

# CHILDREN'S FOREST OF CENTRAL OREGON

*CURRICULUM KITS FOR FIELD EXPERIENCES IN CENTRAL OREGON*

## Science Observation Skills: Life Cycles and Adaptations

Grades 2-3

Developed for Skyliners Lodge

**CHILDREN'S  
FOREST**



**CENTRAL  
OREGON**

*The Children's Forest of Central Oregon provides a network of outdoor places and programs dedicated to moving all children along a continuum of learning, exploration, and healthy living through engagement with nature.*

[childrensforestco.org](http://childrensforestco.org)

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The Children’s Forest of Central Oregon has the mission of providing opportunities for ALL children in Central Oregon to learn, play, and explore in nature. In addition to providing a network of high quality environmental education programs for K-12 students, one of our strategies is to provide teachers skills and resources to implement field experiences themselves. This curriculum kit is intended to provide teachers everything that they would need to plan a field trip for their classroom or grade level. Included in the kit is:

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## Field Trip Overview

### Field Trip Goals:

- Provide students opportunities to explore and build connections with the natural world
- Apply and expand on science concepts learned in the classroom to investigate real-world examples in nature
- Provide opportunities for students to develop inquiry skills, making observations and collecting data about the natural world to develop an understanding of interconnections between living and non-living things
- Provide students time for physical activity and reflection in an outdoor setting

### Suggested Timeframe:

- We recommend 4-5 hours in the field, to provide adequate time for in-depth exploration, questions, and reflection.
- Each lesson can also be taught independently in your school yard, neighborhood park, or other location.

### About Skyliners Lodge:

- The curriculum kit was specifically developed for Skyliners Lodge, located 8 miles west of Bend on Skyliners Road.
- The lodge is leased by HDES and available for educational use at no charge. The lodge must be reserved in advance (we recommend at least 6 months in advance to guarantee your preferred date). For reservation information, visit [hdesd.org/about/skyliner-lodge](http://hdesd.org/about/skyliner-lodge).
- The kit could easily be adapted for other locations in Central Oregon. Note that we have also developed kits for Shevlin Park (Bend) and the Dry Canyon (Redmond).

### Standards:

Oregon State Science Standards	2.1L.1: Compare and contrast characteristics and behaviors of plants and animals and the environments where they live 2.2L.1: Describe life cycles of living things 2.3S.1: Observe, measure, and record properties of objects and substances using simple tools to gather data and extend the senses 2.3S.2: Make predictions about living and non-living things and events in the environment based on observed patterns 3.1L.1: Compare and contrast the characteristics of offspring and parents 3.2L.1: Compare and contrast the life cycles of plants and animals 3.3S.1: Plan a simple investigation based on a testable question, match measuring tools to their uses, and collect and record data from a scientific investigation
Common Core State Standards	CCSS.MATH.CONTENT.2.MD.A.1, CCSS.MATH.CONTENT.2.MD.D.10, CCSS.MATH.CONTENT.3.MD.B.3, CCSS.ELA-LITERACY.L.2.6, CCSS.ELA-LITERACY.L.3.6
Next Generation Science Standards	2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats 2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants 3-LS1-1 Develop models to describe that all organisms that unique and diverse life cycles

## Planning for the Field Trip

### Suggested Timeline

- ✓ 3-4 months in advance
  - ✓ Check with transportation department and Skyliner Lodge availability
  - ✓ Confirm field trip date, reserve bus, and reserve Skyliners Lodge
  - ✓ Reserve curriculum kit with Children’s Forest of Central Oregon (if you’d like to use materials)
  - ✓ Apply to the School Engagement Fund if you need funding for transportation or substitutes
  
- ✓ 1 month in advance
  - ✓ Send permission slips home
  - ✓ Recruit parent chaperone volunteers
  - ✓ Review curriculum with grade level team and determine responsibilities
  
- ✓ 2 weeks in advance
  - ✓ Confirm reservation with transportation department
  - ✓ Meet with school nurse to compile a list of medical issues, allergies, and necessary medications for all students attending. If students have severe allergies and epi-pens, find out if the student can self-administer or if you need to do it.
  - ✓ Make list of student groups (if you are splitting the group) and divide emergency contact/medical information into groups
  
- ✓ 1 week in advance
  - ✓ Discuss field trip behavior rules with your students
  - ✓ Give students a list of required items of the field trip
  - ✓ Confirm itinerary with parent chaperones
  - ✓ Make copies of any necessary data sheets
  - ✓ Pick up curriculum kit with Children’s Forest of Central Oregon
  - ✓ Make nametags for students
  
- ✓ Day before
  - ✓ Review field trip behavior rules with your students
  - ✓ Pack items on the teacher packing list (below)

### Site Location and Information

Skyliners Lodge is located 8 miles west of Bend on Deschutes National Forest. The lodge is on the National Historic Registry and holds 60-70 students indoors. The lodge has easy access to Tumalo Creek, a great spot for stream exploration, and hiking trails through forest that lead all the way to Tumalo Falls. There are 2 outdoor restrooms, as well as 2 indoor restrooms. The lodge has a kitchen, refrigerator, tables, and a fireplace. Just outside of the lodge are benches and views of Tumalo Creek.

#### Reserving the Lodge:

Skyliners Lodge is leased by HDESD and available for educational use at no charge. The lodge must be reserved in advance (we recommend at least 6 months in advance to guarantee your preferred date). For reservation information and forms, visit [hdesd.org/about/skyliner-lodge](https://hdesd.org/about/skyliner-lodge). School groups using the lodge do not need to supply a Certificate of Insurance.

#### Address and Directions:

Skyliners Lodge is located at 16125 Skyliners Road, west of Bend. From Bend, head west on NW Galveston Avenue, which turns into Skyliners Road. Stay straight through the last roundabout (with Mt. Washington Drive). Continue 8.7

miles on Skyliners Road (FS Road 4601), past the Skyliner community. Turn left into the driveway for Skyliner Lodge (High Desert ESD is on the sign). If you cross Tumalo Creek, you've gone too far! There is a bus turnaround in front of the lodge.

