

Teacher's Guide



Learn. Explore. *Discover!*

DR. WILLIAM FERRELL
FOREST DISCOVERY PROGRAM



OSU Research Forest, Peavy Arboretum
541-737-4452



Oregon State
University



Teacher's Guide Contents

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FAQ – FOREST DISCOVERY TRAIL (FDT) PROGRAM

WHAT IS THE FOREST DISCOVERY TRAIL (FDT) PROGRAM?

- The FDT Program is a series of self-guided tour materials to help you lead your class on a forest hike.
- Field trip materials provide hands-on activities, questions, and interesting facts to help engage students in the forest ecology, science, and history of this forest ecosystem.
- This program is free to use and available for teachers, group leaders, and OSU Research Forests visitors.

WHERE DOES THIS PROGRAM TAKE PLACE?

- This program takes place in Peavy Arboretum, located 7 miles north of Corvallis, Oregon on Highway 99. It takes approximately 15-20 minutes to drive to the Arboretum from Corvallis.
- Upon arriving at Peavy Arboretum, follow the signs for “Arboretum Parking”. The hike begins from this large parking lot, which can accommodate school buses and vehicles. There is a porta potty available at this parking area.
- The hike follows the Forest Discovery Trail (total length: 1.2 miles). You can choose how far to hike based on the needs of your students.
- A large shelter is available for groups to use, located 100m from the parking area, beside the first activity stop.

WHO IS THIS PROGRAM FOR?

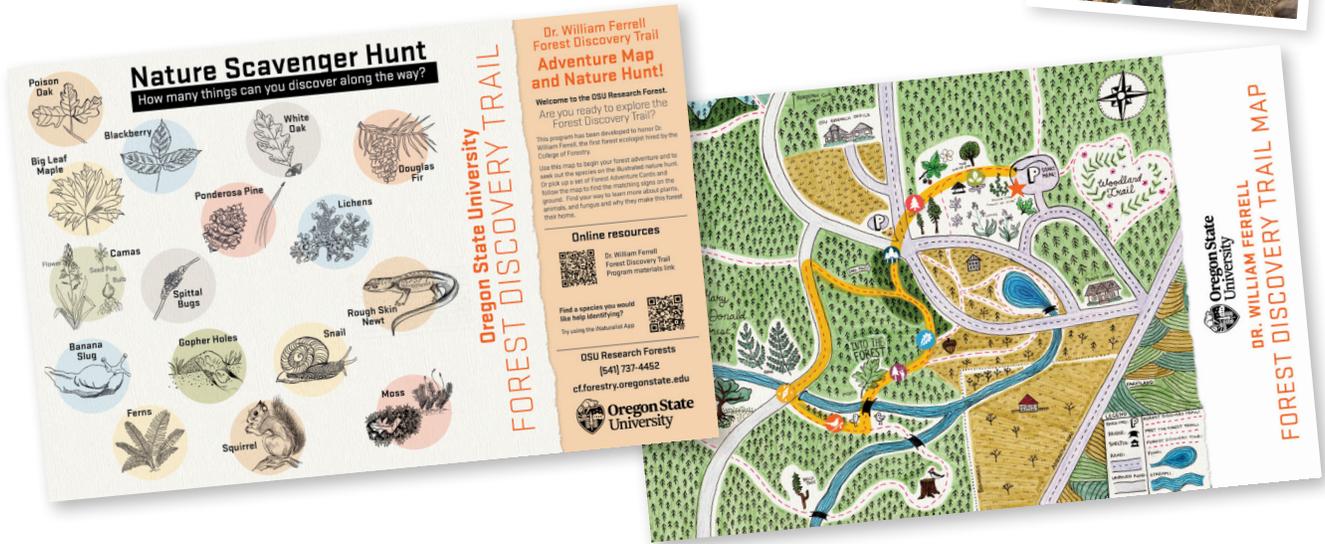
- Field trip materials are written for students Pre K-5.
- You can choose the materials, content, and hiking distance that will work best for your class or group needs.

WHEN IS THE BEST TIME TO BRING STUDENTS TO THE FOREST?

- Weather is likely warmer and drier May to October.
- May and June trips take place during the spring flower bloom, bird breeding season, and higher water levels in the streams.
- September and October trips are great times to see changing fall colors, cones and leaves on the ground, and low water levels in the streams.
- **Groups can visit during the rainy months as well.** Fungi are abundant, and the rain makes the moss, lichens, and ferns green and beautiful. Waterproof clothing is advised.

