literacy*, Vol. 2 pg. 20, AAAS Project 2061). As instruction progresses within and across the grades, teachers should attempt to clearly and accurately foster descriptions of cause and effect relationships.

Potential Objectives for this Grade 1 Unit

The organization of the following objectives reflects the order in which they are expected to be addressed. The proposed timing within the unit (“beginning,” “middle,” or “end”) and aligned NGSS are also noted. In addition to daily lessons focused on each objective, days have been built into the unit for review and assessment.

Beginning

- Explain why different living things are found in different environments
- Identify oak trees, squirrels, and deer and describe their habitats*
- Identify toucans, jaguars, anacondas and describe their habitats*
- Compare and contrast the habitats of jaguars and deer
- Identify lions, antelopes, and zebra and describe their habitats*
- Identify armadillos, cacti, and lizards and describe their habitats*
- Compare and contrast the habitats of lizards and zebra
- Identify worms, moles, and fungi and describe their habitats*
- Identify dolphins, octopi, and starfish and describe their habitats*
- Identify freshwater fish (e.g., bass) and describe their habitats*
- Compare and contrast the habitats of starfish and freshwater fish
- Match plants and animals to their habitats
- Explain how various animals are adapted to their habitats
- Compare and contrast herbivores, carnivores, and omnivores
- Create food chains and food webs for specific habitats

Middle

- Describe the surface of the earth
- Describe the diversity of ocean life
- Explain how ocean water is different from fresh water
- Identify and locate the Pacific, Atlantic, Indian, Arctic, and Southern Oceans on a map
- Identify the coast, shore, waves, and tides (high and low) of an ocean
- Define the term current and provide an example
- Describe the landscape of the ocean floor

End

- Describe how the environment can change
- Explain how changing environments can sometimes pose dangers to specific habitats
- Describe what it means for an animal species to become extinct
- Identify Rachel Carson and describe her efforts to protect the environment

*The intent with these objectives is to choose 1–3 animals in each habitat so students will be able to explore their habitats, recognize the patterns of similarities between these few, and over time, to recognize the patterns of differences across different habitats.

Potential Big Guiding Questions**Essential Questions:**

- **Why are plants and animals in different habitats so different?**
- **How do animals impact their habitats?**
- **How have humans impacted the environment?**
- **What types of natural resources are consumed by wild animals? What patterns do you notice?**

RE: Animals and Habitats

- What does a habitat provide for an animal?
- How do special characteristics of animals help them survive in their given habitats?
- How do characteristics of their habitats help animals survive?
- How are animals in a given habitat alike?

RE: Animal Classifications

- How can animals be grouped together based on how they meet their needs?
- In what ways are the things that animals eat alike and different?

RE: Oceans

- What makes up earth's surface?
- Why are there so many kinds of life under the sea?
- How does the landscape of the ocean compare to the landscape of the earth?
- What causes waves?

RE: Environmental Changes

- Is nature static or dynamic?
- What are some ways in which humans affect the environment?
- What can we do to limit the damage we cause to the environment?
- Why do some animals become extinct?

Potential Assessment Opportunities

The following assessment tasks serve as a sampling of how students can demonstrate mastery of lesson objectives. Each aligned objective and NGSS is noted in parentheses. In addition, the proposed timing (“beginning,” “middle,” or “end”) is noted in order to indicate the approximate point in time the assessment would take place.

Example: (Beginning of Unit 4)

{Evaluates Student Mastery of Objectives: Match plants and animals to their habitats; explain how various animals are adapted to their habitats}

Note: This assessment can be used after Potential Activity Example #1, described below.

Advance Preparation:

Image cards for 5–7 different animals (at least one for each habitat and one challenge: an animal they have not discussed before, optional)

In designated areas around your classroom, post student drawings/representations of each habitat that they created earlier in this unit.

Note: You may wish to use the Animals & Habitats chart (see Sample Activity # 1 below) as a reference for students during this assessment task. For a challenge, you may wish to cover up the Animals row/column of that chart.

As a culminating assessment activity for the Animals and Habitats section of this unit, have students identify the environments to which particular animals are well suited, and describe how the animals are well-adapted to each environment. For this activity, you can utilize designated areas around your classroom by arranging the student drawings/representations of each habitat from previous lessons.

T - For this activity, please stand. You may put on your safari hats (optional). Today, we’ll be doing more than just exploring. You have created habitats in different areas of the room through your drawings/art. Can you tell me the name of each habitat you’ve explored so far, and where it’s represented in the classroom? After students have identified each habitat, show the first animal image card.

