

# Unit 5 Organisms and Change in Environments

**Unit Summary:** In this unit of study, students develop an understanding of the idea that when the environment changes, some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die. Students also develop an understanding of the types of organisms that lived long ago and also about the nature of their environments. Students develop an understanding of the idea that when the environment changes, some organisms survive and reproduce, some move to new locations, some move into the transformed environment, and some die.

Key vocabulary may include but are not limited to: Animal groups, Members, Survival (e.g. obtaining food, defense, response to environmental change), Cause and Effect, Organisms (characteristics, needs), Habitat, Survival (well - less well - not at all), Environments, Fossils, Extinct, Scale (time), Environmental change (e.g. water, temperature, food, etc.), Organisms (plants and animals), Ecosystem, Design solution

## Stage 1 – Desired Results (Also see Disciplinary Core Ideas below)

**Performance Expectations: (PE)** (Established Goals / Content Standards)

**3-LS2-1: Construct an argument that some animals form groups that help members survive.**

**3-LS4-3: Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.** Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.

**3-LS4-1: Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.** Clarification Statement: Examples of data could include type, size, and distribution of fossil organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms. Assessment Boundary: Assessment does not include identification of specific fossils or present plants and animals. Assessment is limited to major fossil types and relative ages.

**3-LS4-4: Make a claim about the merits of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.** Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms. Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p><b>Engaging in Argument from Evidence</b> Construct an argument with evidence, data, and/or a model. (3-LS2-1)</p> <p>Construct an argument with evidence. (3-LS4-3)</p> <p><b>Analyzing and Interpreting Data</b> Analyze and interpret data to make sense of phenomena using logical</p>	<p><b>LS2.D: Social Interactions and Group Behavior</b> Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size (Note: Moved from K–2). (3-LS2-1) LS4.C:</p>	<p><b>Cause and Effect</b> Cause and effect relationships are routinely identified and used to explain change. (3-LS2-1),(3-LS4-3)</p> <p><b>Scale, Proportion, and Quantity</b> Observable phenomena exist from very short to very long time periods. (3-LS4-1)</p>

reasoning. (3-LS4-1) Engaging in Argument from Evidence

Make a claim about the merits of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4)

### **Asking Questions and Defining Problems**

Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1)

### **Adaptation**

For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.

(3-LS4-3)

### **LS4.A: Evidence of Common Ancestry and Diversity**

Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (3-LS4-1)

Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1)

### **LS4.D: Biodiversity and Humans**

Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4) LS2.C:

### **Ecosystem Dynamics, Functioning, and Resilience**

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. (secondary to 3-LS4-4) ETS1.A:

### **Defining and Delimiting Engineering Problems**

Possible solutions to a problem are limited by the available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets

### **Systems and System Models**

A system can be described in terms of its components and their interactions. (3-LS4-4)

	the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1)	
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<p><b>Enduring Understandings</b> (1-3 max) Students will understand that:</p> <p>For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all.</p> <p>Organisms and their habitat make up a system in which the parts depend on each other.</p> <p>Observable phenomena exist from very short to very long periods of time.</p> <p>Fossils provide evidence about the types of organisms that lived long ago, and also about the nature of their environments.</p>	<p><b>Essential Questions</b> (1-2 EQ per EU)</p> <p>How do organisms live, grow, respond to their environment and reproduce?</p> <p>How do the structures of organisms enable life's functions?</p> <p>How do organisms interact with the living and nonliving environments to obtain matter and energy?</p> <p>What happens to ecosystems when the environment changes?</p> <p>How do organisms grow and develop?</p>
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<b>Stage 2 – Model Assessment</b>
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<p><b>Summative Performance Task:</b></p> <p><b>Astronaut in Training</b> In the Mystery, students examine how physical traits can be influenced by the environment. In the activity, students analyze how a NASA astronaut's traits changed during his "year in space," then they predict how their own traits might change after living in space. In this activity, students measure some of their physical traits (arm strength, height, and balance) and learn how spending time in the environment of outer space can change those characteristics. <a href="https://mysteryscience.com/animals/mystery-8/traits-environment/267?r=47229275">https://mysteryscience.com/animals/mystery-8/traits-environment/267?r=47229275</a></p> <p><b>Possible Assessment Rubric</b> Student Self-Reflection Rubric <a href="https://www.exemplars.com/assets/files/seed.pdf">https://www.exemplars.com/assets/files/seed.pdf</a></p>	<p><b>Formative Evidence:</b></p> <p><a href="#">Unit Test</a></p> <p><a href="#">Video, Formative Discussion Questions, Attached Quiz</a></p> <p><b>Newsela Articles on Change in Environment with Quiz</b> <a href="https://newsela.com/read/govt-EPA-climate-alaska/id/28471/quiz/0/">https://newsela.com/read/govt-EPA-climate-alaska/id/28471/quiz/0/</a> <a href="https://newsela.com/read/govt-EPA-climate-great-plains/id/28422/">https://newsela.com/read/govt-EPA-climate-great-plains/id/28422/</a> <a href="https://newsela.com/read/govt-EPA-climate-hawaii-islands/id/28408/">https://newsela.com/read/govt-EPA-climate-hawaii-islands/id/28408/</a></p> <p><b>Mystery Science Assessments</b> <a href="https://mysteryscience.com/animals/animal-survival-heredity/assessments">https://mysteryscience.com/animals/animal-survival-heredity/assessments</a> <a href="https://mysteryscience.com/flowers/plant-life-cycle-heredity">https://mysteryscience.com/flowers/plant-life-cycle-heredity</a></p>
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## Stage 3 – Learning Plan and Resources

