Section 4 – Economic Importance of Oregon’s Forests

17: Oregon’s Forest Economy

Overview

Students read about the economic importance of forests in Oregon and discuss the importance of forests to Oregon’s economy.

Time Considerations

Preparation: 15 minutes
Procedure: One 50-minute class period

Learning Objectives

Students will be able to:

- Articulate the benefits of and current challenges to the forest sector within Oregon’s economy.
- Read and interpret graphs related to Oregon’s forest economy.

Standards Connections

Next Generation Science Standards

- Disciplinary Core Idea – HS-ESS3.A: All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors.
- Science and Engineering Practice – 8. Obtaining, Evaluating, and Communicating Information: Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
Common Core State Standards – English Language Arts

- Reading Standards for Literacy in Science and Technical Subjects – RST.11-12.1: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

Oregon Forest Literacy Plan Concepts

- Theme 2, D.2. Forests provide multiple economic benefits, including jobs and commodities such as forest products, renewable energy and minerals, financial returns to owners and investors, and ecosystem service benefits such as climate change mitigation, clean water, recreation and tourism.
- Theme 2, D.3. Forests provide income for local, state, national and international economies. Oregon’s forest sector is one of the state’s largest economic sectors.

Materials

- “The Forest Economy of Oregon” student page

Background Information

See the “The Forest Economy of Oregon” student page for an overview of Oregon’s forest sector. For more specifics on the economic picture of forests in Oregon, see Oregon’s Forest Economy and Oregon Forest Facts, which are available at learnforests.org.

Key Vocabulary

economic benefit*

*included in Glossary

Preparation

Make copies of the student page or provide on-screen access to it.

Procedure

1. Introduce the activity and the lesson by reviewing the historical and environmental importance of Oregon forests and asking students why Oregon’s forests might be important economically.
2. Provide copies of the “Oregon’s Forest Economy” student page, or make it available online. Allow time for students to read the material.
3. Discuss the reading:
   - What economic benefits do Oregon’s forests provide?
   - Who benefits from Oregon’s forests?
   - What challenges are facing Oregon’s forest sector today?
   - What can Oregonians do to get the most economic benefits from our forests?

Assessment

Have students create a T-chart showing the benefits of and current challenges to the forest sector within Oregon’s economy. The chart should include specific examples from the video or the reading to support their description.

Extension Ideas

- Use information in Oregon Forest Facts (available at learnforests.org) to graph economic data on Oregon’s forests. For example, the 2019-2020 edition presents data on softwood lumber and plywood production over six years.
- Analyze data on Log Prices in Oregon (available from Oregon Department of Forestry at https://data.oregon.gov) to look for economic patterns or trends.
The Forest Economy of Oregon

Oregon’s forestlands are some of the most productive in the world. The state’s mild climate, deep soils and abundant rainfall make it one of the best places to grow trees. A strong social climate helps support our forestlands as well.

As Oregonians, we enjoy:

- Widespread public support for the economic, environmental and social contributions of a stable forest sector.
- Solid educational and research institutions, such as the Oregon State University College of Forestry and the USDA Pacific Northwest Research Station, which keep the sector at the vanguard of best practices.
- Strong forest protection laws under the Oregon Forest Practices Act that ensure landowners employ sound forest management practices.

As a result, by internationally recognized standards of sustainability, Oregon is a world leader in timber production, wood product manufacturing and sustainable forestry.

Jobs and Community

According to 2016 data, forestry products and services employ about 60,000 people in Oregon. These jobs are particularly critical to rural communities where wood product manufacturing can account for more than 50 percent of all manufacturing jobs.

Oregon’s forest sector provides:

- About 60,000 Oregon jobs.
- 3 percent of all jobs in Oregon.
- An average yearly wage of $53,000.

Growing Oregon’s Forests

The total acreage of Oregon’s forestland has remained virtually unchanged since 1953. Yet during the same time period, harvesting has produced more than 440 billion board feet of timber. To put that number in perspective, Oregon’s forests have provided enough timber to

Source: Oregon Forest Facts, 2019-20, Oregon Forest Resources Institute.
frame 27 million homes\textsuperscript{36} without a reduction in the size and volume of the state’s forestland. Now that’s what you call sustainability.

