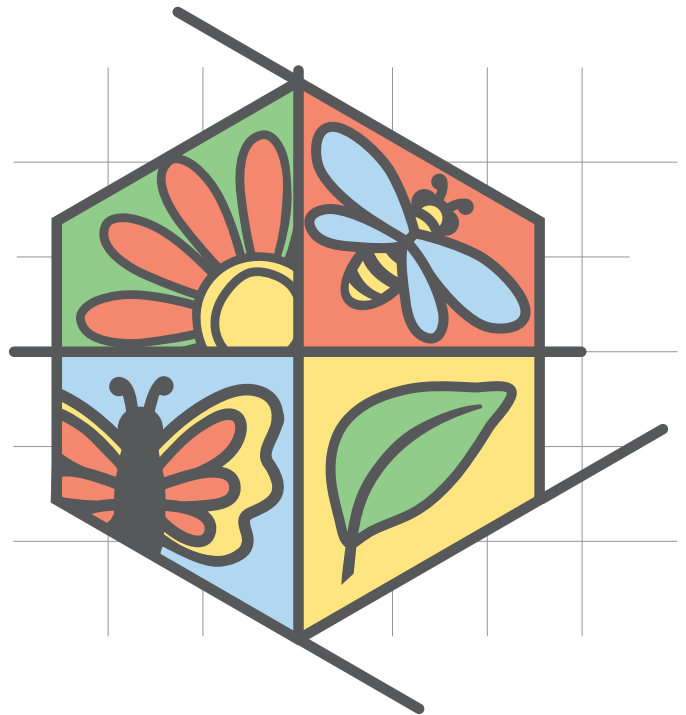


Animal Sanctuary



Kindergarten STEM Storyline



STEM

8.14.20

ABOUT THIS UNIT

We are pleased to present this STEM Storyline Unit to help support educators in our region as we shift towards providing students with NGSS-aligned, phenomenon-based, and project-based learning experiences. Our vision is to provide students with high-quality and equitable learning experiences that empower them to develop fluency in STEM and literacy. This unit strives to engage students in designing an animal sanctuary which will shelter a critically endangered species.

This unit also contains links to online resources created by other organizations which may use a different license. Please make sure that you understand the terms of use of third-party resources before reusing them. Prior to publishing this unit of study, we have reviewed the content of this unit to ensure that all materials are in accordance with creative commons regulations. If you notice that a part of this unit infringes another's copyright, please contact us.



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A digital copy of this document is available on the STEM Materials Center website at:
<https://www.stemmaterials.org/animalsanctuary>

ATTRIBUTION

This unit is a result of a collaborative effort between Educational Service District 112 and educators and specialists from other school districts and agencies.

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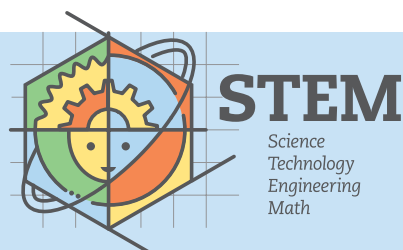
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A program of Educational Service District 112
supporting Next Generation Science Standards


A special thanks to Governor Jay Inslee and the Washington State Legislature who supported the development of this unit through funding the 2020-2021 Climate Science Proviso. We would also like to thank Barbara Soots (Open Educational Resources and Instructional Materials Program Manager, OSPI) and Ellen Ebert (Director, Learning and Teaching Science, Environmental and Sustainability Education, OSPI) for their support of the project and assistance in sharing materials to support educators statewide.



UNIT OVERVIEW

Due to a variety of ways that humans have negatively impacted the natural environment, many plant and animal species continue to become endangered and move towards extinction. Set your kindergarteners on a mission to help shelter an endangered species by creating an animal sanctuary for an animal in need. Students will create a physical model of an animal sanctuary (diorama) for an endangered animal while studying what that animal needs from its habitat in order to survive and thrive. Students will also study the ways that humans can create problems or help solve problems in the world around them. This unit focuses on the NGSS Performance Expectations Bundle for Kindergarten Life Science (K-LS1-1, K-ESS2-2, K-ESS3-1, K-ESS3-3).

 Please note that ESD 112 K-5 STEM kits no longer include live critters, and therefore, this curriculum will not align with FOSS guides for the previous Animals 2 x 2 Kit. The FOSS materials can still be used to support some of the activities in this STEM Storyline. The outline below can help in your planning. Please note that each session is intended to take a class period of 30-45 minutes.

 For your convenience, all resources have been uploaded to this Google drive folder, Animal Sanctuary (<https://bit.ly/kinderanimalsanctuary>) for easy access. Since curriculum revision during the school year will be limited, any additional resources and changes will be reflected in the live file folders on the Google drive. You may also make comments for suggested revisions on these documents. In order to modify the Google resources to make changes, click "file" and "make a copy." This will create a copy in your drive that you can edit to fit your needs or to share with your students on the Google platform. Enjoy!

LESSON 1: Endangered Animals

pg. 6

In this lesson, students will engage in an "entry event" to launch their learning in the unit. Students will be presented with the phenomenon of endangered animals and will learn about several animals that are endangered around the world. Students will be presented with the driving question of the unit and will start on their mission to create an animal sanctuary for their endangered species.

Session	Materials Needed	Page
1. These animal friends need your help!	<ul style="list-style-type: none">• Teacher slides	7
2. Creating our first model of our animal sanctuary	<ul style="list-style-type: none">• Teacher slides• Initial Model Thinking Template• Markers and crayons	9



UNIT OVERVIEW (cont.)

LESSON 2: Survive and Thrive

pg. 11

In this lesson, students will explore what animals need in order to survive! Students will research the animal that they are focusing on and figure out what it needs from its habitat in order to survive and thrive. Then, students will modify their plan for their animal sanctuary by incorporating the information that they learned.

