Oregon Forest Resources Institute

INVESTIGATE THE FOREST

Journal Pages

for Oregon Outdoor Schools

Acknowledgments

We would like to thank the many Outdoor School providers and classroom educators who gave suggestions for these journal pages.

Curriculum writer

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ABOUT THE OREGON FOREST RESOURCES INSTITUTE (OFRI)

The Oregon Forest Resources Institute supports and enhances Oregon's forest products industry by advancing public understanding of forests, forest management and forest products.

Oregon Forest Resources Institute

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INTRODUCTION

Why forests?

All life, including our own, depends on forests. Forests help filter fresh water, supply oxygen, modulate temperatures and rainfall, provide habitat for diverse animal and plant species, and store atmospheric carbon.

In Oregon, nearly 50 percent of our state's 61 million acres is forestland. Our forests supply renewable resources for lumber, paper and heating, along with jobs that support families and communities. They also provide us with an active playground and a quiet retreat.

Because we depend on forests in many different ways, Oregonians need the knowledge and skills to make decisions and understand the impact of our choices affecting forests.

FORESTS AND OUTDOOR SCHOOL

In Oregon, forests are the setting and backdrop for many Outdoor School programs. Using forests as a living laboratory engages students in profound ways. It not only helps connect them to classroom learning, but also gives them concrete, on-the-ground experiences they can draw on throughout their lives. Direct experiences with nature through programs such as Outdoor School have been shown to improve students' overall academic performance, self-esteem and community involvement.

These *Investigate the Forest* journal pages are intended to guide students in learning about Oregon's forests while they explore the outdoors. The journal pages offer them hands-on, student-centered ways to study the forest or other natural environments just outside their door. The journal pages may be used before, during or after attending an Outdoor School program, to enhance students' understanding of Oregon's forests and how they're a vital resource.

USING THE JOURNAL PAGES

The journal pages are intended to help students learn about Oregon's forests while exploring the outdoors. Feel free to select the journal pages that enhance your program goals and are suitable for your setting. The entire *Investigate the Forest* document is available at LearnForests.org for free download.

- These journal pages may be used before, during, after or completely separately from your Outdoor School program.
- While they emphasize outside investigations, most do not require a forest site and can be done at school or home.
- They're designed so students can complete them either independently or as part of a class or group.
- Each journal page is designed to stand alone, but may be used in conjunction with other pages in a learning progression.
- You may print individual pages for students to add to their Outdoor School journals, or print and staple together the complete set.

NAME: _____ DATE: _____

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TWO TYPES OF TREES (part 1)

There are two main types of trees in Oregon's forests. Broadleaf trees have broad, flat leaves and produce seeds in fruits, flowers or nuts. Conifers have needle-like or scale-like leaves and produce seeds in cones.

Questions:

Winter is a stressful time for trees, with cold temperatures, wind and low sunlight.

What adaptation helps broadleaf trees survive winter?

_____

_____

_____

_____

_____

How might having cones and thick waxy needles help conifers survive winter?

_____

_____

_____

_____

_____

Continued on next page

NAME: _____ DATE: _____

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TWO TYPES OF TREES (part 2)

Directions: Look outside for a broadleaf tree and a conifer tree. Find a leaf from each and sketch it here or make a leaf rubbing. (To make a rubbing, place the leaf under this page and rub the side of a pencil lead—not just the tip—against the paper until the leaf's image appears.)

Depending on the time of year, you may also be able to find seed pods, fruit or cones in the branches or on the ground around each tree. Sketch what you find, next to the appropriate leaf rubbing.

BROADLEAF TREE

CONIFER TREE

NAME: _____ DATE: _____

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IDENTIFYING TREES (part 1)

Directions: This key can help you find the names of some common Oregon forest trees. First, pick a tree and decide if it is a conifer or broadleaf tree. If it's a conifer, go through the steps below to find the name. If it's a broadleaf tree, look at the images on the next page to see if it's one of those. If your tree doesn't match any here, see the Oregon Tree Guide at oregonforests.org/content/tree-variety for more.

COMMON OREGON **CONIFER** TREES

leaves, needle-like

leaves, flattened and scale-like

Western Redcedar
Thuja plicata
Large conifer that grows 150 to 200 feet tall, and is found in western Oregon along river bottoms, flats and mountain slopes.

Cones are 0.5 inch long.

clustered needles

non-clustered needles

clusters of 2-5 needles

clusters greater than 10 needles

needles sharp, pointy

needles not sharp, pointy

needles less than 1 inch

needles 1 inch or longer

large pointed buds

buds, round and clustered

Ponderosa Pine
Pinus ponderosa
A very important eastern and southwestern Oregon conifer that grows 125 to 180 feet tall.

Cones are 3–6 inches long.

Western Larch
Larix occidentalis
A large conifer that grows 100 to 180 feet tall and is found in the Blue Mountains and the eastern slopes of the Cascade Range.

Cones are 1–1.5 inches long.

Sitka Spruce
Picea sitchensis
Large conifer measuring 125 to 180 feet tall and found in the "fog zone," generally very close to the ocean.

Cones are 1–3 inches long.

Western Hemlock
Tsuga heterophylla
Large conifer that grows 125 to 200 feet tall and is quite common in western Oregon forests.

Cones are 1 inch long.

Douglas-fir
Pseudotsuga menziesii
A large conifer that grows 100 to 250 feet tall, predominant in western Oregon and common east of the Cascade Range.

Cones are 2–4 inches long.

Grand Fir
Abies grandis
A large conifer that grows 150 to 200 feet tall, preferring cool, moist sites.

Cones are 2–4 inches long.

NAME: _____ DATE: _____

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IDENTIFYING TREES (part 2)

COMMON OREGON **BROADLEAF** TREES

Bitter Cherry
Prunus emarginata

Often more of a bush than a tree, growing on moist, sunny sites.

Bigleaf Maple
Acer macrophyllum

A hardwood that grows 40 to 100 feet tall and is found commonly in western Oregon forests.

Black Cottonwood
Populus trichocarpa

A large hardwood that grows 100 to 200 feet tall and is found on moist sites along streams.

Oregon Ash
Fraxinus latifolia

A small to medium hardwood that grows in the shade of other tree in valleys and along streams.

Oregon White Oak
Quercus garryana

A hardwood that grows 60 to 80 feet tall and is most commonly found in the interior valleys between the Cascade and Coast ranges.

Pacific Madrone
Arbutus menziesii

An evergreen broadleaf with distinctive reddish bark that peels in the fall. Commonly found in the western Willamette Valley and southern Oregon.

Quaking Aspen
Populus tremuloides

Grows in sunny locations up to 50 feet tall. Its leaves tremble in even the slightest breeze.

Red Alder
Alnus rubra

A hardwood that grows 30 to 120 feet tall. The most common broadleaf tree in western Oregon.

Did You Know?

There are two main categories of trees in Oregon's forests: conifers and broadleaf trees (sometimes called hardwoods). Conifers have needle- or scale-like leaves, and their seeds come from cones. Broadleaf trees have wide, flat leaves, and their seeds come from their fruits, flowers and nuts.

NAME: _____ DATE: _____

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FOREST SITE STUDY

Directions: Investigate your forest site to see how much shade, animal evidence and soil wetness it has. Record your observations. For each factor, rate the site by number.

Site location: _____

SHADE

Observations:

See how much sunlight reaches the ground. Use your eye or a light meter to tell. What do you notice?

Rating:

Circle the number that matches your observations.

1. very bright
2. bright
3. medium light
4. shady
5. very shady

ANIMALS

Observations:

Record the animals (insects, birds, etc.) or evidence of animals (tracks, nests, chewed leaves) you see. Count the different kinds of animals or animal evidence.

Rating:

Circle the number that matches your observations.

1. no animals or evidence
2. one or two different ones
3. three different ones
4. four different ones
5. five or more different ones

SOIL WETNESS

Observations:

Use a stick or a trowel to scrape the surface of the ground, making a small hole the size of your palm and about one inch deep. Grab some soil in your fingers from the bottom of the hole. How does it feel?