### Suggested Resources for Planning:

Mystery Science - [www.mysteryscience.com](http://www.mysteryscience.com)

Newsela - [www.newsela.com](http://www.newsela.com)

Better Lesson (free internet resource)-

[https://betterlesson.com/browse/common\\_core/standard/2126/ngss-3-Is4-3-construct-an-argument-with-evidence-that-in-a-particular-habitat-some-organisms-can-survive-well-some-survive-less](https://betterlesson.com/browse/common_core/standard/2126/ngss-3-Is4-3-construct-an-argument-with-evidence-that-in-a-particular-habitat-some-organisms-can-survive-well-some-survive-less)

[Anchor Charts, Videos, Activities](#)

### Learning Activities:

#### Bug Off!

In this activity, students figure out how to help a town deal with an abundance of mosquitoes resulting from a very rainy summer. Students draw and write about their solution of what the town can build or do to solve the problem.

<https://mysteryscience.com/animals/mystery-7/habitat-change-engineering/266?r=47229275>

#### How Can We Help Endangered Species?

Students will engage in a preliminary investigation of how people can help animals that are not adapting well to environmental changes, such as habitat loss.

<http://betterlesson.com/lesson/638380/engage-how-can-we-help-endangered-species>

#### Presenting a Persuasive Argument - Children Can Change the World

Students will present their ideas about how to solve an environmental problem involving natural resource use and loss of gorilla habitat.

<http://betterlesson.com/lesson/638108/presenting-a-persuasive-argument-children-can-change-the-world>

#### Fossil Webquest

Working in collaborative groups, students engage in an interactive research about fossils.

<http://betterlesson.com/lesson/638575/fossil-webquest>

#### How Fossil Records Add to Our Understanding

In this two day lesson, students identify and illustrate how fossil records are used.

<http://betterlesson.com/lesson/638809/how-fossil-records-add-to-our-understanding-day-1>

<http://betterlesson.com/lesson/638823/how-fossil-records-add-to-our-understanding-day-2-biodiversity>

#### Fossil Formation

Students will learn about how fossils are formed and why they are important.

[http://www.crsceience.org/lessonplans/2-Fossil\\_Formation-Alice\\_Mel\\_11-12.pdf](http://www.crsceience.org/lessonplans/2-Fossil_Formation-Alice_Mel_11-12.pdf)

#### Discovering Fossils

This activity allows students to explore the process used by paleontologists — scientists who study fossils to understand ancient landscapes, climate, and life on Earth — to find and identify fossils.

<http://www.earthsciweek.org/classroom-activities/discovering-fossils>

#### Where Can You Find Whales in the Desert?

In this activity, students use paper to create a model fossil dig. They identify traits of fossils to determine what the habitat looked like when these organisms were alive. Then they use this information to figure out where some Mystery Fossils belong in their fossil dig.

<https://mysteryscience.com/animals/mystery-1/habitats-fossils-environments-over-time/379?r=47229275>

### **Guess What these Animals Eat**

In this visual activity, students examine a printout that shows skulls of both familiar animals and dinosaurs. Questions prompt students to examine each animal's teeth to figure out what each animal eats.

<https://mysteryscience.com/animals/mystery-2/structures-adaptations-fossil-evidence-classification/32?r=47229275>

### **Can You Outrun a Dinosaur?**

In this Mystery, students will learn how a dinosaur's footprints reveal how quickly a dinosaur was running.

<https://mysteryscience.com/animals/mystery-3/fossil-evidence-behavior/24?r=47229275>

**Suggested Methods:** (The following methods anchor learning with a purpose, mitigating the “why do I need to know this” questions.)

- Phenomena based learning
- Problem Based Learning (PBL)
- Inquiry Based Learning
- Case studies
- Engaging in Argument w/ evidence