

UNIT 2

Investigation II: How do Plants and Animals Change the Environment to fit their Needs?

Disciplinary Core Idea: Earth Systems (Grade K)

Overarching Question:

- How do plants and animals change the environment to fit their needs?

Overall Learning Goal:

Students will use observation skills to discover how plants and animals (including people) change the environment to fit their needs and that people can make choices to help reduce their impact on the environment.

Overall Learning Objectives:

- Students that demonstrate understanding can conclude that plants and animals (including humans) can change their environments.
- Students that demonstrate understanding can construct an argument with evidence how plants and animals change the environment to meet their needs.
- Students that demonstrate understanding can explain that things that people do to live comfortably can affect the world around them but can make choices to reduce those impacts (on land, water, air and other living things).
- Students that demonstrate understanding can conclude that people use natural resources for everything they do to demonstrate they understand the relationship between people's needs and the places they live.

Materials

Lesson 1: Pre-Assessment (What do we know?)

- Pre-Assessment Worksheet: Can Plants and Animals Change the Environment to Meet their Needs? (2 pages in total- 1 copy for every student's science notebook)
- Glue
- Crayons
- Colored Pencils
- Science Notebooks

Lesson 2: Traditional Knowledge

- Refer to Section 2: Habit and Habitats in ANKN "A Unit on Predicting Weather," attached at the end of the investigation

Lesson 3: Can plants and animals change the environment? (modified from Beautiful Basics)

- *The Salamander Room* (book) by, Anne Mazer
- Felt story board (or whiteboard)
- Teacher Template: Food, Water, Shelter and Space pictures (Note: It may be helpful to laminate these pictures for later use)
- Teacher Worksheet: Animal Coloring Page (Salamander)
- Cut out pictures various pictures of food, water, shelter and space from magazines for both wild animals and pets. (For instance, a dog shelter may be a house, and a wolf shelter may be woods)

Lesson 4: How do Plants and Animals change the Environment?

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- Choose clips from a nature documentary that show how plants and animals change the environment in order to survive. Optional: Use following clips from BBC documentary, *Frozen Planet*:
 - Episode *From Pole to Pole*: Orcas make waves to turn over icebergs in order to get preferred prey (34:16)
 - Episode *Spring*: Penguins select rocks from environment to make nests (1:30)
 - Episode *Summer*: Terns dive bomb polar bear to protect nests (11:18), Elephant seals kick up sand and rocks to cool and protect themselves from hot Antarctic sun
- Student Worksheet: How Animals Change the Environment to fit their Needs? (1 copy per student)

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- Laminated Materials: How do Plants/Animals Change their Environment to Fit their Needs? (42 pages in total)

Lesson 4: Post-Assessment (What did we learn?)

- Pre-Assessment Worksheet: Can Plants and Animals Change the Environment to Meet their Needs? (2 pages in total- 1 copy for every student's science notebook)
- Glue
- Crayons
- Colored Pencils
- Science Notebooks

Timeframe:

Standards:

Next Generation Science Standard

K-ESS2-2: Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to fit their needs.

Overall Procedure:

Lesson 1: Pre-Assessment (What do we know?)

Teacher Prep: Make copies of the Pre-Assessment, one copy for each student. Cut and glue assessments into each student's science notebook.

Procedure:

- Go over *Homework: Observing what Animals Need to Live and Grow* with students. Ask students to expand on the observations of different animals they made with an adult from home. Were the animals drinking or eating anything as they observed them? What can the students say that these animals need in order to survive?
- Ask students to raise their hands if they think animals and plants can change their environment to get the things they need.
- Tell students that they have been investigating what things plants and animals need to survive. Ask students to provide examples. (Overall their examples should exemplify that animals eat plants as well as other animals in order to survive, plants need air/sunlight, but all organisms need water).
- Ask students if they think that animals need to change their environment at times in order to get the things they need to survive. Provide them with an example to clarify what it means to change the environment. (An example can include changing the temperature in the house if it gets too cold).
- Open a science notebook with the pre-assessment in order to explain today's activity. Tell students that they will take the rest of the class period to complete the worksheet. Next to each

picture of a plant or an animal there is a box where they can draw a picture of how that plant and/or animals changes the environment in order to get something they need to survive.

