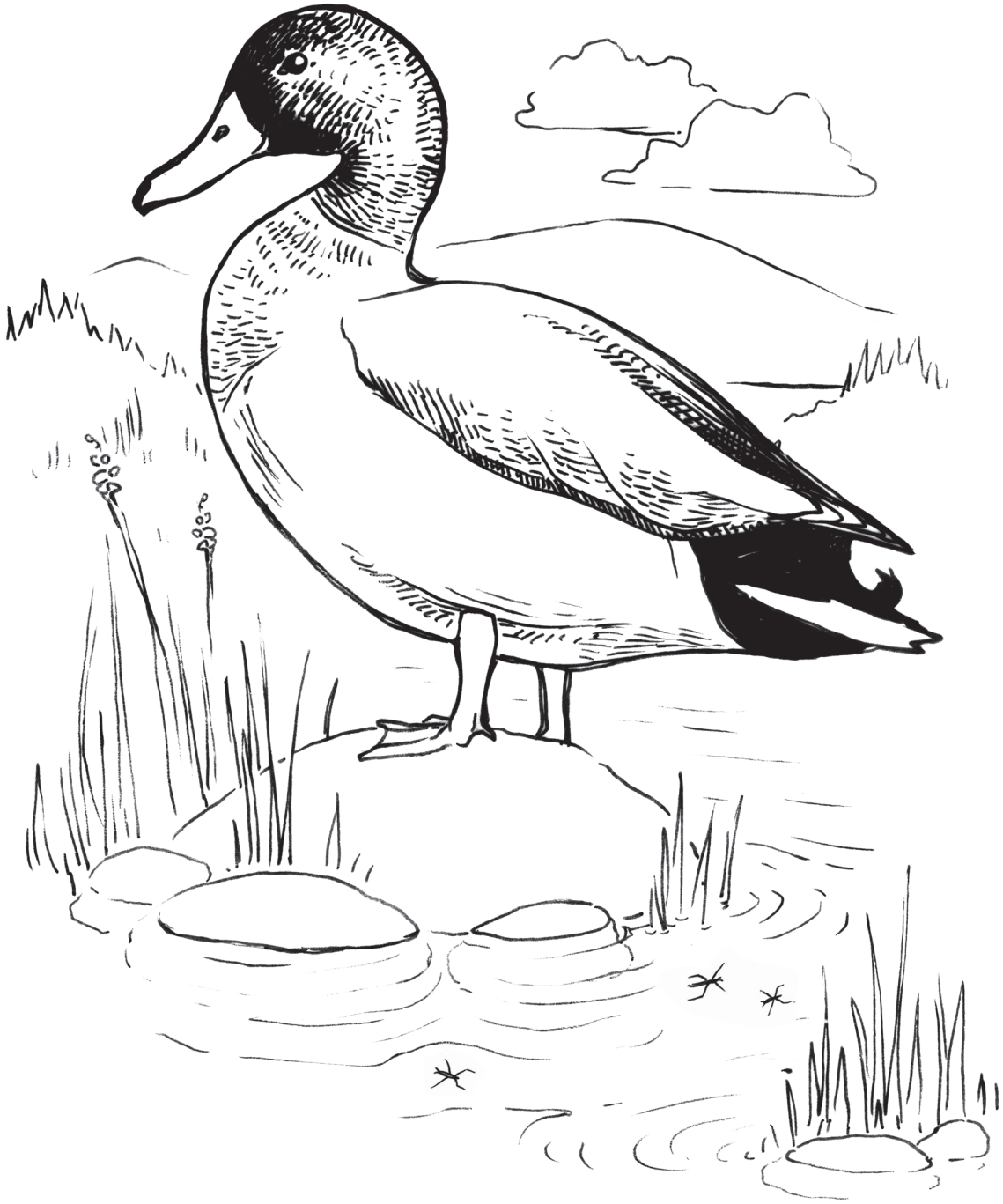
NATURAL RESOURCES JOURNAL

Oregon Forest
Resources Institute



INSTRUCTOR PAGE

OREGON GARDEN
Natural Resources Education Program
LESSONS

Forests are an integral part of the Oregon landscape. With nearly half our state covered by forests, they contribute greatly to our quality of life.

The goal of these four lessons is to enhance students' understanding of and appreciation for Oregon's forests. Each lesson guides students in an engaging investigation of forests they can do on their own at home, no matter where they live.

