

# Teacher's Guide



DR. WILLIAM FERRELL  
FOREST DISCOVERY PROGRAM



OSU Research Forest, Peavy Arboretum  
541-737-4452



**Oregon State**  
University

**OREGON STATE UNIVERSITY**  
**DR. WILLIAM FERRELL**  
**FOREST DISCOVERY PROGRAM**



## **Teacher's Guide Contents**

<b>FAQ – Forest Discovery Trail (FDT) program</b> .....	<b>1</b>
What is the Forest Discovery Trail (FDT) Program? .....	1
Where does this program take place? .....	1
Who is this program for? .....	1
When is the best time to bring students to the forest? .....	1
<b>Forest Discovery Overview and Activity Stops</b> .....	<b>2</b>
<b>Where to find Forest Discovery Program (FDT) Materials</b> .....	<b>3</b>
Teacher's Backpacks .....	3
Online Access: .....	3
<b>Tips for Making your Outdoor Field Trip Fun and Safe</b> .....	<b>4</b>
Field Trip Duration .....	4
What should you and your students bring? .....	4
Safety tips .....	4
Fun is Important! .....	5
Follow your student's interests .....	5
Download iNaturalist and Seek for free to your phone through the App Store .....	5
<b>Checklist - Getting Ready for Your Field Trip</b> .....	<b>6</b>
<b>Directions to Peavy Arboretum</b> .....	<b>7</b>
<b>Who Was Dr. William Ferrell?</b> .....	<b>8</b>
<b>GRADES K-5</b>	
<b>How to Use the Forest Discovery Trail Program</b> .....	<b>9</b>
<b>The Forest Tour and Core Curriculum Science Standards:</b> .....	<b>10</b>
Kindergarten - Grade 2 .....	10
Grade 3 - Grade 5 .....	11
<b>GRADES 5-12</b>	
<b>How to Use the Forest Discovery Trail Program</b> .....	<b>12</b>
The Journey of the Time Traveler .....	12
The Journey of the Time Traveler: QR Bank .....	13
The Journey of the Forest Investigator .....	14
The Journey of the Forest Investigator: QR Bank .....	15
The Journey of the Forest Discoverer .....	16
<b>The Forest Tour and Core Curriculum Science Standards:</b> .....	<b>17</b>
Grade 4 - Grade 5 .....	17
Grade 6 - Grade 8 .....	18
<b>Forest Discovery Trail Cheat Sheet</b> .....	<b>19</b>

---

**Acknowledgments:** This program has been developed in partnership with the Oregon State University College of Forestry, The OSU Research Forests, and the family and friends of Dr. William Ferrell. This program has benefited greatly from the artistic contributions of Caitlyn Reily, and Ava Betts. Photographs: Hankyu Kim, Pat Breen. Graphic Design: Julia Jacobs. Education consultation: Maggie Livesay, Jody Einerson, Kara Olsen. History Consultation: Bob Zyback. Scientific Contributions: OSU College of Forestry. And deep thanks to Ryan Brown for incredible project oversight and management.

# 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 available for students ranging from Pre K to 12th grade.
- 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.