Today, 75 percent of Oregon’s timber production comes from forestlands owned by companies, families and Native American tribes. As active forest managers, these owners are leaders in sustainable forest management practices. To accelerate growth and improve yield per acre, they optimize methods of reforestation, thinning, and fire and infestation prevention, while protecting natural resources such as water and fish and wildlife habitat.

**A Renewable Harvest**

Forests remain Oregon’s most abundant natural resource and a crucial part of the state’s economy. As the country’s economy and housing starts have declined, Oregon’s annual timber harvest has followed. Harvest levels from combined private and public forests now total about 3.8 billion board feet per year — which is only about 30 percent of the new growth being added to our forests each year. While harvest on state and private forestland has remained somewhat stable, harvest of federal forestland has declined by 90 percent over the last two decades due to government restrictions.

Oregon leads the nation in:

- softwood lumber production
- plywood production
- engineered wood product development

**Deck the Halls with Oregon Christmas Trees**

In addition to growing timber for wood and paper products, tree farmers from around the state have made Oregon the country’s leading producer of Christmas trees. Oregon has nearly 68,000 acres dedicated solely to growing Christmas trees. Each year, Oregon tree farmers harvest more than four million Christmas trees — nearly twice as many as any other state — contributing more than $120 million to Oregon’s economy!

Some 92 percent of all Christmas trees are exported out of the region, bringing holiday cheer to California, Hawaii, Alaska, and other states, and to markets as far away as China, Japan, Guam and the Philippines.

\textsuperscript{36} According to http://idahoforests.org, framing an average 2,000-square-foot home requires 15,800 board feet.
Tourism: Oregon’s Natural Attraction

Oregon attracts tourists from around the world, and many of them come to enjoy the natural beauty of our forests and abundant recreational opportunities in the outdoors. A survey by the US Forest Service estimated that more than 11 million recreational tourists visit Oregon’s national forests each year, sustaining nearly 15,000 jobs and contributing an estimated $440 million to the economy.


18: Oregon’s Wood Products

Overview

Students watch a brief video on Oregon wood products and read how engineered wood products are helping build a more sustainable future for Oregon and beyond. They then research and report on different products made from Oregon trees.

Time Considerations

Preparation: 30 minutes
Procedure: Two 50-minute class periods, with time between for student research

Learning Objectives

Students will be able to:

• Articulate the importance of wood products for Oregon’s economy.
• Conduct research on several different products made from Oregon forests.
• Summarize their research.

Standards Connections

Next Generation Science Standards

• Disciplinary Core Idea – HS-ESS3.A: All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors.

Common Core State Standards – English Language Arts

• Writing Standards for Literacy in History/Social Studies, Science and Technical Subjects – WHST.9-12.7: Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
• Writing Standards for Literacy in History/Social Studies, Science and Technical Subjects – WHST.9-12.9. Draw evidence from informational texts to support analysis, reflection, and research.
Oregon Forest Literacy Plan Concepts

- Theme 2, D.1. Forests provide multiple economic benefits, including jobs and forest products, renewable energy and minerals, financial returns to owners and investors, and ecosystem service benefits such as carbon storage, clean water, recreation and tourism.
- Theme 2, D.3. Forest products are an important component of Oregon’s “green” economy. They come from a renewable resource and store carbon, and most are also reusable and recyclable.

Materials

- An assortment of items made from trees (for example, a piece of paper, a swatch of rayon fabric, a piece of cellophane, a disposable diaper, and a bottle cork)
- Forest Fact Break: Wood Products video (1:31 minutes), available at learnforests.org
- Equipment for sharing video
- “Engineered Wood for a More Sustainable Future” in Forest Essays (Level 7-12), available at learnforests.org
- “Wood Products Made from Oregon Trees” student page

Background Information

Wood products make up 47 percent of all raw materials used in manufacturing in the United States. Nearly 100 percent of a harvested log can be used to make wood and other products we use every day — most of which are completely recyclable.

Products from Oregon’s forests include

- Structural lumber: Dimensional lumber, beams, joists, laminated veneer lumber and engineered structural softwood.
- Millwork: Doors, windows, cabinets, furniture, siding, flooring, moldings and fencing.
- Plywood and paneling: Veneer or other composite panels such as particleboard, hardboard and fiberboard.
- Posts, poles and timbers: Utility poles, fence posts, pilings, treated timbers, cross-arms and railroad ties.