The lessons focus on four topics that are explored in on-site programs at The Oregon Garden's Rediscovery Forest. This demonstration forest, which is managed jointly with the Oregon Forest Resources Institute (OFRI), serves the multiple goals of education, research and public enjoyment.

The Oregon Garden Natural Resources Education Program – and the lessons here – focus on four topics:

- Wildlife Habitats
- Adaptations
- Healthy Forests
- Food Webs

STANDARDS CONNECTIONS

RELATED STANDARDS

The four lessons help teach toward the following NGSS standards:

NGSS Performance Expectations

- 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.
- 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

NGSS Disciplinary Core Ideas

- LS1.A: Structure and Function
- LS2.A: Interdependent Relationships in Ecosystems
- ESS3.C: Human Impacts on Earth Systems

NGSS Science and Engineering Practices

- Developing and Using Models
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Obtaining, Evaluating, and Communicating Information

RELATED OREGON FOREST LITERACY PLAN CONCEPTS

- Theme 1, B.3. As part of the forest ecosystem, trees have various roles (e.g., supplying oxygen, providing habitat, holding soil, moderating temperature, capturing and storing carbon, and cycling water and nutrients).
- Theme 1, C.3. Forest ecosystems include processes such as photosynthesis, energy flow and the cycling of nutrients, water, carbon and other matter.
- Theme 1, D.1. Trees can be classified into genus, family, and species groups based on their seeds, leaves, flowers and other tree parts.
- Theme 2, B.5. Oregon's forests are important ecological systems, interconnected with other systems not only environmentally, but socially and economically. Changes in the conditions and uses of Oregon's forests may affect the conditions and uses of forests worldwide.
- Theme 2, C.1. Oregon's forests provide basic resources that people use every day.

Designed for flexibility

Students may do each lesson:

- on their own or as part of directed instruction
- as pre-visit preparation or post-visit follow-up to a Rediscovery Forest field trip

For an electronic version of these lessons that students can complete online, see *LearnForests.org/Oregon-Garden-Lessons*.

Format

Each lesson invites students to explore the lesson topic through videos and other content developed by OFRI. Each lesson also involves students in making direct observations outdoors in their backyard, schoolyard, neighborhood or nearby park.

All lessons include a brief overview to introduce the topic, and simple activities to deepen understanding. They are organized around the 5-E model of science instruction, which stands for Engage, Explore, Explain, Elaborate and Evaluate. This model allows students to develop an understanding of science concepts through active engagement and exploration.

Time considerations

Each lesson will take students approximately 45 minutes to complete. Of course, this will vary depending on the students and whether they do some or all of a given lesson.

VISITING THE OREGON GARDEN AND THE REDISCOVERY FOREST

If you would like to bring your class to The Oregon Garden, please sign up for a field trip on the OFRI website: learnforests.org/resource_article/rediscovery-forest-education-program.

If you're interested in visiting The Oregon Garden with your family, check out hours, prices and more information at The Oregon Garden website: oregongarden.org.

Oregon Forest Resources Institute

LearnForests.org

Student name

School

WILDLIFE HABITATS

Wildlife are animals that live wild in an area. They may include mammals, birds, fish and even insects. An animal's **habitat** is the place where it gets everything it needs to live.

Oregon's forests are home to many kinds of wildlife. To learn about Oregon's forest wildlife and their forest habitats, do the following activities and answer the questions:

Engage

Watch a two-minute video at ***bit.ly/OR-wildlife*** to learn about Oregon's forest wildlife.
What are two factors that affect where forest animals live?

1.

2.

Explore

1. Go outside to look for wildlife or signs of wildlife in your backyard, schoolyard, neighborhood or nearby park. Signs of wildlife are clues animals leave that reveal they live there. Examples are footprints (tracks), eggshells, chewed leaves, droppings or bits of fur. BE SURE TO CHECK WITH AN ADULT BEFORE HEADING OUT.

2. What animals or signs of animals do you see when you:

Look up (at the sky or in trees)?

Look out (at eye level in trees and shrubs)?

Look down (on or under the ground)?

3. Choose one of the animals or signs, and describe how you think that animal gets the food it needs to live.

Animal or sign of animal:

How the animal gets its food:

What evidence supports your claim?

