SUSTAINABILITY
Habitats—Local and Far Away
**STEM Road Map Module Title**
Habitats – Local and Far Away

**STEM Road Map Theme**
Sustainable Systems

**Grade Level**
First Grade

**Authors**
Andrea R. Milner, Vanessa B. Morrison, Janet B. Walton, Carla C. Johnson, & Erin E. Peters-Burton

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**Acknowledgements**
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See https://www.routledge.com/products/9781138804234 for more information about *STEM Road Map: A Framework for Integrated STEM Education*. 
STEM Road Map Curriculum Module Overview

STEM Road Map Module Theme and Grade Level: Sustainable Systems - First Grade

STEM Road Map Module Topic: Habitats – Near and Far: Local and Global and Endangered Species
Lead discipline – Social Studies

Module Summary

In this module, students will explore animal habitats locally and globally. They will be challenged to act as explorers to become experts on an animal species, taking into account the species’ habitat and how humans can impact this habitat (adapted from Koehler, Bloom, & Milner, 2015; see https://www.routledge.com/products/9781138804234).

Established Goals/Objectives
The goal of this module is for students to understand and demonstrate their knowledge about sustainable systems and the wonders of life in places near and far by comparing and contrasting various habitats (local and global) and endangered species. At the conclusion of this module, students will be able to:

- Understand that there are various habitats (local and global)
- Identify various endangered species.
- Identify various habitats (local and global).
- Determine how various habitats (local and global) sustain animals, plants, and people.
- Explain/discuss/express concepts through the development of a Super Species Guide, describing an animal’s habitat’s characteristics as they relate to weather, climate, and how humans and other factors may influence this habitat and contribute to their vitality. (ELA)
- Chart, graph, identify, describe and analyze patterns of your local weather to make connections among weather, climate, habitat, and endangered species. (MATHEMATICS)

Challenge and/or Problem for Students to Solve
In this challenge, students will act as explorers as they investigate animals around the world during a zoo trip. Students will work in teams to become “experts” on their assigned animals and will create a Super Species Guide and a model of their animal and its habitat to present to peers.
### Content Standards Addressed in STEM Road Map Module

<table>
<thead>
<tr>
<th>Next Generation Science Standards</th>
<th>Common Core Mathematics</th>
<th>Common Core English/Language Arts (ELA)</th>
<th>National Association for the Education of Young Children (NAEYC) Developmentally Appropriate Practice</th>
</tr>
</thead>
</table>
| 1-LS1-1 Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs. | **CCSS Math Practices**  
MP1 Make sense of problems and persevere in solving them.  
MP2 Reason abstractly and quantitatively.  
MP3 Construct viable arguments and critique the reasoning of others.  
MP4 Model with mathematics.  
MP5 Use appropriate tools strategically.  
MP6 Attend to precision.  
MP7 Look for and make use of structure.  
MP8 Look for and express regularity in repeated reasoning. | **Reading Standards**  
RI.1.1 Ask and answer questions about key details in a text.  
RI.1.2 Identify the main topic and retell key details of a text.  
RI.1.3 Describe the connection between two individuals, events, ideas, or pieces of information in a text.  
RI.1.7 Use the illustrations and details in a text to describe its key ideas. | 2.E.1 Arrange firsthand, meaningful experiences that are intellectually and creatively stimulating, invite exploration and investigation, and engage children’s active, sustained involvement by providing a rich variety of material, challenges, and ideas. |
| 1-LS1-2 Read texts and use media to determine patterns in behavior of parents and offspring that | **Math Content**  
CCSS.Math.Content.1.NBT.B.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of | **Writing Standards**  
W.1.2 Write informative/explanatory texts in which they name a topic, supply some facts about the | 2.F.3 Extend the range of children’s interests and the scope of their thought, present novel |

1. **LS**: Learning Standards
<table>
<thead>
<tr>
<th>Next Generation Science Standards</th>
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<tbody>
<tr>
<td>help offspring survive.</td>
<td>comparisons with the symbols &gt;, =, and &lt;.</td>
<td>topic, and provide some sense of closure.</td>
<td>experiences and introduce stimulating ideas, problems, experiences, or hypotheses.</td>
</tr>
<tr>
<td>CCSS.Math.Content.1.NBT.C.5</td>
<td>Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.</td>
<td>W.1.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers.</td>
<td></td>
</tr>
<tr>
<td>CCSS.Math.Content.1.NBT.C.6</td>
<td>Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.</td>
<td>W.1.7 Participate in shared research and writing.</td>
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<tr>
<td></td>
<td></td>
<td>W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.</td>
<td></td>
</tr>
<tr>
<td>Speaking and Listening Standards</td>
<td>SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.</td>
<td>2.F.6 Enhance children’s conceptual understanding through various strategies, including intensive interview and conversation, encourage children to</td>
<td></td>
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<tr>
<td>SL.1.1.A Follow agreed-upon rules for discussions.</td>
<td>SL.1.1.B Build on others' talk in conversations by responding to the comments of others through multiple exchanges.</td>
<td>SL.1.1.C Ask questions to clear up any confusion about the topics and texts under discussion.</td>
<td>reflect on and “revisit” their experiences.</td>
</tr>
<tr>
<td>SL.1.3 Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.</td>
<td>SL.1.5 Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.</td>
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</tr>
<tr>
<td>CCSS.Math.Content.1.MD.C.4 Organize, represent, and interpret data with up to three categories.</td>
<td></td>
<td></td>
<td>2.G.2 Scaffolding takes on a variety of forms.</td>
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<tr>
<td>categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.</td>
<td>CCSS.Math.Content.1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.</td>
<td>2.J.1 Incorporate a wide variety of experiences, materials and equipment, and teaching strategies to accommodate the range of children’s individual differences in development, skills and abilities, prior experiences, needs, and interests.</td>
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<td></td>
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<td>3.A.1 Teachers consider what children should know, understand, and be able to do across the domains.</td>
<td></td>
</tr>
<tr>
<td>21st Century Skills</td>
<td>Learning Skills &amp; Technology Tools (from P21 framework)</td>
<td>Teaching Strategies</td>
<td>Evidence of Success</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------------------------------------</td>
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</tr>
<tr>
<td>Interdisciplinary themes</td>
<td>Economic, Business, and Entrepreneurial Literacy Health Literacy Environmental Literacy</td>
<td>Teachers will provide students with the opportunity to investigate sustainable systems, various habitats (local and global), and endangered species, in the context of the business, economics and industry of everyday life (e.g. logging, hunting, agricultural, etc.).</td>
<td>Students will communicate their prior experiences with sustainable systems, various habitats (local and global), and endangered species in the context of everyday life (e.g. logging, hunting, agricultural, etc.) during this module.</td>
</tr>
<tr>
<td>Learning and innovation skills</td>
<td>Creativity and Innovation Critical Thinking and Problem Solving Communication and Collaboration</td>
<td>Creativity and innovation will be facilitated through the development of a Super Species Guide. Communication and collaboration will be facilitated through partner and team work.</td>
<td>Students will demonstrate creativity and innovation, critical thinking and problem solving, communication, and collaboration as they develop a Super Species Guide.</td>
</tr>
<tr>
<td>Information, media and technology skills</td>
<td>Information Literacy Media Literacy Information Communication and Technology Literacy</td>
<td>Teachers will engage students in guided practice and scaffolding strategies through the use of developmentally appropriate books, videos, and websites to advance their knowledge.</td>
<td>Students will acquire and use deeper content knowledge as they develop a Super Species Guide.</td>
</tr>
<tr>
<td>21st Century Skills</td>
<td>Learning Skills &amp; Technology Tools (from P21 framework)</td>
<td>Teaching Strategies</td>
<td>Evidence of Success</td>
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</tr>
<tr>
<td>Life and career skills</td>
<td>Flexibility and Adaptability Initiative and Self-Direction Social and Cross Cultural Skills Productivity and Accountability Leadership and Responsibility</td>
<td>Teachers will facilitate student collaborative team work to foster their life and career skills.</td>
<td>Throughout this module, student teams will collaborate to develop models to demonstrate how humans experience and interact with sustainable systems, various habitats (local and global), and endangered species.</td>
</tr>
</tbody>
</table>
### Key Vocabulary for the Module