# 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!

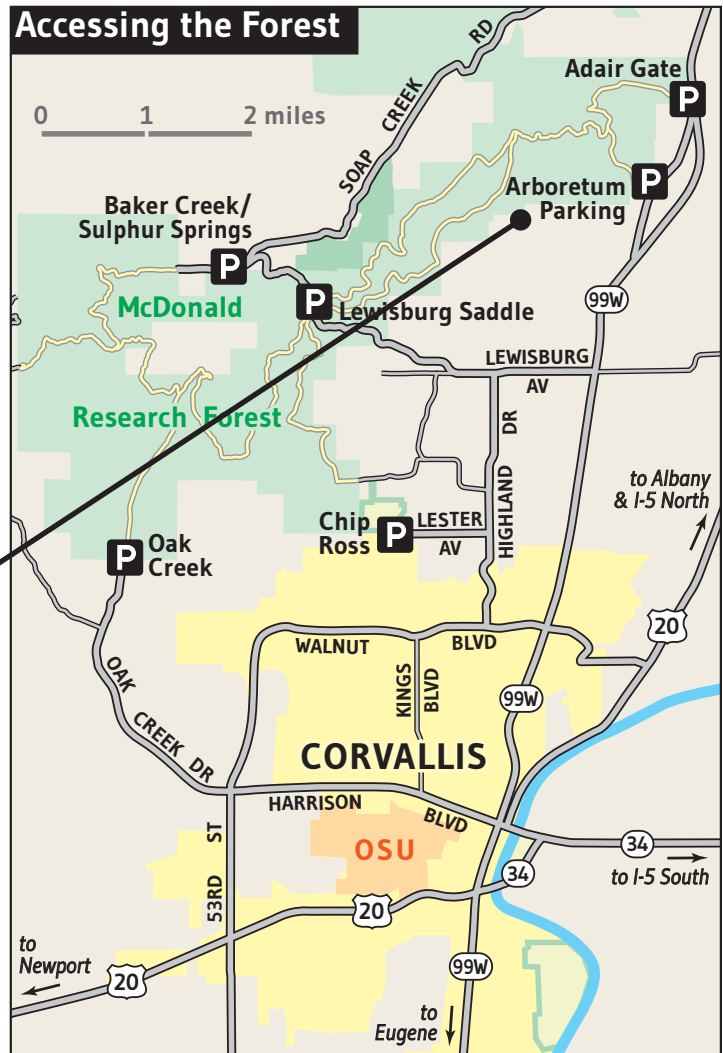
iNaturalist recommends using Seek for student groups. Seek will not upload your findings to the public database but still searches the database to suggest possible species identifications.

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>



## 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.



## 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.



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 OVERVIEW AND ACTIVITY STOPS

## 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.

# THE FOREST TOUR & CORE CURRICULUM SCIENCE STANDARDS

Grade	Core Science Standard	Card	Card Activity
Kindergarten	<b>K-LS1-1. From Molecules to Organisms: Structures and Processes.</b>  <b>K-LS1-1.</b> Use observations to describe patterns of what plants and animals (including humans) need to survive.	White Oak	Students are asked to stand in place and find all the things a tree needs to grow – sun, water, nutrients and air.
	<b>K-ESS3 Earth and Human Activity</b>  <b>K-ESS2-2.</b> Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.	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.
	<b>K-ESS3-3.</b> Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.*	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.
	<b>K-PS3 Energy</b> <b>K-PS3-1.</b> Make observations to determine the effect of sunlight on Earth's surface.	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	<b>L-LS3 Heredity: Inheritance and Variation of Traits: 1</b>  <b>LS3-1.</b> Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	Peavy's Giants	See the stages of redwood growth: cone, sapling, and mature tree.

Grade	Core Science Standard	Card	Card Activity
Grade 2	<b>2-LS4 Biological Evolution: Unity and Diversity.</b>  <b>2-LS4-1.</b> Make observations of plants and animals to compare the diversity of life in different habitats	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	<b>3-LS4 Biological Evolution: Unity and Diversity</b>  <b>3-LS4-3.</b> 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.
	<b>3-LS4-4.</b> 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	<b>4-LS1 From Molecules to Organisms: Structures and Processes</b>  <b>4-LS1-1.</b> 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	<b>5-LS2 Ecosystems: Interactions, Energy, and Dynamics</b>  <b>5-LS2-1</b> 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.
	<b>5-ESS3 Earth and Human Activity</b>  <b>5-ESS3-1.</b> 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.



## THE JOURNEYS

There are three journeys that make up this journal: the **Journey of the Time Traveler**, the **Journey of the Forest Investigator**, and the **Journey of the Forest Discoverer**. This section will break down these journeys in more detail, but please use the Forest Explorer's Journal to familiarize yourself with the journey(s) you intend to complete before your visit. Only the first two journeys (Time Traveler and Forest Investigator) contain onsite interactive capsules for your students to explore.