Rating:

Circle the number that matches your observations.

1. completely dry
2. nearly dry
3. slightly moist
4. wet
5. very wet

NAME: _____ DATE: _____

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WHICH TREES?

Some trees can live in places with different amounts of shade, animals or soil wetness. Other trees are more particular. Below are the preferences of eight different Oregon forest trees. The numbers show the levels each tree can live with (**1**=low tolerance and **5**=high tolerance).

Directions: Use the information below to find trees that might grow at your site. Circle the best matches. Remember to choose trees that would do well with your site's level of shade, animals *and* soil wetness.

Your site's levels (from the Forest Site Study page):

Shade _____

Animals _____

Soil wetness _____

CONIFER TREES

DOUGLAS-FIR

Shade: **1** **2** ☐ ☐ ☐

Animals: **1** **2** ☐ ☐ ☐

Soil wetness: **1** **2** ☐ ☐ ☐

LODGEPOLE PINE

Shade: **1** **2** **3** **4** ☐

Animals: **1** **2** **3** ☐ ☐

Soil wetness: **1** ☐ ☐ ☐ ☐

PONDEROSA PINE

Shade: **1** ☐ ☐ ☐ ☐

Animals: **1** **2** **3** **4** ☐

Soil wetness: **1** **2** **3** **4** **5**

WESTERN REDCEDAR

Shade: **1** **2** **3** **4** **5**

Animals: **1** ☐ ☐ ☐ ☐

Soil wetness: **1** **2** **3** **4** ☐

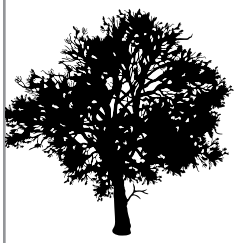
BROADLEAF TREES

BIGLEAF MAPLE

Shade: **1** **2** **3** **4** ☐

Animals: **1** ☐ ☐ ☐ ☐

Soil wetness: **1** **2** **3** **4** ☐



CALIFORNIA BLACK OAK

Shade: **1** ☐ ☐ ☐ ☐

Animals: **1** **2** **3** **4** ☐

Soil wetness: **1** ☐ ☐ ☐ ☐

OREGON ASH

Shade: **1** **2** **3** ☐ ☐

Animals: **1** **2** ☐ ☐ ☐

Soil wetness: **1** **2** **3** **4** **5**

RED ALDER

Shade: **1** ☐ ☐ ☐ ☐

Animals: **1** **2** ☐ ☐ ☐

Soil wetness: **1** **2** **3** **4** ☐

NAME: _____ DATE: _____

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HOW WIDE?

By measuring the widths of trees, foresters can learn a lot about Oregon's forests. For example, they can assess how well the trees are growing, or estimate how dense the forest is.

Since a tree's trunk is often wider at the bottom than higher up, foresters use DBH, which stands for "diameter at breast height," as the standard measure. DBH is the diameter of a tree trunk measured at 4.5 feet above the ground.

Directions: Use one or both of the following methods to estimate the width of a tree.

RULER METHOD

1. Measure 4.5 feet from the ground and hold the ruler against the tree at that height. Keep the ruler on one plane. Don't "wrap" it around the tree.

2. Close one eye and visually line up the left edge of the ruler with the left edge of the tree. Read the measurement where the right side of the tree visually lines up with the ruler.

DBH: _____
(Be sure to include the unit – inches or centimeters.)

TAPE MEASURE METHOD

1. Measure 4.5 feet from the ground and wrap the tape measure around the tree at that height. Note the measurement where the end of the tape measure meets up with the rest of the tape. This is the tree circumference.

   Tree circumference: _____
   (Be sure to include the unit – inches or centimeters.)

2. Using a calculator, divide the tree circumference by 3.14 (π). The resulting number is the tree's DBH.

DBH: _____
(Be sure to include the unit – inches or centimeters.)

Did You Know?

The widest known living tree in Oregon is a California bay laurel in Curry County. Its DBH is 20.9 feet (6.37 meters).

NAME: _____ DATE: _____

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HOW TALL?

By measuring the heights of trees, foresters can estimate the amount of wood the trees contain, or predict how much shade they will create. Foresters use a special instrument called a clinometer to accurately measure, but you can estimate the height using a ruler.

Directions: Use a ruler, a friend and some simple math to estimate how tall a tree is. You won't need to climb to the top with a long tape measure!

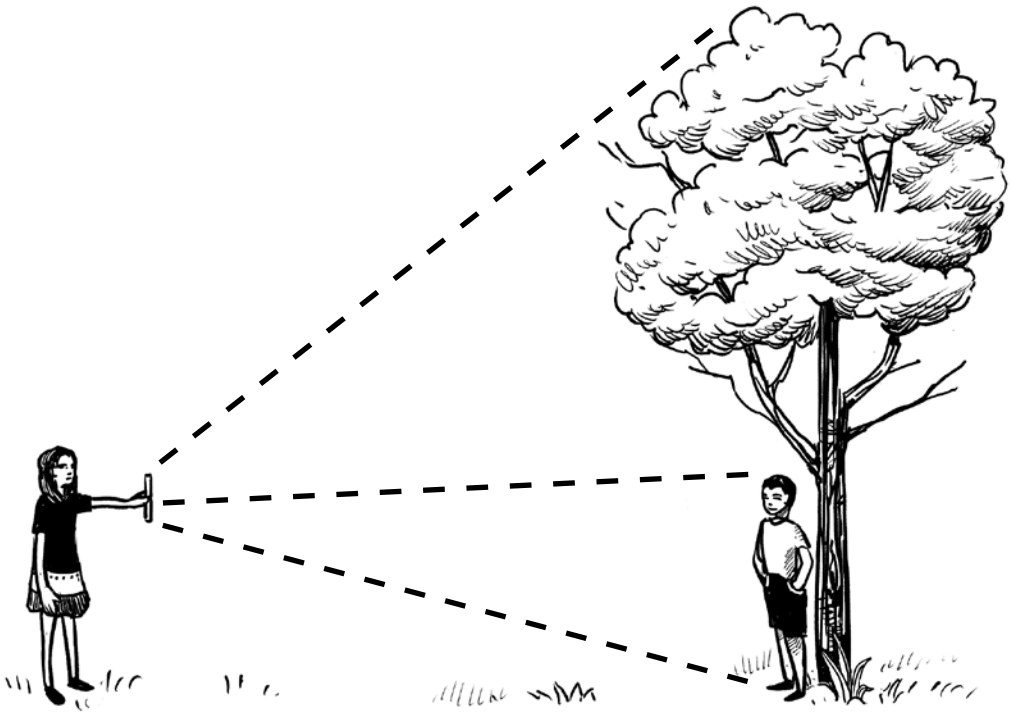
1. Find a spot where you can see the tree from top to bottom without moving your head. Ask your friend to stand at the base of the tree.

2. Hold a ruler in one hand and stretch out your arm so that the ruler is at arm's length in front of you. Step backward or forward until the top and bottom of the ruler line up with the top and bottom of the tree.

3. Look where the top of your friend's head appears to be on the ruler. Note that number to the nearest half-inch or centimeter:

   _____

   This is your friend's "apparent height."



4. Divide the length of the ruler by your friend's apparent height.

_____	÷	_____	=	_____
length of ruler		friend's apparent height		ratio

5. To calculate the tree height, multiply your friend's actual height (in inches or centimeters)* by the ratio from step 4.

_____	x	_____	=	_____
friend's actual height		ratio		tree height

Be sure to include the units (inches or centimeters) for the tree height.

*Tip: Your friend's actual height must be in the same units as your ruler – inches or centimeters. If your friend is 4 feet, 8 inches tall, you would write in 56 inches (48 inches + 8 inches).

Did You Know?

Oregon's tallest known tree is a coast Douglas-fir in Coos County. It is a towering 327 feet (99.7 meters) tall!