---

• Pulp and paper products: Packaging, printing paper, newsprint, tissue, toweling, absorbents, adhesives, fluff pulp, and cellulose products such as rayon, cellophane, food additives and pharmaceuticals.
• Biomass energy: Many Oregon mills burn wood waste to generate heat and electricity for manufacturing.

Key Vocabulary
biomass energy
dimensional lumber
fiberboard
hardboard
particleboard
reconstituted wood
veneer

Preparation
• Gather an assortment of items made from trees.
• Make copies of the *Forest Essays* reading and student page, or provide on-screen access to them.

Procedure
1. Introduce the lesson by showing students the assortment of items you have collected and asking them which are made from trees. After they have had time to consider the items, ask whether they would be surprised to hear that all of them come from trees.
2. Show the 90-second video *Forest Fact Break: Wood Products* and discuss the importance of wood products to Oregon’s economy.
3. Provide copies of “Engineered Wood for a More Sustainable Future” or have it available for students to access online. Allow time for students to read the story and answer the questions. Ask students what other wood products might be important in Oregon, and begin a list on the board.
4. Give students copies of the “Wood Products Made from Oregon Trees” student page. Direct students to choose a number of the wood products to research, or you may assign students particular products to explore. (Assign a number of products for each student to research that takes into account your time, learning objectives, and the size of your class.)
5. Allow time for students to conduct quick research on each product, focusing on the questions listed in the Task section of the student page. Students should write a brief report (one to two paragraphs) about each product, describing what they learned.
Assessment

Use students’ brief reports to assess what they learned about the wood products and their importance to Oregon’s economy.

Extension Ideas

• Explore two careers associated with wood products in Oregon. Show the 5-minute Find Your Path: Mill Operator and Find Your Path: Procurement Forester videos, available at learnforests.org, and have students compare the two careers portrayed.
• Learn about Oregon wood products used to frame high-rise buildings. See Wood Stands Tall, available at oregonforests.org.
• Visit a mill.
• Explore the production and sale of non-timber forest products, using resources from “Non-Timber Forest Products” at knowyourforest.org.
Wood Products Made from Oregon Trees

- Lumber
  - Dimensional lumber
  - Solid beams
  - Laminated beams
  - Joists
  - Laminated veneer lumber
  - Finger-jointed lumber
- Plywood
- Reconstituted Wood
  - Particleboard
  - Hardboard
  - Fiberboard
  - Heating pellets
- Posts, poles and timbers
  - Utility poles
  - House logs
  - Fence posts
  - Pilings
  - Treated timbers, cross-arms and railroad ties
- Pulp and paper products
  - Packaging
  - Printing paper
  - Newsprint
  - Tissue
  - Paper towels
  - Absorbents
  - Adhesives
  - Fluff pulp
- Cellulose products
  - Rayon
  - Cellophane
  - Food additives
  - Pharmaceuticals
  - Biomass energy
- Millwork
- Lumber for products
  - Doors
  - Windows
  - Cabinets
  - Furniture
  - Siding
  - Flooring
  - Moldings
  - Fencing
  - Pallets
  - Lath
  - Pencils
  - Musical instruments
- Cross laminated timber (CLT)
Task

As directed by your teacher, select a number of products from the list of wood products. For each product, research and describe the following.

- Product: ______________________
- What is it? How would you define it?
- What is it used for?
- How is it made? What raw materials are required to make it?
- What are the potential environmental, economic and social impacts of this product for Oregon?
- What sources did you consult?
19: Biomass Energy from Oregon’s Forests

Overview

Students explore renewable energy from forests by generating biomass gas and investigating its potential as a fuel.

Note: For non-lab classes, introduce the topic with the suggested video and then explore further using one or more of the Extension Ideas.

Safety Notes

- The procedures provided in this lesson are intended as suggestions.
- Be sure to follow all lab safety guidelines set out by your school or district.
- Have students wear safety goggles throughout the lab.
- Be mindful of open flames. Use a hood, if possible.

Time Considerations

Preparation: 30 minutes
Procedure: One to two 50-minute class periods, with the lab (steps 3-4) conducted during one period

Learning Objectives

Students will be able to:

- Explain the pros and cons of using biomass gasification to produce energy.
- Use proper lab techniques to generate and collect biomass gases.
- Carry out a scientific investigation using the biomass gases.
- Analyze their data and draw conclusions.

