

## Kindergarten Science, Unit 3

# Animals

### Overview

#### Unit abstract

In this unit of study, students are expected to develop an understanding of what animals (including humans) need to survive and the relationship between their needs and where they live. The crosscutting concepts of patterns and systems and system models are called out as organizing concepts for these disciplinary core ideas. In the kindergarten performance expectations, students are expected to demonstrate grade-appropriate proficiency in developing and using models, analyzing and interpreting data, and engaging in argument from evidence. Students are expected to use these practices to demonstrate understanding of the core ideas.

#### Essential question

- Where do organisms live and why do they live there?

## Written Curriculum

### Next Generation Science Standards

<b>K. Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment</b>		
Students who demonstrate understanding can:		
<b>K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.</b> [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and that all living things need water.]		
The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i> :		
<p style="text-align: center;"><b>Science and Engineering Practices</b></p> <p><b>Analyzing and Interpreting Data</b> Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.</p> <ul style="list-style-type: none"> <li>▪ Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1)</li> </ul> <p style="text-align: center;">-----</p> <p style="text-align: center;"><b>Connections to Nature of Science</b></p> <p><b>Scientific Knowledge is Based on Empirical Evidence</b></p> <ul style="list-style-type: none"> <li>▪ Scientists look for patterns and order when making observations about the world. (K-LS1-1)</li> </ul>	<p style="text-align: center;"><b>Disciplinary Core Ideas</b></p> <p><b>LS1.C: Organization for Matter and Energy Flow in Organisms</b></p> <ul style="list-style-type: none"> <li>▪ All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow. (K-LS1-1)</li> </ul>	<p style="text-align: center;"><b>Crosscutting Concepts</b></p> <p><b>Patterns</b></p> <ul style="list-style-type: none"> <li>▪ Patterns in the natural and human designed world can be observed and used as evidence. (K-LS1-1)</li> </ul>
<i>Connections to other DCIs in kindergarten:</i> N/A		
<i>Articulation of DCIs across grade-levels:</i> <b>1.LS1.A</b> (K-LS1-1); <b>2.LS2.A</b> (K-LS1-1); <b>3.LS2.C</b> (K-LS1-1); <b>3.LS4.B</b> (K-LS1-1); <b>5.LS1.C</b> (K-LS1-1); <b>5.LS2.A</b> (K-LS1-1)		
<i>Common Core State Standards Connections:</i>		
<i>ELA/Literacy –</i>		
<b>W.K.7</b> Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-LS1-1)		
<i>Mathematics –</i>		
<b>K.MD.A.2</b> Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. (K-LS1-1)		

<b>K. Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment</b>		
<p>Students who demonstrate understanding can:</p> <p><b>K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.</b> [Clarification Statement: Examples of relationships could 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.]</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
<p><b>Science and Engineering Practices</b></p>	<p><b>Disciplinary Core Ideas</b></p>	<p><b>Crosscutting Concepts</b></p>
<p><b>Developing and Using Models</b> Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions.</p> <ul style="list-style-type: none"> <li>▪ Use a model to represent relationships in the natural world. (K-ESS3-1)</li> </ul>	<p><b>ESS3.A: Natural Resources</b></p> <ul style="list-style-type: none"> <li>▪ Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)</li> </ul>	<p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>▪ Systems in the natural and designed world have parts that work together. (K-ESS3-1)</li> </ul>
<p><i>Connections to other DCIs in kindergarten:</i> N/A</p>		
<p><i>Articulation of DCIs across grade-levels:</i> <b>1.LS1.A</b> (K-ESS3-1); <b>5.LS2.A</b> (K-ESS3-1); <b>5.ESS2.A</b> (K-ESS3-1)</p>		
<p><i>Common Core State Standards Connections:</i></p> <p><i>ELA/Literacy –</i></p> <p><b>SL.K.5</b> Add drawings or other visual displays to descriptions as desired to provide additional detail. (K-ESS3-1)</p> <p><i>Mathematics –</i></p> <p><b>MP.2</b> Reason abstractly and quantitatively. (K-ESS3-1)</p> <p><b>MP.4</b> Model with mathematics. (K-ESS3-1)</p> <p><b>K.CC</b> Counting and Cardinality (K-ESS3-1)</p>		