NAME: _____ DATE: _____

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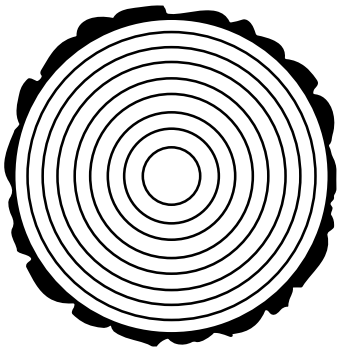
HOW OLD IS YOUR TREE COOKIE?



A tree cookie is a cross-section – or slice – of a tree or branch. By looking at a tree cookie, you can tell the age of the tree or branch and its growing conditions.

Every year, trees grow by adding a layer of new wood just under their bark. In a tree cookie, these layers look like circles, called **growth rings**. Each growth ring shows two colors of wood: a light-colored part added in spring when trees grow quickly, and a dark-colored part added in summer when trees grow slowly.

The width of growth rings can tell you about the growing conditions. For example, they are wider during wet years and narrower if the tree is stressed from drought, disease or insects.

Directions

1. Count the growth rings on your tree cookie. (Hint: Count just the dark parts.) This is the age of the tree or branch when it was cut.

   It was _____ years old.

2. Sketch your tree cookie in the box to the right. In your sketch:

   - Show the accurate number of growth rings.
   - Choose one growth ring and label the lighter, spring-growth part and the darker, summer-growth part.
   - Label the oldest growth ring and the youngest growth ring.

Questions

1. Are all the growth rings in your tree cookie the same width, or do they vary?

2. What does this tell you about the tree's growing conditions?

NAME: _____ DATE: _____

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FOREST HOOP SURVEY

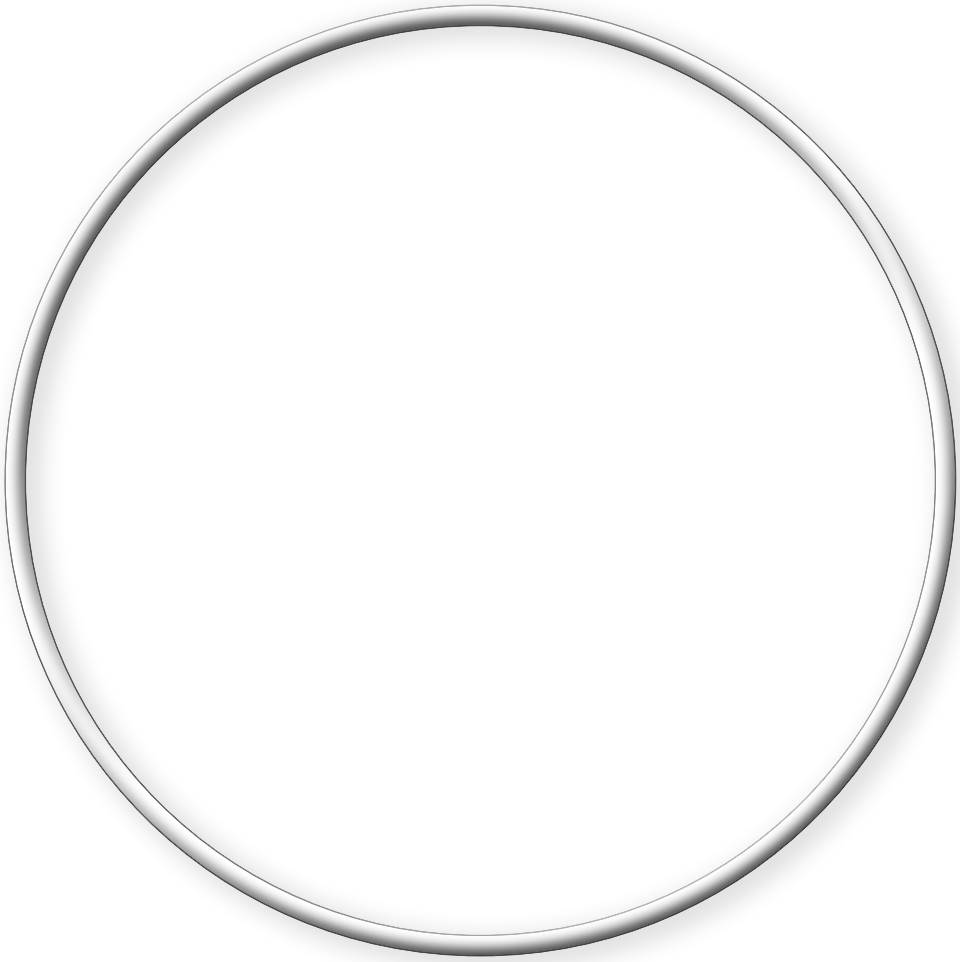
Oregon's forests include a wide variety of organisms that interact in many different ways.

Directions: Toss a hula hoop in a forest or other outdoor area. After it lands, do not move it! Look for organisms or evidence of organisms inside the hula hoop. Use the circle here to draw what you find, then categorize your findings below it. You may want to repeat this process in another area and compare the results.

Location:

_____

_____



Categorize the organisms or evidence you find:

PRODUCERS	CONSUMERS	DECOMPOSERS
Living things that make their own food	Living things that eat other living organisms	Living things that eat dead and decaying organisms

NAME: _____ DATE: _____

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SIGNS OF WILDLIFE

Oregon's forests are home to many kinds of wildlife. Even when animals are hidden from view, they leave evidence that they've been there. Signs of wildlife include nests, eggs or eggshells, chewed leaves, footprints (tracks), droppings or bits of fur.

Directions: Look closely for evidence of forest wildlife in different layers of the forest. Record what you find in each layer below.

FOREST CANOPY
(the highest branches)

MID-CANOPY
(tree trunks and lower branches)

UNDERSTORY
(bushes under the trees)

FOREST FLOOR
(in or on the ground)

NAME: _____ DATE: _____

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WILDLIFE HABITAT

A habitat is a place where an organism makes its home and has the food, water, shelter and living space it needs to survive.

Directions: In a forest or other outside place, inspect the trees and surrounding areas for evidence of how an animal might meet each need. Sketch a map of the area, showing where you find each necesary element:

- FOOD
- SHELTER
- WATER
- LIVING SPACE

NAME: _____ DATE: _____

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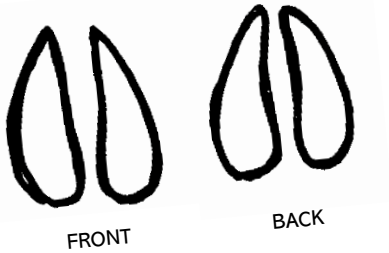
TRACK MATH

One way to learn about the wildlife living in Oregon's forests is to look for the tracks they've made. By counting certain characteristics of mammal tracks, you can tell what mammal family they're from.

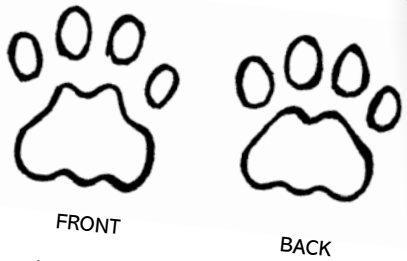


FRONT BACK

Look for:
2 hooves in front +
2 hooves in back

It's in the hoofed family.

May be: **deer, elk, moose, antelope**



FRONT BACK

Look for:
4 toes in front + 4 toes in back

It's in the cat family.

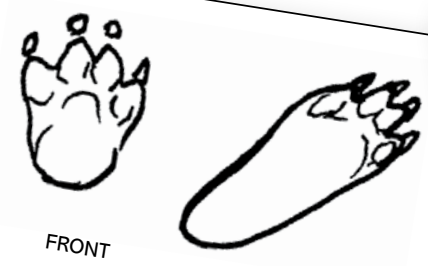
May be: **cougar (mountain lion), bobcat**

FRONT BACK

Look for:
4 toes in front +
4 toes in back + claws

It's in the dog family.