<table>
<thead>
<tr>
<th>Key Vocabulary</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptation</td>
<td>Adaptations are features that people, plants, and animals possess that help them to live in their habitats.</td>
</tr>
<tr>
<td>Behavioral Adaptations</td>
<td>Behavioral adaptations are the ways plants and animals behave in order to live in an environment.</td>
</tr>
<tr>
<td>Climate</td>
<td>Climate is the weather conditions in an area over an extended period of time.</td>
</tr>
<tr>
<td>Conservation</td>
<td>Conservation is to restore or protect something, such as a plant or animal, in the natural environment.</td>
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<tr>
<td>Continent</td>
<td>A continent is any continuous land mass on earth (Africa, Antarctica, Asia, Australia, Europe, North America, and South America).</td>
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<td>Endangered species</td>
<td>An endangered species is a plant or animal that is at risk of becoming extinct.</td>
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<tr>
<td>Extinct</td>
<td>A species is extinct is when there is no longer a type of plant or animal left on earth.</td>
</tr>
<tr>
<td>Habitat</td>
<td>A habitat is a place in nature where plants, animals, and people grow and live.</td>
</tr>
<tr>
<td>Physical Adaptations</td>
<td>Physical adaptations are features that help a plant or animal better live in an environment.</td>
</tr>
<tr>
<td>Predator</td>
<td>A predator is an animal that hunts another animal for food.</td>
</tr>
<tr>
<td>Prey</td>
<td>A prey is an animal that is hunted by another animal for food.</td>
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<tr>
<td>Weather</td>
<td>Weather is the daily conditions over a particular area that includes temperature, precipitation, cloud cover, and air pressure.</td>
</tr>
</tbody>
</table>
Launch

Launch the module by telling students that they will act as explorers in this module. They will explore animals around the world, with a focus on those whose survival as a species is threatened. Hold a class discussion about endangered species and their habitats, asking students questions such as:

- What are endangered species?
- Are there different types of endangered species?
- Where and when have you seen endangered species?
- What are habitats?
- Are there different types of habitats?
- (If they say yes) What kinds of habitats are there?
- How are habitats formed?
- Where and when have you seen various habitats?
- Can we make habitats?

Before showing the video, ask students to guess what type of animals will be on the video about the top 10 endangered species.

Show the Video: “Top 10 Most Endangered Species”
[https://www.youtube.com/watch?v=fm8qTACshos](https://www.youtube.com/watch?v=fm8qTACshos)  (This video is 2:41 minutes long).

Prerequisite Key Knowledge

<table>
<thead>
<tr>
<th>Prerequisite key knowledge</th>
<th>Application of knowledge</th>
<th>Differentiation for students needing knowledge</th>
</tr>
</thead>
</table>
| **NGSS**                    | Understanding cause and effect will enable students to determine how specific components in various habitats (local and global), endangered species, weather, climate, animals, plants, and people are interdependent. | Provide students with specific content via books, videos, songs, computer programs, and real-world experiences.  
Enable students to share their diverse knowledge and experiences as a whole class learning opportunity. |
<p>| Cause and effect            |                           |                                               |
| <strong>CCSS Math</strong>               | Having an understanding of number sense will enable students to Chart, graph, identify, describe and analyze patterns of your local weather to make connections among |                                               |
| Number sense                |                           |                                               |</p>
<table>
<thead>
<tr>
<th>Prerequisite key knowledge</th>
<th>Application of knowledge</th>
<th>Differentiation for students needing knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>weather, climate, habitat, and endangered species as well as sort, count, chart, and graph (e.g. amount and weight). Number sense will allow students to compare (&gt;=&lt;) daily tallies to draw conclusions.</td>
<td></td>
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</tbody>
</table>

**CCSS ELA**
- Visualizing
- Making Predictions
- Journaling in their STEM Notebook
- Question/Verbal Response

Students will pose and test a hypothesis and then confirm or reject their predictions. Through journaling and questioning/verbal response, students will share their thought processes as they engage in the development of a *Super Species Guide*.

**NAEYC**
- Group Discussion

Collaboration during group discussions will support the student teams as they use creativity and innovation, critical thinking and problem solving, communication, and collaboration in the development of a *Super Species Guide*.

### Desired Outcomes and Monitoring Success

<table>
<thead>
<tr>
<th>Desired Outcome</th>
<th>Evidence of Success in Achieving Identified Outcome</th>
<th>Other Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will understand and demonstrate their knowledge about sustainable systems and the wonders of life in places near and far by comparing and contrasting sustainable systems, various habitats (local and global),</td>
<td>Performance Tasks</td>
<td>Formative assessment will be the main source of evidence of success for the first grade module. This will include group discussions, observations, questioning, and STEM Notebooks.</td>
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<tr>
<td></td>
<td>Student teams will develop and present a <em>Super Species Guide</em>.</td>
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</table>
and endangered species through a transdisciplinary lens.

The summative assessment will be the successful development and presentation of a *Super Species Guide*.

Finally, each lesson plan has its own summative assessment.

**Assessment Plan**

<table>
<thead>
<tr>
<th>Major Group Products</th>
<th>Might Mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Super Species Guide</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Individual Products/Deliverables</th>
<th>STEM Notebook entries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mighty Mobile</td>
</tr>
<tr>
<td></td>
<td>Super Species Guide</td>
</tr>
<tr>
<td></td>
<td>Group participation</td>
</tr>
<tr>
<td></td>
<td>Summative assessments from each lesson</td>
</tr>
</tbody>
</table>

**Resources**

**School-based Individuals:** Classroom Teacher  
**Technology:** Developmentally appropriate videos, websites, and computer programs.  
**Community:** Guest Speakers (e.g. Scientist, Ecologist, Climatologist, etc.)  
**Materials:** Materials lists are provided at the start of each lesson.
### STEM Road Map Module Timeline

#### STEM Road Map Module Schedule Week One

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson 1</strong>&lt;br&gt;<strong>Habitats All Around Us</strong>&lt;br&gt;Introduce the concept of habitats and endangered species via discussion and a video.&lt;br&gt;Students participate in an interactive read aloud and the <em>Endearing Endangered Species</em> activity.&lt;br&gt;Students begin charting weather (to be continued daily throughout module).</td>
<td><strong>Lesson 1</strong>&lt;br&gt;<strong>Habitats All Around Us</strong>&lt;br&gt;Students explore habitats in the schoolyard and neighborhood in the <em>Neighborhood Explorers</em> activity.</td>
<td><strong>Lesson 1</strong>&lt;br&gt;<strong>Habitats All Around Us</strong>&lt;br&gt;Student teams present their findings from the <em>Neighborhood Explorers</em> activity.&lt;br&gt;Discuss how humans can help to ensure species’ survival and conduct interactive read aloud.&lt;br&gt;Introduce module challenge.</td>
<td><strong>Lesson 2</strong>&lt;br&gt;<em>Let’s Explore Our Local Endangered Species</em>&lt;br&gt;Introduce students to endangered species in the U.S. through a video and interactive read aloud about American bison.&lt;br&gt;Students begin <em>Mighty Mobile</em> activity.</td>
<td><strong>Lesson 2</strong>&lt;br&gt;<em>Let’s Explore Our Local Endangered Species</em>&lt;br&gt;Students complete and share <em>Mighty Mobiles</em>.&lt;br&gt;Introduce students to bats as a local endangered species and conduct interactive read aloud.&lt;br&gt;Have students paint and decorate bat boxes.</td>
</tr>
</tbody>
</table>
## STEM Road Map Module Schedule Week Two