---

Standards Connections

Next Generation Science Standards

- Disciplinary Core Idea – HS-ESS3.A: All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors.

Oregon Forest Literacy Plan Concepts

- Theme 2, D.1. Forests provide multiple economic benefits, including jobs and forest products, renewable energy and minerals, financial returns to owners and investors, and ecosystem service benefits such as carbon storage, clean water, recreation and tourism.

Materials

- Powered by Oregon video (9:02 minutes), available on the OFRI YouTube channel
- “Syngas Lab” student page
- Lab equipment, per group:
  - Safety goggles
  - Lab coats
  - Latex or nitrile gloves
  - Fume hood (if possible)
  - 35-55 mL test tube with matching one-hole rubber stopper
  - Two ring stands with metal test tube clamp and clamp for Erlenmeyer flask
  - Three pieces stainless steel or glass tubing, each approximately 5 cm long
  - 250 mL Erlenmeyer flask with matching two-hole stopper
  - Three pieces rubber or Tygon tubing, two approximately 60 cm long and one just shorter than the Erlenmeyer flask
  - Bunsen burner and lighter
  - Sink with faucet connection for tubing
  - Wood pellets (enough to fill test tube approximately 3/4 full)
  - Regular-sized marshmallow (not mini-sized)
  - Skewer for roasting marshmallow
  - One large sealable bag for test tube disposal
- Lab equipment, per class
  - One pair leather gloves
  - Acetone (optional, for cleanup)
  - Additional marshmallows
Background Information

If we imagine a way to power Oregon that is less dependent on fossil fuels, that is built instead on renewable and homegrown sources of energy, then woody fuel should be a significant part of the picture. Using local fuel creates jobs and keeps money at home.

In Oregon, we produce millions of tons of wood byproducts every year, from logging slash to sawdust to small trees from US Forest Service thinning projects. All of it contains stored solar energy – in total, enough to power hundreds of thousands of homes, businesses and public buildings.

Woody biomass includes branches, tree tops and other slash left over from logging, as well as bark, sawdust, chips and other residuals from sawmills. It is currently used to heat schools and hospitals and to generate electricity. Entrepreneurs, scientists and advocates are also working to develop fuel to power cars, trucks and airplanes, as well as other practical uses for what we used to call a “waste product.”

Combustion of biomass has been an energy source since humans (or pre-humans) first discovered fire. Biomass fires are, of course, still used for heating and cooking around the world. Modern wood-burning technology extracts more energy from a pound of wood than ever before, and does so with negligible emissions. In addition to wood, people use corn stover (dried leaves and stalks of maize plants), other crop wastes, manure, and other once-living materials for fuel.

In this lab, students will synthesize and use syngas, a gaseous fuel made from biomass. If the biomass is heated at high temperatures, gasification occurs, producing syngas. The main components of syngas are hydrogen, methane, carbon monoxide and carbon dioxide. It can be burned directly to power a turbine and generate electricity.


Key Vocabulary

biomass energy
gasification
syngas
woody biomass

Preparation

• Before the lab, push two of the pieces of 5-cm long tubing into the two holes of the Erlenmeyer flask stopper, and one into the hole of the test tube stopper.
• Make copies of the student page.

Procedure

1. Introduce the lesson by asking students what they think biomass is. What are common forms of biomass? How is it used as energy?
2. Show the 9-minute film *Powered by Oregon* and discuss the benefits of woody biomass as a source of fuel. Point out that researchers are working to develop wood-based liquid fuel and other forms of energy from wood.
3. Divide the class into lab groups to create a biomass gas called syngas. Give each group a copy of the “Syngas Lab” student page. Note that although the gases produced are trapped in the flask, it is advisable to conduct the lab in a fume hood, if possible.
4. As lab groups complete step 10 of the lab procedure, disconnect each groups’ test tube tubing from their Erlenmeyer flasks and – using leather gloves – move the hot tubing out of the way.
5. After students have completed the lab, discuss the results:
   • What did you observe during the lab?
   • What do you think the gas you synthesized is made of? (Explain that the gas is a mixture of methane, hydrogen, carbon monoxide and carbon dioxide. The methane, carbon dioxide and hydrogen are the components of the gas that actually burn.)
   • What was the purpose of roasting the marshmallow?
   • How might this experiment compare with actual gasification? (This experiment is at a much lower temperature than commercial gasification and produces more pyrolysis oils than gas.)
   • What might be the environmental and economic impacts of biomass gasification or other forms of woody biomass fuels for Oregon – both positive and negative?
6. Lab cleanup: Once the test tubes are cool to the touch (this may be after the class period is over), remove them from the clamps and place the tubes and their contents in the sealable bags. Seal the bags – as the tubes will be very stinky – and dispose in the trash. Wash the
dirty tubing and flask in hot soapy water to remove any oils. If oils remain, rinse with acetone.