HOW TO USE THE FOREST DISCOVERY TRAIL PROGRAM

This program is designed to be flexible and meet many different needs of students in Pre K-5. You can mix and match the program materials to meet the needs of your class or group. Program materials can be used to facilitate a short walk or a long hike. You can print out materials from our website: <https://cf.forestry.oregonstate.edu/outreach-education/forest-discovery-trail>



Young students, not much time? The Forest Discovery Adventure Map and Nature Hunt can be used by children of all ages to explore the Forest Discovery Trail at their own pace, discovering new species as they hike and using the map to guide their adventure.



Take a deeper dive into forest learning. The Forest Discovery Activity Cards are intended to help teachers and students gain more knowledge about a variety of forest topics. You can decide which stops and activities will be of most interest to you and your class. Hike to the activity stops of your choice and read the cards aloud to your class. Have your class participate in the questions and activities outlined in the cards.

FOREST DISCOVERY ACTIVITY CARD SETS

OVERVIEW

Title: Meet the Forest Activity Card Set

Age Group: K-5+

Activity Time: It takes 10-15 minutes to walk to each stop and do the card activities

Distance: 1/3 mile to complete the loop

Themes: Introducing the forest ecology and history of the OSU Research Forest



ACTIVITY STOPS



STOP 1

First Steps — Safety Tips and Poison Oak Identification Activity



STOP 2

Peavy's Giants — Learn about College of Forestry's Dean George Peavy and TJ Starker and their dream of creating a living laboratory. Meet the redwoods trees that have grown as a result of these big plans.



STOP 3

Dark Forest — Trees in the forest provide a canopy from the sun. It is dark below. But underneath that canopy, the forest provides layers of vegetation for biodiversity. Students compare different cones, one example of the many different forms life can take.



STOP 4

The White Oak — Learn what trees need to grow. White Oaks dominated parts of the OSU Research Forest for thousands of years. Why has this changed in the last 200 years?



STOP 5

Mary McDonald's Forest — Moving away from the Peavy Arboretum and into the McDonald Forest we learn about Mary McDonald and why she provided the funds needed to purchase this forest for the OSU College of Forestry. Reflect on the importance of forests.



STOP 6

Stairway to the Sky — Learn about forest birds and how they use the forest as habitat. Bird migration connects our forests to the forest of Central and South America. But this trip is not all fun in the sun.



STOP 7

Intersections — Take time to let your students reflect on what they have learned. Choose from a variety of activities that help students stop and look more closely at the forest, or run through the forest like so many of our recreational visitors enjoy doing. You can let the energy level of your group decide which activities will work best.

WHERE TO FIND FOREST DISCOVERY PROGRAM (FDT) MATERIALS

TEACHER'S BACKPACKS

All the FDT Program materials that you need for your field trip are available in Teacher's Backpacks, and are available to sign-out at one of our pick-up locations (listed below).

Teacher's Backpack contain:

- 1 master copy of the Forest Discovery Brochure; Adventure Map and Nature Hunt (you may want to make several copies for your class)
- 5 sets of Activity Cards (you may wish to divide your class into smaller groups)
- Nature samples (Cones, acorns, etc.). Contains nature items referenced to in the Activity Cards
- Art supplies and science supplies for activities
- First-aid kit
- Collecting bags

Teacher's Backpack pickup locations:

OSU Research Forest Office – Peavy Arboretum - 541-737-4452

OSU Extension Service Benton County – 4077 SW Research Way – 541-713-5000

Lincoln Health Office – 121 SE Viewmont Ave. Corvallis – 541-766-3546

ONLINE ACCESS

Find all the Forest Discovery Program (FDT) materials online:

<https://cf.forestry.oregonstate.edu/outreach-education/forest-discovery-trail>



Printing your own FDT Program materials

- You can print out your own set of FDT Program materials from our website.
- Print copies of the Adventure Map and Nature Hunt for your class.
- If you are planning on dividing your class into smaller groups, print off Activity Card sets for each group.
- Laminate the Activity Cards to make them water proof.