<table>
<thead>
<tr>
<th>Day 6</th>
<th>Day 7</th>
<th>Day 8</th>
<th>Day 9</th>
<th>Day 10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lesson 2</strong></td>
<td><strong>Lesson 3</strong></td>
<td><strong>Lesson 3</strong></td>
<td><strong>Lesson 3</strong></td>
<td><strong>Lesson 3</strong></td>
</tr>
<tr>
<td><em>Let’s Explore Our Local Endangered Species</em></td>
<td><em>Habitats Around the World</em></td>
<td><em>Habitats Around the World</em></td>
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</tr>
<tr>
<td>Field trip to nature center or guest speaker from nature center.</td>
<td>Introduce world habitats to students. View webcam video of animals globally.</td>
<td>Zoo field trip. Students document findings in Super Species Guide.</td>
<td>Students prepare a habitat poster and animal model as they act as animal experts in the Animal Educators activity.</td>
<td>Students complete the Animal Educators materials and present to the class.</td>
</tr>
</tbody>
</table>
Lesson Plan #1
Sustainable Systems: Habitats Local and Global and Endangered Species – First Grade

Lesson Title
Habitats All Around Us

Lesson Summary
In this lesson, students will explore various habitats and endangered species. Students will understand that living things have five basic needs (air, water, food, shelter [habitat], and sunlight), and that when any one of those needs is impacted the species’ survival may be endangered.

Essential Question(s)
• What are habitats?
• What kinds of habitats are there?
• What are endangered species?

Established Goals/Objectives
At the conclusion of this lesson, students will be able to:
• Identify various endangered species (e.g. vocabulary words)
• Identify properties of various habitats (local and global)
• Chart, graph, identify, describe and analyze patterns of your local weather to make connections among weather, climate, habitat, and endangered species.

Time Required
3 days (90 minutes each)

Necessary Materials
• Computer and Internet for videos
  ▪ “Top 10 Most Endangered Species”
    https://www.youtube.com/watch?v=fm8qTACshos (This video is 2:41 minutes long).
  ▪ “Why do animals become endangered?”:
    https://www.youtube.com/watch?v=So62I2dJZyo (This video is 2:00 minutes long).
• Books
  ▪ Nature’s Patchwork Quilt: Understanding Habitats by Mary Miche.
  ▪ Will We Miss Them? by Alexandra Wright and Marshall Peck.
• STEM Notebooks for students – 1-inch 3-ring binders
• 3-hole punch
• Chart paper
• Markers
• World map and/or globe
• Index cards
• Binoculars (1 for 2 students)
• Magnifying glass (1 for 2 students)

<table>
<thead>
<tr>
<th>Standards Addressed in STEM Road Map Module Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Next Generation Science Standards</strong></td>
</tr>
<tr>
<td>1-LS1-2</td>
</tr>
</tbody>
</table>

**Common Core Mathematics**
MP1; MP2; MP3; MP4; MP5; MP6; CCSS.Math.Content.1.NBT.B.3;
CCSS.Math.Content.1.OA.A.1; CCSS.Math.Content.1.OA.A.2

**Common Core ELA**
RI.1.1; RI.1.2; RI.1.3; RI.1.7; W.1.2; W.1.6; W.1.7; W.1.8; SL1.1; SL1.1.A; SL1.1.B; SL.1.1.C;
SL.1.3; SL.1.5

**NAEYC**
2.E.1; 2.F.3; 2.F.6; 2.G.2; 2.J.1; 3.A.1

**21st Century Skills**
Interdisciplinary themes; Learning and innovation skills; Information, media and technology
skills; Life and career skills
### Key Vocabulary

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### Teacher Background Information

The STEM Notebook is an important part of this module. The notebook pages are attached at the end of the module. Note that the entry numbers may be discontinuous because this module has been shortened from a longer version in order to accommodate the summer program (for example, entries 4, 10, 11, etc. are missing).

Classroom charts will be used throughout the module to track student ideas. In particular, know, wonder, learned (KWL) charts are useful to track student learning and mirror the format of the STEM Notebook entries. These charts can consist of a page with the name of the topic as a header and three columns, labeled “know” (students’ prior knowledge), “wonder” (what students would like to learn and other questions they have), and “learned” (what information students gained from their activities in the lesson).

Students will track local weather conditions throughout the module. This activity is intended to help students to understand how weather conditions can affect local habitats. You may wish to prepare a weather chart or calendar for students to fill in daily throughout the module.

The following website (Earth’s Endangered Creatures) provides in depth information on endangered species and may be useful to you as you prepare for this lesson:

It is important to consistently utilize the key vocabulary words throughout this lesson to reinforce conceptual awareness of sustainable systems, various habitats (local and global), and endangered species.

Lesson Preparation

Assemble all materials for each day. Copy the STEM Notebook entries for each student as the notebooks will be used every day. Prepare the weather chart to be used daily throughout the module and KWL charts for use in this lesson. Prepare the index cards for the Endearing Endangered Species activity. Each group of four students should have 25 index cards labeled “food,” 25 index cards labeled “water,” and 25 index cards labeled “shelter/habitat,” 25 index cards labeled “air,” and 25 index cards labeled “sunlight.” You may wish to label the cards with images or symbols as well as words. Students will be outdoors for the Neighborhood Explorers activity (see Activity/Investigation). Check the weather and plan appropriately (sunscreen, hats, etc.)

Learning Plan Components

Introductory Activity/Engagement

Present students with their STEM Notebooks that they will use throughout the module.

Launch the module by telling students that they will act as explorers in this module. They will explore animals around the world, with a focus on the habitats where animals live. Introduce the concept that some species are in danger of becoming extinct. Hold a class discussion about endangered species and their habitats, asking students questions such as:

- What are endangered species?
- Are there different types of endangered species?
- Where and when have you seen endangered species?
- What are habitats?
- Are there different types of habitats?
- (If they say yes) What kinds of habitats are there?
- How are habitats formed?
- Where and when have you seen various habitats?
- Can we create habitats?
Next, show the video, “Top 10 Most Endangered Species” (https://www.youtube.com/watch?v=fm8qTACshos - 2:41 minutes). Before showing the video, ask students to guess what type of animals will be on the video about the top 10 endangered species. After the video, have students complete their first STEM Notebook Entry.

STEM Notebook Entry #1:
• Students will identify and draw two endangered species.

Have students share the species they drew with the class, sharing one thing they know about the species and one thing they wonder. Document student responses on a KWL chart.

Ask students to consider where they think endangered species live. Guide students to understand that endangered species are everywhere. There are species that are endangered right in the local community (you may wish to provide photos of several local endangered species; for example the Indiana bat) and all over the world.

Using a world map or globe, help students identify the seven continents (Africa, Antarctica, Asia, Australia, Europe, North America, and South America). Ask students what habitats (local and global) are associated with the different continents (e.g. deserts, rainforests, oceans, forests, plains, etc.). Have students identify what species may live in those habitats and whether they are endangered.