T - What is the name of this animal? What are some key characteristics of this animal? How does it look, get food, and where does it seek shelter? Give students time to answer these questions.

T - Using what you know now about this animal, move to the place in the room that represents the habitat where that animal makes its home. Allow students to arrange themselves in the area of the room representing the animal.

T - Why did you choose this habitat? Guide students to base their answers on the characteristics of the animal and habitat, and how they match. If any students have different answers than their peers, allow

them to voice their reasonings. Give students a chance to rearrange themselves once everyone has explained why they chose their respective habitats.

T - Describe the characteristics of this animal, its traits, that make it particularly suited to this habitat.

Repeat this process and line of questions for each of the image cards. If you have additional time, encourage each student (one at a time) to name an additional animal not represented by the image cards, and repeat the activity for those animals.

Remind students that living things have made their homes in many different environments. A habitat matches the animal, and the animal matches the habitat.

Potential Activities & Procedures

The following activities or procedures serve as a sampling of what instruction could look like in this unit. Each example was specifically designed to contribute to one or more of the aforementioned objectives. In addition, the proposed timing (“beginning,” “middle,” or “end”) is noted in order to indicate the approximate point of instruction where it would be delivered. Aligned NGSS are noted in parentheses.

Example #1: (Beginning of Unit 4)

{Contributes to the Objective: Explain how various animals are adapted to their habitats}

Advance Preparation:

Safari hats (paper or plastic, optional)

Animals & Habitats chart (depicting each animal studied and the characteristics such as food and shelter that make up its habitat)

Image Cards for Habitats chart (optional)

Art supplies (paper, markers, etc.)

During early lessons of this unit, students will discuss particular animals and identify their habitats and their characteristics. Encourage students to explore and make connections about the habitats while providing structure to the conversation, using the following general steps.

Read a short story or share a description of the habitat with students.

T - You will be explorers today, so put on your safari hats and prepare for an adventure to meet a new animal and its habitat. Remind students of the things they have learned about several animals and the habitats already, using the Animals & Habitats chart as a guide.

T - Today, we are going to learn about an animal called the armadillo. Show image of armadillo.

T - What do you notice about this creature just by looking at it? Encourage students to describe its physical characteristics, such as tough shell, pointy nose/face, long tail. Then, show an image, a video,

and/or read a description of the armadillo in its environment. Ask students to describe the armadillo's habitat by leading them through questions of where it gets food, where it sleeps or has shelter, etc.

T - What can you tell me about where this animal lives? Ask students to describe the characteristics of its habitat, including food, shelter, and living and nonliving things.

T - What do you notice about this animal that might help it in its environment? (e.g., shell can help protect it from predators) Then help lead students to identify others that do not arise from discussion (e.g., **T - Why would a long snout be helpful to this animal? How does the armadillo deal with the temperature in the desert?**).

Have students answer questions to fill out the next line of the Animals & Habitats chart, and record their responses using decodable words and/or images.

Have students draw or otherwise construct a representation of the animal and its habitat. As students draw, check in with students around the room, asking about the characteristics they are including and not including, and why. When students are done, you may wish to gather these representations as a check for understanding. Arrange habitat drawings so each habitat is given a different location in the room.

Example #2: (Middle of Unit 4)

{Contributes to the Objective: Describe the diversity of ocean life (*specifically the diversity of size*)}

Advance Preparation:

Computer with internet access to visit a virtual tour of the ocean (whether an aquarium or video of the ocean)

Counting cubes or other items sized to represent the size of different animals as accurately as possible
Images and/or video depicting several different ocean animals (e.g., whale, shrimp, dolphin) and a child

For five minutes, allow students to walk through a virtual tour of the ocean. Ask students to describe their favorite creatures or plants, the most interesting things they saw, the most dangerous, the biggest, the smallest, etc.

T - The ocean is full of many, many interesting plants and animals. As we learned earlier, this is probably related to how much of Earth is covered by water. So since there is so much space, it makes sense there is a lot of ocean life. Today we are going to compare, or find differences between, different animals that live in the ocean. What are some ways we can do that? Guide students to decide on the particular characteristic at which they would like to look more closely (e.g., size of animals). Share with students images and/or videos of several different ocean animals.

T - The ocean is the home of some of the largest animals, and some of the smallest. Today we will look at one way animals in the ocean are very different: by looking at their size. How can we compare the size of these aquatic animals? Let students think of a few ideas for ways to do this. The ideal is for students to compare the animals using something with an easily identifiable size as a reference (e.g., the size of person or an everyday object). Alternatively, you could design an investigation for students to simply see the animals' sizes relative to one another.

