

Out-of-School Innovation Project

Nature-based Curriculum for
Out-of-School Programs in Central Oregon

**CHILDREN'S
FOREST**



**CENTRAL
OREGON**

Out-of-School Innovation Project

Dear Educator,

As a leader or staff of an out-of-school program for youth in Central Oregon, the role that you play in children's lives is huge! The time that youth spend in your programs offers so many opportunities for youth development, learning, and health and wellness. The Children's Forest of Central Oregon and the Central Oregon STEM Hub have teamed up to support you and your programs to be able to provide more opportunities for outdoor learning and exploration and STEM for your participants. Often, with busy school days and family lives, outdoor time and STEM can be among the first things to go. Out-of-school programs, with the relaxed atmosphere, extended time frames, and supportive mentors, are the perfect venue to provide more of these experiences to youth.

Recognizing that time, resources, and training opportunities can be limited for out-of-school providers, The Children's Forest and the STEM Hub have worked on creating six kits and curriculum that have everything a program needs to implement the activities. The kits are free to check-out and include curriculum, materials, and coaching (if needed).

Children's Forest of Central Oregon:

Learn more and reserve these kits at www.childrensforestco.org/out-of-school

- Nature Arts - developed in partnership with the High Desert Museum
- Survival Skills - developed in partnership with Wildheart Nature School
- Habitat Investigations - developed in partnership with The Environmental Center

Central Oregon STEM Hub:

Learn more and reserve these kits at www.centraloregonstemhub.org

- Space Science
- STEM and Sports
- Under Pressure - developed in partnership with the Bend Science Station

The mission of the **Children's Forest of Central Oregon** is to unite our community to inspire lifelong connections to nature for all kids. We are a network of 20+ public, and non-profit organizations working to connect children and families to nature through learning, exploration, and play.

The Central Oregon STEM Hub is a partnership connecting regional pre K-12 education, higher education, industry, and community partners to catalyze opportunities and exploration in science, technology, engineering, and math (STEM).

Thank you to our project partners and funders!



Habitat Investigations

Created in partnership with
The Environmental Center

Overview

No matter where you are in Central Oregon, life is all around us. This curriculum and kit helps youth become more aware of the plants and animals that can be found in Central Oregon and what they need to survive. Participants will learn about concepts including habitat, adaptations, predators, and prey through exploration, hands-on activities, and games. Most of the activities are designed so that they can be done in any outdoor space and some require a more natural area with native trees and shrubs. If your site or program doesn't have immediate access to a natural space, look into nearby parks or public lands that are within walking distance, or consider an off-site field trip if transportation is an option.

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Habitat, What's That?

Habitat Investigations Activity 1

Background

All animals - including people, pets and wildlife - need food, water, shelter and space to live. Every animal needs a home. But a home is not just a house, for many animals, a home, means the outdoors. The environment in which an animal lives is called a "habitat". It includes food, water, shelter, and enough space - all arranged in a way that meets the animal's needs.

Getting Ready

N/A

Doing the Activity:

Hook:

- Put three words on the board: People, Pets and Wildlife. What is the difference between the three? Where are their homes? Where do they get food? How do they travel?
- Ask the students to tell you what each needs to survive. Create a list on the board and then see what is in common. Cluster the ideas together, the most basic survival needs should be the same for all three: food, water, shelter, space.

Zooming In on Central Oregon:

- Have the student list some habitats in Central Oregon. Compile the list on the board. Examples students should come up with include mountains, lakes, forests, deserts.
- Put students into groups and hand out the Habitat matching game to each group of students.
- Tell the students they have 5-10 minutes to match the smaller cards with the correct habitat.
- Go over the students answers. There are many plants and animals that can have different habitats. Perhaps some animals were placed in the urban habitat.
- Lead a discussion about what happens when we take over an animal's habitat? Can we alter habitats?

Recommended Ages: K-5th grade

Duration: 45 minutes - 1 hour

Objectives:

Participants will be able to:

- (1) define the word habitat
- (2) identify the basic components of a habitat as food, water, shelter, and space
- (3) generalize that these components are needed in all animals, including people and wildlife
- (4) come up with ideas on how humans affect habitats.

Notes about location/time of

year: The Habitat Scavenger Hunt is best done in a more natural area where students will be able to find the different habitat needs.