Assessment

Have students write a short essay summarizing what they learned from the lab. The essay should include relevant terminology, a summary of gas collection procedures and the implications of large-scale gasification as a source of renewable energy.

Extension Ideas

• Using the same procedure as described in the lab, students compare different biomass materials to determine which is the best energy source. Sources of biomass could include wood pellets or splints, dried grass, nut shells, manure, and corn stover (leaves and stalks of maize plants). Students could set their own parameters for what the “best” means, but one possibility is the volume of gas produced by one gram of material.

• Have students calculate their average home energy use over four months and compare it to biomass energy. Electricity usage is stated in terms of kilowatts (KW), while gas usage is in therms (one therm = 100,000 British Thermal Units, or BTUs). In general, one kilogram of dry wood or other biomass can produce about one kilowatt (KW) of electricity, and one liter of syngas contains 13.4 BTUs of energy. How much wood and syngas would students’ households need to meet their current energy usage?


• Visit a biomass energy plant, or research bio-energy or co-energy plants in Oregon.

40 One BTU is the amount of energy needed to raise the temperature of one pound of water one degree Fahrenheit.
Syngas Lab

Procedure

1. Fill test tube 3/4 full with wood pellets.
2. Clamp the test tube to the ring stand using the metal clamp. Adjust the height of the tube relative to the Bunsen burner. The bottom of the test tube should be at least 3 centimeters above where the flame will be.
3. Insert the one-hole stopper with tubing into the test tube.
4. Attach the rubber tubing to one of the tubes in the two-hole stopper. The rubber tubing should come from the bottom of the stopper.
5. Fill the Erlenmeyer flask full of water and insert the two-hole stopper with the tubing going into the water. The tube should almost touch the bottom of the flask.
6. Connect the test tube and the Erlenmeyer flask with the piece of rubber tubing from step three.
7. Connect the last piece of rubber tubing to the top of the two-hole stopper and place the other end into the sink. Check the figure to ensure your setup is correct.
8. Light the Bunsen burner and begin heating the test tube. Make sure the flame is at least 3 centimeters away from the test tube so the tube does not melt.
9. Record observations while the tube is being heated.
10. After a few minutes gas will be evolved and will begin to displace the water in the Erlenmeyer flask. Continue heating until all of the water has been displaced.
11. At this point have your teacher disconnect the hot test tube tubing from the Erlenmeyer flask and move the hot test tube out of the way.
12. Connect the drain tubing to the faucet.
13. Slowly turn on the water and light the gas flowing from the end of the glass tubing. Adjust water flow rate to maintain a constant flame.
14. Roast a marshmallow on the flame (but don’t eat it, as it may have a little tar on it). Record your observations below. At the completion of the lab, you may have a fresh marshmallow to eat.

Equipment setup for syngas lab.

**Observations**

<table>
<thead>
<tr>
<th>Lab Step</th>
<th>Time</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating test tube</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turning on water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lighting gas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roasting marshmallow</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
20: Forestry Careers: Find Your Path

Students learn about different forest sector careers in Oregon, articulate which careers appeal to them, and identify what education, skills, experience and personal qualities it takes to succeed in a particular career.

Learning Objectives

Students will be able to:

• Explain that Oregon’s forest sector is an important source of jobs in the state.
• Identify what it takes to succeed in different forest sector careers.
• Articulate which forest sector careers appeal to them and why.

Standards Connections

Next Generation Science Standards

• Disciplinary Core Idea – HS-ESS3.A: All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors.