T - We have this stack of cubes that represents you and your size. (It would help students if you paste a picture of a child on the cube stack to help them visualize this represents them.)

T - We have this cube over here that represents the size of a [fish]. (Again, it would help students if you paste a picture of the [fish] on the stack.) **What do you notice about the sizes of these two things? Is the [fish] bigger than you? Is it taller or wider?** Then introduce new animals (e.g., shrimp, whale, octopus, dolphin), one after another, asking comparison questions between them. Encourage students to compare their own sizes to the size of each of the animals they have seen. You may ask the students to arrange the cube stacks in order, from largest to smallest, or in other patterns to help them see the differences between animals in the ocean.

T - What does seeing all these different sizes of animals tell you about ocean life? (There's a lot of different sizes of animals in the ocean. The ocean must be big to house so many different, large creatures, etc.)

Websites & Media

San Diego Zoo—Habitats & Animals: <http://animals.sandiegozoo.org/habitats>

Select a habitat and scroll through images of animals that live there. This may help your students to begin learning about the diversity of life on earth. This webpage may have been previously shared with students during Kindergarten Unit 2 *Animals & Their Needs*.

Ocean Matching Game: http://www.sheppardsoftware.com/world_G0_Click.html

This game can be used to assess students' knowledge of the locations of the world's oceans. Teachers can also select an option to review the location of the continents if desired, which is a review from Kindergarten science and geography.

Endangered Animals:

http://www.sheppardsoftware.com/content/animals/kidscorner/endangered_animals/whats_the_problem.htm

"By learning about the problems that face animals, we can figure out how to save them!" You may wish to use this website to explore and discuss different threats to animals, such as habitat loss, pollution, and poaching.

American Museum of Natural History: <http://www.amnh.org>

The AMNH website houses wonderful information and ideas for projects and investigations about our natural world. For example, the AMNH online exhibit regarding [Theodore Roosevelt](#) may help Grade 1 teachers to connect previous learning about our 26th president (review from Kindergarten) and expand students' understanding of conservation and protecting the environment.

National Geographic Virtual Worlds—The Deep Sea:

<http://animals.nationalgeographic.com/animals/crittercam-virtual-world-deep-sea/>

This interactive simulation can help students to explore regions of the earth that very few people ever have the chance to visit—the depths of our oceans. Students and teachers use the computer mouse to find specific creatures and learn more about their features and their lifestyles in the ocean habitat.

National Geographic Interview with a Marine Scientist—Sylvia Earle:

http://kids.nationalgeographic.com/kids/photos/oceans/#/tierradelfuego-745734_15601_600x450.jpg

This brief interview can be read and discussed with students to learn more about scientists like Dr. Sylvia Earle who study marine life and our world's oceans.

Supplemental Trade Books

- About Birds: A Guide for Children, by Cathryn Sill and illustrated by John Sill (Peachtree Publishers, 1997) ISBN 1561451479
- Afternoon on the Amazon (Magic Tree House, No. 6), by Mary Pope Osborne and Sal Murdocca (Random House Books for Young Readers, 1995) ISBN 0679863729
- Rain Forests (Magic Tree House Research Guide), by Will Osborne and Mary Pope Osborne (A Stepping Stone Book, 2001) ISBN 0375813551
- Animal Homes (Luxury Lift the Flap Learners), by Debbie Martin, Jane Rigby, and Alan Baker (Usborne Books, 2004) ISBN 0794507158
- Buffalo Before Breakfast (Magic Tree House, No. 18), by Mary Pope Osborne and Sal Murdocca (Random House, 1999) ISBN 0679890645
- Cactus Hotel (An Owlet Book), by Brenda Z. Guiberson and Megan Lloyd (Henry Holt and Company, 1993) ISBN 0805029605
- Dark Day in the Deep Sea (Magic Tree House, No. 40), by Mary Pope Osborne and Sal Murdocca (Random House Books for Young Readers, 2009) ISBN 0375837329
- Sea Monsters: A Nonfiction Companion to Dark Day in the Deep Sea, by Mary Pope Osborne, Natalie Pope Boyce, and Sal Murdocca (Random House Books for Young Readers, 2008) ISBN 0375846638
- Desert Giant: The World of the Saguaro Cactus (Tree Tales), by Barbara Bash (Sierra Club Books for Children, 2002) ISBN 1578050855
- Dingoes at Dinnertime (Magic Tree House, No. 20), by Mary Pope Osborne and Sal Murdocca (Random House Books for Young Readers, 2000) ISBN 0679890661
- Dolphins and Sharks: A Magic Tree House Research Guide, by Mary Pope Osborne, Natalie Pope Boyce, and Sal Murdocca (Random House Books for Young Readers, 2003) ISBN 0375823778
- Dolphins at Daybreak (Magic Tree House, No. 9), by Mary Pope Osborne and Sal Murdocca (Random House Books for Young Readers, 1997) ISBN 067988338X

