

Forestry Conservation: Who Works in The Forest?

Suggested Grade Level: 3-5

Time: 50 minutes

Subject: Science, Biology, Earth and Human Activity, English Language Arts, Speaking and Listening, Social Studies, Economy, Resource Management, Stewardship, School Counseling, Career Development

Overview: Many different people work in forests—from foresters and loggers to scientists and naturalists. Properly managed forests provide recreation, essential products, and a healthy environment that everyone depends on. This discussion-based lesson helps students explore forestry and its ties to Kansas agriculture and biodiversity, its importance to the state’s culture and economy, the principles of resource management and stewardship, and the forest-related careers they could pursue.

Objectives:

1. List five jobs that are directly related to forest resources.
2. Describe how various professionals work together to care for forests.

Background Information:

Forestry is more than just planting trees and fighting forest fires, although those tasks may be part of a professional forester's responsibilities. In nature, forest ecosystems are controlled by sunlight, rain, and soil fertility. Windstorms, insect infestations, tree diseases, and lightning also play a role in regulating forest ecosystems. Our society depends on forests for timber and other forest products, as well as for wildlife, clean air, water, and beauty. We cannot depend on nature to care for forests to maximize these benefits. In forestry, people care for forests in ways that mimic nature. Urban foresters specialize in caring for the nearly 70 million acres (28 million hectares) of forests that grow in and around metropolitan communities. They pay close attention to factors that affect those forests, such as limited growing space, poor air, lack of water, poor soil quality, and vandalism. Urban foresters aim to increase the average lifespan and maintain the aesthetic quality of trees in city parks and forests. Forestry activities can also affect surrounding communities. For example, when trees are harvested or pesticides are used, the water quality in nearby streams must be protected. Foresters are trained to care for all the systems in and around the forest.

While foresters are trained in managing all forest resources, they often collaborate with other professionals who specialize in specific aspects of the forest, such as soils, water, or wildlife. Some specialists work in computer modeling, mapping, and statistical or budget analysis. Typically, a team of foresters and specialists collaborates to determine the best approach for managing the forest, ensuring it provides all that people need and want from it. This process sometimes includes thinning out trees. Forests are thinned out for many reasons, including promoting healthier forests and controlling erosion and fires.

Kansas Industry Information:

Did you know that Kansas forests provide numerous uses for wood and valuable agricultural-based products, both on and off the farm, generating revenue for agricultural industries? According to the Kansas Forest Service, "Many people are surprised to learn that Kansas timber harvests contribute to the state's economy. Though it is a small component of the overall economy (less than 1% of total manufacturing receipts), it is certainly important to the loggers, sawmill operators, and some of the secondary manufacturers who process Kansas wood products," (Kansas). The Kansas Forest Service maintains contact information lists for over 50 sawmills, 40 timber buyers, and approximately 200 secondary manufacturers (such as cabinetmakers) who rely on local timber harvests. Kansas timber harvests also benefit private landowners, and it is not uncommon for landowners in eastern Kansas to make thousands of dollars from periodic timber sales, especially from the sale of black walnut trees. Timber harvest can benefit forest health by releasing desirable understory trees; however, it can also lower forest quality if a desirable understory is absent and proper follow-up management is not implemented.

The Kansas Forest Service reports that although forestland makes up just 4.8% of the state's total area, it remains a vital natural resource. Forests support clean water, prevent soil erosion, provide wildlife habitat, and offer wood products and recreation. Kansas has 2.5 million acres of forestland and another 1.2 million acres of windbreaks and riparian woodlands, with 93% of forestland privately owned and only 7% publicly managed (Kansas Discover). Windrows, or rows of trees, are often referred to as windbreaks because they slow wind speed. Windrows are winners for farmers! They help with soil stabilization and conservation on the farm by preventing the soil from blowing away, reducing crop damage, and increasing yields. Windrows help livestock and wildlife by providing cool shelter in the summer and warm shelter in the winter. This reduces livestock and wildlife losses. Trees also provide food for wildlife, livestock, and even insects. Trees give off oxygen and retain moisture that animals and insects rely on for survival. Trees are also essential to pollinators. Pollinators are vital to crop production and are essential for feeding animals and humans. Windrows reduce farm and home heating costs, minimize exterior building maintenance, enhance the appearance of farmsteads, and control drifting snow. Windrows can be planted using different types of trees, from Evergreen trees to deciduous trees such as American Sycamore, Bald Cypress, Black Walnut, Bur Oak, Chinkapin Oak, Cottonwood - Kansas



State Tree, Eastern Redbud, English Oak, Hackberry, Honey Locust, Lacebark Elm, Northern Red Oak Pawpaw, Pecan, Persimmon, Shumard Oak, and Silver Maple.