Discuss why certain locations provide ideal habitats for specific plants and animals (e.g. climate, food supply, etc.). Guide students to understand that climate is an important factor for species’ survival. Because of this, students will track the local weather conditions throughout this module to understand what the local climate is like and relate this to how species in the area are influenced by climate conditions. Each day of the module, chart, graph, identify, describe and analyze patterns of your local weather. For example, you may wish to have students track:
• warmer, colder, [>=<]
• descriptions of the weather (such as sunny, cloudy, rainy, and warm)
• numbers of sunny, windy, and rainy days in a month
• patterns - analysis could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months)
Activity/Investigation
Students will play an interactive game, Endearing Endangered Species, to explore the basic needs of species – air, water, food, sunlight, and shelter [habitat].

As an introduction to this activity and to habitats, conduct an interactive read aloud of Nature’s Patchwork Quilt: Understanding Habitats by Mary Miche. Students will complete a STEM Notebook Entry both before and after reading.

STEM Notebook Entry #2 (before reading):
• Students will document their “wonderings” about habitats in their STEM Notebooks before the interactive read aloud (with both words and pictures)

Conduct the interactive read aloud of Nature’s Patchwork Quilt: Understanding Habitats by Mary Miche:
• Allow students to share personal stories throughout the reading.
• Ask students to predict throughout the story.
• Allow students to add new ideas from the book to the chart and their STEM Notebooks.

STEM Notebook Entry #3 (after reading):
• Students will document their what they learned in their STEM Notebooks after the interactive read aloud (with both words and pictures)
• Document student responses on the KWL chart and post on classroom wall.

Endearing Endangered Species

STEM Notebook Entry #5:
As you prepare for the “Endearing Endangered Species” investigation, ask students:
What are the basic needs of all living things? (e.g. air, water, food, shelter [habitat], and sunlight)
• Students will document their ideas in their STEM Notebooks through words and pictures.

Group students in teams of four for the Endearing Endangered Species activity.

At each table, there will be 25 index cards labeled “food,” 25 index cards labeled “water,” and 25 index cards labeled “shelter/habitat,” 25 index cards labeled “air,” and 25 index cards labeled “sunlight.” These cards should be shuffled together.

Direct students to:
• Have a student from each team pull eight cards from the deck.
• If that student has cards that read “food,” “water,” “shelter/habitat,” “air” and “sunlight” they can remain standing. If they do not have a card with each label, they must sit (their basic needs have not been met so they are now endangered).
Put the cards that have been pulled into a separate pile **not** to be used again.
Have the second person from each table repeat.
Continue until there is only one person left standing at each table (when the card pile is depleted, have students reshuffle the cards to renew the draw pile).

After students have completed several rounds of the activity, ask students:

- What happens when all five basic needs are not met?
- Why is it important for all living things to have these basic needs met at all times?
- Why do some living things become extinct?

Students will record their ideas about the importance of the five basic needs in STEM Notebook Entry #6.

**STEM Notebook Entry #6:**
- Students will list the five basic needs of species and predict what will happen when those needs are not met (with both words and pictures).

**Neighborhood Explorers**
In this activity, students will explore the schoolyard and/or local neighborhood to identify animal habitats (these may be insect habitats, bird habitats, squirrel habitats, earthworm habitats etc.). Give each pair of students binoculars and a magnifying glass. Discuss why students might need these to see habitats. Review safety guidelines (don’t look at the sun through the binoculars, don’t concentrate the sun through the magnifying glass as this can create a great deal of heat and even fire).

Students should work in pairs to identify at least two habitats, draw a picture of that habitat and label the picture with how the animals’ five basic needs are met in that habitat. Each pair of students should present their drawings and habitats to the class.

**Can Humans Help?**
Ask students if there are things that humans can do to help ensure that species’ needs are met so they are not endangered. Create a list of student ideas before conducting the interactive read aloud of *Will We Miss Them?* by Alexandra Wright and Marshall Peck. Students will create STEM Notebook Entries before and after reading.

**STEM Notebook Entry #8 (before reading):**
- Students will document their “wonderings” about how humans can influence species’ habitats in their STEM Notebooks before the interactive read aloud (with both words and pictures).

Conduct the interactive read aloud of *Will We Miss Them?* by Alexandra Wright and Marshall Peck.
• Allow students to share personal stories throughout the reading.
• Ask students to predict throughout the story.
• Allow students to add new ideas from the book to the chart and their STEM Notebooks.

STEM Notebook Entry #9 (after reading):
• Students will document their what they learned in their STEM Notebooks after the interactive read aloud (with both words and pictures)

Introduce the challenge
Remind students that they are acting as explorers in this module. They will work in teams and become experts on an animal species. They will need to understand whether their species is endangered and, if so, why. This means that they will need to address some of the reasons that species become endangered. Ask students to share what they already know about this from the activities and reading s in this lesson. Create a class list. Next, show the video “Why do animals become endangered?": [https://www.youtube.com/watch?v=So62I2dJZyo](https://www.youtube.com/watch?v=So62I2dJZyo)  (This video is 2:00 minutes long). After the video, ask students to add to the list of why species might be endangered.

Assessment

Performance Tasks

Have students draw and label two pictures of endangered species. Student should use a minimum of two vocabulary words per picture.

Other Measures

Teacher observations.
STEM Notebook entries.
Participation in their teams during investigations.
See assessment rubric at the end of this module.

Internet Resources

• African Wild Dog: [https://www.youtube.com/watch?v=3xmAPxMKXSc](https://www.youtube.com/watch?v=3xmAPxMKXSc)
• Amazing Facts about the African Wild Dogs: [https://www.youtube.com/watch?v=CPLrvBydw4c](https://www.youtube.com/watch?v=CPLrvBydw4c)
• American Bison: [https://www.youtube.com/watch?v=1qOx1Ox6Zro](https://www.youtube.com/watch?v=1qOx1Ox6Zro)
• Animals on the ice: Beluga whale: [https://www.youtube.com/watch?v=TTeT1sG_A2I](https://www.youtube.com/watch?v=TTeT1sG_A2I)
• Antarctic blue whale voyage: [https://www.youtube.com/watch?v=4uRfKP79ciQ](https://www.youtube.com/watch?v=4uRfKP79ciQ)
• Babirusa Pigs: [https://www.youtube.com/watch?v=DdyfU1LU5Y](https://www.youtube.com/watch?v=DdyfU1LU5Y)
• Baby animals, a science lesson: [http://www.kidsdiscover.com/teacherresources/baby-animals-science-lesson/](http://www.kidsdiscover.com/teacherresources/baby-animals-science-lesson/)
• Differentiated Instruction: http://steinhardt.nyu.edu/scmsAdmin/uploads/005/120/Culturally%20Responsive%20Differentiated%20Instruction.pdf
• Diverse Learners: http://www.edutopia.org/blog/differentiated-instruction-ways-to-plan-john-mccarthy
• Earth’s Endangered Creatures: http://www.earthsendangered.com/index.asp
• Endangered Rainforest Animals: https://www.youtube.com/watch?v=iX7ai4_cmkA
• Endangered Species: http://www.kidsdiscover.com/spotlight/endangered-species/
• European Eel: https://www.youtube.com/watch?v=e9wg6TErkgI
• Habitats: Animal Atlas: https://www.youtube.com/watch?v=7Klscf43X4w
• Habitats: Habitat Game: http://www.scholastic.com/magicschoolbus/games/habitat/index.htm
• Habitat Instructional Video: https://www.youtube.com/watch?v=-MQLqalP1yo
• Happenin’ Habitats: http://happeninhabitats.pwnet.org/what_is_habitat/habitat_types.php
• Help save wildlife: http://www.worldanimalfoundation.net/wildlife.html
• I Got A Habitat: https://www.youtube.com/watch?v=H_CSIILuVZs
• National Zoological Parks: http://nationalzoo.si.edu/animals/webcams/
• Overview of endangered animals: http://www.bagheera.com/bagheera_tv.htm
• Point Arena Mountain Beaver: http://www.fws.gov/arcata/es/mammals/mtnBeaver/mtnbeaver.html
• Resources: http://www.fcps.edu/AldrinES/websites/HabitatWebsites.pdf
• San Diego Webcams: http://kids.sandiegozoo.org/animal-cams-videos
• Scaffolding Strategies: http://www.edutopia.org/blog/scaffolding-lessons-six-strategies-rebecca-alber
• United States Fish and Wildlife Service: http://www.eoearth.org/view/article/156779/
• Vanishing Grey Nurse Shark: https://www.youtube.com/watch?v=Ved4x17SnS0
• World Wildlife Foundation: https://support.worldwildlife.org/site/SPageServer?pagename=main_onetime_2014&s_src=AWE1200GDGA1&gclid=Clrh76bE6cQCFZKGAQod74IAGg