### Emergency Information:

Closest medical facility: BMC Urgent Care - Bend Westside Clinic, 1080 Mt Bachelor Drive, (541) 550-4400

Skyliners Lodge phone: (541) 693-5695

Skyliners Lodge Facility Manager: Bob Martin, (541) 280-3108

## School Engagement Fund

Children's Forest of Central Oregon has a School Engagement Fund that teachers can apply to receive funds for transportation or substitute costs associated with field trips. Funds are prioritized for field trips that are inclusive of students with disabilities, aligned with standards, and for Title I schools. To download an application, visit [childrensforestco.org/school-engagement-fund](http://childrensforestco.org/school-engagement-fund).

## Packing List

### For Teachers:

- Copies of emergency contact information and medical information for all students
- Phone numbers for your school and emergency services (there is no cell service at the lodge)
- Copy of student groups and schedule
- First aid kit
- Plenty of extra pencils
- Hand sanitizer
- Camera

### For Students:

- Day pack
- Water bottle (with water)
- Closed-toe shoes
- Sunscreen
- Lunch with extra snacks
- Ziplock bag with pencil and field journal

## Tips for Group Management in the Outdoors

### Before You Go...

- **Discuss field trip behavior rules with your students beforehand.** Students should understand that the same rules that apply in school, apply on the field trip. Explain the consequences of inappropriate or unsafe behavior. Emphasize that they are representing their school's reputation when they are off-campus and that we want to present our best behavior to the outside world.
- **Prepare your students before the trip.** Discuss the subject matter they will be learning in the weeks before the field experience. Give the students a list of questions they will be looking to answer during the field experience. This will keep them focused, informed, and engaged in learning all day long.
- **Choose parent chaperones wisely.** Field trips require extra eyes and ears. Depending on the site, recruit one chaperone for every 5-10 students. The ideal chaperone is one who is engaged, responsible, and caring. Be sure that chaperones understand that they are there to manage their entire group, not just to spend time with their son or daughter.
- **Establish a signal to get students' attention.** This could be a simple call and response such as "One, Two, Three. Eyes on Me!" and students respond "One, Two. Eyes on You!"

- **Give your chaperones the tools they need to be successful.** Make nametags for all chaperones and students. Create a “cheat sheet” of the day’s itinerary, special rules, and the names of all kids in each chaperone’s group. Give chaperones tips for managing challenging students beforehand.
- **Be considerate when creating student groups.** Avoid grouping students who tend to have problems when together. Assign problem-prone students to chaperones with good management skills or to your group. Field trips can also be a great time to allow students from different classes to get to know each other.
- **Make sure you have all necessary medications.** Talk to the school nurse in advance and gather any medications that your students take during the day. Students with severe allergies need to always have immediate access to their epi-pen. Find out from your school nurse if the student is able to self-administer their epi-pen or if you need to do it.

### In the Field...

- **Travel responsibly and safely.** When hiking, travel in a “chaperone sandwich” with an adult in the front and back of the group. Students should stay on designated trails (when appropriate) and should be instructed not to run. When doing activities that require students to spread out, establish clear boundaries before you start and ensure that all students are always in sight.
- **Establish the “Rule of Threes” or “Buddy Rule”.** Anytime that students leave the larger group, they should travel either with another student and an adult (rule of threes, for younger students) or with another student (buddy rule, for older students).
- **Count all day.** Your biggest responsibility as a teacher is keeping track of each student. Chaperones should count the students in their group, but also be sure to get a head count any time the whole group is gathered.
- **Environmental Factors.** Regularly check-in with students to make sure they are staying warm (or cool) and dry, drinking water, and using the restroom. Many student complaints can be avoided by staying hydrated!
- **Leave No Trace.** All students should understand to be respectful of the living and non-living things they encounter. A good rule of thumb is to “leave nothing but footprints and take nothing but pictures.” To find more information about Leave No Trace Principles, visit [Int.org](http://Int.org).

**Sample Itinerary – 1 class (or each teacher stays with their class)**

Time	Activity
9:15	Depart School
10:00	Arrive Skyliners Lodge
10:00 – 10:15	Restroom break, divide into groups
10:15 – 11:00	Adaptation Scavenger Hunt and Sit Spot
11:00 – 11:45	Habitat...What is That?
11:45 – 12:30	Lunch
12:30 – 1:15	Seed Search OR Plants & Pollinators
1:15 – 2:00	Bird Language Skits OR Wildlife Tracking
2:00 – 2:15	Restroom break, load bus
2:15	Depart Skyliners Lodge

**Sample Itinerary – Multiple classes (station model)**

Time	Activity	Lead
9:15	Depart School	
10:00	Arrive Skyliners Lodge	
10:00 – 10:15	Restroom break, divide into groups	
10:15 – 11:00	<b>Rotation 1:</b> Group 1: Adaptation Scavenger Hunt and Sit Spot Group 2: Habitat...What is that? Group 3: Bird Language Skits OR Wildlife Tracking Group 4: Seed Search OR Plants & Pollinators	Teacher 1 (or volunteer) Teacher 2 Teacher 3 Teacher 4
11:00 – 11:45	<b>Rotation 2:</b> Group 1: Seed Search OR Plants & Pollinators Group 2: Adaptation Scavenger Hunt and Sit Spot Group 3: Habitat...What is that? Group 4: Bird Language Skits OR Wildlife Tracking	Teacher 4 Teacher 1 (or volunteer) Teacher 2 Teacher 3
11:45 – 12:30	Lunch	
12:30 – 1:15	<b>Rotation 3:</b> Group 1: Bird Language Skits OR Wildlife Tracking Group 2: Seed Search OR Plants & Pollinators Group 3: Adaptation Scavenger Hunt and Sit Spot Group 4: Habitat...What is that?	Teacher 3 Teacher 4 Teacher 1 (or volunteer) Teacher 2
1:15 – 2:00	<b>Rotation 3:</b> Group 1: Habitat...What is that? Group 2: Bird Language Skits OR Wildlife Tracking Group 3: Seed Search OR Plants & Pollinators Group 4: Adaptation Scavenger Hunt and Sit Spot	Teacher 2 Teacher 3 Teacher 4 Teacher 1 (or volunteer)
2:00 – 2:15	Restroom break, load bus	
2:15	Depart Skyliners Lodge	