- Note: Students may need clarification on what they are required to do. Since this is a Pre-Assessment do not provide them with specific examples regarding the specific animal/plant they are working on. You can clarify by stating that plants and animals need certain things to survive, but sometimes in order to get what they need the plant or animal may have to change the environment. Use another example relating to people. People need houses to live but in order to live in a house they must build it which requires cutting down trees from the forest (which changes the environment). Only provide an extra example if students are at a standstill on the assignment. It is also very helpful to walk around and ask students what they are drawing (otherwise it may be hard to decipher).

Lesson 2: Traditional Knowledge- Beaver Investigation*

*This lesson was adopted from the Alaska Native Knowledge Network (ANKN), which is attached at the end of this investigation and can be accessed online at: <http://ankn.uaf.edu/curriculum/units/beaver.html>.

Estimated time:

Teacher Prep: Read over the procedure for Section One: Physical Characteristics of Beavers of the ANKN Beaver Investigation and organize any materials that have been listed and are required for the implementation of the investigation. Throughout the lesson, continuously ask students to make connections between the physical characteristics of beavers with their ability to live and survive. Section Two incorporates a reading from a book, *The Life Cycle of a Beaver*, which is not available in the education kit. If you do not have another resource that can supplement this book, you can contact U.S. Forest Service wildlife biologist, Susan Oehlers, to come and give a lesson in the classroom about the life-cycle of beavers.

Lesson 3: Can plants and animals change the environment? (modified from Beautiful Basics) *

Estimated time: 1, forty-fifty-minute lesson

Teacher Prep: Read over and prepare materials listed in the *Beautiful Basics* lesson, which be found in the *Alaska Project Wild Early Childhood Curriculum* (pg. 6) and is currently located in the Grade Band K-2 education kit.

Lesson 4: How do Plants and Animals Change the environment?

Estimated time:

Teacher Prep (Day1): Before the lesson go behind the school to find signs of how wildlife and plants change the environment to meet their needs. Examples may include: broken branches from a moose (finding food to eat), moss growing on cement (sunlight and air), roots from a plant breaking cement (plant needing space as it was growing), and dug up areas from various animals (either trying to find food or burying it).

Teacher Prep (Day 2): Make copies of *Student Worksheet: How Animals Change the Environment to fit their Needs?* and glue one copy into each student science notebook. Review movie clips that you want to show to students.

Teacher Prep (Day 3): Make sure that that there are 42 laminated copies of the Materials: How do Plants/Animals change the Environment to Fit their Needs? You will be splitting the students up into 3 groups, so each group should receive 7 laminated photos of animals and plants (i.e. People, Wolf, Bear, Moose, Beaver, Raven, Sitka Spruce Tree) and 7 laminated photos of different environmental scenes. Each group will receive the following “pairs” of photographs:

- People → Cabin

- Wolf → Den
- Bear → Dug out in soil
- Moose → Broken tree branches
- Beaver → Dam
- Raven → Acorns hidden in tree (i.e. food cache)
- Sitka Spruce Tree → Roots breaking up cement

Day 1

Procedure

- Ask students to recall from previous lesson the things living things need to live (Food, water, shelter and space).
- Next, ask students to raise their hands if they think animals and plants can change their environments to meet their needs. (Just note this as an additional component of the Pre-Assessment)
- Pose the following scenarios to students to demonstrate what it means to “change” the environment in order for plants and animals to meet their needs.
 - You walk into your house after a long day of school during the winter and the house is very cold. What can you do to change the environment inside your cabin so that you are more comfortable? (Start a fire in the stove OR turn on the furnace)
 - You wake up one morning during the winter and it has snowed a lot! There is so much snow that no one in your house can get the car out of the driveway. What can you and your family do? (Plow the snow from the driveway)
 - During the spring a male beaver needs to build a home for his growing family, and he has found a perfect stream where he wants build it. What does he need to do in order to start building a dam for his family? (Gather sticks around the stream and cut down small trees)
- Tell students they are going to go outside to find signs of how plants animals can change the environment to meet their needs. In order to do that they are going to have to practice their observation skills. Ask students what observation skills they should practice while they are outside. (If they have a hard time coming up this themselves tell them they are going to use their eyes to “see” and their ears to “listen.”) Next, ask students what are the two outdoor rules they need show while they are outside? (1. Listen to the teacher 2. Respect the environment)
- Take students outside to the places that you found earlier. You can ask questions like how the plant/animal is changing the environment and have students explain why that plant/animal needs to change the environment in the first place.
- Back in the classroom have a class discussion about what the students saw outside. Ask students what specific plants and animals they saw outside. How did those plants/animals change the environment to meet their needs?