Books

Lesson Plan #2
Sustainable Systems: Habitats Local and Global and Endangered Species – First Grade

Lesson Title
Let’s Explore Our Local Endangered Species

Lesson Summary
In this lesson, students will explore endangered animal species in the U.S. and locally. Students will create mobiles of local endangered species and present these to the class. Students will begin to understand that humans can impact species’ survival both negatively and positively. In particular, students will consider how they can provide a remedy for the loss of habitat of a local endangered species, the Indiana bat. An optional field trip to a nature center or guest speaker is incorporated into this lesson.

Essential Question(s)
• What causes species to become endangered?
• What is the weather and climate like where we are?
• What types of animals and plants live where we are?

Established Goals/Objectives
At the conclusion of this lesson, students will be able to:
• Identify local endangered species.
• Determine how local species become endangered.
• Design and construct mobiles to illustrate local endangered species.
• Chart, graph, identify, describe and analyze patterns of your local weather to make connections among weather, climate, habitat, and endangered species.

Time Required
3 days (90 minutes each)

Necessary Materials
• Computer and Internet for videos:
  ▪ American Bison: https://www.youtube.com/watch?v=1qOx1Ox6Zro (This video is 1:00 minute long)
• Books:
  ▪ Habitat for Bats by Maureen Picard Robbins and Ed Myer
• STEM Notebooks for students
• Chart paper
• Markers
• U.S. map
• Paper plates (1 per group of 3-4 students)
• Yarn/String
• Hole punch (1 per group of 3-4 students)
• Images and facts about endangered species from http://www.in.gov/dnr/naturepreserve/files/np_wabash.pdf (option: students can conduct Internet search on their species and identify facts and pictures)
• Markers
• Glue
• Construction paper
• Scissors
• Bat houses – 1 per 4 students (http://www.amazon.com/Coveside-thick-Wooden-Mini-House/dp/B000KFW4FE/ref=sr_1_4?s=lawn-garden&ie=UTF8&qid=1464096005&sr=1-4&keywords=bat+box)
• Black exterior latex paint (half gallon)
• Dark brown exterior latex paint (half gallon)
• Various colors of craft paints (small bottles of acrylic paint found at craft stores)
• Medium and small paint brushes
• Optional: shoe box, construction paper, scissors, glue sticks or tape (How Many Indiana Bats Can Live in a Shoebox? activity)

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**Teacher Background Information**
In this lesson students will explore endangered species in the local area and in the U.S. The following resources may be useful to you:

Happenin’ Habitats:  
[http://happeninhabitats.pwnet.org/what_is_habitat/habitat_types.php](http://happeninhabitats.pwnet.org/what_is_habitat/habitat_types.php)

United States Fish and Wildlife Service:  

World Wildlife Foundation:  
[https://support.worldwildlife.org/site/SPageServer?pagename=main_onetime_2014&s_src=AWE1200GDGA1&gclid=CIrh76bE6cQCFZKGaQod74lAAGg](https://support.worldwildlife.org/site/SPageServer?pagename=main_onetime_2014&s_src=AWE1200GDGA1&gclid=CIrh76bE6cQCFZKGaQod74lAAGg)

U.S. Fish and Wildlife Service, Indiana endangered species:  
In this lesson you will introduce to students the Indiana bat as a local endangered species (see Extend/Apply section). These bats hibernate in caves and their habitat has been disrupted because of human disturbance to these caves. Additionally, pesticides and other contaminants threaten the bats’ existence, and white-nose disease has further depleted their numbers (see http://www.fws.gov/midwest/Endangered/mammals/inba/index.html). Students will prepare bat boxes to be placed as alternative hibernation spots for the bats (see Extend/Apply for more details).

It is important to consistently utilize the key vocabulary words throughout this lesson to reinforce conceptual awareness of sustainable systems, various habitats (local and global), and endangered species.

**Lesson Preparation**
Assemble all materials for each day. Have the student STEM Notebook entries copied for each student as the STEM Notebooks will be used every day. Prepare materials for the Mighty Mobile activity. If students do not have Internet access, print out a picture and some facts about each of the local endangered species from http://www.in.gov/dnr/naturepreserve/files/np_wabash.pdf (see Activity/Investigation for more details). For the A Home for Bats activity (see Extend/Apply section), you will need to decide whether you and your class will hang the boxes (this will require advance permission, tools, and identifying a specific location – see Extend/Apply for more details) or if you will donate them to a local nature center to hang in an appropriate place. The bat box donation could be done in conjunction with a field trip to a nature center or a visit from a nature center representative.
Learning Plan Components

Introductory Activity/Engagement

*Each day of the lesson, chart, graph, identify, describe and analyze patterns of your local weather to make connections among weather, climate, habitat, and endangered species:*

- warmer, colder, [>=<]
- descriptions of the weather (such as sunny, cloudy, rainy, and warm)
- numbers of sunny, windy, and rainy days in a month
- pattern analysis could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months

Introduce the lesson by telling students that often when we think of endangered species we think of animals in Africa and other far away places. In fact, however, there are many endangered species here in the U.S. and even locally. Show students the image of the American bison attached at the end of this lesson. Ask students to identify the animal. Tell students that the American bison was near extinction about 100 years ago, but that people have done things to help save the bison population. Have students complete STEM Notebook Entries before and after watching the video and reading the book below.

STEM Notebook Entry #12 (before video and book):

- Students will document their “wonderings” about bison in their STEM Notebooks before the video AND the interactive read aloud (with both words and pictures)

Show the Video: North America: American Bison:  
https://www.youtube.com/watch?v=1qOx1Ox6Zro (This video is 1:00 minute long)

Conduct an interactive read aloud North America: *The Buffalo are Back* by Jean Craighead George

- Allow students to share personal stories throughout the reading.
- Ask students to predict throughout the story.
- Allow students to add new ideas from the book to the chart and their STEM Notebooks.

STEM Notebook Entry #13 (after video and book):

- Students will document what they learned about bison in their STEM Notebooks after the video and the interactive read aloud (with both words and pictures)
- Teacher will document student responses on the KWL chart and post on classroom wall. (Keep up throughout module)
**Activity/Investigation**

**Mighty Mobile**

Students will work in teams of 3-4 to create mobiles featuring local endangered species. Use the list of endangered species in Wabash County, Indiana found at [http://www.in.gov/dnr/naturepreserve/files/np_wabash.pdf](http://www.in.gov/dnr/naturepreserve/files/np_wabash.pdf) to identify local endangered animal species. Choose enough species off the list so that all class members will have one species to work with. Ideally, student teams will each have one animal family with all members of the team investigating an animal from that family (i.e., one group has birds, one group has insects, etc.). Students will work in teams to conduct research on their assigned species and create their mobiles. If students do not have access to the Internet, you may wish to print out a picture and some basic facts about each species.