CHECK LIST - GETTING READY FOR YOUR FIELD TRIP

- Call the OSU Research Forests and let us know when you are planning your field trip. We can help you reserve a Teacher's Backpack from one of our locations. Let us know if there is anything else we can help you with: **OSU Forests Research Office: 541-737-4452**
- Look through the program materials in advance of your field trip.**
<https://cf.forestry.oregonstate.edu/outreach-education/forest-discovery-trail>
- Decide whether you would like to print your own materials, or arrange a Teacher's Backpack pick-up from one of the locations listed on page 9.** You can pick-up a Teacher's Backpack from the OSU Research Office before doing your pre-walk of the Forest Discovery Trail. We will be happy to arrange a pick-up with you. Office Hours are 8-5pm, Monday to Friday.
- Visit Peavy Arboretum and walk the trail ahead of time.** Knowing where to park, trail head location and how to easily navigate the Forest Discovery Trail will help make your field trip a success.
- Recruit Chaperones.** It is important to have an adult at both the front and back of the group to make sure students stay together on the trail. We recommend having 2 adults for every 5-10 children, to have an adult at the front and the back of each group. Send your chaperones links to the materials online so they can also become familiar with the materials before they arrive.
- Send home permission slips.**
- Establish outdoor rules for safety and trail etiquette with your class before you arrive.**

EARTH MANNERS (From Project Learning Tree, Pre K-8 Environmental Education Activity Guide)

Have students name rules or guidelines they think would make sense for learning outdoors. List these on the board. Here are some examples: Stay on marked trails. Show your class a picture of poison oak. It is abundant just off the trails in the Peavy Arboretum. Encouraging students to stay on the trails will help keep students poison oak free.

1. **Always think of safety – for yourself and others.**
2. **Be careful not to litter.**
3. **Don't carve or draw on trees, rocks or property.**
4. **Show respect for all living things**

TIPS FOR MAKING YOUR OUTDOOR FIELD TRIP FUN AND SAFE

FIELD TRIP DURATION

We recommend scheduling at least 2 hours for your trip. Students will have more time to notice nature and ask questions if they are not rushed during a hike.

WHAT SHOULD YOU AND YOUR STUDENTS BRING?

1. Warm clothes/rain proof gear.
2. Encourage students to bring a back-up set of clothes or have extra sets on hand.
3. Comfortable shoes for hiking
4. A snack
5. **Water
6. One first aid kit per group

*** there is no public drinking water at Peavy. We recommend you bring extra for your class, in case any students forget their own water. This may be particularly important when weather is warm.*

SAFETY TIPS

Here are some safety recommendations. The first activity card “First Steps” covers these tips using questions and a plant identification activity. This card is read at the beginning of the hike at the Firefighters Memorial Shelter to get groups started off safely on their hike. But let’s review it here too:

1. Keep student groups together by having an adult at both the front and back of the group. This helps to make sure no students accidentally stray away from the group.
2. Wait for your entire group at every intersection before moving on. This ensures your group stays on the trail together.
3. Teach your students how to identify poison oak. This is a valuable skill for students for all future hikes and outdoor time. Encourage students to stay on the trail. Pointing out the prevalence of poison oak off the trail may help remind students why this is important.
4. Introduce the idea of a “Safety Bubble.” Students are to stay inside their own safety bubbles – essentially the hand and foot swinging distance. Remind students that even small accidents can be difficult to deal with in the forest.
5. Sticks need to stay on the ground during the group hike. We don’t want any sticks accidentally bursting any friends “safety bubbles.”
6. Staying together in a group will almost guarantee you will not encounter any larger mammals that share the forest with us.

TIPS FOR MAKING YOUR OUTDOOR FIELD TRIP FUN AND SAFE

FUN IS IMPORTANT!

Children gain so much from being outside. Outdoor time has been scientifically proven to increase the physical, emotional and mental well-being of people throughout their entire lives. We hope students enjoy their time here and return for more forest time in the future.

FOLLOW YOUR STUDENT'S INTERESTS

Let your students take time during their hike to look at things. The program materials are here to serve as a guide for you and your students. But - when students find something interesting during the hike – stop and look at it with them. They just made their own discovery, and this is the most important thing – and likely the thing that will be of most interest to all your students!

“When I take groups on a walk, I like to tell them that I often miss the coolest and most interesting things on the trail, and I need them to look for those things. If they find something - we stop and look at it. Often it is something new to me. This is what discovery is all about, and this is where the real learning happens. Take a photo of what they have found. You can use iNaturalist to try and identify it. Contact the OSU Research Forest and we will work with you to try and discover what it is you found. Who knows what we can discover together?”