Materials Needed:

- Whiteboard
- Dry erase markers
- Habitat Matching Game
- Habitat Scavenger Hunt cards

Activity 1

(continued)

Habitat Scavenger Hunt:

- Explain that you're about to go on a scavenger hunt to find the essential needs for a habitat.
- Create groups of 2 - 3. Let each group choose an animal that can be found in Central Oregon. If they have trouble coming up with one, offer examples: coyote, rockchuck (marmot), deer, woodpeckers, cottontail rabbits, sage grouse, porcupines, gopher, snake, mountain lion, etc. Let them know they'll be looking to see if they can find a food source, water source, cover, and a place to raise their young, specific to their animal.
- Hand out the Habitat Scavenger Hunt cards and explain that they should check off things that they find and write a description, if possible. Example: food = pinecone.
- Give students 5 - 10 minutes to explore the area (create boundaries, as appropriate)
- Gather students back together to discuss whether or not this would be a good home for their animal, and why or why not?

Disappearing Habitats

Habitat Investigations Activity 2

Background

Habitats need specific components in order for the organisms that rely on them to survive and thrive. An animal will be affected if any of the components of the habitat are missing.

Getting Ready

Part A: Create the playing field by marking a “North” and “South” end with the pin flags. Place the one hula hoop for every 3-5 students throughout the playing field.

Doing the Activity:

Part A: Disappearing Habitat Game:

- Habitats are homes to plants and animals. They allow each animal or plant to receive shelter, food, and water and space.
- In this game, the students are Canada geese. The object of the game is for the geese to fly South, and then fly North. The hula hoops represent habitat for native animals.
- During each round, when you yell out “land”, the students need to find suitable habitat to land by going in one of the hula hoops. If a goose can’t find habitat, they will be left standing without safety. In the next rounds, they will then be able to tag other geese.
- After each round, remove one of the hula hoops by imitating a bulldozer. You can provide a story along with the action, such as the habitat being developed into a mall or new neighborhood.
- Play the game until the habitat is gone, or most of the geese have been tagged or are out.
- Discussion:
 - What are some ways in which we reduce habitat for animals and plants?
 - What could we do to meet our needs, while maintaining habitat for animals and plants?
 - Can you think of an animal that you’ve seen in the city whose habitat may have been taken away?

Recommended Ages: K-5th grade

Duration: 1 hour

Objectives:

- Participants will play a game highlighting the impacts of shrinking habitat
- Participants will play a game highlighting the limited resources that are available in a given habitat

Notes about location/time of

year: Part A can be played in any outdoor space, including a grassy lawn. For Part B, a more natural area with plenty of hiding spots for the “nests” works best.

Materials Needed:

- Hula hoops (5-8)
- Pin flags (8-10)
- Set of paper cups (for nests)
- Bag of dried beans

Part B: Robins and Magpies (or Osprey and Eagles):

- In this activity one or two students will be magpies (or bald eagles) and everyone else will be robins (or osprey). Depending on your location you may want to use bald eagles and osprey.
- Each Robin will get a cup that will represent their nest. You can also use the bowls to have students create and gather nesting material for their own nest.
- While the magpie has his/her eyes closed, the robins must find a place within the boundary to hide their nests. The nests need to be on the ground, but the students are able to camouflage the nest if they want to. Remind students that once they've hidden their nest, it cannot be moved.
- The magpie (or magpies) also get a cup to store food, although they will carry it with them.
- Once the nests are hidden, the game will start. The robins need to come and start collecting food (beans) from the teacher. They can only get one bean at a time and must take it back to their nest before receiving anymore.
- After about 15 seconds, the magpie (or magpies) will be able to open their eyes and start looking for nests. If a magpie finds a nest, he/she can empty the whole nest into their cup, then put the nest back carefully. (You can also have a rule that magpies may only take 1 bean at a time from a Robin's nest)
- Robins are not allowed to guard their nest or bully the magpies (they are too small) but can try to distract them in other ways (making sounds, etc.).
- The robins cannot move their nest during a round, even if it is found by a magpie. Instead, they want to keep on putting food in the nest in hopes they will have food at the end. Magpies are allowed to visit the same nest more than once.
- During one point in the game, the teacher will yell out "night time." When this is called, the magpie (or magpies) must stop and close their eyes while the robins can continue to collect beans. This will continue until "day time" is called out.
- The game will end when the students get tired, usually 5-7 minutes per round.
- Have the students collect their nest and count the number of beans they have. Let them know that, the more beans they have, the more offspring they will be able to produce.
- Wrap Up:
 - What were some strategies used by the robins? And magpies?
 - How did the robins "protect" their nests?
 - What do you think birds do if their nests are robbed?
- Play additional rounds, as the students are interested, allowing the robins to move their nests to new locations for each round.

Predator and Prey Interactions

Habitat Investigations Activity 3

Background

An adaptation is a body part, feature, or behavior that helps an organism survive or function better in its environment. For example, carnivorous animals have long, sharp teeth adapted to ripping, tearing or cutting flesh. While many also possess a few molars in the back of their mouths, and sharp incisors in the front, the most important teeth for carnivores are their long, sharp canine teeth. This is an example of a physical adaptation. Herbivores survive by consuming plant material. In general, plant foods are difficult to breakdown and digest; so, many herbivores have several pairs of broad molars that they use to grind leaves, shoots, and twigs. Often, herbivores feature ridged molars and jaws capable of moving sideways.