As you prepare for the Mighty Mobile investigation, hold a class discussion, asking students:

- Where are we located?
- What is the weather and climate like where we are?
- What types of animals and plants live where we are?
- What time of year is it? How can you tell?
- Are there any animals or plants that are endangered where we are?

Group students in teams of 3-4. Have each student choose one animal from the endangered species list to include on their team mobile (ideally each student team will be assigned an animal family). Students should complete STEM Notebook Entry #14 (see below) and use this information to create their mobiles.

**STEM Notebook Entry #14:**

1. Identify their local endangered species.
2. Identify the region where their endangered species lives.
3. Describe the habitat of the endangered species.
4. Describe why this species is endangered.
5. Describe what is being done to help the endangered species.

For the mobile, should attach a picture (drawn or printed) to a half sheet of construction paper. On the back of the paper they should include 2-3 facts about the species (i.e., why is it endangered, where it lives, what efforts are being made to ensure its survival, etc.).

The team should decorate a paper plate and include the animal family (birds, insects, etc.) that their species belong to.

Each student should attach the picture of their endangered species to one end of a string, and then attach the strings to a decorated paper plate to create their Mighty Mobile.
Have student teams present their Mighty Mobiles, introducing the animal family their team was assigned and allowing each team member to present their endangered species.

**Extend/Apply Knowledge**

You may wish to invite a guest speaker to talk to students about local endangered species. This may be a representative of a local nature center or zoo, or a biologist or ecologist. Have this visitor share information about a few local endangered animal species with students and discuss the efforts that are being made to increase the population of this species. As an alternative, you may wish to schedule a field trip to a local nature center. This can be done in conjunction with hanging or donating the bat boxes students decorate (see below).

**A Home for Bats**

Introduce to students the Indiana bat as a local endangered species. These bats hibernate in caves and their habitat has been disrupted because of human disturbance to these caves. Additionally, pesticides and other contaminants threaten the bats’ existence, and white-nose disease has further depleted their numbers (see http://www.fws.gov/midwest/Endangered/mammals/inba/index.html).

Conduct an interactive read aloud of *Habitat for Bats* by Maureen Picard Robbins. After reading the book, discuss bat habitats.

Tell students that Indiana bats will hibernate in bat boxes, small wooden boxes hung outdoors. Show the class an unfinished bat box. Explain that the boxes need to be a dark color because these colors absorb sunlight and keep the box warm. Have groups of 4 students each paint a bat box (black roof, black or brown exterior). Once the paint dries, have students decorate the boxes with acrylic paints, but remind them that most of the surface area of the box must remain a dark color, so their decorations should be somewhat small.

You may either take a field trip to hang the boxes (be aware that you will need a ladder, hammer, nails, etc.) or donate the boxes to a local nature center to hang in an appropriate place. To be effective at attracting bats, the bat boxes should be hung according to the following specifications:
- At least 10 feet off the ground
- In a South or Southeast facing orientation
- Where they receive at least 7 hours of sun
- Preferably within 1500 feet of a stream or pond
- Within 10-30 yards of a tree line

Assessment

Performance Tasks

Have students draw and label two pictures of a single local endangered species. Have students write two sentences about how local species become endangered. Students should use at least three vocabulary words.

Other Measures

Teacher observations.
STEM Notebook entries.
Participation in their teams during investigations.
See assessment rubric at the end of this module.

Internet Resources

- African Wild Dog: https://www.youtube.com/watch?v=3xmAPxMKXSc
- Amazing Facts about the African Wild Dogs: https://www.youtube.com/watch?v=CPLrvBydw4c
- American Bison: https://www.youtube.com/watch?v=1qOx1Ox6Zro
- Animals on the ice: Beluga whale: https://www.youtube.com/watch?v=TTeT1Sg_A2I
- Antarctic blue whale voyage: https://www.youtube.com/watch?v=4uRfKP79cIQ
- Babirusa Pigs: https://www.youtube.com/watch?v=DdyfULUS5Y
- Baby animals, a science lesson: http://www.kidsdiscover.com/teacherresources/baby-animals-science-lesson/
- Diverse Learners: http://www.edutopia.org/blog/differentiated-instruction-ways-to-plan-john-mccarthy
- Endangered Rainforest Animals: https://www.youtube.com/watch?v=iX7ai4_cmkJ
- European Eel: https://www.youtube.com/watch?v=e9wg6TERkfl
- Habitats: Animal Atlas: https://www.youtube.com/watch?v=7KIscaf43X4w
- Habitat Instructional Video: https://www.youtube.com/watch?v=-MQLqalP1yo
- Happenin’ Habitats: http://happeninhabitats.pwnet.org/what_is_habitat/habitat_types.php
- Help save wildlife: http://www.worldanimalfoundation.net/wildlife.html
- I Got A Habitat: https://www.youtube.com/watch?v=H_CSIlLIVZs
• National Zoological Parks: http://nationalzoo.si.edu/animals/webcams/
• Overview of endangered animals: http://www.bagheera.com/bagheera_tv.htm
• Point Arena Mountain Beaver: http://www.fws.gov/arcata/es/mammals/mtnBeaver/mtnbeaver.html
• Resources: http://www.fcps.edu/AldrinES/websites/HabitatWebsites.pdf
• San Diego Webcams: http://kids.sandiegozoo.org/animal-cams-videos
• Scaffolding Strategies: http://www.edutopia.org/blog/scaffolding-lessons-six-strategies-rebecca-alber
• United States Fish and Wildlife Service: http://www.eoearth.org/view/article/156779/
• Vanishing Grey Nurse Shark: https://www.youtube.com/watch?v=Ved4x17SnS0
• World Wildlife Foundation: https://support.worldwildlife.org/site/SPageServer?pagename=main_onetime_2014&s_src=AWE1200GDGA1&gclid=C1rh76b6cQCFZKGaQod74IAGg
• Indiana bat information: http://www.fws.gov/midwest/Endangered/mammals/inba/index.html)
• Choosing a bat box location: http://www.batmanagement.com/Batcentral/batboxes/choosingsite.html

Books

• Robbins, M. C. & Myers, E. (2011) *Habitat for Bats*.
American bison
Lesson Plan #3
Sustainable Systems: Habitats Local and Global and Endangered Species – First Grade

Lesson Title
*Habitats Around the World*

Lesson Summary
In this lesson, students will explore animal species from other parts of the world. A zoo field trip is incorporated into this lesson as an opportunity for students to conduct research and observe animals, becoming animal “experts” and sharing their new knowledge with the class.

Essential Question(s)
- How can we describe an animal that lives far away from us?
- How do humans impact a species’ survival?

Established Goals/Objectives
At the conclusion of this lesson, students will be able to:
- Identify animal species from other parts of the world.
- Identify and discuss features of the animal’s habitat.
- Identify and discuss sources of food for the animal.
- Chart, graph, identify, describe and analyze patterns of your local weather.