<b>K. Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment</b>		
<p>Students who demonstrate understanding can:</p> <p><b>K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.</b> [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.]</p>		
<p>The performance expectations above were developed using the following elements from the NRC document <i>A Framework for K-12 Science Education</i>:</p>		
<p style="text-align: center;"><b>Science and Engineering Practices</b></p> <p><b>Engaging in Argument from Evidence</b></p> <p>Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).</p> <ul style="list-style-type: none"> <li>▪ Construct an argument with evidence to support a claim. (K-ESS2-2)</li> </ul>	<p style="text-align: center;"><b>Disciplinary Core Ideas</b></p> <p><b>ESS2.E: Biogeology</b></p> <ul style="list-style-type: none"> <li>▪ Plants and animals can change their environment. (K-ESS2-2)</li> </ul> <p><b>ESS3.C: Human Impacts on Earth Systems</b></p> <ul style="list-style-type: none"> <li>▪ Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (<i>secondary to K-ESS2-2</i>)</li> </ul>	<p style="text-align: center;"><b>Crosscutting Concepts</b></p> <p><b>Systems and System Models</b></p> <ul style="list-style-type: none"> <li>▪ Systems in the natural and designed world have parts that work together. (K-ESS2-2)</li> </ul>
<p><i>Connections to other DCIs in kindergarten:</i> N/A</p>		
<p><i>Articulation of DCIs across grade-levels:</i> <b>4.ESS2.E</b> (K-ESS2-2); <b>5.ESS2.A</b> (K-ESS2-2)</p>		
<p><i>Common Core State Standards Connections:</i></p> <p><i>ELA/Literacy –</i></p> <p><b>RI.K.1</b> With prompting and support, ask and answer questions about key details in a text. (K-ESS2-2)</p> <p><b>W.K.1</b> Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book. (K-ESS2-2)</p> <p><b>W.K.2</b> Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. (<i>K-ESS2-2</i>)</p>		

## Clarifying the standards

### *Prior learning*

There are no disciplinary core ideas that are considered prior learning for the concepts in this unit of study

### *Progression of current learning*

#### **Driving question 1**

What do animals need to survive?

##### Concepts

- Scientists look for patterns and order when making observations about the world.
- Patterns in the natural and human-designed world can be observed and used as evidence.
- All animals need food in order to live and grow. They obtain their food from plants or from other animals.

##### Practices

- Observe and use patterns in the natural world as evidence.
- Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.
- Use observations to describe patterns in what animals need to survive. Examples of patterns could include:
  - Animals need to take in food, but plants do not.
  - Different kinds of food are needed by different types of animals.
  - All living things need water.

#### **Driving question 2**

What is the relationship between the needs of different animals and the places they live?

##### Concepts

- Systems in the natural and designed world have parts that work together.
- Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do.

##### Practices

- Observe that systems in the natural and designed world have parts that work together.
- Use a model to represent the relationships between the needs of different animals and the places they live in the natural world. (Plants, animals, and their surroundings make up a system.)
  - Examples of relationships could include that deer eat buds and leaves and therefore usually live in forested areas.
  - Examples of models include diagrams, drawings, physical replica, dioramas, dramatizations, and storyboards.

**Driving question 3**

How can animals change their environment to meet their needs?

**Concepts**

- Systems in the natural and designed world have parts that work together.
- Animals can change their environments.
- Things that people do to live comfortably can affect the world around them. People can make choices that reduce their impact on the land, water, air, and other living things. *(The focus of this unit is on animals. Even though this particular concept is part of K-ESS2-2, it will not be addressed in this unit of study, but instead will be addressed in Unit 4, The Human Factor.)*

**Practices**

- Observe systems in the natural and designed world have parts that work together.
- Construct an argument with evidence to support a claim.
- Construct an argument with evidence to support a claim for how animals can change their environment to meet their needs. Examples of animals changing their environment could include a squirrel digging into the ground to hide its food.