- Penguins and Antarctica (Magic Tree House Research Guides), by Mary Pope Osborne, Natalie Pope Boyce, and Sal Murdocca (Random House Books for Young Readers, 2008) ISBN 0375846646
- Eve of the Emperor Penguin (Magic Tree House, No. 40), by Mary Pope Osborne and Sal Murdocca (Random House Books for Young Readers, 2008) ISBN 0375837337
- Exploring Tide Pools, by Monica Halpern (National Geographic Society, 2002) ISBN 0792285131
- Good Morning, Gorillas (Magic Tree House, No. 26), by Mary Pope Osborne and Sal Murdocca (Random House Books for Young Readers, 2002) ISBN 0375806148
- Here Is the African Savanna (Web of Life), by Madeleine Dunphy (Web of Life Children’s Books, 2006) ISBN 0977379523
- Here Is the Arctic Winter (Web of Life), by Madeleine Dunphy (Web of Life Children’s Books, 2007) ISBN 0977753913
- Here Is the Coral Reef (Web of Life), by Madeleine Dunphy (Web of Life Children’s Book, 2006) ISBN 097737954X
- How to Hide an Octopus and Other Sea Creatures (All Aboard Book), by Ruth Heller (Grosset and Dunlap, 1992) ISBN 0448404788
- Life in a Pond (Pebble Plus: Living in a Biome), by Carol K. Lindeen (Capstone Press, 2003) ISBN 0736834028
- Life in a Wetland (Living in a Biome), by Carol K. Lindeen (Capstone Press, 2006) ISBN 0736834052
- Lions at Lunchtime (Magic Tree House, No. 11), by Mary Pope Osborne and Sal Murdocca (Random House Books for Young Readers, 1998) ISBN 0679883401
- Oil Spill! (Soar to Success), by Melvin Berger (Houghton Mifflin Company, 2006) ISBN 0395779138
- Polar Bears and the Arctic (Magic Tree House Research Guide), by Mary Pope Osborne and Natalie Pope Boyce (A Stepping Stone Book, 2007) ISBN 037583222X
- Polar Bears Past Bedtime (Magic Tree House, No. 12), by Mary Pope Osborne and Sal Murdocca (Random House Books for Young Readers, 1998) ISBN 067988341X
- Seven Continents, by Elaine Morris (National Geographic Society, 2003) ISBN 0792243684
- Snakes Are Hunters (Let’s-Read-and-Find-Out Science, Stage 2), by Patricia Lauber (HarperTrophy, 1989) ISBN 0064450910
- Starfish (Let’s-Read-and-Find-Out-Science), by Edith Thacher Hurd and illustrated by Robin Brickman (HarperTrophy, 2000) ISBN 0064451984
- The Arctic Habitat, by Mary Aloian and Bobbie Kalman (Crabtree Publishing Company, 2006) ISBN 0778729818
- The Great Kapok Tree: A Tale of the Amazon Rainforest, by Lynne Cherry (Voyager Books, 2000) ISBN 0152026142
- Tigers at Twilight (Magic Tree House, No. 19), by Mary Pope Osborne and Sal Murdocca (Random House Books for Young Readers, 1999) ISBN 0679890653
- What is a Carnivore?, by Bobbie Kalman (Crabtree Publishing Company, 2010) ISBN 9780778732945

- What is Hibernation?, by John Crossingham and Bobbie Kalman (Crabtree Publishing Company, 2002) ISBN 0865059640
- What Lives in a Tide Pool?, by Lily Richardson (National Geographic Society, 2007) ISBN 0792243374
- Who Eats What? Food Chains and Food Webs (Let's-Read-and-Find-Out-Science, Stage 2), by Patricia Lauber and Holly Keller (HarperTrophy, 1994) ISBN 0064451305
- Why do Animals Migrate?, by Bobbie Kalman (Crabtree Publishing Company, 2009) ISBN 9780778733034