Timber harvests in Kansas dropped by nearly half between 2003 and 2009, with about 20.4 million board feet harvested in 2009—enough to build roughly 1,700 homes. However, most of the wood is used for products such as furniture, veneer, pallets, and gunstocks rather than for home construction (Kansas Forest).

Farmers remove unnecessary woody biomass on farmland and use it to help Kansas become more energy-independent and environmentally friendly. Wood veneer is made by cutting solid pieces of wood from the outer layer of the log and is used to make furniture. Many wood pallets are made from wood sourced from forests in Kansas. Many agricultural (food and non-food) companies and farms use pallets to keep products off the ground, away from moisture. They can be wrapped to hold everything on and are often easily stacked using a forklift. Fence posts can be made from tree trunks. Wood pellets are used for starting fires. Special ones are created to use in pellet stoves for heat. Many people burn wood in a fireplace to heat their homes. People also use campfires for heat and cooking. Wood ash can be used as a soil additive with the benefits of a fertilizer to promote plant growth. Some Kansas trees are used for grilling and smoking meats. Fruitwood will give meat lighter and smokier flavors. Wood traps flavors and moisture in meats. Some woods used for BBQing include maple, cherry, hickory, and oak. Mulch, a wood product made in Kansas, is used in fruit orchards, gardens, and flower beds to prevent weed growth. Fewer weeds in the garden result in better root growth, stronger plants, and more food production. Sawdust is much finer than mulch and is used as bedding for livestock animals at county fairs in Kansas and sometimes on farms. It can be used for composting gardens and can be applied directly to the soil. Fruit trees grown in Kansas provide fresh fruit for people and wildlife during their in-season. They include apple, peach, apricot, pear, cherry, and mulberry trees. When the trees can no longer produce fruit, they can be turned into lumber. Lumber is used mainly for small projects. Nut trees grown in Kansas include pecan, chestnut, hazelnut, hickory, and black walnut. Black walnut trees are native to Kansas! Black Walnut and Pecan trees provide nuts for making cakes, cookies, and candy. Black Walnuts have the highest protein of any nuts. They are often used in oatmeal, salads, and trail mixes. Nuts and specialty crops are not just for eating! Hammons Black Walnuts, a company that purchases, shells, and sells black walnuts in the U.S. (including seven Kansas locations), grinds walnut shells into a powder and uses them to make products like abrasive cleaners, water filtration systems, cosmetics, soap, dental cleaners, skin exfoliates, and denture polishers. It is also used to make dynamite filler and in the production of plywood and particleboard adhesive. It is also used on the seals of oil-drilling rigs (Hammons).

Materials:

- Who Works in the Forest worksheet
- Magazines (optional)



Instructional Format:

1. Review background Information and Kansas Connections.
2. Lead a class discussion.
3. Conduct assessment exercise.

Engagement: N/A**Procedures:***Discussion:*

1. Ask students if they have either visited a forest or seen pictures of one. Do they think those forests require people to take care of them? If so, what kind of work is necessary? Record their answers on the board. You might want to have students create a concept map of the discussion with a graphic organizer.
2. Discuss with students how forests provide habitats for plants and animals, paper and wood products, recreational areas, and protection for air, soil, and water. Explain that people must manage forests to enhance all of these. See if students can add more jobs to their list based on the discussion that has taken place.
3. Pass out copies of the worksheet and inform students that it will describe several individuals who perform specific types of work. Students should read the brief descriptions and explain how each job is necessary for forest conservation.
4. Review the student page with the students. Have them share their reasoning for how the jobs are necessary. By the end of the discussion, all students should understand that every job on the page contributes to the conservation and care of forests. Also, use background information to discuss other people who work with forests.
5. Write the following occupations on the board: logging truck driver, cardboard box maker, naturalist, wildlife biologist, newspaper deliverer, wildlife artist, sawmill operator, campground manager, and garden supply store owner.
6. Ask students how each worker could benefit from having forests managed by the people they've learned about. Which workers depend on forests in some way to do their jobs? (Answer: all of them.) Ensure that students can explain how each person depends on the forest.
7. Wrap up the lesson with a quick review of the career vocabulary: say the job title and have students call out what that person does.