Time Required
4 days (90 minutes each)

Necessary Materials
- Computer and Internet for videos
- Books:
  - *I See a Kookaburra! Discovering Animal Habitats Around the World* by Steve Jenkins and Robin Page
- STEM Notebooks
- Clipboards – 1 per student
- Chart paper
- Markers
- Map and/or globe
- Poster board (1 piece per 4 students)
- Clay
- Craft paint
- Paint brushes
- Markers
- Construction paper
- Scissors
- Glue sticks
Standards Addressed in STEM Road Map Module Lesson

Next Generation Science Standards
1-LS1-1; 1-LS1-2

Common Core Mathematics
MP1; MP2; MP3; MP4; MP5; MP6; CCSS.Math.Content.1.NBT.B.3; CCSS.Math.Content.1.NBT.C.5; CCSS.Math.Content.1.NBT.C.6; CCSS.Math.Content.1.MD.C.4; CCSS.Math.Content.1.OA.A.1; CCSS.Math.Content.1.OA.A.2

Common Core ELA
RI.1.1; RI.1.2; RI.1.3; RI.1.7; W.1.2; W.1.6; W.1.7; W.1.8; SL1.1; SL1.1.A; SL1.1.B; SL.1.1.C; SL.1.3; SL.1.5

NAEYC
2.E.1; 2.F.3; 2.F.6; 2.G.2; 2.J.1; 3.A.1

21st Century Skills
Interdisciplinary themes; Learning and innovation skills; Information, media and technology skills; Life and career skills

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<thead>
<tr>
<th>Key Vocabulary</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptation</td>
<td>Adaptations are features that people, plants, and animals possess that help them to live in their habitats.</td>
</tr>
<tr>
<td>Behavioral Adaptations</td>
<td>Behavioral adaptations are the ways plants and animals behave in order to live in an environment.</td>
</tr>
<tr>
<td>Climate</td>
<td>Climate is the weather conditions in an area over an extended period of time.</td>
</tr>
<tr>
<td>Conservation</td>
<td>Conservation is to restore or protect something, such as a plants or animals, in the natural environment.</td>
</tr>
<tr>
<td>Continent</td>
<td>A continent is any continuous land mass on earth (Africa, Antarctica, Asia, Australia, Europe, North America, and South America).</td>
</tr>
<tr>
<td>Endangered species</td>
<td>An endangered species is a plant or animal that is at risk of becoming extinct.</td>
</tr>
<tr>
<td>Extinct</td>
<td>A species is extinct is when there is no longer a type of plant or animal left on earth.</td>
</tr>
<tr>
<td>Habitat</td>
<td>A habitat is a place in nature where plants, animals, and people grow and live.</td>
</tr>
</tbody>
</table>
Physical Adaptations

<table>
<thead>
<tr>
<th>Physical Adaptations</th>
<th>Physical adaptations are features that help a plant or animal better live in an environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predator</td>
<td>A predator is an animal that hunts another animal for food.</td>
</tr>
<tr>
<td>Prey</td>
<td>A prey is an animal that is hunted by another animal for food.</td>
</tr>
<tr>
<td>Weather</td>
<td>Weather is the daily conditions over a particular area that includes temperature, precipitation, cloud cover, and air pressure.</td>
</tr>
</tbody>
</table>

**Teacher Background Information**

In this lesson, students will investigate animal habitats around the world. Students will begin by investigating ocean, desert, forest, and plains habitats as a preparation for a zoo field trip. Information about the Indianapolis Zoo and exhibits can be found at [http://www.indianapoliszoo.com/plan-your-visit/animals-exhibits](http://www.indianapoliszoo.com/plan-your-visit/animals-exhibits). At the zoo, teams of 4 student explorers will be responsible for investigating an animal. Students will collect facts about this animal’s habitat, endangered species status, and food requirements. After the field trip, students will create a poster of their animal’s habitat and a model of their animal to share with the class.

**Lesson Preparation**

Assemble all materials for each day. Have the student STEM Notebook entries copied for each student as the STEM Notebooks will be used every day. A zoo field trip is incorporated as an activity for the second day of this lesson, so you should make appropriate preparations for this trip.
Learning Plan Components

Introductory Activity/Engagement

Continue to chart, graph, identify, describe and analyze patterns of your local weather each day of the lesson:

- warmer, colder, [>=<]
- descriptions of the weather (such as sunny, cloudy, rainy, and warm)
- numbers of sunny, windy, and rainy days in a month
- pattern analysis could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months)

Tell students that in this lesson they will be studying animals in other parts of the world. Ask students to share ideas about how they might be able to view animals that live on different continents. Tell students that webcams are one way of seeing animals in places that are too far for us to travel to. As a class, explore animals on one of the following webcams:

Mangolink: Live animal cams and videos:  http://www.mangolinkcam.com/
WildEarth:  http://lite.wildearth.tv/

STEM Notebook Entry #17:

- Students will document information about an animal they viewed on the webcam in their STEM Notebooks (with both words and pictures)

Discuss student’s STEM Notebook Entries, asking students:

- What continent does your animal live on?
- What is the animal’s habitat (i.e., ocean desert, forest, plains)?

Tell students that there are several categories of habitats that exist around the world. Today the class is going to concentrate on four of these: ocean, desert, forest, and plains. Discuss each of these habitats with the class (you may wish to create a chart in which you list the major characteristics of each). Give each student 2 paper plates. Have students label each side of the plates with one habitat (with words or pictures). Tell students that you are going to read a book that includes animals from different habitats. When they recognize one of the four habitats they should lift up their plate with the habitat facing forward.

Conduct an interactive read aloud of I See a Kookaburra! Discovering Animal Habitats Around the World by Steve Jenkins and Robert Page.

- Allow students to share personal stories throughout the reading.
- Ask students to predict throughout the story.
STEM Notebook Entry #22:

- Students will document their what they learned about habitats in their STEM Notebooks after the interactive read aloud (with both words and pictures)
  Document student responses on a KWL chart chart and post on classroom wall.

Activity/Investigation

Zoo Explorers
Prepare for the zoo field trip by grouping students into teams of four and telling them that their explorer team will be responsible for investigating one species of animal at the zoo and becoming experts about that animal. Students will use the Super Species Guide found at the end of the STEM Notebook to document their findings. You may wish to have students attach the pages to a clipboard during their zoo trip.

Extend/Apply Knowledge

Animal Educators
After the zoo field trip, tell students that since they are the experts on their animal, they will teach the rest of the class about that animal, acting as animal educators. Students should create a poster that simulates the animal’s habitat that shows animal’s food sources and any threats to its habitat. They should also create and paint a clay model of their animal. Students will then present their animal to the class, providing details about where the animal lives (i.e., what continent and country), what kind of habitat it lives in (ocean, desert, forest, plains), what it eats, whether it is endangered, and how humans affect this animal’s habitat or other factors of its survival.

Assessment

Performance Tasks

Have students draw and label pictures of two species from other parts of the world. Compare student pictures. Allow students to identify the differences in the pictures. Student should use a minimum of three vocabulary words.