Common Core State Standards – English Language Arts

• Writing Standards for Literacy in History/Social Studies, Science and Technical Subjects – WHST.9-12.7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Oregon Forest Literacy Plan Concepts

• Theme 2, D.1. Forests provide multiple economic benefits, including jobs and forest products, renewable energy and minerals, financial returns to owners and investors, and ecosystem service benefits such as carbon storage, clean water, recreation and tourism.
• Theme 4, B.4. A variety of professionals and skilled trade workers are needed to sustain our forests, including foresters, biologists, soil scientists, engineers, lawyers, information technology professionals, land managers, investors, environmental educators, communications specialists, logging operators, mechanics and wood products manufacturers.
Background Information

Oregon’s forest sector – the part of Oregon’s economy derived from forests – represents about 60,000 jobs for our state. This sector encompasses the management of forests, the harvest of trees, and their conversion into consumer and construction products, such as lumber, plywood, poles, paper and energy. It also includes careers in forestry, science and engineering, trucking and equipment, manufacturing, energy, recreation, government, and forest support.

*Find Your Path* is a booklet produced by OFRI that explores a variety of careers in the forestry sector. It includes profiles of 19 different Oregonians working in the following forest-related careers:

- Field Forester
- Forest Manager
- Wildlife Biologist
- Forest Engineer
- Natural Resource Ecologist
- Recreation Unit Manager
- Road and Right-of-Way Specialist
- Research Economist
- Logging Crew
- Harvester Processor Operator
- Log Truck Driver
- Field Technician / Service Mechanic
- Wildland Firefighter/Base Manager
- Nursery Manager

---

• Mill Operator
• Shipping and Sales Coordinator
• Vice President of Manufacturing
• Millwright
• Vice President of Timberlands

In addition to the booklet, OFRI has also created a series of short *Find Your Path* videos, each highlighting a particular forest career from the voice and perspective of a real person in that career. Currently, the videos profile an Electrician, Engineer, Field Forester, Fish Biologist, Forest Hydrologist, Forest Logging Crew, Forestry Teacher, Mill Operator, Procurement Forester, Recreation Manager, Rolling Stock Manager, Seedling Nursery Manager, Stewardship Forester, Wildlife Biologist, and Wildland Firefighter.

**Preparation**

Make copies of the student page.

**Procedure**

1. Show one or more of the *Find Your Path* videos to begin a discussion about Oregon forest sector careers. Ask students to describe the education, skills, experience and personal attributes necessary to be successful in each career. Discuss: What does or doesn’t appeal to you about that career? What might be challenging about that career?
2. Give students copies of the *Find Your Path* booklet (or online access to it), and a copy of the “What Does It Take?” student page.
3. Direct students to choose three (or more) careers in the booklet to examine in-depth. For each career, they should describe the job involved, as well as the education, skills, experience and personal attributes that someone would need to be successful in that career. They should also write a brief paragraph about whether or not that particular job appeals to them, and why.

**Assessment**

Use students’ responses to the “What Does It Take?” student page to assess their learning.

**Extension Ideas**

• Students conduct research on a different forest-related career to find out what education, experience, skills and personal qualities are required (see *Forestry Works* at https://www.forestryworks.com for a list of possibilities). Then, they create an online poster or other visual to share what they learned.
• Create a “dichotomous key” to forest sector careers that can help others determine which might be best suited to them. The key would be a series of paired questions or attributes to which users respond. It might include such attributes as indoor versus outdoor, high school education versus college education, urban setting versus rural setting and so on, to organize the career options.

• Invite someone from the forest sector to come in and talk to students about a range of careers.

• Share the Find Your Path: Recreation Manager video, available at learnforests.org, and explore recreation careers related to forests, including opportunities, safety, regulations and OHV (off highway vehicle) use.

• Have students explore their interests and skills related to future careers using various assessment tools available on the Oregon Career Information System website, https://oregoncis.uoregon.edu.
What Does It Take?

For each forest related career, identify what education, skills, experience and personal qualities are required. Then, write a paragraph telling whether that career appeals to you and why (or why not).

Job Title:

Job Description:

Education:

Skills:

Experience:

Personal Qualities:

Does this career appeal to you? Explain why or why not.

Job Title:

Job Description:

Education:

Skills:

Experience:

Personal Qualities:

Does this career appeal to you? Explain why or why not.

Job Title:

Job Description:

Education:

Skills:

Experience:

Personal Qualities:

Does this career appeal to you? Explain why or why not.