Vocabulary:

- **Wildlife biologist:** helps make sure that wild animals and plants have all the things they need to survive, such as food, water, and space.
- **Hydrologist:** looks at water supplies, studies watersheds, and water cycles to solve water pollution problems.
- **Budget:** an outline of the money an organization expects to spend during a year.
- **Budget analyst:** reviews budgets people set up to make sure they're not spending too much money or spending money on the wrong things.



- **Forester:** makes essential decisions on how a forest should be managed, including finding the right balance between various needs, such as those of people, plants, and animals.
- **Soil scientist:** Monitors soils to ensure they don't get smashed down (compacted), which can cause erosion.
- **Geneticist:** helps make living things more resistant to diseases and pests so they can grow better.

Kansas Standards:

Next Generation Science Standards

3rd Grade

Biological Evolution: Unity and Diversity

3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

Earth and Human Activity

3-ESS3-1. Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

4th Grade

Energy

4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

5th Grade

Earth and Human Activity

5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Language Arts

3rd Grade

Reading: Informational

Key Ideas and Details

RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts or steps in technical procedures in a text, using language that pertains to time, sequence and cause/effect.

Craft and Structure

RI.3.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a third grade topic or subject area.

Speaking and Learning

Comprehension and Collaboration

SL.3.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups and teacher-led) with diverse on third grade topics and texts, building on others' ideas and expressing their own clearly.

SL.3.3 Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

4th Grade

Reading: Informational

Key Ideas and Details

RI.4.3 Explain events, procedures, ideas or concepts in a historical, scientific or technical text, including what happened and why, based on specific information in the text.



Craft and Structure

RI.4.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a fourth grade topic or subject area.

Research to Build and Present Knowledge

W.4.9 Draw evidence from literary or informational texts to support analysis, reflection and research.

Speaking and Learning

Comprehension and Collaboration

SL.4.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups and teacher-led) with diverse partners on fourth grade topics and texts, building on others' ideas and expressing their own clearly.

5th Grade

Reading: Informational

Key Ideas and Details

RI.5.3 Explain the relationships or interactions between two or more individuals, events, ideas or concepts in a historical, scientific or technical text based on specific information in the text.

Craft and Structure

RI.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a fifth grade topic or subject area..

Research to Build and Present Knowledge

W.5.9 Draw evidence from literary or informational texts to support analysis, reflection and research.

Speaking and Learning

Comprehension and Collaboration

SL.5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups and teacher-led) with diverse partners on fifth grade topics and texts, building on others' ideas and expressing their own clearly.

SL.5.2 Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively and orally.

History, Government, and Social Studies

Standard 1: Choices have consequences.

1.1 The student will recognize and evaluate significant choices and consequences that have impacted our lives and futures.

1.2 The student will analyze the context and draw conclusions about choices and consequences.

1.3 The student will investigate and connect examples of choices and consequences with contemporary issues.

1.4 The student will use their understanding of choices and consequences to make a claim or advance a thesis using evidence and argument.

Standard 2: Individuals have rights and responsibilities.

2.1 The student will recognize and evaluate the rights and responsibilities of people living in societies.

2.2 The student will analyze the context and draw conclusions about rights and responsibilities.

2.3 The student will investigate and connect the rights and responsibilities of individuals with contemporary issues.

2.4 The student will use their understanding of rights and responsibilities to make a claim or advance a thesis using evidence and argument.

Standard 3: Societies are shaped by the identities, beliefs, and practices of individuals and groups.

3.1 The student will recognize and evaluate how societies are shaped by the identities, beliefs, and practices of individuals and groups.



3.2 The student will analyze context and draw conclusions of how societies are shaped by the identities, beliefs, and practices of individuals and groups.

3.3 The student will investigate and connect how societies are shaped by the identities, beliefs, and practices of individuals and groups with contemporary issues.

3.4 The student will use their understanding of how societies are shaped by the identities, beliefs, and practices of individuals and groups to make a claim or advance a thesis using evidence and argument.

School Counseling

Career Development

Standard 1: The student will acquire the skills to investigate careers in relation to their knowledge of themselves and make informed career decisions.

Benchmark 1: The student will develop career awareness.

6-8.5. The student recognizes the value of all occupations.

National Agricultural Literacy Standards:

Agriculture and the Environment

- Recognize the natural resources used in agricultural practices to produce food, feed, clothing, landscaping plants, and fuel (T1.3-5 e.)

Culture, Society, Economy & Geography

- Discover that there are many jobs in agriculture (T5.3-5 b.)
- Explain the value of agriculture and how it is important in daily life (T5.3-5 d.)
- Provide examples of agricultural products available, but not produced in their local area and state (T5.3-5 e.)

Supporting Resources:

Discover the Forest activities: <https://discovertheforest.org/activities>

Idaho Forest Products Commission: Types of Jobs in the Forest-Related Industry:
<https://www.idahoforests.org/content-item/what-jobs-in-the-forest-related-industry/>

Kansas State University: 4H Forestry Project:
wildcatdistrict.k-state.edu/4-h/county-fairs/montgomery-county-fair/documents/forestry_pressing_leaves.pdf

My American Farm games: <http://www.myamericanfarm.org/games/themes/forestry>

Peacock Kids: Shrek Forever After - Discover the Forest:

<https://www.youtube.com/watch?v=swtFdaQmKDY>

Smokey Bear resources:

<https://smokeybear.com/en/for-educators/elementary-resources>

Career Information: Forester

A forester manages and protects forests to keep them healthy for people and nature.

Their work includes restoring damaged areas, conserving habitats, and sustainably harvesting timber. They balance the needs of wildlife, the environment, and human use.

Most foresters hold a bachelor's degree in forest management, natural resources, or a related field of conservation.



Assessment: Using magazines, have each person create a collage that shows how people depend on forests. It can include pictures of forests, trees, streams, or rivers; wildlife; people living near forests; forest products; people using forests or their products; and people working in forests. Have the students explain their collages to you verbally or in writing. OR: Have students select a new forest-related job they would be interested in doing and explain why. Also, have them describe how the job relates to caring for the forest.

Author: Adapted by Wanda Small, teacher at USD#377, Atchison County Community Elementary School, 2018 KFAC Teacher of the Year, KFAC Curriculum Advisory Council, from a lesson by Project Learning Tree PreK-8 Environmental Education Activity Guide provided by "Kansas Association of Conservation and Environmental Education" (KACEE), and edited by Marissa Cook, Secondary Art Education Major at KSU, KFAC intern.

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Who Works in the Forest?

Elena

Elena is a wild life biologist. She helps make sure that wild animals and plants have all the things they need to survive, such as food, water, and space. Why is this job important? Explain.

Caleb

Caleb is a hydrologist. He looks at water supplies, studies water sheds and water cycles, and tries to solve water pollution problems. Why is this job important? Explain.

Mira

Mira is a budget analyst. She reviews the budgets people set up to make sure they're not spending too much money and to make sure they're spending money on the "right" things. Why is this job important? Explain.

Leo

Leo is a geneticist. Some living things are naturally better at resisting diseases and pests than others and survive in tougher conditions. A geneticist studies these traits and explores whether they can be passed down to create stronger, healthier living things. Why is this job important? Explain.

Jonah

Jonah is a soil scientist. A soil scientist studies the ground beneath the forest. They look at what soil is made of, how it holds water, and how it helps plants grow. Why is this job important? Explain.

Anya

Anya is a forester. She has to find the right balance between all kinds of needs, including the needs of people, plants, and animals. Why is this job important? Explain.