Getting Ready

Part A: Lay out the laminated camouflage images in a large circle, or on tables.

Part B: Line up the skulls with their “Who Am I” cards on the ground or on tables.

Doing the Activity:

Part A: Camouflage Activity:

- “Ask the students, Do you play hide and seek with your friends? How do you play this game? What do you need to do so you won’t be found? Do you think animals play hide and seek too? How? Why?”
- Write the word “adaptation” on the whiteboard. Ask students, “what do you think this word means?” underline the word “Adapt” to help. An adaptation is a physical or behavioral trait an animal has that helps it survive or adapt to an area. Camouflage is one example of this.
- Have students walk around the circle to observe the different camouflage images and try to guess what animal they are. Come together as a group and briefly discuss each one. Ask students about the different ways animals are camouflaged (color/pattern, shape, and size).

Recommended Ages: K-5th grade

Duration: 1 hour

Objectives:

- Participants will learn what adaptations help animals survive
- Participants will compare and contrast adaptations for predators and prey
- Students will learn about camouflage and how animals use their body, shape, and color to blend into their environment.

Notes about location/time of year: These activities can be done in any outdoor location.

Materials Needed:

- Whiteboard and dry erase markers
- Laminated camouflage images
- Laminated Predator/Prey images
- Assorted skulls (kit includes squirrel, black bear, coyote, bobcat, Great Horned Owl, and beaver)
- “Who Am I?” laminated sheets
- Assorted fur samples (kit includes coyote, bobcat, and black bear)
- Talons (kit includes Bald Eagle and Great Horned Owl)
- Bandana/blindfold

Part B: Predator and Prey Skulls

- Let students know that some adaptations can be seen on a skull, and often, this helps us understand if the animal was a predator or prey.
- Hold up the skull of an herbivore/prey (examples include mule deer, snowshoe hare). Ask them what they notice about the eyes. Introduce the phrase “eyes on the side, likes to hide”. This allows them to have better peripheral vision so they can see predators coming in from the sides. They can also easily detect motion. Ask students what they notice about the teeth. The incisors allow them to cut grass, but they have flat molars for grinding the fibers of plants. Allow students to pass the herbivore skull around the group.
- Hold up the skull of a carnivore or omnivore/predator (examples include wolf, coyote). Ask them what they notice about the eyes. Introduce the phrase “eyes in the front, likes to hunt”. This allows them to have greater depth perception. They can zone in on prey from far away. Ask students what they notice about the teeth. They have sharp incisors, canines, and even sharp molars for cutting and chewing meat. Pass the skull around the circle.
- Allow time for students to explore the skulls, fur samples, and talons on the tables. They can touch any of the materials. If you have a large group, break them up into smaller groups to rotate through looking at each skull.
- Come back together and briefly discuss each skull. What animal does it belong to? What did they notice?

Adaptation: Put the skulls out without any identifiers or the “Who Am I?” cards. Have the group guess what animal each skull is after they have time to observe them.

Part C: Foxfeet and Deer Ears

- Introduce two new adaptations to your students: foxfeet and deer ears.
- To introduce deer ears, have students listen to your voice or a sound nearby (like other kids playing) with their normal ears. Then, have them increase the surface area of their ears by cupping their hands behind their human ears. In this way they have simulated deer ears. The larger surface area captures and amplifies sound waves. Let them listen again to hear the difference.
- Next, introduce fox feet. Many predators have soft padded feet to stalk their prey. Teach students to walk with the outside of their feet, and then onto the ball of their feet. Walking slowly will help them catch their prey.
- Next, have the group stand in a large circle. Place one person in the middle with their eyes closed, preferably blindfolded. This person will be a deer (prey) and use their hearing to evade their predator.
- Place any object on the ground between this person’s feet. Tell the group that this is a quiet game and everyone should stay as quiet as possible.
- The individuals making up the circle must attempt to move undetected towards the person in the middle and retrieve the item, utilizing their fox feet as they go. It’s important that the leader selects who gets to attempt to move by quietly pointing to players around the circle. You can select 1-2 people at a time to stalk their prey.
- If the person in the middle hears or otherwise detects a person moving from their original spot in the circle they can point to them and say “stop”. If the person in the middle is correct the person moving must return to their original spot.
- If a person from the circle successfully grabs the item without being detected, they get to be the deer in the next round.
- Play multiple rounds to allow most or all students to have a chance being the deer.
- Debrief by asking students how it felt to be the deer and the predator.