May be: **coyote, wolf, fox**



FRONT BACK

Look for:
4 toes in front +
4 toes + heel in back

It's in the hopping mammal family.

May be: **cottontail rabbit, jackrabbit, hare**

FRONT BACK

Look for:
4 toes in front +
5 toes in back

It's in the rodent family.

May be: **beaver, nutria, porcupine, mouse, squirrel, chipmunk**

FRONT BACK

Look for:
5 toes in front +
5 toes in back

It's in another mammal family.

May be: **weasel, raccoon, opossum, bear, skunk**

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TRACKING

To search for animal tracks, look in bare dirt, mud or wet sand. If you find a set of mammal tracks, use the Track Math journal page to try to figure out which mammal family it's from.

Tracking is a challenging skill to learn, and takes a lot of practice. Don't be discouraged if you don't find any tracks, or can't tell what animal made them if you do. Keep trying!

Directions: Sketch a track you find. Try to answer the questions below about the animal.

What kind of animal made this track? _____

When do you think it made the track? _____

Where was it headed? _____

How fast was it going? _____

NAME: _____ DATE: _____

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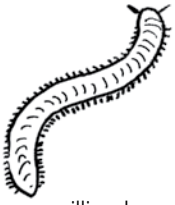
DECOMPOSER BINGO

Decomposers have one of the most important roles in Oregon's forests. They break down dead leaves and other dead plant or animal material, and make the nutrients available to other organisms.

Directions: Mark off all the different types of decomposers (or sign of decomposers) you see in or on the forest floor or other outdoor site. Can you find four in a row? All 16?

 decaying leaf	 ant	 mushrooms growing out of a stump	 millipede
 snail	 mold	 sow bug or pill bug	 Insect eggs or holes in a dead tree
Another sign of decomposer: _____ _____	 worm	 rotting log	 moss*
 mushrooms growing out of the ground	 fly	 beetle	 slug

*Moss is both a decomposer and a producer.

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THE FOOD CHAIN STORY

Directions: Write a story about a food chain that includes animals and plants you might find in Oregon's forests.

_____
_____
_____

Producers receive energy from the sun.

_____
_____
_____

Primary consumer (herbivore) eats the producer.

_____
_____
_____

Secondary consumer (carnivore) eats the herbivore.

_____
_____
_____

Decomposer helps break down the producers and consumers after they die.

Did You Know?

An Oregon forest is a complex system of interactions among plants and animals. As in all ecosystems, different forest **food chains** interconnect to form a **food web**.

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FOREST BENEFITS SCAVENGER HUNT

Directions: Oregon's trees and forests provide many environmental, economic and social benefits. Check out a forest or other outdoor area with trees and find as many of these benefits (or evidence of them) as you can. Be creative!

ENVIRONMENTAL BENEFITS

- ☐ Provide oxygen — Evidence: _____
- ☐ Store carbon — Evidence: _____
- ☐ Filter water — Evidence: _____
- ☐ Provide animal habitat — Evidence: _____
- ☐ Other environmental benefit: _____
  Evidence: _____

ECONOMIC BENEFITS

- ☐ Provide wood products — Evidence: _____
- ☐ Provide paper or cardboard products — Evidence: _____
- ☐ Provide food products — Evidence: _____
- ☐ Provide jobs — Evidence: _____
- ☐ Other economic benefit: _____
  Evidence: _____

SOCIAL BENEFITS

- ☐ Provide places to play or recreate — Evidence: _____
- ☐ Provide shade — Evidence: _____
- ☐ Provide beauty or inspiration — Evidence: _____
- ☐ Provide a home for people — Evidence: _____
- ☐ Other social benefit: _____
  Evidence: _____

Sustainable forests include all three types of benefits. In Oregon, forest managers plant about 40 million seedlings a year to ensure we will always have a growing forest.

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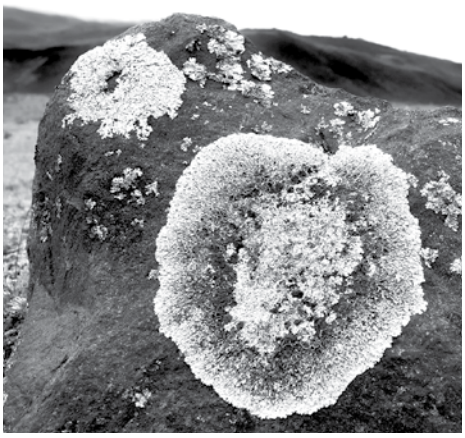
LIKIN' LICHENS

Lichens are not a single organism; they're a partnership – or symbiosis – between a fungus and one or more algae. The fungus surrounds the cells of the algae, which nourish the fungus through the process of photosynthesis. The fungus provides shelter, moisture and an anchor for the algae.

There are many different species of lichens, which fall into three main types:



CRUSTY LICHENS
firmly attach as a "crust"
on the surface of trees or rocks.

LEAFY LICHENS
look like flat leaves.

SHRUBBY LICHENS
look like small leafless bushes.

Directions: Go for a walk in a forest or other outdoor area. Stop to look at any lichens you see, checking trees, rocks and other hard surfaces. Lichens are very slow-growing, so try not to disturb them!

How many different examples of each type do you see?

Crusty lichens: _____

Leafy lichens: _____

Shrubby lichens: _____

Lichen or Moss?

Mosses and lichens both grow on trees and rocks, and people sometimes get them confused. Unlike lichens, mosses are true plants with small leaves. If it looks like a soft, green, fuzzy carpet, it's a moss.

Sketch the lichens you find most interesting:

NAME: _____ DATE: _____

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ASSESSING AIR QUALITY

Some lichens are sensitive to air pollution, and cannot thrive if the air quality is poor. Crusty lichens tend to be less sensitive than leafy and shrubby ones. One way to assess air quality is to look for the presence or absence of certain lichens, and to measure them.

Directions: Conduct a lichen survey to assess the air quality in an area of the forest.

METHOD 1

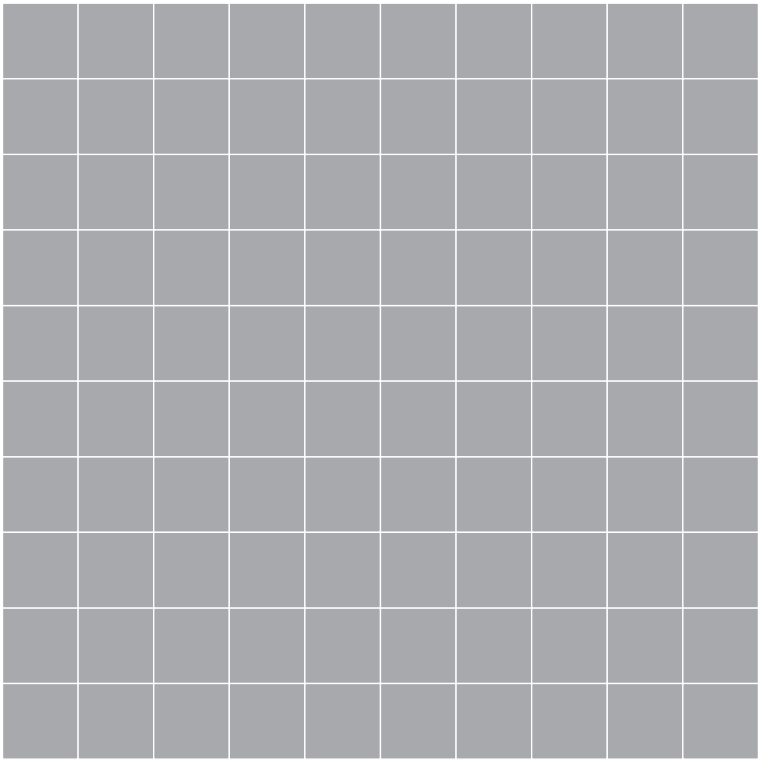
Use data you collected on the "Likin' Lichens" journal page to estimate air quality. Circle your result below.

Types of Lichens Present	Air Quality
Shrubby, leafy and crusty lichens	Excellent
Leafy and crusty lichens	Good
Crusty lichens	Fair
No lichens present	Poor

METHOD 2

Use lichen size to estimate air quality. Find the five largest lichens in the study area and measure them using the CM Grid. Circle your highest result below.

Lichen Size (in square cm)	Air Quality
>10	Excellent
7-9	Good
4-6	Fair
0-3	Poor



CM Grid: Each square in the grid is one square centimeter.

Questions:

Are the results the same using both methods?

Do you think air quality is affecting the lichens in this area? Why or why not?

NAME: _____ DATE: _____

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HOW MUCH CARBON?

Oregon's forests store approximately 3.2 billion metric tons of carbon in the soil, live trees and dead plant material. During photosynthesis, trees absorb carbon dioxide from the atmosphere and turn it into solid carbon, which is stored in wood. Use the Tree Carbon Tape (on following pages) to estimate the amount of carbon in nearby trees.

Directions:

1. Identify five trees to measure with the Tree Carbon Tape.
2. Determine the circumference of each tree: Hold the tape at about 4.5 feet (1.4 meters) from the ground and wrap it once around the tree trunk. Find the measurement to the nearest 3 inches and record the result below.
3. Use the tape to find the approximate carbon dioxide equivalent (CO_2e) contained in each tree. Record below.
4. Use the tape to the find the approximate number of miles driven in a car that would emit the same amount of carbon as there is stored in the tree. In growing to that size, the tree can "offset" the emissions from driving that number of miles.

	Location	Circumference (in inches)	Approximate carbon dioxide equivalent (pounds CO_2e)	Approximate car miles offset by tree
TREE 1				
TREE 2				
TREE 3				
TREE 4				
TREE 5				

CALCULATE:

What is the average circumference of this group of trees? _____ inches

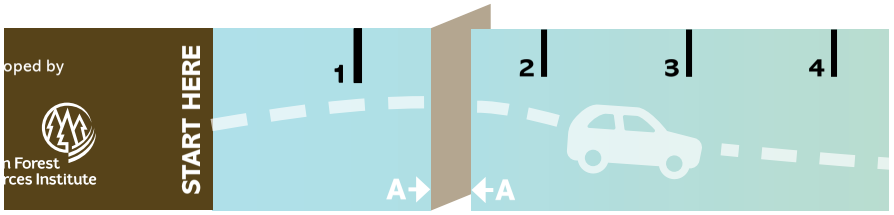
What is the average pounds CO_2e of this group of trees? _____ pounds

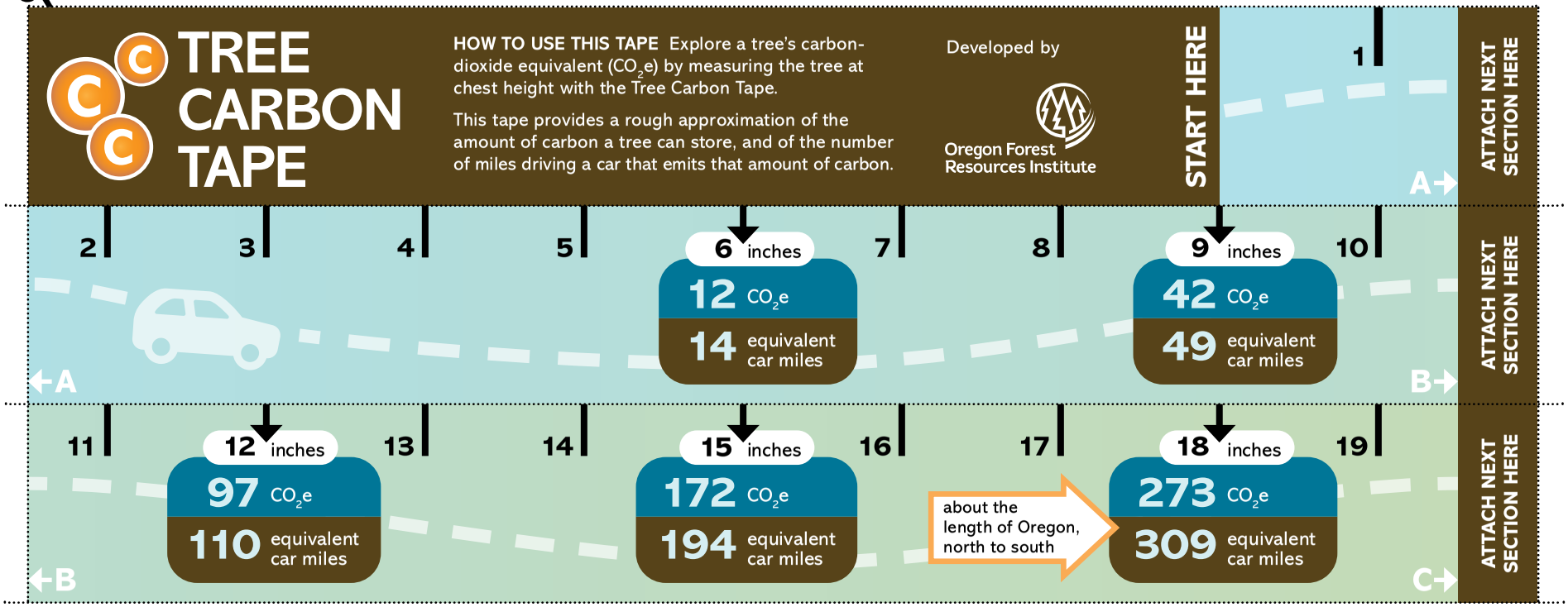
About how many total car miles are offset by this group of trees? _____ miles