— Karen DeWolfe, OSU Research Forest Interpretive Programs Coordinator

WANT HELP TO ID WHAT YOU FIND ON THE TRAIL?

Download **iNaturalist** and **Seek** to your phone for free through the App Store

Use your phone camera to take a photo of any species you would like to identify. iNaturalist and the student friendly version Seek use image recognition to help you identify the species!

iNaturalist recommends using Seek for student groups. Seek will not upload your findings to the public database but still searches the database to suggest possible species identifications.

The data collected through iNaturalist adds to this growing database that scientists use to understand our natural world. If you are more familiar with iNaturalist and have an account, you and your class can actually collect data for scientists while you hike! Learn more about iNaturalist from their website: <https://www.inaturalist.org>



WHO WAS DR. WILLIAM FERRELL?



A questioning mind is the most important thing to inspire". These are the words of Dr. Ferrell, the son of a school teacher and the first forest ecologist hired by the College of Forestry in 1955. Widely regarded as a great teacher, he was known for helping his students develop their critical thinking and scientific skills.

Dr. Ferrell was the first faculty member hired to understand how forests function. His research interests in forest carbon storage made a large contribution to this field. In 1990, Dr. Ferrell and other forest scientists published in the journal *Science*, showing that old growth forest stands stored significantly more carbon than younger forests. This paper continues to impact old growth conservation and forest management to this day.

The Forest Discovery Trail Program was initiated by the family, friends and colleagues of Dr. William Ferrell to honor his life and work, shortly after his death in 2016. We hope this program helps Dr. Ferrell's love of nature and science live on, reaching OSU Research Forest visitors, and inspiring a new generation of young scientists.

WHAT ARE THE OSU RESEARCH FORESTS?

The OSU Research Forests were donated to the College of Forestry to serve as a living laboratory and outdoor classroom for students, researchers and managers to learn about forest ecosystems and management. OSU utilizes the Research Forests to find new ways to sustainably manage forests for conservation, education, business and recreation.

Find more information and resources on the OSU Research Forest Website and the FDT Program – <https://cf.forestry.oregonstate.edu/outreach-education/self-guided-tours>

WHY TAKE THE TIME AND EFFORT TO GET STUDENTS OUTSIDE IN THE FOREST?

- Studies show that outdoor learning opportunities can improve student's academic performance, and their physical, mental, and emotional health and wellness.
- You are helping introduce your students to the natural resources that sustain our society.
- Forests are vital resources for humans, plants, and animals; filter the earth's air and water; house a high percentage of the world's biodiversity; and store carbon, which is becoming increasingly significant in the face of climate change.
- Forest provide a tremendous number of products that society relies on; wood for houses, buildings, furniture, and paper products.

THE FOREST TOUR & CORE CURRICULUM SCIENCE STANDARDS

Grade	Core Science Standard	Card	Card Activity
Kindergarten	<p>K-LS1-1. From Molecules to Organisms: Structures and Processes.</p> <p>K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.</p>	White Oak	Students are asked to stand in place and find all the things a tree needs to grow – sun, water, nutrients and air.
	<p>K-ESS3 Earth and Human Activity</p> <p>K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.</p>	Dark Forest	Let's Learn: Student's learn how different forest species use (and change) forest structures for habitat. Students can continue to look for evidence throughout the walk.
	<p>K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.*</p>	Mary McDonald Forest	The card encourages student to discuss how humans use the forest. Students are asked to look for evidence of forest use. Students will learn about the many benefits forests provide, and how humans are learning to manage and conserve forest resources.
	<p>K-PS3 Energy</p> <p>K-PS3-1. Make observations to determine the effect of sunlight on Earth's surface.</p>	Dark Forest	Students will move from an open area into a dense forest. They are asked to see if they noticed any changes as they enter the forest.

Grade	Core Science Standard	Card	Card Activity
Grade 1	<p>L-LS3 Heredity: Inheritance and Variation of Traits: 1</p> <p>LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.</p>	Peavy's Giants	See the stages of redwood growth: cone, sapling, and mature tree.

Grade	Core Science Standard	Card	Card Activity
Grade 2	<p>2-LS4 Biological Evolution: Unity and Diversity.</p> <p>2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats</p>	Dark Forest along with White Oak	Look for the different habitats types available in the forest and compare forest habitat with the open habitat in the arboretum.

THE FOREST TOUR & CORE CURRICULUM SCIENCE STANDARDS

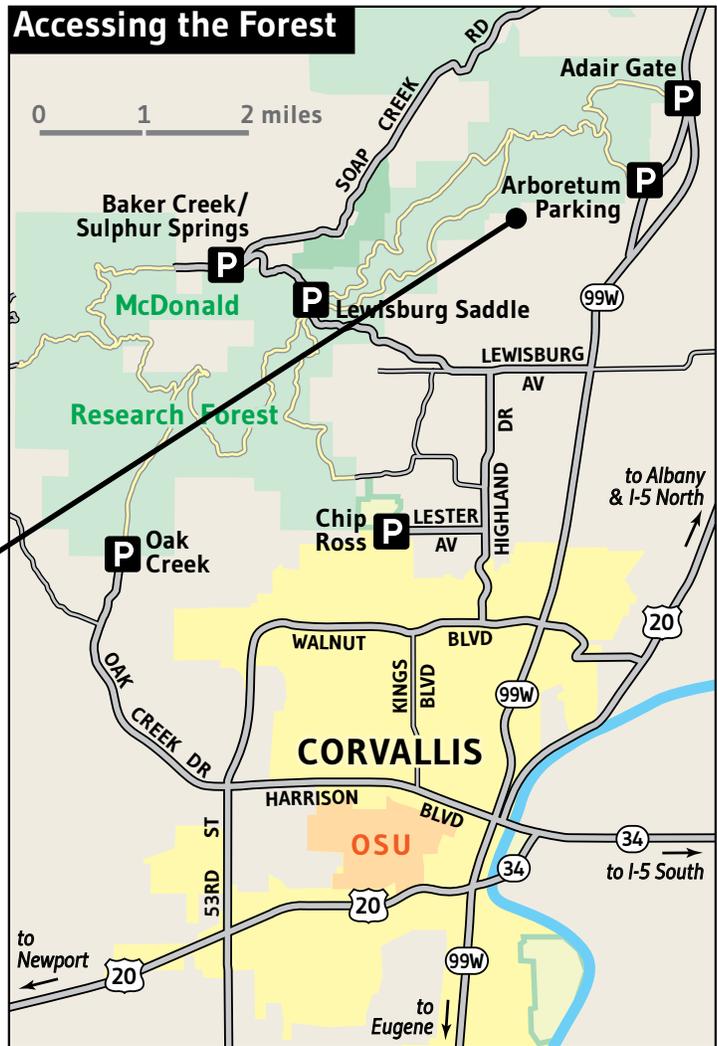
Grade	Core Science Standard	Card	Card Activity
Grade 3	3-LS4 Biological Evolution: Unity and Diversity 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.	White Oak	Using active storytelling, students will learn about White Oak and forest succession: Students learn how species have changed in the Arboretum area over time do to historical and environmental changes.
	3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*	White Oak	Observe and discuss a Douglas fir selection harvest that has released white oak trees. Discuss with your students how they view this harvest, after learning about the history of white oak. Continue to discuss this concept as you walk into the forest where the Douglas fir have not been harvested.

Grade	Core Science Standard	Card	Card Activity
Grade 4	4-LS1 From Molecules to Organisms: Structures and Processes 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	Peavy's Giants	Observe bark and wood as important structural components of trees. Students will also look at a variety of cones from different species.
		White Oak	Leaves and their roles in photosynthesis
		Stairway to the Sky	Birds use wings to take advantage of the full height of the forest. Some birds use their ability to flight to take advantage of migration.

Grade	Core Science Standard	Card	Card Activity
Grade 5	5-LS2 Ecosystems: Interactions, Energy, and Dynamics 5-LS2-1 Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	White Oak	Learn what elements trees need to survive.
	5-ESS3 Earth and Human Activity 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	Peavy's Giants AND Mary McDonald Forest	Learn how the College of Forestry uses the OSU Research Forests for education, and learn about the people who have helped make this forest a reality.

DIRECTIONS TO PEAVY ARBORETUM

1. Take Highway 99 to Arboretum Road. Arboretum road parallels Highway 99 and can be accessed coming from both the Southern and Northern directions.
2. Turn onto Arboretum road and follow the road to the Peavy Arboretum. There is a sign to welcome you.
3. Once you turn into the Arboretum, follow the signs to **Arboretum Parking**. You will take your first left and then a right to arrive at the Arboretum Parking Lot.





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