**Grade Level:** 2-3

**Duration:** 30-45 minutes

**Time of Year/Day:** Any

**Ideal Location:** Site with a variety of plants/habitats

**Materials Needed:**

Adaptation Scavenger Hunt (1 per 1-3 students), pencils, clipboards

**Objectives:**

- Students will be able to explain what an adaptation is
- Students will learn about adaptations that plants and animals in Central Oregon have to live in this environment

**Science Standards:**

Oregon State Science Standards:

*2.1L.1: Compare and contrast characteristics and behaviors of plants and animals and the environments where they live.*

*3.1L.1: Compare and contrast the characteristics of offspring and parents.*

Next Generation Science Standards:

*2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats*

**Connections to FOSS Kits:**

Plants and Animals, Insects and Plants, Structures of Life

## Adaptation Scavenger Hunt

### *Rotation 1: Activity 1 of 2*

**Preparation:**

- Print enough copies of the scavenger hunt so every 2-3 students can have one
- Locate an area with a variety of habitats and diversity of plants

**Background:**

Adaptations are physical characteristics or behaviors that organisms have that make them well-suited to live in an environment. Examples of adaptations include animals that live in cold environments having thick fur or plants having very light seeds so that they can get blown by the wind. Central Oregon generally has hot and dry summers, and cold winters. Plants and animals that live in Central Oregon must be suited for these conditions.

**Activity:**

1. Ask students if they know what an adaptation is. Ask students to share examples of adaptations for plants or animals they are familiar with. Do their pets have any adaptations?
2. Based on their observations, ask students to describe the environment around them. Is it hot or cold? Dry or wet? Next, explain that all of the organisms around them are adapted to live in this environment. That means that they have physical characteristics or behaviors that make them good at living here.
3. Explain that they are all going to get to do a scavenger hunt, looking for different adaptations of the plants and animals that live here. Point out boundaries for the activity and explain that students can explore anywhere inside the boundaries, as long as they are respectful of what lives here.
4. Divide the students into groups of 2 or 3 and hand out a scavenger hunt, clipboard, and pencil to each group. Explain that they should try to check off everything on the list and also draw their favorite adaptation on the back. Give the students 15-20 minutes to explore and look for everything on their scavenger hunt.
5. Regroup everyone and have each student share something exciting that they found. Ask if there were any that were difficult to find. Do they think we could find it another time of year or somewhere else? Did they notice any other adaptations that weren't on the scavenger hunt?

**Optional Extension:**

- Have students design a plant or animal that is adapted to live in this environment. Have them consider seasonal weather patterns, potential predators that they need to protect themselves from, and potential prey or food that they need to hunt.



# Adaptation Scavenger Hunt

**Look up! Look down! Look all around! Listen up! Explore with your sense of touch! Try to find all of these adaptations that help plants and animals survive in this environment.**

- Find a plant that has tiny leaves to conserve water.
- Find a plant that has thick bark to protect it from extreme weather
- Find an animal (or sign of an animal) that escapes being eaten by burrowing in the ground.
- Find signs of an animal that drills in tree bark to find food.
- Find a plant that has thorns or sharp edges to keep from being eaten.
- Find a non-human animal that uses its voice to communicate with others of its kind.
- Find an animal that uses pollen from flowers for food.
- Find a plant that is covered with tiny hairs to keep it from drying out.
- Find a plant that loves to grow in the sun.
- Find a plant that can grow somewhere with very little water.
- Find a plant that can grow with very little sunlight.
- Find an animal that uses bushes for protection.
- Find an animal that walks on two feet.
- Find a plant that produces berries or fruit to spread its seeds.
- Find a plant that spreads its seeds by wind or water.
- Find a plant that grows fast

***Use the back of the page to draw the coolest adaptation that you found!***

**Grade Level:** 2-3**Duration:** 10-15 minutes**Time of Year/Day:**

Any

**Ideal Location:**

Quiet location

**Materials Needed:**

Paper and pencil (optional)

**Objectives:**

- Students will tune into their observation skills by spending quiet time in nature
- Students will develop a connection with the place they are spending the day

**Science Standards:**Oregon StateScience Standards:

*2.1L.1: Compare and contrast characteristics and behaviors of plants and animals and the environments where they live.*

Next GenerationScience Standards:

*2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats*

## Sit Spot

### *Rotation 1: Activity 2 of 2*

#### **Preparation:**

- Find a location that is quiet and away from the rest of the groups

#### **Background:**

During field experiences it is important to integrate sensory awareness and nature immersion activities as often as you can into all the curriculum areas. A sit spot is an easy yet incredibly powerful way to create this deeper connection to nature and tune-in students' observation skills. Rather than rushing along a trail without necessarily tuning in to anything going on around them, sit spot time is sedentary time alone in the forest, a unique opportunity for many people, especially children. One sit spot can be powerful, but getting to know one spot over time is life-changing. We can introduce the routine here, but we're hoping they take this concept home with them to find a sit spot near home.

#### **Activity:**

1. Find a quiet location with a large enough area for everyone to spread out. Explain that we will be doing a sit spot and taking some time to use our senses to observe nature. Explain that students will simply sit quietly by themselves and enjoy using each of their senses.
2. For the first sit spot, it is a good idea to do a sense meditation beforehand. Have them tune into each of their five senses one by one - close their eyes and notice everything they hear, feel, taste the air, smell, then open eyes and look around. Suggest this as a focus for sit spot time today, tuning in to each of the senses separately.
3. Have students spread out within viewing distance of you or drop students off along the trail, with enough space between them. Students should be far enough away from each other so they don't distract each other. Give students 5 or so minutes to be quiet.
4. Come back together and debrief your experiences. Did they enjoy the quiet time? What did they observe? Do they think they would have noticed these things if we were walking quickly down the trail?
5. Ask students if there is a place near their home where they can do this, even if it's in their yard. Encourage them to continue the routine.

#### **Optional Extension:**

If you have a quiet area outside your school or can go on multiple field experiences, try these variations for your sit spots:

- Notice as many different colors as you can.
- Feel as many different textures as you can.
- Notice as many different plants as you can. Or birds. Or insects.
- Make a sound map, marking all the sounds they hear.

**Grade Level:** 2-3

**Duration:** 45-60 minutes

**Time of Year/Day:** any

**Ideal Location:** Natural area with at least two different habitats

**Materials Needed:** Dry erase board and markers (or large butcher paper), Habitat matching game, Habitat Investigation Data Sheet (optional)

**Objectives:**

- Students will be able to define habitat and identify the basic components of a habitat as food, water, shelter, and space
- Students will be able to generalize these components are needed in all animals including people and wildlife

**Science Standards:**

Oregon State Science

Standards:

*2.1L.1 Compare and contrast the characteristics and behaviors of plants and animals in the environments where they live.*

*2.3S.1 Observe, measure, and record properties of objects using simple tools to gather data and extend the senses*

Next Generation Science

Standards:

*2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats*

## Habitat...What is that?

### Rotation 2

**Preparation:**

- Print the habitat matching game (if you aren't borrowing the kit)
- Print the Habitat Investigation Data Sheet

**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". A Habitat is a special place where a plant or animal lives. Just like you have a home or place to live, so do animals and plants. When we talk about an animal's or a plant's home it is more like a neighborhood than a "house." An animal needs five things to survive in its habitat: food, water, shelters and enough space in a special arrangement for the animals needs. An animal will be affected if any of the components of the habitat are missing.

All habitats have four important components (parts) for wildlife: shelter, water, food, and space. Most of the time, people only think of shelter when considering habitat, but the other three components are just as important, and an organism cannot survive without all four.

**Shelter** describes the structures which an organism lives near, around, on top of, or inside. A home can be considered shelter, such as a burrow, tree cavity, or space beneath an old log. A nest is also shelter, such as a bird's nest or beehive. Another type of shelter is "cover." Cover may not be a home or nest, but simply an arrangement of plants, rocks, dead leaves, water, or shade that an organism can hide in or move undetected by other organisms. Shelter can also be anywhere that an organism uses to escape weather or other dangerous conditions.

**Water** is important to all forms of life, and without getting enough water in some way, an organism will die.

**Food** is also essential. Food comes in many forms for many different organisms. Food may be a plant that a rabbit munches on; or, to a hawk, the rabbit is the food. Nutrients in the soil are food for plants.

**Space** is often overlooked as a component of habitat, but all organisms must have it to be healthy. If too many of one kind of animal lives in the same area eating the same kinds of food, using the same shelter, and drinking the same water, these things will soon be used up and none of the animals will survive. The same goes for plants, which crowd each other as they reach for light (with branches), water and nutrients (with roots).

**ACTIVITY: Part 1: 10-15 minutes (ADAPTED FROM PLT Everybody Needs a Home and Habitat Lap Sit)**

1. Put three words on the white board or large paper: People, Pets and Wildlife.
2. Ask the students to tell you what each of these 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, and space.
3. Explain that together, these things make up a habitat, which is the environment where a plant or animal lives. Habitats should have all the things that organisms need to survive. This can be thought of as our neighborhood, which has all of the things we need to survive as people.
4. Next have the students stand up and get into a circle. Have students count off in the habitat components, food water, shelter, space.
5. Ask the students to turn to their right, at the same time taking one step toward the center. Ask everyone to listen carefully, place their hands on the shoulders of the person in front of them (students need to be snug together). At the count of three, ask the students to sit down slowly on the knees of the person behind them keeping their knees together to support the person in front of them.
6. Have students then stand up. Ask students what would happen if we took out one of the components (i.e. shelter). Have the shelter students step out of the circle. Would we be able to link together the habitat circle? How can animals lose their shelter? How can humans help support habitats and keep them healthy?



**Part 2: Habitat Matching Game (10-15 minutes)**

1. Have the student list some habitats in Central Oregon. Compile the list on the board. Students should come up with: mountains, lakes, forests, deserts, urban, streams, etc. Explain that for each of these habitats there is a different mix of plants and animals that can be found there.
2. Put students into groups and hand out the Habitat matching game (page x) to each group of students.
3. Tell the students they have 5-10 minutes to match the smaller cards with the correct habitat.
4. Go over the students answers. Were there any that they thought could survive in multiple habitats? Were there any that were placed in the urban habitat?
5. Ask students what happens when we take over or change an animal's habitat? What types of things might humans do to change habitats?

**Part 3: Mini-habitat investigation (15-30 minutes)**

1. Take a walk around the property with the students to two different habitats, the forest and the riparian area by the stream.
2. Have students observe and record the differences in the amount of sunlight, soil, plants, and signs of wildlife in each area. Students can dig a soil sample, turn over rocks, etc. to look for insects and wildlife. If they can't see wildlife, have them predict what kinds of animals they might find there. (OPTIONAL: Use the data sheet on page 13 to record observations).
3. Regroup the students. Ask them to describe differences in sunlight, soil, plants, and wildlife that they found in each habitat. Do they think that the sunlight or soil affected what kinds of plants they found there? Do they think the types of plants growing in each habitat would impact what wildlife lives there? Ask students for examples.

## HABITAT INVESTIGATION DATA SHEET

	HABITAT 1	HABITAT 2
Describe the habitat. Is it forest, meadow, desert, along a stream?		
Is sunny, shady, or in between?		
Dig a small soil sample. Describe the color and texture of the soil. Is it wet or dry?		
Check all the types of plants you can find:	<input type="checkbox"/> Trees <input type="checkbox"/> Shrubs ( <i>woody stems, usually with more than 1 stem</i> ) <input type="checkbox"/> Grasses <input type="checkbox"/> Other	<input type="checkbox"/> Trees <input type="checkbox"/> Shrubs ( <i>woody stems, usually with more than 1 stem</i> ) <input type="checkbox"/> Grasses <input type="checkbox"/> Other
How many different kinds of plants can you find? (Count each kind of tree, shrub, & grass separately)		
Can you find any signs of wildlife (tracks, scat, nests, holes, munched leaves)? Record what you found.		
Did you find any insects in the soil?		

**Grade Level:** 2-3

**Duration:** 45 minutes

**Time of Year/Day:** any, but preferably in the morning or spring

**Ideal Location:** any, preferably plenty of bird activity

**Materials Needed:** Bird language scenarios, binoculars (optional), bird field guides (optional)

**Objectives:**

- Students will be able to identify different ways that birds communicate with each other for their basic needs and survival
- Students will understand how birds interact with their environment and other living creatures

**Science Standards:**

Oregon State Science Standards:

*2.1L.1 Compare and contrast the characteristics and behaviors of plants and animals in the environments where they live.*

Next Generation Science Standards:

*2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats*

**Connections to FOSS kits:**

Plants and Animals

## Bird Language Skits

### *Rotation 3: Activity 1 of 2 options*

**Background:**

Because birds are the most abundant and visible wildlife, many people are drawn into the natural world by birds. Our interest in birds may be more deeply rooted in survival than aesthetics. Birds tell us secrets and give us clues about what is happening in nature. Birds and their vocalizations and behaviors constantly radiate information and by learning about bird language, we tap into a network of alarms and news reports of events in the landscape.

**Activity:**

1. Sit down in a circle and give the students a few moments to tune into the world around them, using their sense of sight and hearing. Ask the students if anyone heard any birds. If they did, ask them what they thought the bird was communicating.
2. Ask the students if they have had any experiences where they learned something by what a bird was communicating. Has anyone ever been walking and had a bird swoop close to you and give you an alarming call? What do you think this bird was telling you? Explain that we can learn a lot about the world around us just by listening to the birds.
3. Explain that we will divide into 4 groups, each who will have a different bird scenario. The students will read their scenario and develop 2 skits to go along with it. One skit will be in “bird language” with the students acting like birds (not using human words, only the sounds of birds). The next skit will happen right after the first, and will be in “human language”, which the students acting like birds, but using human words to express what they are saying. Give the students 5-10 minutes to develop and practice their skits, assisting them as needed.
4. Gather the group back together and have the students perform their skits for the larger group. After each group, ask the students what they thought the birds were communicating and share the the type of bird language.
5. After all the groups have presented, ask the students if they can think of another type of bird language (HINT: song). Ask students what bird song is for and how it is different than the other types of language (bird song is used to define their territory, attract a mate, or done when the birds are feeling comfortable and happy).
6. Next, encourage the students to use their senses to try and observe these behaviors in the wild. Take 5-10 minutes to use the binoculars (or just their eyes) to quietly look for birds, watch what they are doing, and listen to their language. Ask students to share their observations with the larger group. Do they think they would observe different behaviors at different locations or at different times of year?



**The Scenarios:**

**Companion Calls** are used by birds to keep them in touch with their families and flocks. Companion calls are usually call-and-response, with one bird giving a “cheep” and other birds answering with a “cheep”.

Bird Language: Start with your flock hanging out and checking in with each other as everyone is looking for food. After a minute, one bird doesn’t answer with a “cheep” because it got too far away looking for food. The other birds get worried and start to “cheep” loudly. Finally, the lost bird hears and answers and the others calm down. Then the birds go back to “cheeping” back and forth.

Human Language: Same as the skit above, but the birds would say, “are here?” and “yes, I’m here”. If you want, you could pretend to be a family shopping in the grocery store, and one of the kids gets lost for a little while, looking at the candy.

**Alarm Calls** are used by birds to warn others that there is danger nearby. Alarm calls are short, sharp, and loud. The greater the danger, the louder and more frequent the alarm calls.

Bird Language: Start with your flock going about their business, looking for food, and “cheeping” now and then. Then, in sneaks a fox, and the first bird to see it starts alarming loudly and the other birds join in loudly. The fox sneaks a little closer, and the birds alarm even louder, until finally the fox goes away.

Human Language: Same as the skit above, but the birds would alarm by saying “Look out! Look out!” and “Go away, fox!”

**Juvenile begging** sounds happen when baby birds ask for food. These calls are short, repetitive, high-pitched, and are also coupled with the young birds flapping their wings.

Bird Language: Have 1 student acting as the tired mother and the rest acting as baby birds in a nest. The baby birds are chirping loudly non-stop and their mom is working very hard to look for food and feed them.

Human Language: Same skit as above, but the baby birds can yell out for favorite snacks.

**Male to male aggression** is two males fighting over their “turf” or territory.

Bird Language: The males call very loudly and chase each other all over the place, sometimes making bumping into each other to send a stronger message (no one really gets hurt).

Human Language: The males say funny insults, bumping chests and chasing each other way. “This is my side of the line, don’t you even cross it or I’m going to get real mad!” and “Oh yeah, what do I care? I can do what I want, I’m my own boss!” The scenario can end with one of them eventually winning the battle, while the other retreats to other habitat.

**Grade Level:** 2-3

**Duration:** 45 minutes

**Time of Year/Day:** any, great when there's snow!

**Ideal Location:** any

**Materials Needed:** Set of 6 skulls, 6 scats, and 6 tracks (in kit), tracking field guides

**Objectives:**

- Students will gain skills for recognizing differences in animal signs
- Students will connect physical characteristics of skulls to an animal's role in the ecosystem

**Science Standards:**

Oregon State Science Standards:

*2.1L.1 Compare and contrast the characteristics and behaviors of plants and animals in the environments where they live.*

Next Generation Science Standards:

*2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats*

**Connections to FOSS kits:**

Plants and Animals, Structures of Life

## Wildlife Tracking

### *Rotation 3: Activity 2 of 2 options*

**Preparation:**

- Set-up 6 stations (1 per animal), each with the skull, scat, and track of the animal, plus a couple of field guides. It's recommended that you cover the stations or put them in a box until the activity starts.

**Background:**

Wild animals are all around us – even in urban areas or just outside of cities. Most animals hide when they hear a sense of danger, making it difficult to see them. Lucky for us, wild animals do leave lots of clues about who they are and what they are up to. They chew leaves, scratch bark, dig underground tunnels, build nests, lose feathers, leave scat (poop), make footprints, and also leave behind skeletons when they die.

Animals footprints, or tracks, are one way to learn about an animal without actually seeing it. Since different animals leave different tracks, we can identify what animals made a particular set of tracks. Most of us would easily recognize a human footprint in mud or sand from its familiar shape and the fact that it has 5 toes. Likewise, the tracks of other animal families have distinctive shapes and characteristic numbers of toes that help identify them.

In addition to tracks, wild animals can also be recognized by their scat. Each animal's scat has a different shape, size, and texture, often relating to their diet. Finding animal skeletons is a jackpot! Their skulls especially give us clues to what type of animal it is. The saying "Eyes on the side, likes to hide. Eyes in the front, likes to hunt" can be very helpful. The teeth can also tell us if the animal is a meat eater, plant eater, or both (omnivore). Sharp teeth are made for tearing flesh or meat, while flat teeth are made for grinding plants.

**Activity:**

1. Ask students if any of them have seen wildlife around their home or while hiking in the forest. After hearing a few examples, ask students if they think people always see wildlife when it's nearby? Explain that animals often hide from people if they think it's dangerous. The good news is that often they leave behind signs that let us know they were there.
2. Ask students what examples of animal signs are (scat, tracks, skeletons, scratched bark, etc.) and help them if they are having a hard time. Explain that these signs are kind of like books, and if we look closely, they can tell us a story. Each animal leaves behind a distinct track, which helps to identify what it is. Ask students if they've ever looked at their pet's feet or seen their track. Have them describe what the track or foot looks like.
3. Explain that they will get a chance to observe animal signs from 6 different animals. Divide the students into 6 groups and assign them each to a station. Tell



them that they will have a few minutes to observe the scat, tracks, and skull of the animal and make a hypothesis about what the animal is. Give them some hints for identifying skulls and teach them the phrase “Eyes on the side, likes to hide. Eyes in the front, likes to hunt.” Using the skull and tracks, have them imagine how big the animal would be.

4. Depending on time, have the students rotate through the stations, allowing enough time for them to make careful observations. After 20-25 minutes, regroup the students.
5. Go through each station and have students share their ideas for what animal each was. When they share their ideas, ask them what clues led them to that guess. Afterwards, share with students the correct answer and a photo of each animal.
6. Next, give students 5-10 minutes to explore the area as “wildlife biologists”, looking for signs of wildlife (not just tracks and scat). Review what the students find together as a group.

**Optional Extensions:**

- Before exploring, have each group do a bit of research using the field guides about one of the animals. Ask them to find out what kind of habitat the animal prefers, and what they like to eat. When you’re out exploring, ask the students if they think their animal could live in this area, based on their habitat needs.
- Have students draw maps or write stories about an animal visiting the site (have them base it off of the animal signs that you find, if possible). Have students answer in their drawings or stories the following questions:
  - **Who** is the species that made the track? Male or female? Young or old?
  - **What** was the animal doing? Standing, walking, trotting, bounding, hopping?
  - **When** was the track left?
  - **Where** was the animal going?
  - **Why** was it travelling AND why was it travelling here? What habitat characteristics would be favorable for the species who left the track?

**Grade Level:** 2-3

**Duration:** 45 minutes

**Time of Year/Day:** any

**Ideal Location:** any, preferably with a wide variety of plants

**Materials Needed:** Part 1 - whiteboard, markers, Seed Search data sheet, rulers, clipboards, pencils, examples of seeds, fruits, and nuts (optional), large socks (optional); Part 2 – Poker chips or plastic eggs in 5 colors (5 per student)

**Objectives:**

- Students will observe the diversity of seeds and fruits and understand how the structure of a seed influences how seeds are dispersed
- Students will use observation skills to measure and record properties of seeds

**Science Standards:**

Oregon State Science Standards:

*2.2L.1 Describe life cycles of living things*

*2.3S.1 Observe, measure, and record properties of objects and substances using simple tools to gather data*

*3.1L.1 Compare and contrast the characteristics of offspring and parents*

Next Generation Science Standards:

*2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants*

*3-LS1-1 Develop models to describe that all organisms that unique and diverse life cycles*

**Connections to FOSS kits:**

Structures of Life

## Seed Search

### *Rotation 4 (Option 1 of 2)*

**Preparation:**

- Make copies of the Seed Search data sheets
- Collect examples of fruits, nuts, cones, and seeds (part 1)

**Background:**

Plants grow in nearly every environment on earth and serve as food for people and many animals. Plants produce seeds to reproduce and develop into new plants. Seeds are formed after a plant is fertilized, and sometimes plants develop fruits with the seeds inside. It is important for seeds to be spread (dispersed) away from each other and from the parent plant. This helps to avoid overcrowding and the competition for light, water and mineral salts that would result.

Plants have a variety of ways in which they disperse their seeds, or the fruits containing the seeds. There are four main groups of dispersal mechanisms: animal, wind, water and self-dispersal. The size, shape and color of the fruit and seed, together with other features, reflect the method of dispersal.

For animal dispersal, some seeds have little barbs or hooks that catch on an animal's body as it passes by. Later, grooming or brushing up against an object will knock the seed off in a new location. Many plants have developed brightly colored, flavorful fruit as a means of attracting animals. Fruit-eating animals, including many birds and mammals pass hard to digest seeds out of their bodies in their "poop", called scat. Animals may also loosen seed heads or drop cones and other seeds to the ground as they are feeding. The seeds can then roll to a new location. Squirrels and many jays are famous for burying "nuts" to eat at a later time. When they lose track of their hidden treasures, seeds are dispersed. If seeds get enough water, nutrients, and sunlight, new plants may grow in many new locations.

**Part 1: Seed Search**

1. Begin by asking the students to share any information that they know about seeds and collect a list on a whiteboard.
2. Optional: Bring some examples of seeds, fruits, and cones (pine cones, juniper berries, apple, orange, walnut, acorn, corn) and explain sometimes seeds are carried inside of fruits. Pass out examples to small groups of students. Ask the student to spend some time making observations about the fruits and seeds in front of them.

3. Ask students how they think seeds get spread from the parent plant. Why is it important for seeds to move some distance away from each other?
4. Explain that, we are going learn about the seeds of plants around us and collect data about their characteristics. As they are collecting data, they should think about how they think the seeds are spread.
5. Divide students into groups of 3-4, and give each group a clipboard, data sheet, pencil, ruler, and socks (optional).
6. Define the boundaries of where groups can explore. Remind students that they must stay within sight and with their groups. Additionally, explain that each plant produces seeds at different times, so some plants may have seeds and others won't. Also explain that for taller trees, look around on the ground surrounding the tree for seeds, as they may not be able to reach them.
7. Give students 15-20 minutes to collect their data, checking in with groups to answer their questions. If you brought socks, have students wear them over a shoe and walk through areas with lots of grass to collect seeds.
8. After 20 minutes, gather the group together to share what they found. Ask students what their favorite seed they found was. Did the students notice any patterns between the size or shape of seeds and how they thought they were spread? Did the students find any plants where they couldn't find the seed?
9. Ask the students to share with the class anything new that they learned about fruits and seeds during the investigation. Add their comments to the list on the board. Conclude by asking the students to write down 2-3 questions that they have about fruits and seeds in nature that they could investigate.
10. **Classroom Extension:** Collect data from all the groups about their seeds. Have students make bar graphs of the number of seeds found that disperse by animals, wind, water, and self-dispersing. Ask students what type of dispersal method was most common for the area they collected seeds.

### **Part 2 (Optional): Seed Dispersal Simulation**

1. Gather students at a large open area and count them off from 1-5. Designate each number group as a different animal (black bears, squirrels, mice, deer, and robins), each with a different color. Allow each "animal" to gather 5 "seeds" (poker chips or plastic eggs) in their color. Explain that you are the parent plant where the seeds came from.
2. Blow a whistle and encourage the animals to move off in any direction. The bears must skip, the squirrels must hop on 1 leg, the mice must crawl, the deer must walk, and the robins can "fly"/run. After about 5 seconds blow your whistle 2 times. All the animals should freeze and drop 1 "seed" wherever they stopped.
3. Repeat Step 2 five times, reminding students that they may move in a different direction each time.
4. After the final seeds drop, gather the students on the sidelines to observe the area. Ask students which seeds travelled the least distance from the parent plant. Have 1 volunteer from each animal group try and find the seed in their color that is the farthest from the parent plant. Have the volunteers pace how far they are from the parent plant. Which animal covered the most territory? Optional: Record the distances for each animal and make a bar graph when you return to class.

## SEED SEARCH DATA SHEET

	SEED 1	SEED 2	SEED 3	SEED 4	SEED 5
How big is the fruit or seed? Measure it's length in inches.					
Is the seed from a tree, shrub, grass, or other plant?					
Do the fruits or seeds have hooks (HINT: do they stick to your clothes?)					
Do the fruits or seeds have wings?					
Do the fruits or seeds have a parachute of wings?					
What color is the fruit?					
Is the fruit or seed juicy?					
How do you think the seed is dispersed (or spread) – wind, water, animal, or self-dispersing?					

# Plants and Pollinators

## Rotation 4 (Option 2 of 2)

**Grade Level:** 2-3

**Duration:** 45 minutes

**Time of year/Day:** Spring-Summer (preferably warm and sunny)

**Ideal Location:** Natural Area, sunny, blooming plants, weedy area, school garden

**Materials Needed:** Who's Who Fact Sheets, Pollinator Name tags

### Objective:

- Students will learn about the physical characteristics and adaptations of pollinators in our region
- Students will learn why pollinators are important to ecosystems

### Science Standards:

Oregon State Science

Standards:

*2.2L.1 Describe life cycles of living things*

*2.3S.2 Make predictions about living and non-living things and events in the environment based on observed patterns*

*3.1L.1 Compare and contrast the characteristics of offspring and parents*

*3.2L.1 Compare and contrast the life cycles of plants and animals*

Next Generation Science

Standards:

*2-LS2-2 Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants*

*3-LS1-1 Develop models to describe that all organisms that unique and diverse life cycles*

### Preparation:

- Make Pollinator name tags (or use the curriculum kit). Each set has 9 name tags and you'll need 1 nametag per student. The names are: Honey Bee, Bumble Bee, Butterfly, Moth, Paper Wasp, Yellow Jacket, Hummingbird, Bat, and Beetle. Copy on card stock and laminate. Punch holes in name tags and attach string so tags can be worn around the neck.
- Make copies of the Who's Who? Fact Sheet (1 for every student).

### Background:

Many flowering plants depend on animals to reproduce. Bees, bats, butterflies, hummingbirds, moths, beetles, and others visit flowers in search of food. In the process, animals pollinate the flowers, bringing reproductive cells from one plant to another of the same species. Pollination leads to fertilization, the development of new seeds, and in some plants, fruit. Plants, rooted in place, must face the challenge of transferring pollen to another flower of the same species. Some flowers rely on wind to carry pollen grains, while others use water. Animal pollinators, give plants an advantage as they deliver pollen directly to the flower. While collecting nectar from the base of a flower, pollinators like bees brush against pollen from the flower's anther. Then the pollen is stuck on the bee, and hopefully brushes off when the bee visits the next flower. Over time, flowers have developed adaptations to ensure that the best pollinator for their species will visit and return often to feed. In fact, flowers' fragrance, bright colors, nourishing nectar, and varied shapes are considered adaptations to attract certain pollinators. Each pollinator has different preferences for the flowers they visit, based on these adaptations. For example, because beetles are clumsy flyers, they need flowers with large openings and because moths are mostly out at night, they are attracted to white fragrant flowers that are open at night.

### Pollinator Vocabulary:

Pollen baskets: Smooth concave areas with stiff hairs on the hind legs of a bumble bee or honey bee that they use to transport pollen back to the nest.

Pollinator: An animal that helps to spread pollen between flowers.

Proboscis: Elongated mouthparts, forming a drinking tube, used by some insects, especially butterflies, moths and some bees.

Antennae: Feelers out of the heads of insects that are used to smell and feel

Compound Eyes: Eyes that are made of many different lenses (up to 30,000!) (instead of just one lens like people have). Compound eyes cannot see very much detail or things that are far away, but they can see extremely quick movements and things that are close to them.

Life cycle: The sequence of changes that a living thing goes through as it grows and develops. The stages are egg, larvae, pupa, and adult.

### Activity:

**Part 1: Who's Who Pollinator Game (20 minutes)**

- Ask students if they know what a pollinator is. Have them share anything they know about pollinators. What types of animals pollinate flowers? Use guiding questions until they have come up with the 9 groups for the game.
- Explain that just like all kids don't like the same kinds of food, the different pollinators are attracted to different kinds of flowers to get food (nectar). Explain that they are going to play a game to learn about the different adaptations of pollinators and flowers.
- Divide students into groups of 9 (there are 9 pollinator name tags). Give each student a copy of the Who's Who Pollinator Fact Sheet. Review some of the vocabulary (proboscis, compound eyes, antennae, pollen baskets).
- Place a pollinator name tag on each student. The name tag is worn on the back of each player, **it's important that they don't see their name tag.**
- For the game, each student tries to determine what pollinator they are by asking yes or no questions to their classmates. The fact sheets help them answer questions as well as ask questions to try to determine which pollinator they are. Important: Students can't ask "Am I a \_\_\_\_\_"
- Once the student has identified their pollinator he/she can turn around their name tag to the front. They can continue to play, answering questions from other students.

**Part 2: Plant and Pollinator Observation (25 minutes)**

- Explain that now that students are familiar with the different types of pollinators and their adaptations, they will get a chance to explore the area, looking for different pollinators and recording their behavior.
- Pass out the Pollinator and Plant Observation Sheet. Explain that when they see a pollinator, they should quietly observe it, noting their behavior including what they're doing, what type of flower they are visiting, and what the flower looks and smells like. They will record this information on their Observation Sheet.
- Divide the students into small groups and give them 10-15 minutes to explore and look for pollinators. This activity is best done in a sunny area with plenty of flowers.
- Regroup the students and ask them to share what they found. Do they think it would be different if they returned at a different time of year or did the activity somewhere different?
- Review with the students why pollinators are important to ecosystems.

## Who's Who Pollinator Name Tags

**Honey Bee**

**Bumble Bee**

**Butterfly**

**Moth**

**Beetle**

**Paper Wasp**

**Bat**

**Hummingbird**

**Yellow Jacket**

## Who's Who? Pollinator Fact Sheet

### Honey Bee

- Social insects that live in colonies in hollow tree cavities or hives
- Antennae are sensitive to touch and odor
- Drinks nectar, honey and water through a long hairy tube called a proboscis
- Can sting only once (dies after stinger is detached from body)
- Sees colors from ultraviolet to orange (can't see red)
- Carry pollen in pollen baskets or stuck to the hairs on their body

### Bumble Bee

- Large and very fuzzy
- Yellow and black
- Wings are clear with black veins
- Slow and clumsy when flying
- Can sting more than one time.
- Makes its nest close to the ground. Likes to find empty holes where little critters lives before.
- Only the Queen bumble bee lives through the winter
- Collects pollen and nectar from flowers that are very hard to get

### Butterflies

- Flies only during the day when it is warm
- Covered with scales
- Rest with their wings folded together
- Some migrate long distances to find warmer climates
- Drink nectar from a long tube called a **proboscis**
- Butterflies form a chrysalis
- Antennae have knobs at the end and are used for smelling
- Pass through four (4) stages of development- egg, larva, pupa, adult

### Beetles

- they are clumsy flyers
- can't see or smell well
- the flowers they visit produce lots of pollen
- the flowers they visit are usually white or green or maroon and smelly
- They pollinate flowers with large openings so they can fit inside and have room to land

### Moths

- Usually on fly at night
- Have a very plump body
- Covered with scales
- Rest with their wings flat
- Spins a cocoon
- Attracted to light, sweet smells or white flowers that are open at night
- Antennae are hairy or feathery and end in a point

### Paper Wasps

- No hair on body
- Can't carry pollen \*
- Eats insects and spiders
- Builds its nest out of "paper" it looks like gray tissue paper
- Black and yellow stripes on abdomen

### Yellow Jacket

- Often mistaken for a bee
- A social wasp
- A pest at picnics
- Not usually considered a pollinator \*
- Hairless, no pollen baskets
- Carnivorous, eats insects and meat

### Hummingbirds

- Their favorite flowers is red and tubular
- Important for pollinating flowers and eating insects
- Bright orange, pink and red flowers are more visible than other colors
- Feed 5-8 times an hour
- Eggs are smaller than a jelly bean
- Nests are used year after year
- Have a huge brain and heart

### Bats

- Bats look for food at night
- They like white flowers
- There are almost 1,000 species of bats
- Pollen gets stuck to their head as they reach into the flower for the nectar
- They have a long bristly tongue to reach the nectar
- They pollinate bananas , peaches and avocados





## Pollinator and Plant Observation Sheet



Name \_\_\_\_\_ Site \_\_\_\_\_ Date \_\_\_\_\_

Time of Day \_\_\_\_\_ Weather \_\_\_\_\_

Insect/Animal	Behavior crawling, drinking nectar, collecting pollen, # of visits	Flower Shape (make a drawing)	Flower Color	Flower Scent
Bee				
Butterfly				
Fly				
Hummingbird				
(other)				

# Science Observation Skills: Life Cycles and Adaptations (2<sup>nd</sup>-3<sup>rd</sup> grade) Curriculum Kit

## **Materials List**

If you plan on doing all of the activities, listed below are the recommended materials. All materials are available through Children's Forest of Central Oregon. To reserve materials, email [katie@childrensforestco.org](mailto:katie@childrensforestco.org).

Item	Quantity
Whiteboard and markers	1
Clipboards and pencils	30-45
Habitat Matching Game	4
Bird Language Scenarios	1
Binoculars (optional)	15
Bird Field Guides (optional)	8
Set of 6 wildlife skulls, scats, and tracks (replicas)	1
Animals Tracks of Washington and Oregon	8
Rulers	10
Large socks (optional)	10
Poker chips or plastic eggs (in 5 colors – 30 each)	150
Master copies of all handouts, data sheets, etc.	N/A

























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