### Forest Discovery Trail STOPS Along the Way

#### JOURNEY OF THE TIME TRAVELER

- STOP 1** - At The Root of the Camas
- STOP 2** - Searching for Douglas
- STOP 3** - Life on the Edge
- STOP 4** - Classroom Escapes to the Forest

#### JOURNEY OF THE FOREST INVESTIGATOR

- STOP 5** - Holey Stump!
- STOP 6** - Stairway to the Sky
- STOP 7** - The Case of the Curious Stump
- STOP 8** - Highs and Lows in the Rainforest
- STOP 9** - Seeing the Forest for the Trees
- STOP 10** - A Tree After Life

#### LEGEND

- FOREST DISCOVERY TRAIL - JOURNEY OF THE TIME TRAVELER
- FOREST DISCOVERY TRAIL - JOURNEY OF THE FOREST INVESTIGATOR
- FOREST ROAD
- ACCESS ROAD
- OTHER TRAILS
- STREAMS
- P** PARKING
- i** INFORMATION KIOSK
- T** TOILET

**NORTH**



# The Journey of the Time Traveler

**The Journey of the Time Traveler** uses the first half of the Forest Discovery Trail to walk students through the history of the Peavy Arboretum. Students will learn about the Kalapuya people and early explorers and settlers, as well as the land use patterns for these groups of people. They will also learn the story of the College of Forestry acquiring Peavy Arboretum as a forest classroom.

This journey is comprised of six time travel challenges. The first five are included in the journal as written or creative activities. Notice that the fifth challenge has two parts.

The sixth and final challenge is to open each of the four Forest Discovery Time Capsules. There are time capsules located at four stops, which are marked by signs on trees matching the icons in the journal. Each capsule will be hidden near to the tree stops. Instructions for opening these capsules are found on the first page of the Journey of the Time Traveler, page 4 of the Forest Explorer's Journal (shown here). The journal contains the lock codes for each of these capsules.

**Difficulty:** This is the easier of the two interactive journeys. The trail is shorter, there is less elevation gain, and there are fewer activities and boxes. There is also a large open space that may be suitable to free play near the Firefighter Memorial Shelter. Note that there are some stops on this trail that correspond to our activity cards and not to the journal, which may be confusing.

## *Journey of the Time Traveler*

### Follow These Steps to Complete Your Quest!

Complete the Time Traveler Challenges to learn how and why this forest has changed through time. Use your Forest Explorers Map to find your way. Travel back in time by opening and exploring the four time capsules.

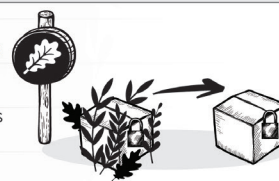
- ☐ **Time Travel Challenge #1:** Nature Survival Guide
- ☐ **Time Travel Challenge #2:** How Much Money are Trees Worth?
- ☐ **Time Travel Challenge #3:** Forest Explorer Species List
- ☐ **Time Travel Challenge #4:** Forest Snapshot
- ☐ **Time Travel Challenge #5:** (A) The Other Side of the Fence & (B) Animals on the Edge
- ☐ **Time Travel Challenge #6:** Explore All Four Forest Discovery Time Capsules

Journey of the Time Traveler follows the **BLUE** path on the Explorer's Map.

### How to Use the Time Capsules

#### Step 1.

The time capsules are hidden in camouflaged boxes located near the activity stop. If needed, use the cheat sheet in the Teacher's Guide for locations.



#### Step 2.

Enter the 4-digit time travel code (found here in your journal) to unlock the time capsule.



#### Step 4.

Stamp your journal with the nature stamp inside.



#### Step 3.

Explore time capsule contents.



#### Step 5.

Please place all the contents back into the time capsule (camouflaged box), lock and return for the next quester.



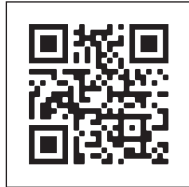
# The Journey of the Time Traveler: QR Code Bank

These QR codes let kids connect to videos and additional resources available online. They may be suitable for supplemental activities back in the classroom, especially if cell signal is spotty for you in the forest.

## QR Codes on Page 5



Videos about the  
Kalapuya people



Video of camas flowers

## QR Codes on Page 8



Movie: *Standing Strong:  
The Tribal Nations of  
Western Oregon*



"Fermenting Ideas,"  
lecture and slides  
by David Lewis

## QR Codes on Page 10



Watch this documentary about  
Douglas' Pacific Northwest  
adventures!

## QR Codes on Page 16



Visit the Chachalu  
Museum and Cultural  
Center to learn more about  
the Kalapuya People

## QR Codes on Page 12



Forest Discovery Trail iNaturalist Project:  
[www.inaturalist.org/projects/forest-discovery-trail](http://www.inaturalist.org/projects/forest-discovery-trail)

# The Journey of the Forest Investigator

The **Journey of the Forest Investigator** uses the second half of the Forest Discovery Trail and challenges students to solve forest mysteries. Students will learn about forest ecology and hydrology (water science), soil science, forest wildlife, and carbon storage.