Session	Materials Needed	Page
1. Outdoor STEM: Imagine you are a critter	<ul style="list-style-type: none"> Teacher slides Piece of paper on clipboard with pencil (optional) 	12
2. Needs of plants and animals	<ul style="list-style-type: none"> Teacher slides What Do I Need to Thrive Template 	13
3. My endangered species research	<ul style="list-style-type: none"> Teacher slides My Initial Model Template (from previous lesson) 	14
4. Project building session: Creating a model of our animal friend	<ul style="list-style-type: none"> Teacher slides White paper Cardboard (recycled boxes) Markers, colored pencils, crayons Scissors, glue, popsicle sticks 	15

LESSON 3: Homes

pg. 17

In this lesson, students will further refine their plan for an animal sanctuary by studying how plants, animals, and humans change the environment to meet their needs. They will study the sheltering behaviors of different types of animals and will provide their endangered animal with the things needed to make cozy adjustments to their sanctuary.

Session	Materials Needed	Page
1. Our homes	<ul style="list-style-type: none"> Teacher slides <i>Home</i> by Carson Ellis (video reading) <i>This is How We Do It</i> by Matt Lamothe (video reading) Our Home Thinking Template 	18
2. How animals build homes	<ul style="list-style-type: none"> Teacher slides <i>Mama Built a Little Nest</i> by Jennifer Ward National Geographic Kids Readers: Animal Homes (optional) 	19
3. Outdoor STEM: How we change our environment	<ul style="list-style-type: none"> Outdoor STEM Observation Template Clipboard Pencil 	20
4-5. Let's keep building!	<ul style="list-style-type: none"> Teacher slides Construction paper (various colors) Cardboard (old boxes) Markers, crayons Alfalfa seeds Rocks, plants, moss, etc. (from outside) 	21



UNIT OVERVIEW (cont.)

LESSON 4: Human-Caused Problems

pg. 23

In this lesson, students will explore some ways that people threaten endangered species by causing problems in ecosystems and in the world. Students read texts about deforestation, climate change, and poaching and make some recommendations to their community.

Session	Materials Needed	Page
1. Deforestation	<ul style="list-style-type: none"><i>The Lumberjack's Beard</i> by Duncan Beedie (video reading)Deforestation Thoughts Template	24
2. Climate Change	<ul style="list-style-type: none">Teacher slides<i>The Lonely Polar Bear</i> by Khoa Le (video reading)Climate Change Thoughts Template	25
3. Poaching	<ul style="list-style-type: none">A Message About Poaching Template<i>Dowlina: A Rhino's Story</i> by Grace Borgeson	26
4. Being a helpful human!	<ul style="list-style-type: none">Teacher slidesMy Helpful Human Template	27

LESSON 5: The Sanctuary is Ready!

pg. 29

In this lesson, students will check to see if their Animal Sanctuary model has some key components. They will make some final touches and will get ready to share their project with a public audience. They will practice their presentation and will finally share with the community! This part of the unit should feel like a celebration, where students hard work has come to fruition and to be impactful in the world!

Session	Materials Needed	Page
1. Our animal sanctuary—final touches	<ul style="list-style-type: none">Teacher slides	30
2. Practicing our presentations	<ul style="list-style-type: none">Teacher slidesStudents projectsEncouragement and support from teacher	31
3. STEM Fair: Animal Sanctuary Expo	<ul style="list-style-type: none">Teacher slidesStudents projectsSpace for students to set up the expoGuests	32



A large hexagon is centered on the page, divided into four equal quadrants by a horizontal and a vertical line. Each quadrant contains a different nature-themed illustration. The top-left quadrant is green and features a stylized sun with a yellow face and orange rays. The top-right quadrant is red and features a blue butterfly with yellow and black stripes on its body. The bottom-left quadrant is blue and features a black butterfly with orange and yellow wings. The bottom-right quadrant is yellow and features a single green leaf. The entire hexagon is outlined in black.

STRATEGY: ENGAGE

In this lesson, students will engage in an “entry event” to launch their learning in the unit. Students will be presented with the phenomenon of endangered animals and will learn about several animals that are endangered around the world. Students will be presented with the driving question of the unit and will start on their mission to create an animal sanctuary for their endangered species.



SESSION 1:

These animal friends need your help!

Warm-up

Tell students that today, they will start on a special mission to help animals that are in danger around the world! Students will become scientists and will try to solve a problem for an animal in need! Have students watch [the video on the teacher slides](#). Stop the video at about 1 minutes and 23 seconds.

Present students with the driving question of the unit: ***How can we design a sanctuary to help an endangered animal?***

Ask students what they think the word sanctuary means. Let students share their ideas. Reinforce the idea that a sanctuary is a safe space for someone. In this case, an animal sanctuary is a safe place where your endangered animal will be able to live and grow.

Materials Needed

[Teacher slides](#)

Main activity: Notice, Wonder and Know protocol

Give students post-its or paper to draw some of their ideas to remember their discussion points with their partners.

- Ask students: What are some things they notice about the problem that endangered species are facing? Let them talk to a partner and draw their ideas (optional).
- Ask students: What are some things they wonder? A wondering is a question. It usually starts with the word “why...” “what...?” or “how...” Give students examples of questions. Let them talk to a partner and draw their ideas (optional).
- What are some things they know? Let them talk to a partner and draw their ideas (optional).

Scientists' Circle!

Start by asking one student to share something they noticed about the phenomenon that was presented (numerous animal species dying and becoming endangered). A phenomenon is something that happens in nature and can be observed by us. Thank that student and include their thought on the [Notice, Wonder, Know Chart](#).