*Integration of content, practices, and crosscutting concepts*

In this unit of study, students develop an understanding of what animals need to survive and the relationship between their needs and where they live. Throughout this unit, students collect and analyze data, look for patterns, develop and use system models, and engage in argument from evidence.

In this unit's progression of learning, students first learn that scientists look for patterns and order when making observations about the world and that patterns in the natural world can be observed and used as evidence. Students conduct firsthand and media-based observations of a variety of animals and use their observations as evidence to support the concepts that all animals need food in order to live and grow, that they obtain their food from plants or from other animals, that different kinds of food are needed by different kinds of animals, and that all animals need water.

After determining what animals need to survive, kindergarteners learn that animals are systems that have parts, or structures, that work together, enabling animals to meet their needs in a variety of environments. Many animals have similar structures, such as mouths or mouthparts, eyes, legs, wings, or fins, but the structures may look different, depending on the type or species of animal. Although there are many types of animals, their structures function in similar ways, allowing them to obtain the water and food they need to survive. In other words, each type of animal has structures that are well-suited to the environment in which they live. As students learn about different types of animals and the environments in which they live, they use models, such as diagrams, drawings, physical replicas, or dioramas, to represent the relationships between the needs of animals and the places they live in the natural world. For example, deer eat buds and leaves; therefore, they usually live in forested areas; pelicans eat fish, therefore they live near the shorelines of oceans or seas.

The final portion of the learning progression focuses on the understanding that animals are a system with parts, or structures, that work together. Students use what they have learned about animals to make further observations to determine ways in which animals change their environment to meet their needs. For example, a squirrel digs in the ground to hide food, and birds collect small twigs to build nests in trees. Students need opportunities to make observations, and then, with adult guidance, to use their observations as evidence to support a claim for how an animal can change its environment to meet its needs.

### Integration of DCI from other units within this grade level

In Unit 2, Plants, student learning included the same disciplinary core ideas as in this unit, with the focus on plants.

### Integration of English language arts and mathematics

#### *English language arts*

Kindergarteners will make connections to the CCSS for English Language Arts when using trade books (read-alouds and big books) to learn about animals. With prompting and support strategies, such as Think-Pair-Share, students can discuss what they have learned and read and answer questions using key details from text.

As students learn about different types of animals and the environments in which they live, they will use models, such as diagrams, drawings, physical replicas, or dioramas, to represent the relationships between the needs of animals and the places they live in the natural world. This gives students an opportunity to use simple informative writing to provide additional detail that will enhance their visual displays.

#### *Mathematics*

During this unit of study, students will make connections to the CCSS for mathematics by learning to use simple measurements to describe various attributes of animals. Kindergarteners can use simple, nonstandard units to measure such attributes as height, length, or weight. They can also count numbers of appendages or other body parts. They might use Unifix cubes to measure height or length and wooden blocks to measure weight. Students should work in groups to measure and record their data.

With adult guidance and questioning, students can then learn to analyze their data. As they use data to compare various attributes of animals, students are given the opportunity to reason abstractly and quantitatively. In addition, their data can be used as evidence for making claims about animals and the environments in which they live. Students should also have opportunities to solve one-step addition/subtraction word problems based on their collected data.

#### ***Future Learning***

The following disciplinary core ideas are future learning related to the concepts in this unit of study.

In Grade 1, students will know that:

- All organisms (animals) have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water, and air.

In Grade 2, students will know that:

- Plants depend on animals for pollination or to move their seeds around.

In Grade 3, students will know that:

- When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die.
- Sometimes the differences in characteristics among individuals of the same species provide advantages in surviving, finding mates, and reproducing.

In Grade 4, students will know that:

- Living things affect the physical characteristics of their regions.

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In Grade 5, students will know that:

- Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion.
- The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (plants or their parts and animals) and therefore operate as *decomposers*. Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem.
- Earth’s major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth’s surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.

## Number of Instructional Days

*Recommended number of instructional days: 14 (1 day = approximately 20-30 minutes)*

**Note**—The recommended number of days is an estimate based on the information available at this time. Teachers are strongly encouraged to review the entire unit of study carefully and collaboratively to determine whether adjustments to this estimate need to be made.