This journey is comprised of seven forest mystery challenges. The first six are included in the journal as written, interactive, or creative activities.

The seventh and final challenge is to open each of the six Forest Science Boxes. These are located at six stops, which are marked by signs on trees matching the icons in the journal. Each capsule will be hidden near to the tree stops. Instructions for opening these capsules are found on the first page of the Journey of the Forest Investigator, page 18 of the Forest Explorer's Journal (shown here). The journal contains the lock codes for each of these boxes.

## Journey of the Forest Investigator

### Follow These Steps to Complete Your Quest!

Become a Forest Investigator by solving the Forest Mystery Challenges. As you walk the second half of this trail, you will find six different forest mysteries that need investigating. Try solving each mystery using the Forest Mystery questions in this journal and your own careful observations. Clues are in the Science Boxes at each mystery stop. Inside each box, you will discover what other investigators have learned about each topic and how they figured it out!

Your investigations will begin at the **Holey Stump**.

- ☐ Forest Mystery Challenge #1: Holey Stump!
- ☐ Forest Mystery Challenge #2: Stairway to the Sky
- ☐ Forest Mystery Challenge #3: The Case of the Mysterious Stump
- ☐ Forest Mystery Challenge #4: Highs and Lows of the Rainforest
- ☐ Forest Mystery Challenge #5: Seeing the Forest for the Trees
- ☐ Forest Mystery Challenge #6: A Tree After Life
- ☐ Forest Mystery Challenge #7: Explore All Six Science Boxes



Journey of Forest Investigator follows the **ORANGE** path on the Explorers Map. Your journey begins at Stop 5.

### How to use the Science Boxes

Try to solve the mysteries using your own nature observations. Then open the science box to learn more. Read as much as you want to help solve each forest mystery, and visit the Forest Discovery Trail as many times as you would like. Explore and investigate at your own pace.

Use these tools to help solve each forest mystery!

**Step 1.** The time capsules are hidden in camouflaged boxes located near the activity stop. If needed, use the cheat sheet in the Teacher's Guide for locations.

**Step 2.** Enter the four-letter code (found in the journal) to unlock the science box.

**Step 3.** Explore science box contents.

**Step 4.** Stamp your journal with the nature stamp inside.

**Step 5.** Please return all the contents, lock the science box, and hide it again for the next quester.

### Forest Investigator Tips

Forest scientists use the following process to help with their investigations:

1. Test ideas by experiments and observations.
2. Build on the ideas that pass the tests.
3. Reject the ideas that fail.
4. Follow the evidence wherever it leads.
5. Question everything.

A **hypothesis** is an educated guess about the way the world works. After you make a hypothesis, then comes the really fun part: doing the science experiment or make careful observations to see what happens! This lets you discover if your hypothesis was correct or incorrect.

18 Forest Explorer Journal | OREGON STATE UNIVERSITY

## JOURNEY OF THE FOREST INVESTIGATOR



**Notes:** You will have to travel through the first trail, the Journey of the Time Traveler, to get to the beginning of the trail for the Journey of the Forest Investigator. After the final stop on the Journey of the Time Traveler, there is a fork in the trail with a carsonite sign. One sticker on the sign points to the end of the Forest Discovery Trail, which takes you back toward the parking lot. The other sticker (shown here) points to the beginning of the Journey of the Forest Investigator, which will start you on your journey.

**Difficulty:** This trail is the more difficult of the two onsite interactive journeys. It is a longer trail with more elevation gain, and it requires an extra hike through the first journey to access it. It also has more stops, and the materials in the boxes require more reading.



# The Journey of the Forest Investigator: QR Code Bank

These QR codes let kids connect to videos and additional resources available online. They may be suitable for supplemental activities back in the classroom, especially if cell signal is spotty for you in the forest.

## QR Codes on Page 20

You can also watch a video about this mystery topic!



## QR Codes on Page 21



Would you like to try an amazing app to help you identify birds? Try the Merlin app: <https://merlin.allaboutbirds.org>



Are you already really into birds? Would you like to help scientists collect bird data and learn more about birds in your area and all over the world? Check out eBird.org and the eBird app.