Day 2

Procedure

- Ask students what kinds of needs plants and animals (including people!) have in order to live. (Obvious answers may be food and water. If students are having a hard time coming up with more examples tell them to think back on the book they read about the salamanders in class. Do animals and people need a place to live? Shelter. Do animals and plants need space to get the food and water they need? Yes. Do animals and plants need to protect themselves from predators? Yes.)
- Tell students that sometimes plants and animals need to change their environment to get the things they need. Pose the following questions:
 - What would you do if your house was cold? (Turn on furnace or start wood stove)
 - What would a bear need to do to get the roots or seeds of a plant that were underground? (Dig them up!)
 - What would a wolf do if it needed a den? (Dig one up or take another animal’s den)

- Tell students that they went outside the other day to find signs of how local plants and animals change their environment to get something that they needed. Ask students which specific plants and animals they saw and how they changed the environment.
- Tell students they are going to use their observation skills to discover how other animals (and possibly plants) change the environment.
- Play movie clips for students. It may be helpful to preface each clip by telling students to use their observation skills to watch the animal closely to see what it needs or wants and what it has to do to get that particular thing. After each clip discuss what students noticed. (What did the animal need? How did it get it?)
- After reviewing all the clips have students complete the worksheet in their science notebook.

Day 3

Procedure

- Ask students to think how the animals they've learned about so far in class have been able to change the environment to get what they need. (If they are having a difficult time doing this provide an example of an animal that has been talked about to jog student's memory).
- Show students 1 laminated photograph at a time of the different animals and plant. Ask them to name the plant/animal and give an example of something each would need to live. Ask students how that plant/animal may change to environment to get what they need. Once students have provided some ideas, match each photograph of the animal/plant with the corresponding photo that shows how they change the environment.
 - o People need to live in homes for protection. They change the environment by cutting down trees to build their homes.
 - o Wolves also need to live in dens for protection as well a place to raise their pups. They change the environment by either digging out dens in the soil OR finding an abandoned den from another animal.
 - o Bears need to eat a lot of food! They change the environment when they dig up roots and seeds of plants located underground when they get hungry.
 - o Moose also need food to live. They are big animals and sometimes as they are looking for willow branches in the woods to eat they will break the branches of trees.
 - o Beavers need a place to live with their young so that they are protected from predators as they grow. To make their homes, called dams, they collect fallen branches or twigs. If there aren't enough of those they will cut down trees with their two front teeth!
 - o Ravens like all animals need food to eat. Since food is hard to find in the winter they will either bury or hide it from other animals in order to eat it later.
 - o Sitka spruce trees need air, water and sunlight to grow. These trees can sometimes grow 800 feet tall and if not given enough space to grow are able to break through cement!
- Tell students they will now play an activity. Their job will be to match up each plant and animal with the picture that shows how they change their environment to fit their needs. (Demonstrate an example if need be)
- Activity: May be best to conduct activity in the gymnasium or an open area. Split class into three groups. Each group receives 7 of the laminated animal/plant photos, which are placed face down. The environmental pictures are placed on the opposite end of each group and are placed face up. One at a time, each student is to pick up an animal/plant photo and walk (it's also fun to have them imitate walking like some kind of animal) to the other side of the gym and place their photo in hand on its match, then walk back, tag the next student in line, who then proceeds with the next photo. This continues until all of the seven animal/plant photos have been correctly matched.
- Back in the classroom discuss the results from the activity. Hold up each animal/plant photo again and ask students which environmental photo they placed it on top of. At this time you can assess

and correct any misconceptions or mistakes that took place as they were going through the activity.

Lesson 5: Summative Assessment (What did we learn?)

Estimated Time

Teacher Prep: Glue or staple the post assessment into student's science notebooks.

Procedure

- Tell students that they are going to review all that they have learned over the last few lessons about how animals and plants change the environment to get what they need to **survive**.
- **First ask students to give examples of different things animals and plants need. (Plants need space to grow as well as water and sun. Animals need water as well as food, shelter for protection and a place to live.)** Ask students to recall certain animals that they learned about in class and how they can change the environment to in order to get those things that they need.
- Tell students they are going to complete an activity in their science notebooks. Have students take the rest of the period to complete the summative assessment.
- Note: Since this is the final assessment only clarify directions for students if questions arise.