Explain

1. Go to ***oregonforests.org/content/wildlife-variety*** to see a guide to Wildlife of Oregon's Forests.

2. From the guide, choose an animal that lives in Oregon's forests. In the space here, draw a picture of its habitat. Your drawing should include where it gets its food, water and shelter. It should also show how much space the animal needs to survive.

Elaborate

Wildlife biologists study animals and their behaviors. Go to ***bit.ly/Fisher-study*** to read a case study about the fisher.

What differences do you notice between historic and current ranges of the fisher on the map?

What does the evidence tell us about fisher range in Oregon?

In the past, fisher were hunted for their fur. What might be affecting fisher populations today?

What are some ways people can positively impact wildlife habitats?

Evaluate

What is the most interesting thing you learned about Oregon's forest wildlife?

ADAPTATIONS

An **adaptation** is a feature or trait that helps a plant or animal survive. To learn about tree adaptations in Oregon environments, do the following activities and answer the questions:

Engage

Watch a two-minute video at ***youtu.be/VDSFck-h8D4*** that explains how the different parts of a tree help it live. What features or adaptations help trees survive?

Explore

Go outside and find a tree in your backyard, schoolyard, neighborhood or nearby park. BE SURE TO CHECK WITH AN ADULT BEFORE HEADING OUT.

In the space here, draw a picture of the tree. In your drawing, point out the features or adaptations of the tree that help it:

- get water
- capture sunlight
- protect itself
- reproduce

Explain

Watch a two-minute video at ***youtu.be/elCPyzPwFjI*** that describes different forests in Oregon.

Why are there different forest types in different regions (ecosystems) of Oregon?

How are different forest trees adapted to different ecosystems?

Elaborate

1. Pick an ecosystem such as a desert, a tropical rainforest, a temperate forest (like those in Oregon), the Arctic, an island, a mountain range or a field.

2. Design a tree that has adaptations to help it survive in that ecosystem. In the space here, draw a picture of the tree, labeling its adaptations. Examples might include waxy needles to shed rain, branches that allow snow to slide off, or big leaves to capture more sunlight.

Evaluate

How does a tree's adaptations help it survive in its ecosystem?

HEALTHY FORESTS

Nearly half of Oregon is covered in forests. Our forests supply lumber, paper, fuel for heating, and jobs that support families and communities. They also filter drinking water, provide a home for many plants and animals, give us oxygen and store carbon from the atmosphere.

Forest management helps Oregon maintain healthy forests and the many benefits they provide.

Engage

Watch a two-minute video at ***youtu.be/SFhuCcMc7yY*** to learn about forest management.
Why is it important to manage forests?

Explore

1. Go outside to assess the health of a tree in your backyard, schoolyard, neighborhood or local park. BE SURE TO CHECK WITH AN ADULT BEFORE HEADING OUT.

2. Use the Tree ID Guide at ***bit.ly/Tree-ID*** to determine if the tree is a common native Oregon forest tree. Note that many trees in cities and towns are not native to Oregon. Is it a common native Oregon forest tree?

3. Assess the tree's health:

   - Look at the base of the tree where the trunk and roots meet at the soil surface. Check for signs of decay, such as missing or broken bark, or cracks in the trunk.
   - Examine the trunk. Look for deep cracks, which can indicate weakness in the tree.
   - Look up at the tree's top. Check for branches that are broken, bare or missing bark, which can indicate disease.

On a scale of 1 to 10, with 10 being most healthy, how healthy you would say this tree is?

What evidence supports your answer?

Explain

Create a plan for a healthy forest! Imagine that you own and manage 100 acres of forest, which is made up of conifer trees that are all about the same age; your forest has a stream running through it.

What is your goal for this forest?

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

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

What would you do to ensure that your forest remains healthy for the next 25 years and more, while also meeting your goal?

Elaborate

Go to ***bit.ly/Forest-care*** to read about things people can do to care for Oregon's forests.
What's something you can do to help a forest near you stay healthy?

Evaluate

How does forest management help keep forests healthy?