After one student has shared their thought, ask if any other students have any similar “noticings.” Allow students to continue to share in a chain. Continue to ask if students have thoughts that are similar. Once there is a lull, ask students if there is a noticing that goes along a different line of thinking. At some point, students will start to ask questions, which will be a perfect segue into sharing “wonderings.” Continue with the wonderings column. It is important that each student has shared at least once by this point. Ask for students who have not spoken to share an idea, even if it is similar to an idea that was already stated.

Once students have all shared, ask students if they'd like to share something for the “know” column. What is something they already know about the problem? It is ok if only some students want to share their knowings. ***(Note: There is a difference between something that they “notice” and something that they “know.” Noticings relate directly with the phenomenon being explored. Knowings are a piece of information that students already have before walking into the activity that connects with what we are learning.)***



SESSION 1:

These animal friends need your help! (cont.)

Pedagogical strategy: Equity and Inclusion:

In order for your students from diverse ethnic, linguistic, and socioeconomic backgrounds to feel empowered and included, they must learn that their voice has value and impact. It is important to give students an opportunity to share their ideas. Students may also share their drawings to be added to the NWK charts if they are not yet comfortable speaking. Allow students to share their insights based on the unique funds of knowledge from their culture. They may have experiences that are atypical and at the same time a huge asset in the STEM classroom. This protocol is intended to appreciate and validate students' unique thoughts, questions, and experiences.

Wrap-up

Thank students for their contributions. Tell students that their ideas (both questions and thoughts) will be very important as we move through the project and create an animal sanctuary for an endangered animal.



NOTICE, WONDER, KNOW Chart

Driving Question:		
What do we NOTICE?	What do we WONDER?	What do we KNOW?

SESSION 2: Creating our first model of our animal sanctuary

Warm-up

Ask students to remember what the driving question is. Who are we trying to help with this project?

Driving question: *How can we design a sanctuary to help an endangered animal?*

Career connection: Zoologist

Tell students, “A zoologist is a person who studies animals and the way that they survive in their habitat. Some zoologists study animals in the wild. Other zoologists study animals that are being taken care of by humans. In this project, you will become a zoologist and will find a way to help an endangered animal in need by creating a safe space for them!”

Main activity

Tell students that they will be creating a prototype or a model of an animal sanctuary and will work on improving this model as the project goes on. It’s important to get your brilliant ideas on paper so we can make sure that we end up creating the best animal sanctuary ever! We will start by creating a drawing to plan our animal sanctuary. Provide students with the [Initial Model Thinking Template](#) and allow them to draw and write down their thoughts. Remember that this is the initial model—students have not selected an animal to focus on yet. Students will refine this model throughout the project.

Pedagogical strategy

In high-quality STEM and PBL learning, students take initiative in their work and monitor their progress towards learning goals. The teacher can also use these models as a formative assessment to gauge students’ preconceptions of concepts. Keep students models in a safe place so that they will be able to revisit and make modifications as they deepen their understanding of content. After each modification, have students talk to a partner about what they added to or changed about their model.

Model share-out/gallery walk

Have students share their model with a partner. What are the different things they drew? Why are they important for the animal to thrive?

Materials Needed

[Teacher slides](#)

[Initial Model Thinking Template](#)

Markers & crayons



My First Model of an Animal Sanctuary

Name of Scientist _____

How Lesson 1 Supports Next Generation Science Standards



K. Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment

Performance Expectation	Connections to Classroom Activity, <i>Students</i> :
K-ESS3-1 Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.	<ul style="list-style-type: none"> Begin to develop a model to plan an animal sanctuary that will meet the needs of an endangered species.
SCIENCE & ENGINEERING PRACTICES	
Asking questions and defining problems Developing and using models	<ul style="list-style-type: none"> Ask questions about how they can help endangered species. Communicate information about the phenomenon of species becoming endangered. Develop an initial model showing their thoughts about creating an animal sanctuary.
DISCIPLINARY CORE IDEAS	
ESS3.A: Natural Resources 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.	<ul style="list-style-type: none"> Will think of the different things that their endangered animal will need in its natural environment in order to survive, as they develop their initial models.
CROSSCUTTING CONCEPTS	
Energy and matter	<ul style="list-style-type: none"> Start to develop their initial models and begin to think of the needs that their animal has in order to sustain itself.

The materials/lessons/activities outlined in this activity are just one step toward reaching the Performance Expectations listed above. Additional supporting materials/lessons/activities will be required.



In this lesson, students will explore what animals need in order to survive! Students will research the animal that they are focusing on and figure out what it needs from its habitat in order to survive and thrive. Then, students will modify their plan for their animal sanctuary by incorporating the information that they learned.



SESSION 1:

Outdoor STEM: Imagine you are a critter

Warm-up

Tell students that today, we will pretend to be a critter OR a plant who lives in the habitat near us! You can use [the slide](#) to introduce the activity.

Main activity

Take students outside to an open space that is preferably close to some grass, greenery, or trees and have them sit in a circle. Tell students that can now close their eyes and think of which animal they want to pretend to be. As their eyes are closed, ask them to think about what that animal looks like and how it behaves. Tell students that when they open their eyes, they are to pretend to be that animal. What would they need from their habitat to survive? Give students space to walk around as an imaginary critter and to explore the environment. Give students time to walk around, explore and imagine. Prompt students to think about what their animal would need from its habitat to survive.

Wrap-up

Have students pair up with a partner and talk about this question: What critter are you? What did you need from your habitat to survive? After students share with each other, allow them to share with the whole group. Tell students that we will be exploring what animals need from their habitat so we can make our animal sanctuary the best place for our endangered animal friends!

Materials Needed

[Teacher slides](#)

Piece of paper on clipboard with pencil (optional)

Safe outdoor space



SESSION 2:

Needs of plants and animals

Warm-up

Use [these slides](#) to help facilitate the lesson. Ask students, as a human, what are some things that YOU need in order to survive? What does it mean for you to survive? Let students share their ideas.