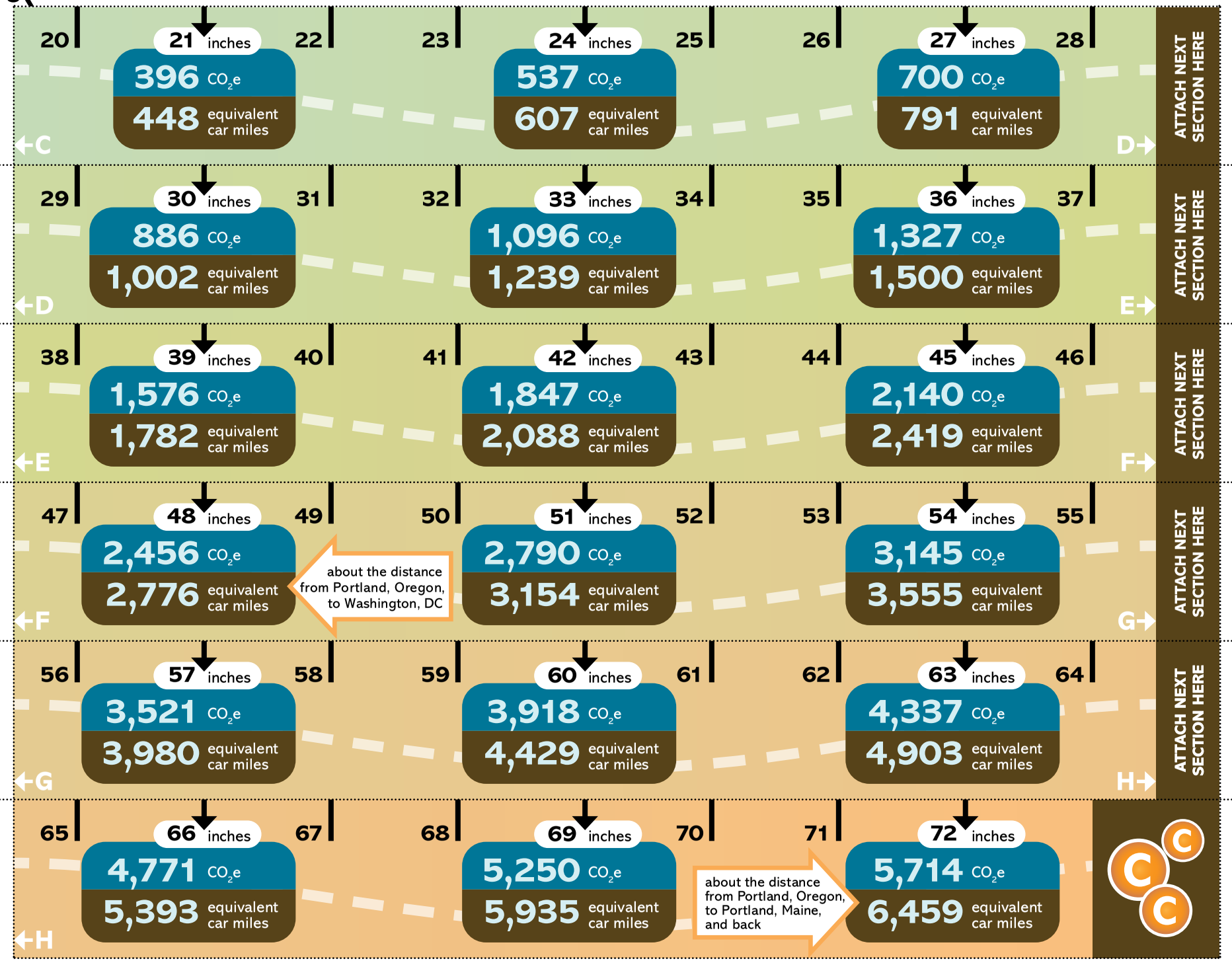
TREE CARBON TAPE

Making Your Tree Carbon Tape:

- Print out these two pages on 8-½" x 11" paper at actual size (100%).
- Cut out all nine sections along the black dotted lines.
- Glue, staple or tape the sections together as shown. The finished tape measure should be 72 inches long.






20
21 inches
396 CO_2e
448 equivalent car miles
22
23
24 inches
537 CO_2e
607 equivalent car miles
25
26
27 inches
700 CO_2e
791 equivalent car miles
28
ATTACH NEXT SECTION HERE
C
D
29
30 inches
886 CO_2e
1,002 equivalent car miles
31
32
33 inches
1,096 CO_2e
1,239 equivalent car miles
34
35
36 inches
1,327 CO_2e
1,500 equivalent car miles
37
ATTACH NEXT SECTION HERE
D
E
38
39 inches
1,576 CO_2e
1,782 equivalent car miles
40
41
42 inches
1,847 CO_2e
2,088 equivalent car miles
43
44
45 inches
2,140 CO_2e
2,419 equivalent car miles
46
ATTACH NEXT SECTION HERE
E
F
47
48 inches
2,456 CO_2e
2,776 equivalent car miles
49
about the distance from Portland, Oregon, to Washington, DC
50
51 inches
2,790 CO_2e
3,154 equivalent car miles
52
53
54 inches
3,145 CO_2e
3,555 equivalent car miles
55
ATTACH NEXT SECTION HERE
F
G
56
57 inches
3,521 CO_2e
3,980 equivalent car miles
58
59
60 inches
3,918 CO_2e
4,429 equivalent car miles
61
62
63 inches
4,337 CO_2e
4,903 equivalent car miles
64
ATTACH NEXT SECTION HERE
G
H
65
66 inches
4,771 CO_2e
5,393 equivalent car miles
67
68
69 inches
5,250 CO_2e
5,935 equivalent car miles
70
about the distance from Portland, Oregon, to Portland, Maine, and back
71
72 inches
5,714 CO_2e
6,459 equivalent car miles
C
C
C
H

NAME: _____ DATE: _____

Oregon Forest Resources Institute

FIRST FOODS OF OREGON

Traditional local foods have nourished Indigenous people of Oregon since time immemorial. These traditional foods, often called "first foods," vary by local geography, seasonality and cultural group. A few first foods – such as the ones shown below – are common to many tribes in Oregon.

Directions: Look for these first foods – or evidence of them – in one or more places:

- forest or other outdoor site
- river or stream
- grocery store
- farmers market

List what you find:

_____

_____

_____

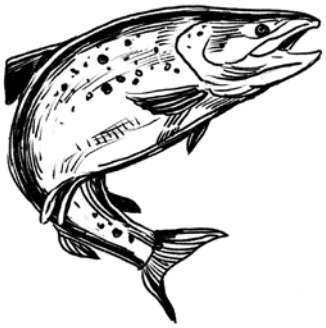
_____

First Foods and Resilience

Many tribes in Oregon are working to restore access to first foods and reconnect to traditional food practices. Emphasizing first foods is one approach Oregonians can take to make our food system more sustainable, and to increase our resilience to climate change and other environmental challenges.

SALMON

Traditionally, salmon were cleaned, hung on racks to dry in the sun and stored for the winter and spring.



CAMAS

Traditionally, the bulbs of this lily were slow-roasted in pits, then dried and baked to be stored for later use.

HUCKLEBERRIES

Traditionally, huckleberries were often sun-dried or smoked before being mashed into cakes and wrapped with leaves for future use.

DEER AND ELK

Traditionally, the meat was roasted, steamed or boiled for eating during summer or fall. It was also smoked or dried and then stored for winter and spring.

NAME: _____ DATE: _____

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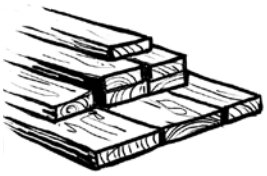
FOREST PRODUCTS SCAVENGER HUNT

Directions: Oregon's forests provide many products people use every day. Find as many of these products as you can at Outdoor School, at your school or at home. Check each one you find, and note where you find it.

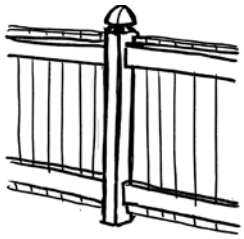


☐ lumber

☐ newspaper

☐ animal bedding

☐ bark mulch



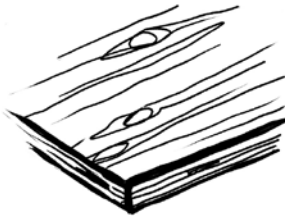
☐ fence post

☐ tissue

☐ holiday decoration

☐ telephone pole

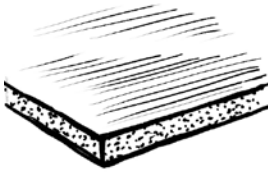
☐ outdoor wood furniture



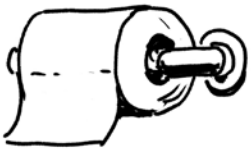
☐ plywood

☐ wild edible mushroom

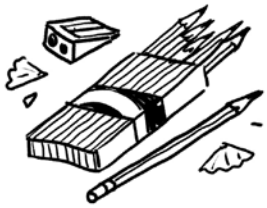
☐ wood toy



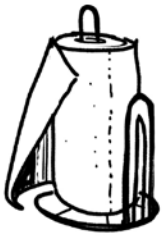
☐ particle board



☐ toilet paper

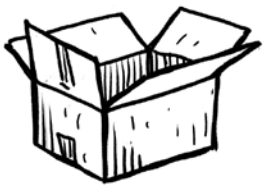


☐ pencil



☐ paper towel

☐ book



☐ cardboard box

☐ huckleberry

☐ wood flooring

NAME: _____ DATE: _____

Oregon Forest Resources Institute

INVASIVE OR NOT?

An invasive species is one that's not native to an area and has the potential to spread at a harmful rate. Whether a plant is invasive or not depends on its characteristics and location. Many invasive plants have similar characteristics that make them more likely to take over an area.

Directions:

1. Choose a plant in a forest or other outside area to assess.

   Plant name _____
   (the plant's actual name or a short description)

   Location _____

2. Look for the following characteristics, which many invasive plant species share. Place a checkmark next to each characteristic that describes your plant. The more checkmarks, the more likely the plant is invasive.