### Do you love drawing?

Learn to draw birds like David Sibley, author of *The Sibley Guide to Birds* through his own tutorial series!



## QR Codes on Page 23

Watch this short video to learn more about this mystery topic.



## The Journey of the Forest Discoverer

The **Journey of the Forest Discoverer** is a more reflective, self-led journey comprised of four activities. These do not correspond to trail stops or need to be localized to the Forest Discovery Trail. Furthermore, these activities are intended to take more time and effort than the activities in previous journeys. We recommend reading through the instructions for each in the Forest Explorer's Journal to familiarize yourself with the material.

You may choose to embark on these activities as a classroom, or you may choose to allow your students to do these activities on their own time. Ultimately, it is up to your judgment as to what will best serve your classroom's learning.

## *Journey of the Forest Discoverer*

## Follow These Steps to Complete Your Quest!

**You are ready to embark on the most important part of your Forest Explorer's Quest – The Journey of the Forest Discoverer.** This section is dedicated to your discoveries. Good luck on this final journey. We can't wait to find out what you have discovered during your quest!

Use these final challenges to complete your quest and discover what you can do to help forests.

- ☐ **Forest Discovery Challenge #1:** Forest Explorer's Map
- ☐ **Forest Discovery Challenge #2:** **Forest Explorers** Give Back
- ☐ **Forest Discovery Challenge #3:** Make Your Own Forest Discovery
- ☐ **Forest Discovery Challenge #4:** Letter to Forest Researchers

**Join the Forest Discovery Club to meet other explorers and share your discoveries with forest experts.**

[www.facebook.com/groups/forestdiscoveryclub](http://www.facebook.com/groups/forestdiscoveryclub)

**Notes:** The final activity is a letter they can send to the OSU Research Forest. Students can tell us know what they have discovered, ask questions and/or let the OSU Research Forest know what they think is important about the forest, and we will send students a letter in return. If you choose to do this as a class, you may send the letters in as a group. We will still respond to these letters, but in the absence of return addresses, we will send responses back (also as a group) to your school.

# THE FOREST TOUR & CORE CURRICULUM SCIENCE STANDARDS

Grade	Core Science Standard	Activity Stop	Connection
Grade 4	<b>4-LS1-1. From Molecules to Organisms: Structures and Processes</b>  <b>4-LS1-1.</b> Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	<b>Holey Stump!</b>	Students will learn about pileated woodpeckers and their physiological structures that enable their drilling behaviors.
		<b>The Case of the Mysterious Stump</b>	Students will learn about mycorrhizae fungi and their relationships with tree root systems.

Grade	Core Science Standard	Activity Stop	Connection
Grade 5	<b>5-LS1-1. From Molecules to Organisms: Structures and Processes</b>  <b>5-LS1-1</b> Support an argument that plants get the materials they need for growth chiefly from air and water.	<b>A Tree After Life</b>	Students will learn about the carbon cycle and how trees store carbon in the form of glucose made from carbon dioxide in the air.
	<b>5-LS2-1. Ecosystems: Interactions, Energy &amp; Dynamics</b>  <b>5-LS2-1.</b> Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	<b>The Case of the Mysterious Stump</b>	Students will learn how trees share nutrients with each other through a fungal network of mycorrhizae to promote mutual growth throughout the forest.
		<b>A Tree After Life</b>	Students will learn the role that decomposers play in the carbon cycle.
	<b>5-ESS2-1. Earth's Systems</b>  <b>5-ESS2-1.</b> Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.	<b>Highs and Lows in the Rainforest</b>	Students will learn about how the changes in the water cycle affect and are affected by trees in the forest.
	<b>5-ESS3-1. Earth &amp; Human Activity</b>  <b>5-ESS3-1.</b> Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	<b>The Journey of the Time Traveler (all activities)</b>	Students will learn how land was managed by a variety of communities who lived on the land, including the indigenous Kalapuya people, European settlers, and now researchers and workers from the OSU College of Forestry.
	<b>5-PS3-1. Energy</b>  <b>5-PS3-1.</b> Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	<b>A Tree After Life</b>	Students will learn about how plants take in energy from the sun and convert into sugar that is edible for heterotrophic organisms (including animals).