Main activity

Show students the different videos (or parts of videos) that show some different plants and animals in their environment. Ask students to talk about what the living things featured in those videos need in order to survive. Have them share with a partner. What do they need from their environment or habitat?

Wrap-up/Formative Assessment

Provide students with the [What Do I Need to Thrive Template](#). Allow them to draw the different things that they think each organism needs in order to survive.

Materials Needed

[Teacher slides](#)

[What Do I Need to Thrive Template](#)

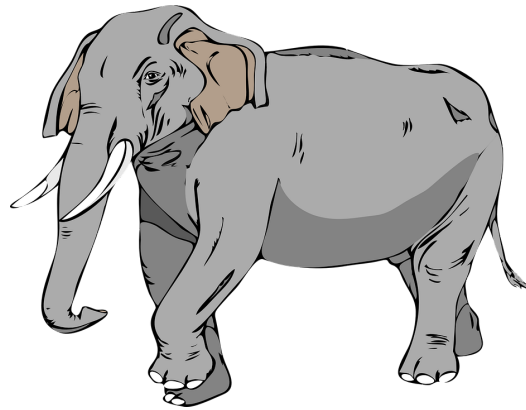


Name_____

What do I need to thrive?

Draw what these living things need in their habitat to survive.





SESSION 3:

My endangered species research

Warm-up

Use [these slides](#) to help facilitate the lesson. Remind students about the driving question. We are trying to create a sanctuary for an animal who is endangered. What are some things that we need to know before we can create a great home for them?

Main activity

Show students the different animals that they can choose to focus on for their animal sanctuary. Which animal do they think is the coolest? Which one would they like to help and why? Have them discuss with a partner. Students may work with a partner on this project. If you feel that your students will achieve most by working on individual projects, that is fine.

Using videos and articles to collect information: The slide with animal images has hyperlinks to a video about each animal. Let students know that this is how we will be collecting information about what our animal needs in its sanctuary. What are some things that this animal needs in order to survive? What did they see the animal doing in the video?

Pedagogical strategy: Equity & Inclusion

Students will be drawn to helping different animals. This may depend on a variety of factors. Encourage students to identify an animal that they connect with. Students from diverse ethnic backgrounds or from immigrant families may want to help an animal that has significance for their family. Present this resource as an optional place to identify an interesting animal in need: www.worldwildlife.org/species. **Do not require students to pick an animal that you perceive is somehow tied to their culture.**

Adding to their model of the Animal Sanctuary

Have students return to their work-in-progress model of the animal sanctuary. Now they know what animal they are building it for!

- What changes do they need to make?
- What are some things that it will need in its habitat to survive?

Allow students to start over if they need to (ex. if they want to make a sanctuary for an animal like a dolphin and will need to rethink their whole idea if their plan was a forest). Be flexible and open to students' choices.

Wrap-up

Have teams pair up and talk about their model of their sanctuary that is in-progress. Congratulate the students on getting one step closer to creating the perfect animal sanctuary for their endangered animal friend!

Materials Needed

[Teacher slides](#)

My Initial Model Template (from previous lesson)



SESSION 4:

Project building session

Warm-up

Congratulate students on their amazing work! They are doing a wonderful job learning about the animal species that they will be helping! By this point, we have some great ideas about our animal sanctuary and we should get started!

Main activity

Ask students to draw a picture of their animal on a piece of white paper or white cardboard. Require students to use color to add details to their animal. If students draw on white paper, have them cut out, and glue to cardboard to make their animal more sturdy. Glue a popsicle stick behind the animal and let dry. **They now have an endangered animal popsicle stick puppet!** Keep students animals in a safe spot so that they do not get lost. This will be the focus of their animal sanctuary model.

Wrap-up

Have students walk around the classroom and take a look at each other's creations!

Materials Needed

[Teacher Slides](#)

White paper

Cardboard (recycled boxes)

Markers, colored pencils, crayons

Scissors

Glue

Popsicle stick



How Lesson 2 Supports Next Generation Science Standards



K. Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment

Performance Expectation	Connections to Classroom Activity, <i>Students</i> :
K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.	<ul style="list-style-type: none"> Conduct a video study and talk about the different needs of animals and plants Develop a model to show what different organisms need from their environment. Conduct research (read a text) to see what their endangered animal needs in order to survive.
SCIENCE & ENGINEERING PRACTICES	
Developing and using models Obtaining, evaluating, and communicating information Designing a Solution	<ul style="list-style-type: none"> Develop several models to show what a specific animal needs from its habitat. Obtain information through several forms of media (video and text), apply this information to create improvements in their model of an animal sanctuary, and refine their model. Continue to work on their design to support an endangered animal.
DISCIPLINARY CORE IDEAS	
ESS3.A: Natural Resources 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.	<ul style="list-style-type: none"> Develop their initial models, they think of the different things that their endangered animal will need in its natural environment in order to survive.
CROSSCUTTING CONCEPTS	
Systems and systems models Energy and matter	<ul style="list-style-type: none"> Study the needs of different animals and how they use elements from their habitat to gain energy and sustain themselves. Study how a plant/animal's ecosystem provides it with things that it needs for survival.

The materials/lessons/activities outlined in this activity are just one step toward reaching the Performance Expectations listed above. Additional supporting materials/lessons/activities will be required.