Is a "bully"

- ☐ Grows up and over other plants, often smothering them.
- ☐ Forms a dense cluster of plants that the sun cannot penetrate.

Defends itself

- ☐ Has thorns, burrs or spines.
- ☐ Has chemical defenses that prevent other plants from growing. (Look for a lack of plants growing around your plant.)

Produces lots of seeds

- ☐ Has too many seeds to count.
- ☐ Its seeds are dispersed by the wind. (Look for seeds with wings.)
- ☐ Its seeds can stick to fabric or animal fur. (Look for seeds with barbs or hooks.)

Can spread through roots or fragments

- ☐ Has stems called "runners" that grow near the ground, with roots or stems coming from them.
- ☐ Has tiny rootlets growing from pieces of stem.

Displaces native species

- ☐ Is the main or only species growing in a 6-foot-wide circle around the plant.

Did You Know?

Controlling invasive plants in Oregon's forests is a constant battle for forest managers. Invasive plants such as Scotch broom, English ivy and non-native species of blackberry and thistles outcompete young trees and other native plants for sunlight, water and nutrients.

Question:

Based on your findings, do you think this plant could be invasive? Why or why not?

_____

_____

_____

_____

NAME: _____ DATE: _____

Oregon Forest Resources Institute

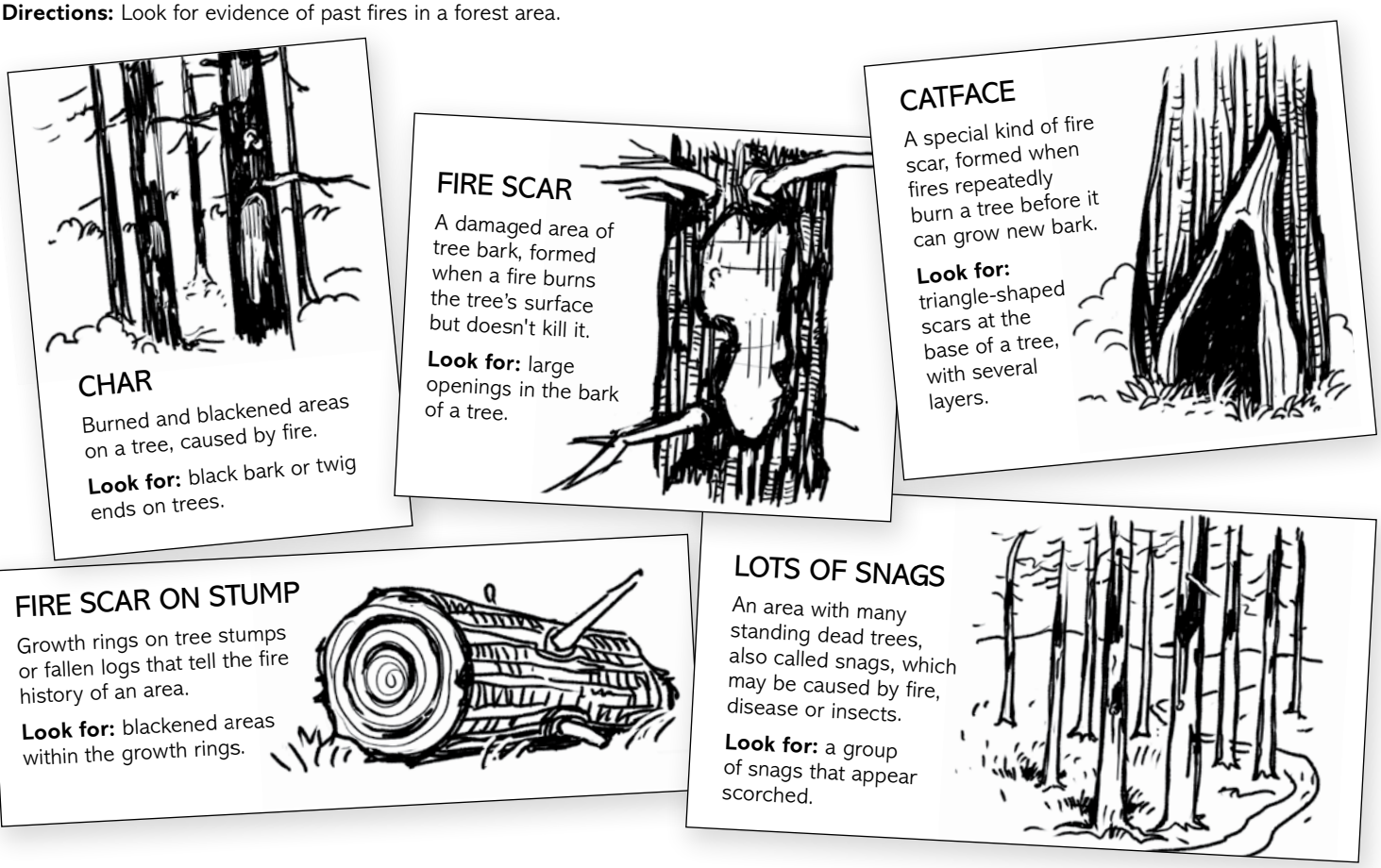
DETECTING PAST FOREST FIRES

Fires are a natural and necessary part of Oregon's forests. They:

- form openings in the forest that enable a variety of plants to grow
- create standing dead trees (called snags) that many animals rely on for food and shelter
- help fire-adapted plant species* reproduce by opening their cones or triggering their seeds to grow

*Being "fire-adapted" means having behaviors or characteristics that enable an organism to live, or even thrive, with repeated fires.

Directions: Look for evidence of past fires in a forest area.



Questions:

What evidence do you see of the forest recovering from past fires?

How might fire have helped this forest?

NAME: _____ DATE: _____

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PREVENTING WILDFIRE

Most wildfires in Oregon are caused by people. While fire can often benefit forests, unnaturally severe wildfires – particularly near homes and communities – are a serious problem. In addition to destroying buildings and threatening lives, wildfires reduce air and water quality, damage fish and wildlife habitat, and are costly to put out.

Directions: There are many ways people can prevent wildfire. Check the things you already do.

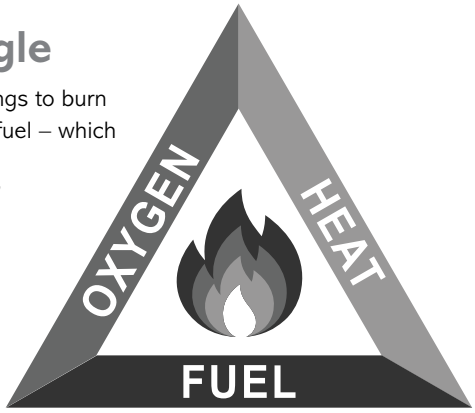
- ☐ I never shoot off **fireworks** in or near the forest.
- ☐ I only use **all-terrain vehicles** on roads and trails, and park them only on gravel surfaces.
- ☐ I avoid shooting **firearms** on hot, dry days, and keep a fire extinguisher or water hose nearby.
- ☐ I take care when building a **campfire**. I check that the area around it is clear, keep the fire small and watch it at all times.
- ☐ I take care when using a **gas lawnmower**. I only use it early in the day when moisture is higher and temperatures are lower.
- ☐ I help keep a 30-foot **defensible space** around my home that is free of anything that can burn.

Question:

What else can you do to help prevent wildfire?

Fire Triangle

Fires need three things to burn – heat, oxygen and fuel – which together are known as the "fire triangle."



Managing for Fire

Forest managers in Oregon work to decrease the severity of wildfires in a number of ways. They use "prescribed burns" – controlled, low-intensity fires – to reduce needles, branches and other fuel for fires. They also remove small trees that are growing too close together, which makes it harder for wildfires to quickly spread across the forest by jumping from tree to tree.