Other Measures

Teacher observations.
STEM Notebook entries.
Participation in their teams during investigations.
See assessment rubric at the end of this module.
Internet Resources

- **African Wild Dog**: [https://www.youtube.com/watch?v=3xAPxMKXSc](https://www.youtube.com/watch?v=3xAPxMKXSc)
- **Amazing Facts about the African Wild Dogs**: [https://www.youtube.com/watch?v=CPLrvBydw4c](https://www.youtube.com/watch?v=CPLrvBydw4c)
- **American Bison**: [https://www.youtube.com/watch?v=1qOx1Ox6Zro](https://www.youtube.com/watch?v=1qOx1Ox6Zro)
- **Animals on the ice: Beluga whale**: [https://www.youtube.com/watch?v=TTeT1Sg_A2I](https://www.youtube.com/watch?v=TTeT1Sg_A2I)
- **Antarctic blue whale voyage**: [https://www.youtube.com/watch?v=4uRfKP79cI0](https://www.youtube.com/watch?v=4uRfKP79cI0)
- **Babirusa Pigs**: [https://www.youtube.com/watch?v=Ddyfu3lL5Y](https://www.youtube.com/watch?v=Ddyfu3lL5Y)
- **Baby animals, a science lesson**: [http://www.kidsdiscover.com/teacherresources/baby-animals-science-lesson/](http://www.kidsdiscover.com/teacherresources/baby-animals-science-lesson/)
- **Endangered Rainforest Animals**: [https://www.youtube.com/watch?v=iX7ai4_cmkA](https://www.youtube.com/watch?v=iX7ai4_cmkA)
- **European Eel**: [https://www.youtube.com/watch?v=e9wg6TERkgl](https://www.youtube.com/watch?v=e9wg6TERkgl)
- **Habitats: Animal Atlas**: [https://www.youtube.com/watch?v=7Klscf43X4w](https://www.youtube.com/watch?v=7Klscf43X4w)
- **Habitat Instructional Video**: [https://www.youtube.com/watch?v=-MQLqalP1yo](https://www.youtube.com/watch?v=-MQLqalP1yo)
- **Happenin’ Habitats**: [http://happeninhabitats.pwnet.org/what_is_habitat/habitat_types.php](http://happeninhabitats.pwnet.org/what_is_habitat/habitat_types.php)
- **Help save wildlife**: [http://www.worldanimalfoundation.net/wildlife.html](http://www.worldanimalfoundation.net/wildlife.html)
- **I Got A Habitat**: [https://www.youtube.com/watch?v=H_CSlLUvVZ5](https://www.youtube.com/watch?v=H_CSlLUvVZ5)
- **National Zoological Parks**: [http://nationalzoo.si.edu/animals/webcams/](http://nationalzoo.si.edu/animals/webcams/)
- **Overview of endangered animals**: [http://www.bagheera.com/bagheera_tv.htm](http://www.bagheera.com/bagheera_tv.htm)
- **Resources**: [http://www.fcps.edu/AldrinES/websites/HabitatWebsites.pdf](http://www.fcps.edu/AldrinES/websites/HabitatWebsites.pdf)
- **San Diego Webcams**: [http://kids.sandiegozoo.org/animal-cams-videos](http://kids.sandiegozoo.org/animal-cams-videos)
- **Vanishing Grey Nurse Shark**: [https://www.youtube.com/watch?v=Ved4x17SnS0](https://www.youtube.com/watch?v=Ved4x17SnS0)
Books

HABITATS: LOCAL and GLOBAL and ENDANGERED SPECIES

NAME:
Draw and label two different endangered species you know about (e.g. giant panda, sea turtle, etc.).
STEM Notebook #2 (Lesson Plan 1) (Before reading the book)

I wonder...
STEM Notebook #3 (Lesson Plan 1) (After reading the book)

NAME_______________________________________ DATE___________________

I learned...

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
## Endearing Endangered Species

<table>
<thead>
<tr>
<th>List the basic needs of all living things</th>
<th>Illustrate the needs of all living things</th>
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<tbody>
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</tbody>
</table>
### Endearing Endangered Species

<table>
<thead>
<tr>
<th>List the basic needs of all living things</th>
<th>Describe what happens if this need is not met</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>
STEM Notebook #8 (Lesson Plan 1) (Before reading the book)

NAME______________________________________________DATE___________________

I wonder...

______________________________________________________________________________

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______________________________________________________________________________

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______________________________________________________________________________
STEM Notebook #9 (Lesson Plan 1) (After reading the book)

NAME_________________________________________ DATE____________________

I learned...

______________________________________________________________________________

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______________________________________________________________________________

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______________________________________________________________________________
STEM Notebook #12 (Lesson Plan 2) (Before watching the video and reading the book)

NAME______________________________________________DATE___________________

I wonder...

_________________________________________________________________________

______________________________________________________________________________

---------------------------------------------------------------------------------------------------------------------

___________________________________________

_______________________________________
STEM Notebook #13 (Lesson Plan 2) (After watching the video and reading the book)

NAME______________________________________________DATE___________________

I learned...
Mighty Mobile

• What is the local endangered species you are studying?

Draw a picture of your endangered species.
• Where are we located? (City and State)

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Shade the state where we are.
• What is the habitat like where your endangered species lives?

Draw a picture of the habitat where your endangered species lives.
List one reason your species is endangered.

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______________________________________________________________________________
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______________________________________________________________________________

List one thing people can do to help your endangered species.

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

______________________________________________________________________________
Name one animal you saw on the webcam.

Draw a picture of the animal.
• Where does this animal live? (continent and country)

Shade the continent where your animal lives.
• What is the habitat like where your animal lives? (e.g. forest, prairie, desert, wetland, tundra, ocean, mountain, etc.)

Draw a picture of the habitat where your animal species lives.
STEM Notebook #22 (Lesson Plan 3) (After reading the book)

NAME____________________________________________ DATE______________________

I learned...

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________
Identify your animal:

----------------------------------------------------------------------------------------------------------------------------------

----------------------------------------------------------------------------------------------------------------------------------

Draw a picture of your animal:
HABITATS

Identify the habitat where your animal lives (ocean, desert, forest, or plains):

______________________________________________________________________________

-------------------------------------------------------------------------------------

______________________________________________________________________________

Shade in the continent where your animal lives.
Food

What kind of food does your animal eat? Draw a picture and label it.

______________________________________________________________________________

---------------------------------------------------------------------------------------------------------------------

_____________________________________________

_________________________________
Weather and Climate

Draw a picture of the weather and climate conditions when you saw your animal.

What is the climate like where your animal lives?

________________________________________________________________________

________________________________________________________________________
**Endangered?**

Is your animal an endangered species?

______________________________________________________________________________

________________________________________________________________________________

______________________________________________________________________________

**Plants**

What kinds of plants were in your animal’s habitat? Name them and draw pictures!

1.  
2.  
3.  

**People**
On the following pages, identify, illustrate, and one thing that people can do to help your animal species survive:

Observation/STEM Notebook/Participation Rubric
<table>
<thead>
<tr>
<th>Categories (Components)</th>
<th>0) Missing or unrelated</th>
<th>1) Beginning</th>
<th>2) Developing</th>
<th>3) Meets expectations (Target Level)</th>
<th>4) Exceeds expectation</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Observation</strong></td>
<td>Missing or unrelated</td>
<td>Does not listen to others and shows little respect for alternative viewpoints.</td>
<td>Occasionally listens to others but often speaks out of turn.</td>
<td>Listens to others, only occasionally speaks out of turn, and generally accepts other points of view.</td>
<td>Listens carefully to others, waits for turn to speak, and respects alternative viewpoints.</td>
<td></td>
</tr>
<tr>
<td><strong>STEM Notebook</strong></td>
<td>Missing or unrelated</td>
<td>Indicates little understanding of the concepts being taught.</td>
<td>Indicates modest understanding of the concepts being taught. (Bloom’s Taxonomy – Knowledge; Comprehension)</td>
<td>Indicates good understanding of concepts being taught. (Bloom’s Taxonomy – Application)</td>
<td>Indicates a deep understanding of the concepts being taught. (Bloom’s Taxonomy – Analysis; Synthesis; Evaluation)</td>
<td></td>
</tr>
<tr>
<td><strong>Participation</strong></td>
<td>Missing or unrelated</td>
<td>Does not volunteer. When responding to teacher prompts, comments are sometimes not relevant to the discussion.</td>
<td>Responds to teacher prompts during classroom discussions but does not volunteer.</td>
<td>Willingly participate in classroom discussions and offers relevant comments.</td>
<td>Contributes insightful comments and poses thoughtful questions.</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL**

**COMMENTS:**