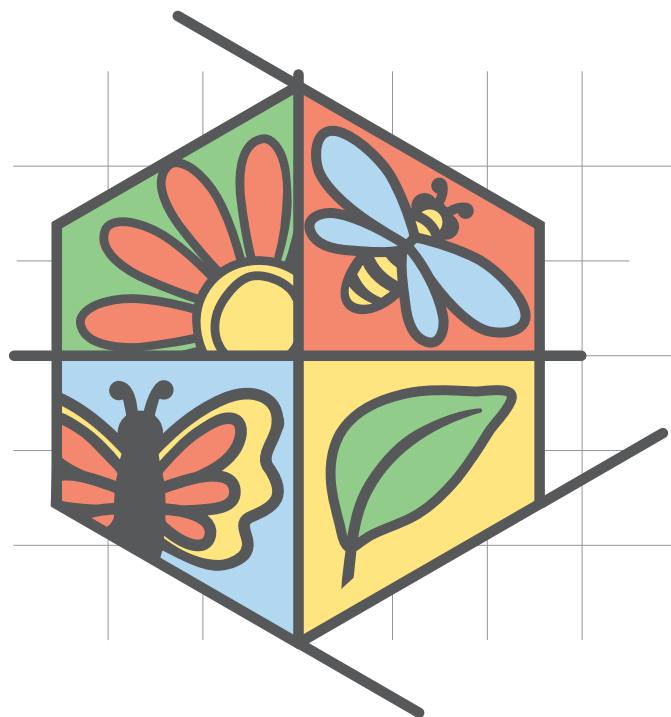


LESSON 3:

Homes

STRATEGY: EXPLAIN

In this lesson, students will further refine their plan for an animal sanctuary by studying how plants, animals, and humans change the environment to meet their needs. They will study the sheltering behaviors of different types of animals and will provide their endangered animal with the things needed to make cozy adjustments to their sanctuary.



STEM

SESSION 1:

Our homes

Warm-up

Remind students that we are creating an animal sanctuary, which is a home for an animal. Start by reading *Home* by Caron Ellis (*Note: this is a partially fictional book with some whimsical ideas, but can be used to engage learners*) and/or *This is How We Do It* by Matt Lamothe. Allow students to share their thoughts together as you read. After you are done reading, ask them to share with a partner: which home was most interesting to you? Do all people live in the same type of home? Why not? Have students share as a group. Why do people make homes?

Main activity

Have students think about where they live. Ask them to draw a picture of their home and to write a sentence below in this [Our Home Thinking Template](#).

Ask students to think, why do people make homes? Have students talk with a partner to complete this sentence frame:

People build homes because_____.

Homes are important because_____.

Wrap-up

Ask students to share their pictures with a partner, and bring students together to share what they talked about with their partner.

Materials Needed

[Teacher slides](#)

Home by Caron Ellis
([video reading](#))

This is How We Do It
by Matt Lamothe
([video reading](#))

[Our Home Thinking Template](#)



Our Home

Draw what your home looks like. Then, write why your home is important to you.



SESSION 2:

How animals build homes

Warm-up

Start by reading students the story, *Mama Built a Little Nest* by Jennifer Ward. Ask students the following questions during/after the read.

- How is this bird changing her environment to make it more comfortable?
- Why is this bird changing his/her environment?

Main activity

Ask students if they can think of any other animals or plants that make a change in their habitat to create a better place to live. Show students the slides and ask them to share what they notice the animal has created. On each slide, ask them, how did this animal change its environment?

When you reach the video about deforestation, pause the video at each text title and read to students to spur their thinking. How is deforestation affecting animals? Do you think our endangered species are affected by people? How do you feel about it? Have students talk to a partner and identify some emotions that they feel about this phenomenon of deforestation.

Wrap-up

Have students take a look at their animal sanctuary plan again. Is there anything they can add there to make the environment more cozy for their animal?

Materials Needed

[Teacher slides](#)

Mama Built a Little Nest
by Jennifer Ward

National Geographic Kids
Readers: Animal Homes
(optional)



SESSION 3: Outdoor STEM:

How we change our environment

Warm-up

Tell students that today, we will go outside to see how plants and animals (including humans) have changed the environment around them. You can use this [Outdoor STEM Observation Template](#) to have students record their ideas. Alternatively, you can engage students in discussion during the outdoor activity and use the template as a follow-up formative assessment (possibly homework).

Main activity

Take students outside. Have them sit in a circle. Give them each prompt below followed by 5 minutes to look around and 5 minutes to record observations in their journals. It may be helpful to have a loud signal (ex. whistle or chimes) to get their attention and get them back in a circle after each prompt. Ask them to look around and think about the following.

- Do they see any way that plants have changed their surroundings? Do they see any cracks in the concrete or any signs of plants changing the environment because they need more space to grow?
- How about animals? Do they see any evidence of animals being in the environment? Can you see any nests or places that animals might live? (another example: spider web)
- How about people? Imagine what this place was like before people lived here, how have people changed this place? What have people done to make the environment comfortable for themselves?

Wrap-up

Allow students to share their findings with the whole group.

Materials Needed

[Outdoor STEM Observation Template](#)

Clipboard

Pencil



Outdoor STEM: How we change our environment

Draw how plants, animals, and people have changed their environment.



SESSIONS 4-5:

Let's keep building!

Teacher Prep: Use [teacher slides](#) to get the lesson started. Your STEM kit includes some materials that can be used to have students build prototype models of their animal sanctuary. If you do not have enough containers for the number of teams or students that you have, you can have families collect/donate shoeboxes in which to build their animal sanctuary models. Please think of this project as a more rigorous and relevant version of the traditional animal diorama project that many of us experienced as children.

Warm-up

Tell students that we will be working on creating some of the things that are needed in our habitat for our endangered animal. Show students some materials that are available and ask them to get started.

Main activity

Have the students think about these questions and talk with their team.

- Do you have any trees or plants in your model? What materials can you use to make trees or plants?
- Does your animal need plants, flowers, fruits, or meat?

As students are talking, circulate the classroom and help each team make a checklist of the things they need to create for their model. Ask them to decide who will start working on what.