Trees as Habitats

Background

Habitats can be vast, like a savannah for a lion, or microscopic, such as the habitat for a single ant. Trees provide habitat everywhere from their roots to their bark, to their branches and leaves. Trees are often part of a habitat, but they can also be the sole habitat for many plants and animals. For example, a squirrel may use the tree for its shelter, seeking water and food elsewhere, but a patch of moss can exist solely on a tree and have all of its needs met. Dead trees, known as snags, often provide excellent habitats for a range of birds. Fallen trees provide room for decomposers to move in and do their work.

Getting Ready

Part B: Create a playing field that is about 20x20 yards (enough room for your group to spread out across one end).

Doing the Activity:

Part A: Trees as Habitats

- Ask students “What animals or plants have you seen living on trees? What needs do you think they were meeting by using the tree?” Guide the students as needed to the four components of habitat: food, shelter, water, space.
- Ask students, “A tree can be the only habitat for an animal or plant. Can you think of an animal or plant that only lives in a tree?”
- Ask students, “A tree can also be part of a larger habitat. Can you think of an animal or a plant that uses a tree for some of its needs? Which needs are being met?”
- Divide students into small groups. Pass out one animal card (tree frog, squirrel, woodpecker, owl, bear, fox, centipede, pillbug, deer, rabbit, coyote, spider) to each group of students.
- Have students discuss how trees are an important part of their animal’s habitat. Have the students share their answers.
- Show students the images of examples of how animals use trees as habitat. Discuss each sign and ask what could have created it and what need was being met. For example, hold up the bark with holes. The holes could have been created by a bird seeking insects for food, or perhaps a larger hole provides it shelter.

Recommended Ages: K-5th grade

Duration: 1 hour

Objectives:

- Participants will make observations about the plants and animals that utilize trees for their habitat needs
- Participants will play a game that highlights habitat needs and introduces the idea of carrying capacity
- Participants will get practice building an animal habitat

Notes about location/time of year: Part A requires trees for exploration, preferably a more natural area. Part B can be played in any outdoor space, including a grassy lawn. Part C requires natural materials.

Materials Needed:

- Laminated animal cards
- Laminated images of examples of how animals use trees for habitat
- Laminated Trees As Habitats Checklist
- Dry erase markers
- Magnifying glasses
- Cones
- Laminated images of fox dens

Habitat Investigations

Activity 4

(continued)

Part A: Trees As Habitats (continued)

- Tell the students that they're going to search for signs of trees as habitat. Hand out the checklist, clipboards, dry erase markers, and magnifying glasses.
- Before they begin, ask the following guiding questions:
 - Can you spot a bird's nest, chewed leaves, or other signs that an animal used that tree?
 - Do you see any animals climbing the tree, or flying from one tree to the next?
 - Do you see anything on the ground that could indicate an animal is using this tree? Examples include fallen leaves, twig, seeds, fruits, or nuts.
- Give the students 10-15 minutes to explore the trees in the area, looking for signs.
- Come together as a group and have students share what they found.
 - What did you find on a tree's trunk?"
 - What did you find in the tree's branches?"
 - Do you think the tree is affected or impacted by the life using it as a habitat?"

Part B: Oh Deer!

- Divide your class in half. Half of the students become the "deer" and line up along one line facing away from the other students. The other students are the habitat and line up along the other line facing away from the deer.
- Explain that the deer need to find food, water, and shelter in the habitat in order to survive in their environment. If they don't find what they need, they will die.
- Explain that in each round, both the deer and the habitat will pick a habitat component (food, water, or shelter). For the deer, this is the habitat component they are looking for. Each component has a symbol. The symbol for food is rubbing their stomach, the symbol for water is putting their hands over their mouths, and the symbol for shelter is creating a roof over their heads with their hands. Emphasize that no one can change their symbol during the round.
- Once everyone has chosen food, water, or shelter, you yell "Oh Deer!". At this point, everyone turns around while doing their symbol. The deer runs towards someone on the habitat line that is doing the same symbol. The "habitat" cannot move. Once the deer finds a match in the habitat, they link arms. Only two people can link arms together and the deer takes the habitat back to their line and that person becomes a deer for the next round. If a deer doesn't find a match, they "die" and become habitat for the next round.
- Repeat for several rounds.
- Optional: Add in a predator to tag the deer.

Part C: Fox Dens

- One example of an animal that consistently uses trees for its habitat are foxes.
- Show the images of fox dens that utilize trees. Have students describe the shapes made by the foxes.
- If the area allows, provide time for students to build their own fox dens using branches or the hollows of trees. Be sure to take apart the fox dens after students are done to create less of an impact on the area.