NAME: _____ DATE: _____

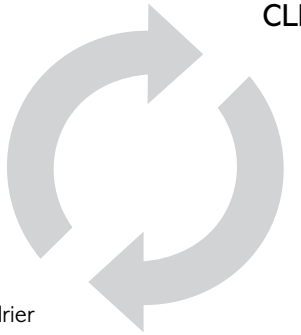
Oregon Forest Resources Institute

CLIMATE CHANGE AND FORESTS

Increased amounts of carbon dioxide in the atmosphere result in warmer temperatures and other changes in Earth's climate.

CLIMATE CHANGE AFFECTS OREGON'S FORESTS:

- Rising temperatures and longer droughts in some parts of Oregon cause more frequent and intense fires, and more insect and disease outbreaks.
- More intense storms cause some trees and branches to fall, making forests more prone to insect and disease outbreaks while also fueling wildfires.
- Changes in moisture affect which tree species make up Oregon's forests. Climate change brings drier conditions in some areas and wetter conditions in others.



FORESTS CAN REDUCE THE EFFECTS OF CLIMATE CHANGE:

- Forests can reduce carbon dioxide in the atmosphere. Trees absorb and store carbon through photosynthesis.
- Carbon continues to be stored in the wood even after a tree is harvested and made into wood products.
- Forests lower temperatures by providing shade and releasing water from their leaves.

Directions: Draw a diagram to show both how climate change affects forests and how forests affect climate change.

Question:

Why is it important to understand the effects of climate change on forests?

NAME: _____ DATE: _____

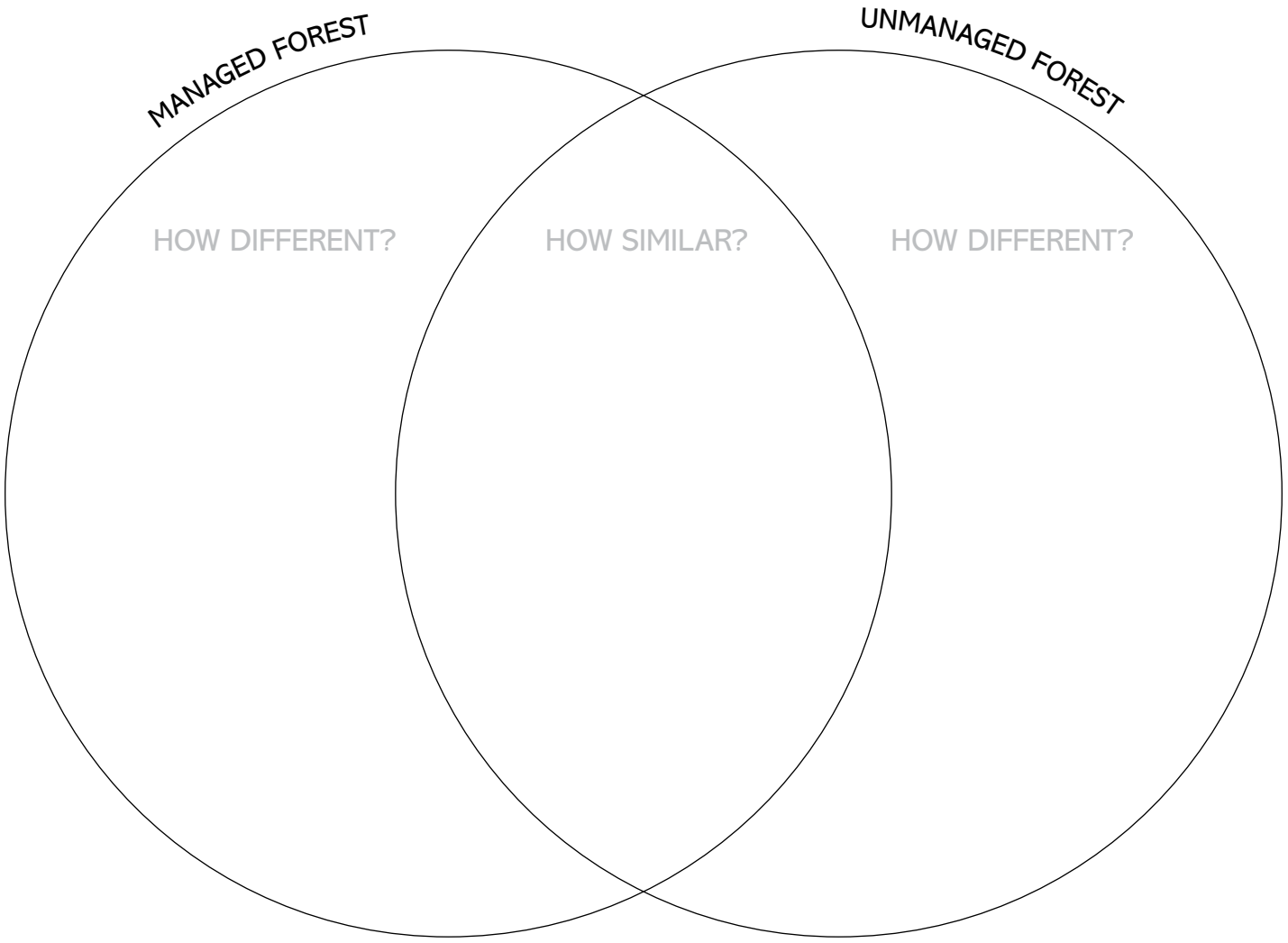
Oregon Forest Resources Institute

FOREST MANAGEMENT

Directions: Compare two different forest areas: one managed by a forester or landowner, and one that is unmanaged. Use this Venn diagram to compare the two areas.

Did You Know?

Forest management is the process of humans caring for a forest so it remains healthy and provides desired benefits.



Question:

Looking at both forest areas, does one appear to have healthier trees? If so, which one? Why? (Keep in mind that trees need enough sunlight, water, soil nutrients and space to stay healthy.)

NAME: _____ DATE: _____

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YOUR FOREST PLAN

Forest landowners in Oregon create forest management plans to describe their vision for their forests, and to lay out the steps needed to achieve that vision.

Directions: Imagine you own 100 acres of forestland. It could be like the forest you're in now, or one you picture in your mind. Decide on a goal for your forest that will achieve the forest benefit that's most important to you. See the list of sample forest management goals in the box to the right for some ideas.

What is your goal for your forest? _____

_____

_____

Sample Forest Management Goals:

- improve wildlife habitat
- store carbon
- protect water quality
- produce lumber or firewood
- create access for hiking, mountain biking or other recreation
- enhance beauty

What would your forest look like if your goal is being met? Draw a picture of it.

What would you do in the next year to move toward your goal?

_____

_____

What would you do after that to make sure your forest remains healthy for many years to come, while also meeting your goal?

_____

_____

_____

NAME: _____ DATE: _____

Oregon Forest Resources Institute

SUSTAINABLE FORESTRY CAREERS

Oregonians have many different jobs that help sustain our forests. Some forestry jobs involve working mostly outdoors, while others are mostly indoors.

Directions:

1. Imagine yourself working outside most of the time. What do you think you would enjoy? What wouldn't you enjoy so much? Write your thoughts below.

I WOULD ENJOY…	I WOULDN'T ENJOY…

2. Consider different forest careers based on your responses.

If you would enjoy working **outside**:

- Field Forester*
- Fish Biologist*
- Forest Engineer*
- Forest Hydrologist*
- GIS Specialist*
- Logging Crew Member*
- Recreation Manager*
- Seedling Nursery Manager*
- Stewardship Forester*
- Wildland Firefighter*
- Wildlife Biologist*

If you would prefer working **inside**:

- Electrician*
- Forest Economist
- Forestry Teacher*
- Media Specialist
- Mill Operator*
- Policy Advisor
- Procurement Forester*
- Rolling Stock Maintenance Manager*
- Sustainability Manager

CAREER VIDEOS

You can watch a 2-minute video on each starred (*) career shown at left at youtube.com/user/oregonforests (under Playlists, select *Careers in Forestry: Find Your Path*).