# THE FOREST TOUR & CORE CURRICULUM SCIENCE STANDARDS

Grade	Core Science Standard	Activity Stop	Connection
Grade 6	<b>MS-ESS3-3. Earth &amp; Human Activity</b> <b>MS-ESS3-3.</b> Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	<b>Journey of the Forest Investigator</b> (all activities)	Students will learn ideas about maintaining healthy forests and the elements necessary to sustain them.
		<b>Journey of the Forest Discoverer</b> (all activities)	Students will be asked to reflect on their experiences in forests and take action to create improvements or identify new ideas for supporting these ecosystems.

Grade	Core Science Standard	Activity Stop	Connection
Grade 7	<b>MS-LS1-6. From Molecules to Organisms: Structures and Processes</b> <b>MS-LS1-6.</b> Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.	<b>A Tree After Life</b>	Students will learn the role of trees in carbon storage and the larger carbon cycle, and how this creates food for animals and decomposers.
	<b>MS-LS2-2. Ecosystems: Interactions, Energy, and Dynamics</b> <b>MS-LS2-2.</b> Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	<b>The Case of the Mysterious Stump</b>	Students will learn how mutually beneficial relationships between trees and fungi create networks of interactions that help to sustain whole forests.
	<b>MS-LS2-4. Ecosystems: Interactions, Energy, and Dynamics</b> <b>MS-LS2-4.</b> Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	<b>Highs and Lows in the Rainforest</b>	Students will collect data and learn about water availability and how it interacts with tree populations in forests.

Grade	Core Science Standard	Activity Stop	Connection
Grade 8	<b>MS-ESS3-4. Earth and Human Activity</b> <b>MS-ESS3-4.</b> Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	<b>Life on the Edge</b>	Students will learn the history of the land in this part of Oregon, including how timber consumption and demand for timber changed the way the landscape was managed.

# FOREST DISCOVERY TRAIL CHEAT SHEET

## The Journey of the Time Traveler

Time capsules are disguised or under false rocks or in camouflaged boxes. Camouflaged boxes will be brown, with vegetation adhered to them. Please be gentle.



### STOP 1 At the Root of the Camas

The **rock** obscuring this capsule is located in the middle of a clump of oak trees, several steps behind the stop with the green oak leaf sign. The first picture shows the location of the box relative to the trail sign (walking toward the trail sign from the trailhead).



This second picture shows what the rock looks like amidst the oak trees that partially obscure it.

*There is a lot of poison oak in this area, so watch your step!*





## STOP 2 Searching for Douglas

The **disguised box** for this stop is located to the right of the tree with the trail sign, as pictured here. It is buried a little under needles and sticks. Please re-hide the box when you have finished looking through it.



## STOP 3 Life on the Other Side of the Fence



Walking toward the bench in front of the tree with the trail sign, the **disguised box** is located in a patch of ferns back and to the left, as pictured here.



## STOP 4 The Classroom Escapes to the Forest

The **disguised box** is tucked under the trees and brush across the trail from the tree with the trail stop. (This picture was taken facing across the trail with the photographer's back to the trail stop.)





# The Journey of the Forest Investigator

Some science boxes are located under false rocks, and some are disguised to blend with their surroundings.



## STOP 5 Holey Stump!



You'll notice this stop is marked with a trail marker and not with a sign on a tree. The **false rock** is on the opposite side of the "holey stump" and the trail marker, a little ahead of both on the trail.



## STOP 6 Stairway to the Sky

This **disguised science box** is located immediately behind the tree with the trail sign.

This picture shows what the box looks like in its hiding spot. There is a social trail that leads to a neighbor's private property. *Please take care to remain on our property (the main trail), to avoid accidentally trespassing on theirs.*





## STOP 7 The Case of the Mysterious Stump



The **disguised box** is located near the tree with the activity stop sign.



## STOP 8 Highs and Lows in the Rainforest



This **disguised box** (no rock) is hidden in the patch of ferns immediately before the bridge crossing next to the tree with the trail stop.





## STOP 9 Seeing the Forest for the Trees



This **disguised box** is located near a stump across the trail from the tree with the trail sign.

**Note:** we have placed the rock in a location without poison oak, but there is a lot in this area, so be careful where you walk.



## STOP 10 A Tree After Life

The fallen tree sits in front of a smaller tree with the trail sign. The **disguised box** is hidden under the tree.





**Oregon State  
University**

**OSU Research Forest, Peavy Arboretum**

541-737-4452