Provide each team with either a shoebox or a plastic container (found with FOSS materials). Let students cut and create using the materials that are available. Encourage students to be creative.

Wrap-up

Have students clean up and carefully store all items safely so that elements of their model are not lost. Have students re-visit their plan of the animal sanctuary after each building session to see how close they are to their idea being finished. Have students use the checklist you created for them to track their progress as a team.

Materials Needed

[Teacher slides](#)

Construction paper
(various colors)

Cardboard (old boxes)

Markers, crayons

Alfalfa seeds

Rocks, plants, moss, etc.
carefully and respectfully
scavenged from outside.



How Lesson 3 Supports Next Generation Science Standards



K. Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment

Performance Expectation	Connections to Classroom Activity, <i>Students:</i>
K-LS2-2 Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.	<ul style="list-style-type: none"> Use their ideas to write claim that plants, animals, and people cause change in their environment. Use drawings to show the evidence about how plants, animals and people affect their environment.
SCIENCE & ENGINEERING PRACTICES	
Developing and using models Constructing explanations and designing solutions Engaging in argument from evidence Obtaining, evaluating, and communicating information	<ul style="list-style-type: none"> Draw several diagram models showing a plant, animal, and person causing change in their environment. Conduct an outdoor investigation to see how plants, animals, and people have affected the natural environment on their campus. Write an argument about organisms causing changes in their environment and use evidence from examples to support their ideas. Communicate their ideas to their peers and the whole class. Continue to build their animal sanctuary prototype by adding things that their animal might need in order to be comfortable.
DISCIPLINARY CORE IDEAS	
ESS2.E: Biogeology Plants and animals can change their environment. ESS3.C: Human Impacts on Earth Systems	<ul style="list-style-type: none"> Study different types of homes that people live in. Study different plants and animals and how they have affected their environment to aid in their survival. Apply their understanding of changes to their model of an animal sanctuary. Are introduced to the phenomenon of deforestation—a process where humans impact an ecosystem in a negative way.
CROSSCUTTING CONCEPTS	
Systems and systems models	<ul style="list-style-type: none"> Connect the idea of shelter with the concept of ecosystems by studying how animals interact with their ecosystem to create ideal conditions for survival. Apply their understanding of shelter to further develop their model of the animal sanctuary.

The materials/lessons/activities outlined in this activity are just one step toward reaching the Performance Expectations listed above. Additional supporting materials/lessons/activities will be required.



SESSION 1:

Deforestation

Warm-up

Tell students, “You have been doing an amazing job trying to help your endangered species by creating an animal sanctuary to keep them sheltered and safe. Now, we are going to think more about why people might have caused our animal friends to become endangered.

Career connection: Habitat Restoration

Did you know that there are scientists that help protect habitats from being destroyed? They are called Habitat Restoration Biologists. They also try to help a habitat return to normal after it has been destroyed. Tell students that in this unit, they will be doing work similar to a Habitat Restoration Scientist. Someone who figures out how to heal a habitat that has been hurt by humans.

Main activity

Read the book *The Lumberjack's Beard* by Duncan Beedie with students. Ask students to share their thoughts during the read. When the lumberjack first chops the forest, then the branches, and then rolls the log down the river, pause to ask students what they think will happen. If they look closely to the illustrations, they will see that there is an animal in the background who is likely to be impacted! Ask students to talk with a partner and then with the whole-group about these ideas:

- What happened after the forest was chopped down?
- Why did the animals want to live in his beard?
- How did you feel about the animals losing their home?
- How did the lumberjack try to fix the problem?

Formative Assessment: Ask students to draw how animals are affected by deforestation, or cutting down of forests. You can use [this template](#) which gives them a space to draw and write.

Wrap-up

Have students share their drawing and words with a partner. Ask students, what is something WE can do in our area to prevent animals from losing their habitat? You can use this [digital tracker](#) to help track students' learning for use later in the lesson.

Materials Needed

The Lumberjack's Beard
by Duncan Beedie ([video reading](#))

[Deforestation](#)
[Thoughts Template](#)



Deforestation

How does cutting down forests affect animal friends?

SESSION 2:

Climate change

Warm-up

Tell students that today, we will read a story about a polar bear. Polar bears are endangered animals. There are lots of changes that have happened that have caused the polar bears to have trouble surviving.

Main activity

Read the book *The Lonely Polar Bear* by Khoa Le. Ask students to share their thoughts during the read.

Ask these questions as you read:

- Why is the polar bear not as big as he should be?
- Is the polar bear fast enough to catch the fish? Why do you think so?
- Why do you think the ice is melting? When does ice usually melt?

Ask students to talk with a partner and then with the whole-group about these ideas:

- Why couldn't the polar bear find his family?
- How did the story make you feel?
- How would you help the polar bear?

Talking about Global Warming (kindergarten-friendly)

Please use the [teacher slides](#) to facilitate the following activity.

1. Ask students to share their ideas about this question with a partner: Why didn't the polar bear have a lot of ice to rest on?
2. Follow-up with these questions:
 - When does ice melt?
 - What is temperature?
3. Show students the graph of global temperature changing over the past few decades. Explain to students that the graph shows how the temperature (how hot the earth has been) has been changing over time.
4. Ask students: Do you notice anything about the red bars? Let students share with a partner before sharing with the whole-group. Students will likely notice that the bars on the right side of the graph are taller than the ones on the left. What does this mean? Allow students to share their ideas and validate their observations.
5. Ask: If the world is getting hotter, how would that affect polar bears that need the ice to rest after they hunt for food?

Formative Assessment: Ask students to draw how animals are affected by climate change, or temperatures getting hotter around the world. You can use [this template](#) which gives them a space to draw and write. This can also be assigned for homework.

Warm-up

Ask students to work with their teams to think about how their animal might be affected by the climate changing. Do they have any thoughts? What can WE do to protect animals around the world from Climate Change? You can use this [digital tracker](#) to help track students' learning for use later in the lesson.

Materials Needed

[Teacher slides](#)

The Lonely Polar Bear by Khoa Le ([video reading](#))

[Climate Change Thoughts Template](#)

[Teacher's Digital Tracker of how we can help locally](#)



Climate change

How does the earth getting hotter affect animals?



SESSION 3:

Poaching

Warm-up

Ask students to share their thoughts: "What are some ways that humans cause problems for animals?"

Main activity

Read the book *Dowlina: A Rhino's Story* by Grace Borgeson. Ask students to share their thoughts during the read and ask questions throughout the reading to clarify ideas and have students make predictions.

Optional Formative Assessment: Ask students to draw or write a message to people about poaching. Is it something good or bad? They can include words to help with their message. [This blank template](#) can be used to draw and write their ideas.

Wrap-Up

Ask students, "Think about your endangered animal. Are they affected by poaching, deforestation or climate change? Talk with your team about the different threats that make life dangerous for your animal friend."

Ask students to share, "What are some things we can do here to keep animals in our area safe from poaching?" You can use this [digital tracker](#) to help track students' learning for use later in the lesson.

Materials Needed

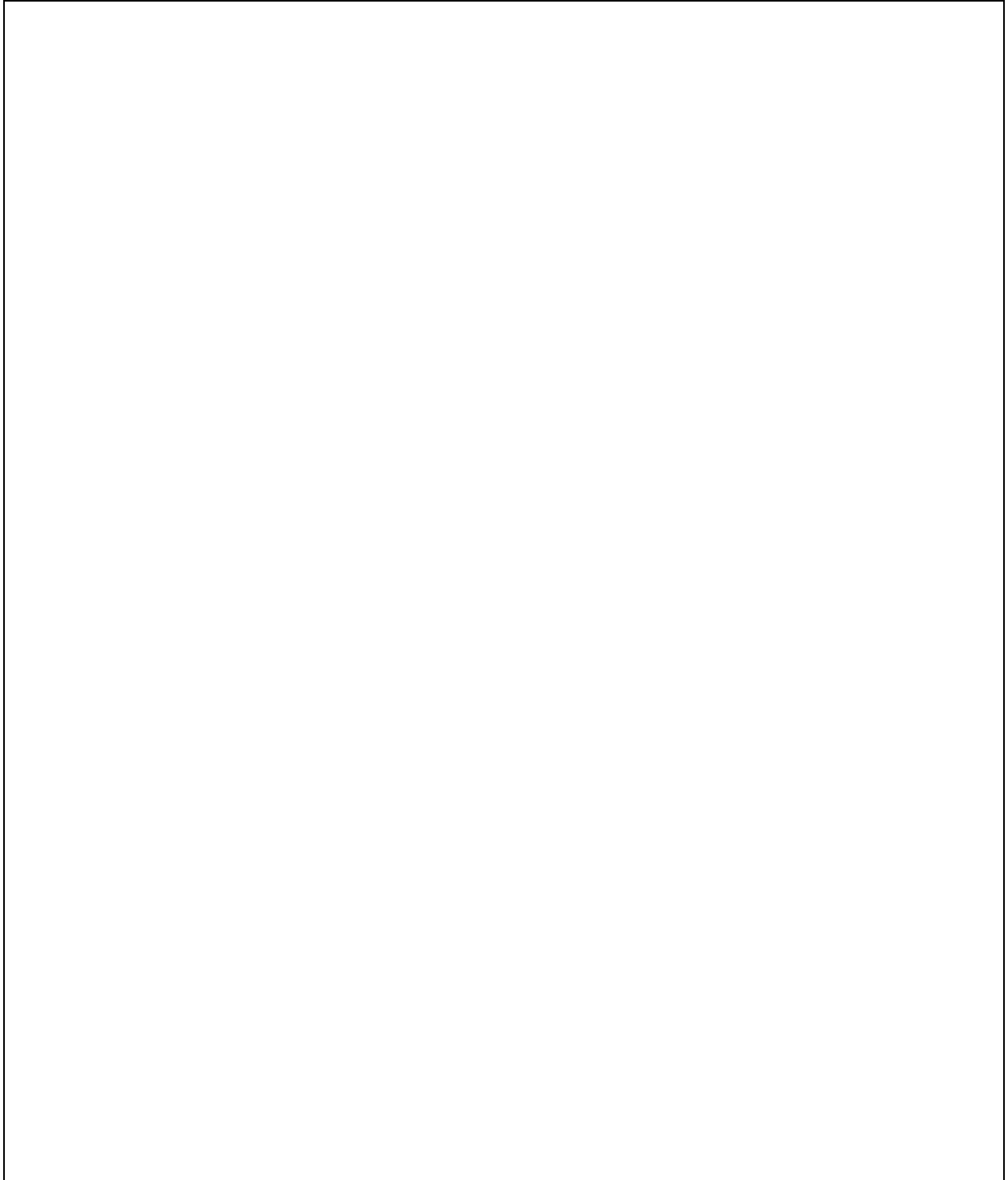
[A Message About Poaching Template](#)

Dowlina: A Rhino's Story
by Grace Borgeson

[Teacher's Digital Tracker of how we can help locally](#)



Draw a message about poaching for the world to see.



SESSION 4:

Being a helpful human!

Warm-up

Tell students that we have talked about some ways that people can hurt the environment and animals. There are lots of times that people are very helpful to animals and the environment.

Main activity: Humans helping video activity

Use [teacher slides](#) and allow students to pick a video they're interested in watching which shows how a person helped an ecosystem or animal in need.

Adding a helping human:

1. Will people be helping your endangered animal friends? How? Ask students to create a little person who will be helping the animals who live in the sanctuary. [This template](#) can be used for them to draw and cut their addition. What will that person be doing? Draw and cut some objects that help people understand what that person will do.
2. What can your helpful person do in their community to help the animals who live there? Share and review the [digital tracker](#) that you were using to collect students thoughts as a starting point. Draw and cut some objects that help people understand what that person will do.

Wrap-Up

Ask teams to share all about their helpful person with other teams. What will their helpful person do?

These sentence frames can be used to help students articulate their ideas:

- My human will help my animal friend by_____.
- My human will help the animals in {insert city/town} by _____.

Materials Needed

[Teacher slides](#)

[My Helpful Human Template](#)



My Helpful Human

Create a helpful human to include in your model of your animal sanctuary. Then, cut ✂ them out and put them in the model.



How Lesson 4 Supports Next Generation Science Standards



K. Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment

Performance Expectation	Connections to Classroom Activity, <i>Students</i> :
K-ESS3- Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.*	<ul style="list-style-type: none"> Study several ways that humans negatively impact their environment and ecosystems. Create a “helpful human” who strives to reduce impact to their endangered species. Students’ helpful human will also do something helpful for the local community, students articulate this and include in their model.
SCIENCE & ENGINEERING PRACTICES	
Asking questions and defining problems Developing and using models Planning and carrying out investigations Analyzing and interpreting data Using mathematics and computational thinking Constructing explanations and designing solutions Obtaining, evaluating, and communicating information	<ul style="list-style-type: none"> Read a variety of texts and define the problems created by humans’ interactions with ecosystems and organisms. Develop models to show how humans are impacting their environment. Analyze and interpret data which shows how the climate has been changing over time. Use mathematical thinking to analyze graphs that show climate science data. Explain how humans are negatively affecting animals. Communicate information about how animals are affected by humans.
DISCIPLINARY CORE IDEAS	
ESS3.C: Human Impacts on Earth Systems ETS1.B: Developing Possible Solutions	<ul style="list-style-type: none"> Read a variety of texts that talk about the various impacts of human activity on animals, either directly (poaching) or indirectly (deforestation). Learn about and create models of humans impacting the ecosystems and animals around them. Design “a helpful human” who strives to reduce impact to a particular endangered species.
CROSSCUTTING CONCEPTS	
Systems and systems models	<ul style="list-style-type: none"> Study and draw models showing how humans impact and disrupt ecosystems. Create a model of a helpful human who reduces impact to their environment.

The materials/lessons/activities outlined in this activity are just one step toward reaching the Performance Expectations listed above. Additional supporting materials/lessons/activities will be required.



SESSION 1:

Our animal sanctuary—final touches

Warm-up

Remind students about the driving question of the unit and have students revisit their drawing models and their 3D models (dioramas). Is your animal sanctuary model ready? What if you were to pitch this idea to a grown-up who was going to help you build this? Let's make sure we have all the parts needed to communicate a great model.

Materials Needed

[Teacher slides](#)

Main activity: Checking out model

Ask students to take a look at their model and look for the following thing:

- Animal friend
- Food for animal friend
- Shelter for animal friend
- Other things that will help

Peer feedback: Have students partner up with another team. Have each team give each other feedback.

- Can they see who the animal friend is?
- Do they have things in the sanctuary that will help the animal?

Ask students to tell the team they are reviewing what they like about model and what they wonder about the model.



SESSION 2:

Practicing our presentations

Warm-up

Tell students that today, they will be practicing their presentations for the Animal Sanctuary Expo!

Main activity

Ask students to think about the following questions and rehearse their responses. They can work with a partner or practice at home with a grown-up. Let students use their initial model and project blueprints to help them answer these questions.

- What animal were you creating the sanctuary for?
- Why is your animal endangered?
- What does that animal need in order to survive?
- How will the sanctuary help your animal?

Wrap-up

Thank students for their hard work and time. Their message is so powerful and will definitely be received by the world!

Materials Needed

[Teacher slides](#)

Students projects

Encouragement and support from teacher



How Lesson 5 Supports Next Generation Science Standards



K. Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment

Performance Expectation	Connections to Classroom Activity, <i>Students</i> :
K-ESS3- Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.*	<ul style="list-style-type: none"> Finalize their models of their animal sanctuary and make final touches. Communicate how their animal sanctuary will positively impact an organism who is endangered. Share how people can reduce their impact to local animals by making changes in lifestyle.
SCIENCE & ENGINEERING PRACTICES	
Developing and using models Constructing explanations and designing solutions Obtaining, evaluating, and communicating information	<ul style="list-style-type: none"> Finalize their model and make final touches that help convey their message. Share their solution (animal sanctuary) with their community and describe the reasoning for each part of their design. Communicate the information that they have collected and synthesized throughout the unit.
DISCIPLINARY CORE IDEAS	
ESS3.C: Human Impacts on Earth Systems ETS1.B: Developing Possible Solutions	<ul style="list-style-type: none"> Finalize their model which shows how human impact on a species will be reduced in the setting of an animal sanctuary. Share with the community about the features of their animal sanctuary that provide a solution to the problem being faced by the endangered species. Share actions that people can do locally to prevent the animals from being negatively impacted by humans at a local scale.
CROSSCUTTING CONCEPTS	
Systems and systems models	<ul style="list-style-type: none"> Finalize their model showing how their animal sanctuary will create a safe space for an endangered animal that has been negatively impacted by humans. Share how their “helpful human” is positively affecting their sheltered species and their local ecosystem.

The materials/lessons/activities outlined in this activity are just one step toward reaching the Performance Expectations listed above. Additional supporting materials/lessons/activities will be required.