FOOD WEBS

A **food chain** describes how energy and nutrients move through an ecosystem. It shows the order of what eats what. An example of a food chain in an Oregon forest is:

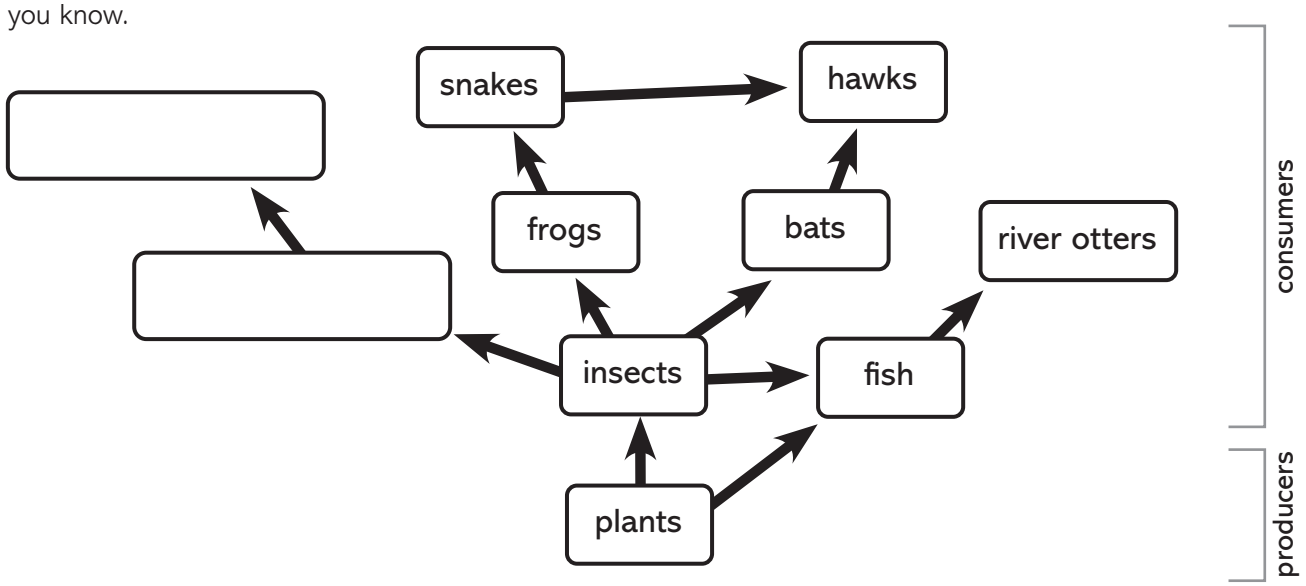
A **food web** describes the complex network of food chains in an ecosystem.

green plant –> caterpillar –> deer mouse –> owl

Arrows in a food chain or food web show the flow of food energy from one living thing to the next. The arrows point to who is doing the eating.

Engage

Complete a forest food web by filling in the missing parts. You may add animals from the above example or others you know.



Explore

Go outside to look for different members of the food web in your backyard, schoolyard, neighborhood or nearby park. BE SURE TO CHECK WITH AN ADULT BEFORE HEADING OUT.

Find as many as you can of the following kinds of living things. Write the name or a description of each you find.

Producers – living things that can make their own food from sunlight:

Consumers – living things that eat other living things:

Decomposers – living things like insects or worms that eat dead things, and mushrooms (fungi) that break down dead things:

Safety note: Don't touch mushrooms or fungi unless you're familiar with them; some are poisonous.

Explain

Create a food web of your backyard, schoolyard, neighborhood or nearby park.

1. On the bottom of page 12, draw pictures of the different kinds of producers you observed.
2. Above the producer pictures, draw consumers you observed or that you think live there.
3. Above the consumers, draw the decomposers you observed or that you think live there.
4. Draw arrows to show the flow of energy through the ecosystem. Choose one picture and draw an arrow pointing from it to a living thing that could feed on it. If there are multiple living things that could feed on it, draw arrows to each of them.
5. Repeat step 4 for each of the living things in your food web.

Elaborate

Research an animal that lives in Oregon forests, to find out what it eats and what eats it. Using the internet, type "What eats _____ (animal)?" and "What are _____(animal) predators?" into the search bar of your browser. You may also go to ***nationalgeographic.com/animals/facts-pictures*** to look at animal profiles.
Possible animals include:

Bald eagle	**Cougar**	**Northwestern salamander**	**Squirrel**
Beaver	**Coyote**	**Pileated woodpecker**	**Western toad**
Black bear	**Elk**	**Raccoon**	**White-tailed deer**
Common garter snake	**Gray wolf**	**Sockeye salmon**	

Animal you researched:

What does it eat?

What eats it?

Write out a food chain or food web for this animal. Add arrows to show the flow of food energy.

Evaluate

What might happen if a "link" in the food web for the animal you researched was missing?

Draw your **food web** here: