South Carolina FORESTS FOREVER

Instructor Guide

Special Note to Users of this Guide:

We hope you find your *South Carolina Forests Forever* Instructor Guide useful as you set out with your students to explore the wonders of South Carolina's most valuable and ... properly managed ... and ... infinitely renewable resources. Hopefully, you and your students will enjoy the learning and implementation challenges of the program and Guide to be as rewarding as we found their development to be.

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INTRODUCTION

Purpose

The *South Carolina Forests Forever* website was designed and produced with one goal in mind—to educate. Using the website to actively engage student learning will increase understanding of the importance of employing scientific principles to sustainable forest management. The interactive format provides a captivating presentation of forest facts and the forest products we use.

Use in the Classroom

The *South Carolina Forests Forever* Instructor Guide is designed to assist the educator in using the website. Presented in an easy-to-use format, the guide provides information to facilitate learning about South Carolina's forests. To assist in the learning experience, each of the four content areas include grade level, subjects, concepts, skills and correlations to the South Carolina Course Content Standards.

Using the *South Carolina Forests Forever* website, this Instructor Guide, the contact list provided, and imagination, the educator can lead students into subjects beyond forest resources. Educators may: explore the role of forest products in South Carolina's economy, examine the importance of forestry as related to societal values and even challenge students' skill in creative writing. There is no limit!

The *South Carolina Forests Forever* website is developed for use in the middle grades classroom, but can be utilized with a wide variety of audiences. It is designed primarily for single-user or small group settings.

ENVIRONMENT

Levels
Grades K - 8

Subjects
Science, Math

Concepts
The forest provides habitat for thousands of different creatures. Each inhabitant does its part in continuing the forest life cycle.

Skills
Observing, Organizing Information, Identifying Relationships, Patterns, Analyzing

It's an air conditioner, a water purifier, an air filter, a zoo — it's a South Carolina Forest! The shade that trees give can cool the surrounding area by almost 10 degrees. One acre of trees can provide enough oxygen for you and seventeen of your friends. The trees themselves pull in the carbon dioxide we exhale, and produce the oxygen we inhale air, clean air, we all need to breathe. The forest provides habitat for thousands of different creatures, including a number of endangered species. Each creature does its part to continue the forest life cycle. Professional foresters understand the complexity of ecosystems and are committed to maintaining balanced forests.

Components

In the environment section, students will see and hear about the things trees do for our environment. They will participate in a virtual forest activity. The virtual forest activity allows students to discover wildlife in the forest and learn facts about each.

Sample Activity

Imagine, living in a place with no trees. What would happen to us? To help us think about trees and their place in the environment, plan a scientific field study of an area close to the school.

Plants and animals benefit from the forest as a whole as well as from individual trees that woodpeckers or squirrels might call home, or a brook that nurtures aquatic life. A forest habitat thus may range in size from a lone limb on a tree trunk in a five-acre stand to a forest of many thousand acres. To better understand the dependency of plants and animals, let's examine the interactions of the various life forms inhabiting the forest.

Have students, individually or in groups, examine a tree. You might recommend they begin by standing back and surveying the whole tree, using binoculars, then examine it in detail. Ask them to note all kinds of living creatures — including other plants, that depend on the tree. Make a distinction between those animals that actually live on the tree and those that just visit the tree. Have them look for signs of life such as chewed leaves, holes in bark, broken branches, carved initials, etc.

Be sure to study the area around the tree for signs of animal life among the fallen twigs, leaves, nuts, seeds, etc. Are there any signs that humans have used this tree?

Have the students organize the information they collect into a booklet, table or some other format. It might be organized by where the organisms were found or the type of organisms found. Have them note how the organisms benefit from the tree and how they affect the tree. Encourage them to create charts, tables and graphs to illustrate their data.

Some questions you might ask the students include:

- What did you find on the tree's trunk?
- What did you see in the tree's branches?
- How might the tree be affected by the plants and animals that live on it?
- Which of these organisms seemed to harm the tree?
- Do any of the plants or animals seem to benefit the tree?

STUDENTS ASSESSMENT - ENVIRONMENT

A. Match the animal with its habitat.

___1. White-tail Deer	a. feed on leaves, twigs, fruits and acorns
___2. Gopher Tortoise	b. amphibians which feed on insects
___3. Rat Snake	c. has three sets of eyelids for hunting underwater
___4. Tree Frog	d. excellent climber that eats birds and frogs
___5. Alligator	e. makes holes that provide shelter for many animals

B. Select the answer which best completes the statement.

___6. The shade that trees give can cool the surrounding area by:
a. 10 degrees b. 30 degrees c. very little

___7. The root systems of trees hold together the forest floor and:
a. make room for insects b. purify drinking water c. destroy ecosystems

___8. Forests are a home to a variety of:
a. plants b. wildlife c. both a and b

___9. Trees act as an air filter by:
a. taking in oxygen and giving off carbon dioxide
b. taking in carbon dioxide and giving off oxygen

___10. These animals scatter seeds in the forest as they roam.
a. black bears b. wild turkeys c. both a and b

C. Describe why a forest might be considered a zoo.

PRODUCTS

Levels
Grades 5 - 7

Subjects
Science, Social Studies

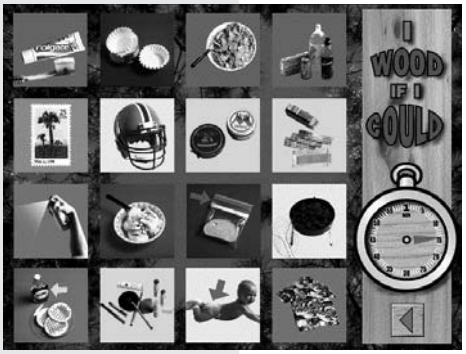
Concepts
Trees provide a large number of products people use every day. Trees are a renewable resource.

Skills
Classifying and Categorizing
Evaluating

There are so many different parts to trees that we can make over five thousand different products. We can actually use every part of the tree the solid wood, the wood pulp, the bark, sugars and cellulose. The usefulness of the tree doesn't stop there...many wood products are recovered, recycled and reused every day. In fact, many egg cartons and cereal boxes are made entirely of recycled fiber.

Components

Students will discover a number of products that come from trees. There is an interactive game entitled "I Wood If I Could" in which sixteen wood products are shown on a grid. The students are to identify the products that do not come from wood. Every one of the fourteen products listed in the game is made from wood. As a student chooses a product, a voice explains how the item is a wood product as well as from which tree it comes and what part of the tree is needed for its production. The student plays against a game clock to make the game more challenging.



STUDENT ASSESSMENT-
PRODUCTS SECTION

A. Match the tree product with the part of the tree from which it is made.

___1. Coffee Filter	a. wood
___2. Ice Cream	b. tree bark
___3. Shoe Polish	c. cellulose
___4. Cereals	d. wood pulp
___5. Charcoal	e. wood sugars

B. Select the answer which best completes the statement.

___6. Trees provide us with more than:
a. 100 different products b. 5000 different products c. 500 different products

___7. Everyday many wood products are:
a. recovered b. recycled c. reused d. a, b, and c

___8. Many orange-flavored drinks contain this ingredient which comes from trees:
a. cellulose b. bark c. estergum d. resin

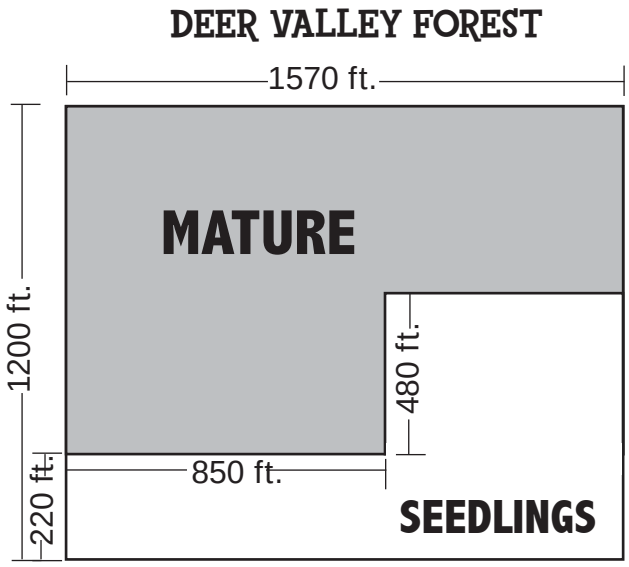
___9. Sandwich bags are made from this part of the tree:
a. cellulose b. resin or storax c. bark d. lumber

___10. Football helmets contain this part of a tree.
a. cellulose b. bark c. lumber d. sugars

C. List 5 items you have used today that were made from wood products.

MATH ACTIVITIES-PRODUCTS SECTION

The shaded area of Deer Valley Forest is a mature forest while the rest of the area is a forest with newly planted seedlings.



1. What is the area of the mature forest?
   - **a. 1,884,000 square feet**
   - **b. 1,193,000 square feet**
   - **c. 785,000 square feet**
   - **d. 2,292,000 square feet**

2. Convert the area in question 1 to acres.
HINT: There are 43,560 square feet in 1 acre.
   - **a. about 18 acres**
   - **b. about 4 acres**
   - **c. about 27 acres**
   - **d. about 53 acres**

3. Land managers plan to harvest 1/3 of the mature forest. How many acres will that be?
   - **a. about 6 acres**
   - **b. about 1.3 acres**
   - **c. about 17.6 acres**
   - **d. about 9 acres**

4. Two-thirds of mature forest will be left for a hunting preserve. The landownder will charge a hunter $35.00 a year for hunting rights to this area. Only 8 hunters each year can purchase hunting rights. How much money can the landowner earn per year selling hunting rights?
   - **a. $185**
   - **b. $3500**
   - **c. $280**
   - **d. $150**

Over two-thirds of a plot of land is forested, while less than one-third is developed land.

5. The percentage of forest land is
   - **a. < 50%**
   - **b. > 66%**
   - **c. < 66%**
   - **d. about 25%**

6. The community would like to build a swmming area on the pond in the forested area. The funds for building this will be funded through homeowner dues. If there are 360 homes in in the community, and the swimming area will cost $18,000 to build, how much will each homeowner need to pay in dues?

a. $5
b. $50
c. $500
d. $.02

7. Part of the forest will be harvested while creating the swimming area, resulting in $1,800.00 of revenue for the project. How much of a reduction in dues will that be for each homeowner?

a. $5
b. $45
c. $16,200
d. $36

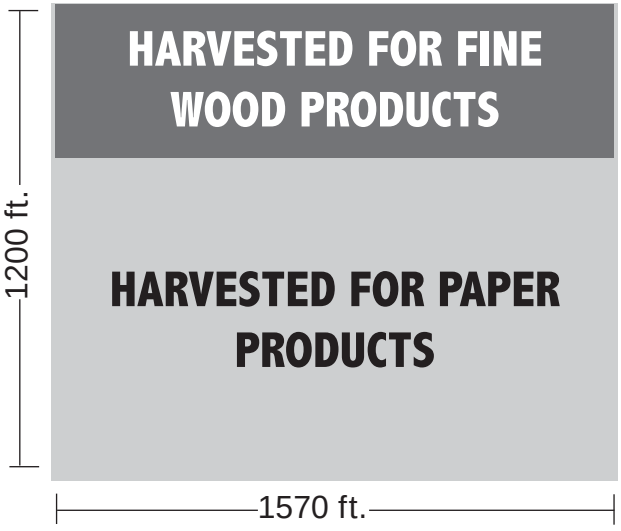
Look at the plot of land below to see what products are generated from each section.

8. About how much of the land will be used for making fine wood products, such as furniture?

a. 1/3
b. 33%
c. more than a quarter of the land
d. all of these are correct

9. About how much of the land will be used for pulp for paper?

a. 1/4
b. 33%
c. 2/3
d. 50%



10. After harvesting the entire plot of land, it will cost the land manager $98.00 per acre to re-seed, fertilize, and manage the forest for a new crop. How much money will the land manager need to make in order to offset these costs?

a. about $185,000,000
b. about $4,250
c. about $1,900,000
d. about $2,500

BALANCE

Levels
Grades 4 - 8

Subjects
Science, Math, Social Studies

Concepts
Conservation and management practices can enhance and extend the usefulness of the resources as well as the quality of the environment.

Skills
Identifying Main Idea, Analyzing, Solving Problems, Synthesizing & Creating

South Carolina has 22 million acres of forestland. That means over two-thirds of the state is covered with trees. However, over the years, things like urban encroachment building restaurants, shopping centers and highways have replaced thousands of acres of valuable woodlands and wildlife habitat. As these forests disappear, it becomes more important than ever to manage and protect the trees that remain.

Trees are a renewable resource. That means there is virtually an unlimited supply if we take care of our forests. By practicing proper forest management we can maintain healthy ecosystems and provide a steady supply of products. In fact, forests managed by professional foresters are actually healthier and more productive than forests left unmanaged. Harvests are staggered over many years; while new trees are growing in one part of the woods, another is cut and quickly reforested, either by planting, natural reseeding or sprouting. Forest managers sometimes use fire to help keep the forests healthy. Small controlled fires reduce undergrowth that competes with the trees for water, sunlight and nutrients, along with getting rid of dead branches which could fuel wild fires. They also open up new habitat for wildlife, new plant growth and return nutrients to the soil.

With responsible forest practices people enjoy the environmental benefits that forests bring and the products that trees provide.

Components

The role of trees as a renewable resource is explored in the Balance section. Students will listen to and view information on the forest life cycle. They will learn the approximate number of years in each cycle, how the trees are managed during that time, what the characteristics of the forest will be, the products that come from trees in each stage, and the animals and insects which inhabitat the forest during each stage.

Activity

This activity can be done individually or in student groups of three to four.

Using large sheets of poster paper, have students plot out a bird's eye map with drawings and labels that show the a variety of the following elements:

1. Different parcels of land that show forests in different stages – aged forests, young forests, seedlings, areas that are ready for planting – be sure to include different animals that live in the different stages of the forest areas.
2. Recreation areas such as campgrounds, bike trails, nature paths, etc – this can include ski trails, lakes and ponds for fishing, boating, swimming, hunting areas, and much more.
3. Environmentally sensitive areas such as wildlife preserves or wetlands.

As the students share these maps and labels with the whole class, look for elements of BALANCE – balancing recreational and environmental needs with the needs for forests as natural resources for products.

STUDENT ASSESSMENT BALANCE

Select the answer which best completes the statement.

___1. Professional foresters manage the forests by:
a. planting trees b. harvesting c. controlling undergrowth d. all of these

___2. Nearly _____ of South Carolina is covered with trees.
a. 1/2 b. 2/3 c. 1/4 d. 1/8

___3. Trees are a _____ resource.
a. nonrenewable b. renewable c. recycled d. none of these

___4. This has replaced thousands of acres of valuable woodlands over the years:
a. wildlife habitat b. meadows c. watersheds d. urban encroachment

___5. The key to a well-managed forest is
a. photosynthesis b. balance c. urban encroachment d. wood products

Determine if the statement is True or False. Write the correct answer in the blank.

_____6. Forest managers sometimes use fire to help keep the forest healthy.

_____7. Renewable resource means a limited supply.

_____8. Trees are harvested at different ages for different products.

_____9. Stage 1 of the forest lifecycle has the most diverse plant life.

_____10. In Stage 2 of the forest lifecycle, forest managers cut all the trees down.

Describe the stages of a forest and list products and wildlife found in each stage.

RECREATION

Levels
Grades 5 - 8

Subjects
Social Studies, Language Arts, Science, Art

Concepts
Forests provide a place for recreation as well as growing commercial products. Proper management allows South Carolina's citizens to enjoy the forests.

Skills
Analyzing, Data Gathering, Discussing, Interpreting, Researching

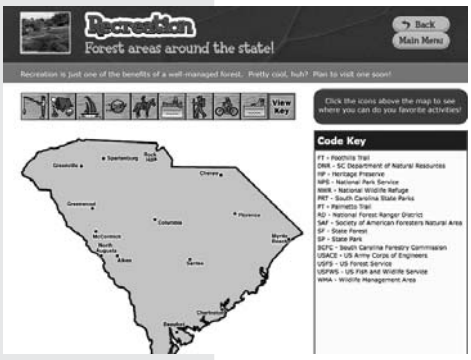
Just about any outdoor activity can be done in a forest. Hiking, horseback riding, canoeing, camping, fishing, and swimming are all activities that are popular in forests. All of these are benefits of a well-managed forest. No matter where a person lives, one of the state's coolest recreational areas, the forest, is always close at hand.

Components

The recreation section shows the richness of recreational resources in the state. Students can study the state from a number of different perspectives, checking the availability of different activities. The students will see a map of the state with recreational areas marked. They will be able to choose activities to explore, and the website will show the location of the activities.

Sample Activity

To introduce this section, have the class make a list of recreational facilities within their travel region. As they list the facilities, have them describe all the activities that go on there. Students will probably be able to relate some of their own experiences. Post this list for everyone to see. Ask students what age groups would most enjoy each site. Discuss facilities/accommodations for children, for wheelchair visitors, etc. Challenge students to research their region for answers to questions.



Extend/Enrich Activities

1. Create a collage of recreational forest activities
2. Make a map of local areas used for recreational purposes.
3. Take pictures of recreational areas and use the pictures to make promotional materials, e.g., brochures, media presentations, etc.
4. Write newspaper articles for the local newspaper regarding recreational areas.
5. Present programs for in-school media services (tv, radio) regarding recreational areas.
6. Have students play the role of travel agents to identify recreational sites in the state that would be of interest to certain populations like the handicapped, families with small children, hikers, etc. Using maps, have the students calculate a route to follow and the mileage. Students can write letters to request information on a certain site.

Activity - "Taking a Stance"

Once students have explored what there is for them to enjoy in the forest, then they begin to consider changes brought about by man and nature, why these changes occur and how we balance the use of forests for recreation and industry:

1. Examine state and federal laws regarding the use of recreational areas. Explore any recent changes and why they have happened.
2. Debate land use topics by using local issues and/or related topics.
3. Examine local controversial land use areas such as freeways, swamps, archeological/Native American sites, construction sites and the impact of these areas on the region.

STUDENT ASSESSMENT RECREATION

I. List 5 recreational activities that can be done in a forest.

1._____

2._____

3._____

4._____

5._____

II. List 5 parks in South Carolina where you can go horseback riding.

1._____

2._____

3._____

4._____

5._____

III. List three parks in the state where you could go canoeing.

1._____

2._____

3._____

IV. Describe how a well-managed forest can provide recreation.

PRE/POST TEST

1. **One acre of trees can provide enough oxygen daily for:**
   a. You and 2 friends
   b. You and 17 friends
   c. You and 100 friends
   d. Just you

2. **What do trees do for us?**
   a. Give off carbon dioxide, and take in oxygen
   b. Provide a home for wildlife
   c. Clean our water and prevent soil erosion
   d. b & c

3. **How much of South Carolina is covered with trees?**
   a. Almost one quarter
   b. About half
   c. two-thirds
   d. three fourths

4. **What kind of recreation does South Carolina's forest provide?**
   a. Hiking
   b. Camping
   c. Fishing
   d. All of the above

5. **What do forest managers sometimes use to keep the forest healthy?**
   a. Fire
   b. Egyptian scrub beetle
   c. Thinning
   d. a & c

6. **Which of the following is not a wood product?**
   a. Latex paint
   b. Football helmet
   c. Tin foil
   d. Aspirin

7. **How many different products are made from trees?**
   a. 153
   b. About 2,500
   c. Over 5,000
   d. 5 million

8. **Shade from trees can cool the surrounding area by as much as?**
   a. 2.5 degrees
   b. 10 degrees
   c. 16 degrees
   d. 30 degrees

9. **What is one important way professional foresters plan to keep *South Carolina Forests Forever*?**
   a. Stagger harvests and replant seedlings
   b. Prevent all forest fires
   c. Prevent people from using the forest for recreation
   d. Never cutting trees

10. **Which of these is a renewable resource?**
    a. Gold
    b. Coal
    c. Trees
    d. Copper

11. **What is the most important function of South Carolina's professional foresters?**
    a. Controlling beavers
    b. Balancing the environment benefits with the need for wood products
    c. Acting as a lookout for forest fires
    d. Making paper out of trees

GLOSSARY

Canopy - layer formed by the leaves and branches of the tallest trees in the forest.

Cellulose - the main part of the cell walls of wood which produce fiber.

Composite panels - panel products made of wood particles (e.g., oriented strand board, medium density board, particleboard).

Coniferous - a tree that bears its seeds in cones. Usually refers to needleleaf trees.

Conservation - responsible use, protection, and improvement of natural resources for the present and future.

Deciduous - term describing a plant that sheds its leaves annually, usually in autumn.

Forest Management - the practical application of scientific, economic, and social principles to the use and care of a forest.

Hardwood - wood produced by deciduous trees such as maples and oaks. Also, another term for deciduous trees.

Harvest - managed removal of trees by selective or complete harvest methods.

Nonrenewable Resources - substances (e.g., oil, gas, coal, copper, and gold) which once used, cannot be replaced.

Recreation - the use of forestland for human enjoyment and relaxation.

Regeneration - the renewal of a tree crop whether by natural (seed trees, sprouts) or artificial (planting) means.

Renewable Resources - naturally occurring raw materials or form of energy, which can replenish itself through sound management practices in your lifetime (e.g., trees).

Sawtimber - size of trees yielding logs considered suitable in size and quality for producing lumber or sawn wood (logs cut into a square edged form).

Seedling - a young tree grown from the seed.

Softwood - wood produced by coniferous trees such as pines, cedars, and firs. A common but not strictly accurate term since the wood of some conifers is harder than some hardwood trees. Another term for a coniferous tree.

Sprout - healthy new trees growing from a stump or roots of a tree that has been harvested.

Stewardship - using wise management practices for many benefits and uses of forestland.

Succession - the gradual replacement of one plant community by another, through natural processes over time.

Sustainability - use and growth of natural resources to meet present and future needs.

Timber Cruise - a survey of a forest to identify health, types, and number of trees.

Understory - layer formed by the leaves and branches of smaller trees under the forest canopy.

Urban Forest - an urban area that extends from town center to suburb's edge. This includes tree-lined roadways, open green spaces, undeveloped forests and parks, along with other public and private spaces within this urban area.

Veneer - a thin sheet of wood of uniform thickness produced by rotary cutting, slicing, or sometimes sawing.

Watershed - an area of land that drains water from small streams toward a major river or stream.

ANSWERS

Answers Environment Section

1.a, 2.e, 3.d, 4.b, 5.c, 6.a, 7.b, 8.c, 9.b, 10.c

Write in answer: The forest provides habitat for thousands of different animals just like a zoo provides a place for animals to live. We can visit the zoo or the forest and enjoy seeing and learning about many different kinds of animals.

Answers Products Section Math Activity

1.b, 2.c, 3.d, 4.c, 5.b, 6.b, 7.a, 8.d, 9.c, 10.b

Answers Products Section

1.d, 2.c, 3.b, 4.e, 5.a, 6.b, 7.d, 8.c, 9.a, 10.a

Write in answer: Answers will vary.

Answers Balance Section

1.d, 2.a, 3.b, 4.d, 5.b, 6.T, 7.F, 8.T, 9.T, 10.F

STAGE ONE: 0 – 15-year trees
In the forest's earliest stage of growth, the canopy is open allowing sunlight to reach the forest floor. This stage has the most diverse plant life, which attracts the greatest variety of foraging animals.

Products: Small poles and fence posts, pulp for paper products
Wildlife: cottontail rabbit, southeastern kestrel, white-tailed deer, nighthawk, field mouse, gray fox.

STAGE TWO: 15 – 30-year trees
In this stage the forest has a more closed canopy, resulting in less plant diversity. Trees provide cover and protection for animals, places for birds to roost, and produce cones and seeds. Professional foresters thin out deformed, diseased, or crowed trees, using them to make products. The re-opened canopy allows for the diverse species of plants to return.

Products: chipboard and particle board, small lumber for housing, small poles, pulpwood, some veneer
Wildlife: crows, red bat, raccoon, rufous-sided towhee, gray catbird.

STAGE THREE: 30 – 45-year trees
The trees that remain after thinning continue to mature during this stage of the forest cycle. Larger and fewer, these trees produce more seeds and cones, and attract animals that live in dens in addition to those that nest in the canopy. At this point professional foresters remove some trees to produce valuable products, replacing the harvested mature trees with seedlings.

Products; lumber for housing, poles, pulpwood, veneer
Wildlife: flatwoods salamander, screech owl, flying squirrel, downy woodpecker

STAGE FOUR: 45-year trees and UP!
In this stage the forest continues to mature. Fewer trees result in even more open areas in the canopy. Dying from the inside out, some trees become hollow, creating cavities for den-based animals. Professional foresters harvest some of these older, larger trees to make high quality products.

Products: telephone poles, lumber for housing, pulpwood, veneer
Wildlife: red-cockaded woodpecker, fox squirrel, gopher tortoise, indigo snake, bobwhite quail, mourning dove, brown-headed nuthatch

Answers Recreation Section

I. Camping, hiking, boating, hunting, fishing, trout fishing, picnicking, swimming, horseback riding.

II. See list on website

III. See list on website

IV. Well managed forests clean the air, conserve the land and prevent soil erosion. With healthy forests we will have more and better recreational opportunities within the forests for many people to enjoy.

Answers Pre/Post Test

1.b, 2.d, 3.b, 4.d, 5.d, 6.c, 7.c, 8.b, 9.a, 10.c, 11.b

CORRELATIONS TO STATE STANDARDS

E = ENVIRONMENT SECTION
P = PRODUCTS SECTON
B = BALANCE SECTION
R = RECREATON SECTION

Science

Standard	Section
K-2.1 Recognize what organisms need to stay alive (including air, water, food, and shelter).	E
K-2.5 Recognize that all organisms go through stages of growth and change called life cycles.	B
K-5.2 Compare the properties of different types of materials (including wood, plastic, metal, cloth, and paper) from which objects are made.	P
1-2.1 Recall the basic needs of plants (including air, water, nutrients, space, and light) for energy and growth.	E
1-2.4 Summarize the life cycle of plants (including germination, growth, and the production of flowers and seeds).	B
2-2.1 Recall the basic needs of animals (including air, water, food, and shelter) for energy, growth, and protection.	E
2-2.4 Summarize the interdependence between animals and plants as sources of food and shelter.	P, B
3-2.1 Illustrate the life cycles of seed plants and various animals and summarize how they grow and are adapted to conditions within their habitats.	E, B
3-2.2 Explain how physical and behavioral adaptations allow organisms to survive (including hibernation, defense, locomotion, movement, food obtainment, and camouflage for animals and seed dispersal, color, and response to light for plants).	E, B
3-2.3 Recall the characteristics of an organism's habitat that allow the organism to survive there.	E, B
3-2.4 Explain how changes in the habitats of plants and animals affect their survival.	E, B
3-3.7 Exemplify Earth materials that are used as fuel, as a resource for building materials, and as a medium for growing plants.	E, P, B
4-2.2 Explain how the characteristics of distinct environments (including swamps, rivers and streams, tropical rain forests, deserts, and the polar regions) influence the variety of organisms in each.	E, B
4-2.5 Explain how an organism's patterns of behavior are related to its environment (including the kinds and the number of other organisms present, the availability of food and other resources, and the physical characteristics of the environment).	E, P, B
5-2.3 Compare the characteristics of different ecosystems (including estuaries/salt marshes, oceans, lakes and ponds, forests, and grasslands).	E, B
5-2.4 Identify the roles of organisms as they interact and depend on one another through food chains and food webs in an ecosystem, considering producers and consumers (herbivores, carnivores, and omnivores), decomposers (microorganisms, termites, worms, and fungi), predators and prey, and parasites and hosts.	E, P, B
5-2.5 Explain how limiting factors (including food, water, space, and shelter) affect populations in ecosystems.	E, B
6-3.5 Illustrate animal behavioral responses (including hibernation, migration, defense, and courtship) to environmental stimuli.	E, B
7-4.6 Classify resources as renewable or nonrenewable and explain the implications of their depletion and the importance of conservation.	E, P, B

Language Arts

Standard	Section
K-5.3 Use symbols (drawings, letters, and words) to create descriptions of personal experiences, people, places, or things.	E
K-6.3 Classify information by constructing categories (for example, living and nonliving things).	E
K-6.4 Use complete sentences when orally communicating with others.	E
K-6.5 Follow one and two step oral directions.	E
1-5.2 Create narratives (for example, stories and journal entries) about people, places, actions, or things.	E
1-5.3 Create written pieces that describe personal experiences, people, places, or things and that use words that appeal to the senses.	E
1-6.3 Create categories (for example, plants and animals) to classify information.	E
1-6.6 Follow one and two step oral directions.	E
2-2.4 Create responses to informational texts through a variety of methods (for example, drawings, written works, and oral presentations).	E
2-5.3 Create written pieces that describe objects, people, places, or events and that use words that appeal to the senses.	R
2-6.2 Use a variety of print sources (for example, books, pictures, charts, graphs, diagrams, and picture dictionaries) and nonprint sources to access information.	R
2-6.3 Create categories (for example, solids and liquids) to classify information.	E
2-6.6 Follow multistep directions.	E, R
3-2.4 Create responses to informational texts through a variety of methods (for example, drawings, written works, and oral presentations).	E, B, R
3-4.1 Generate and organize ideas for writing using prewriting techniques (for example, creating lists, having discussions, and examining literary models).	E, B, R
3-5.3 Create written descriptions about people, places, or events.	E, B, R
3-6.2 Use print sources (for example, books, magazines, charts, graphs, diagrams, dictionaries, encyclopedias, atlases, and thesauri) and nonprint sources (for example, pictures, photographs, video, and television) to access information.	E, B, R
3-6.3 Organize information by classifying or sequencing.	E
3-6.4 Paraphrase research information accurately and meaningfully.	E, R
3-6.7 Use appropriate visual aids (for example, pictures, objects, and charts) to support oral presentations.	E, R
4-2.6 Use graphic features (including illustrations, graphs, charts, maps, diagrams, and graphic organizers) as sources of information.	E, B, R
4-5.1 Create informational pieces (for example, postcards, flyers, letters, and emails) that use language appropriate for the specific audience.	R
4-5.3 Create written descriptions using language that appeals to the readers' senses.	R
4-6.2 Use print sources (for example, books, magazines, charts, graphs, diagrams, dictionaries, encyclopedias, atlases, thesauri, newspapers, and almanacs) and nonprint sources to access information.	E, B, R
4-6.3 Organize information by classifying or sequencing.	E
4-6.4 Paraphrase research information accurately and meaningfully.	E, B, R
4-6.8 Select appropriate graphics, in print or electronic form, to support written works and oral and visual presentations.	E, B, R
5-2.4 Create responses to informational texts through a variety of methods (for example, drawings, written works, and oral presentations).	E, B, R
5-2.6 Use graphic features (including illustrations, graphs, charts, maps, diagrams, and graphic organizers) as sources of information.	E, B, R

5-4.1 Generate and organize ideas for writing using prewriting techniques (for example, creating lists, having discussions, and examining literary models).	E, B, R
5-5.1 Create informational pieces (for example, book reviews and newsletter articles) that use language appropriate for the specific audience.	R
5-5.3 Create written descriptions using precise language and vivid details.	R
5-6.2 Use print sources (for example, books, magazines, charts, graphs, diagrams, dictionaries, encyclopedias, atlases, thesauri, newspapers, and almanacs) and nonprint sources to access information.	E, B, R
5-6.8 Use appropriate organizational strategies to prepare written works and oral and visual presentations.	E, B, R
5-6.9 Select appropriate graphics, in print or electronic form, to support written works and oral and visual presentations.	E, B, R
6-2.6 Interpret information from graphic features (for example, illustrations, graphs, charts, maps, diagrams, and graphic organizers).	E, B, R
6-5.1 Create informational pieces (for example, brochures, pamphlets, and reports) that use language appropriate for the specific audience.	R
6-5.3 Create written descriptions using precise language and vivid details.	R
6-6.6 Select appropriate graphics, in print or electronic form, to support written works, oral presentations, and visual presentations.	E, B, R
6-6.7 Use a variety of print and electronic reference materials.	E, B, R
7-2.4 Create responses to informational texts through a variety of methods (for example, drawings, written works, oral and auditory presentations, discussions, and media productions).	E, B, R
7-2.6 Analyze information from graphic features (for example, charts and graphs) in informational texts.	E, B, R
7-5.1 Create informational pieces (for example, book, movie, or product reviews and news reports) that use language appropriate for a specific audience.	R
7-6.5 Use appropriate organizational strategies to prepare written works, oral and auditory presentations, and visual presentations.	E, B, R
7-6.6 Select appropriate graphics, in print or electronic form, to support written works, oral presentations, and visual presentations.	E, B, R
7-6.7 Use a variety of print and electronic reference materials.	E, B, R
8-2.4 Create responses to informational texts through a variety of methods (for example, drawings, written works, oral and auditory presentations, discussions, and media productions).	E, B, R
8-2.6 Analyze information from graphic features (for example, charts and graphs) in informational texts.	E, B, R
8-5.1 Create informational pieces (for example, reports and letters of request, inquiry, or complaint) that use language appropriate for the specific audience.	R
8-6.5 Use appropriate organizational strategies to prepare written works, oral and auditory presentations, and visual presentations.	E, B, R
8-6.6 Select appropriate graphics, in print or electronic form, to support written works, oral presentations, and visual presentations.	E, B, R
8-6.7 Use a variety of print and electronic reference materials.	E, B, R

Social Studies

Standard	Section
K-5.3 Construct a simple map.	B
K-5.4 Recognize natural features of the environment, including mountains and bodies of water, through pictures, literature, and models.	E, B, R
1-2.2 Compare the ways that people use land and natural resources in different settings across the world, including the conservation of natural resources and the actions that may harm the environment.	E, P, B, R
2-2.2 Recognize characteristics of the local region, including its geographic features and natural resources.	E, P, B, R
2-5.3 Recognize that people's choices about what they buy will determine what goods and services are produced.	E, P, B, R
2-5.4 Identify the relationships between trade and resources both within and among communities, including natural, human, and capital resources.	E, P, B, R
5-6.2 Explain how humans change the physical environment of regions and the consequences of such changes, including use of natural resources and the expansion of transportation systems.	E, P, B, R
7-7.7 Summarize the dangers to the natural environment that are posed by population growth, urbanization, and industrialization.	E, P, B, R

Math

Standard	Section
5-5.4 Apply formulas to determine the perimeters and areas of triangles, rectangles, and parallelograms.	P

CAREERS IN FORESTRY

Forestry and related fields offer many challenging and rewarding career opportunities. Foresters are employed to manage land, timber and other resources; buy and sell timber; plan and implement public relations and promotional programs. They also teach and conduct research, extension and public service programs. Among the many diverse groups who look to those with forestry expertise for employees are pulp and paper companies, lumber and plywood producing firms, consulting firms, government agencies, conservation groups, public and private laboratories, and suppliers of forestry equipment.

Most entry-level positions in forestry require a minimum of a bachelor's degree in forestry or a related field. Today's foresters must be proficient in the technical aspects of managing forests and land. It is equally essential that they be able to understand, communicate and work effectively with people outside the forestry profession. This means that writing and presentation skills are a must.

Forestry graduates are most often employed in the forest products industry to manage land and by forestry consulting firms to assist landowners to achieve their varied management objectives. Federal and state government agencies and private conservation groups also hire professional foresters to manage lands and related resources in their care. Urban forestry is yet another employment source for the forestry graduate.

Almost anyone can find a niche in the forestry field. Read the biographical sketches below for more information:

Jim is a unit manager for a major pulp and paper company in the Southeast. He is responsible for all forest management activities on 30,000 acres of company-owned and leased lands. Six years out of college, he has been promoted to this position after various job assignments involving forest inventory, harvesting, and regeneration. He has surveyed forest boundaries, estimated timber volumes, marked trees for harvest boundaries, supervised planting crews, fought fires, and checked permits giving access to company lands during hunting season. He now supervises all of these activities, administers timber sales contracts, negotiates leases, and prepares operational plans and budgets.

Helen is a district ranger on a National Forest in the Pacific Northwest. She is the manager of a district covering over 200 square miles of both forests and grasslands. As such, Helen is responsible for managing these lands to assure wildlife habitat, sustained timber yields, forage production, watershed values and recreational opportunities for over one million forest visitors each year. In her job as a forester, Helen must be highly skilled not only in vegetation management but in planning and budgeting, personnel management and public relations. She oversees five foresters, four forest technicians and 25 other employees.

Steve is a consulting forester in New England. He provides specialized services to private forestland owners. His clients are farmers, professional people and small forest-product companies. Steve has built his business over the past nine years, and is involved daily in such activities as preparing woodlot management plans administering timber sales, evaluating insect and storm damage and meeting with clients. Steve holds a real estate appraiser's license in his home state. He has also become an expert in forest taxation.

Joe is an urban forester. With a degree in forestry, including special courses in urban forest vegetation, communications, planning, city government, and urban sociology, he is one of a growing number of foresters bringing their special skills to the urban environment. Employed by a mid-size city in the East, he has just completed an inventory of all street-side and park trees. The inventory information, available from his computer, will aid the city forestry department in a systems approach to managing the urban forest.

Connie is a field forester for a large land management company in the east central states. She has recently

completed a computerized forest site inventory and is currently working with a wildlife biologist to enhance wild turkey habitat. Connie's company is also cooperating with forestry researchers from a local university to assess the long-term ecological effects of gypsy-moth infestations on the forest.

Miguel is a forest geneticist. He has recently earned a Ph.D. and is now employed by a major university. Involved in both teaching and research, he is leading a long-term project in tree improvement – selecting, testing, and developing new trees for better quality, faster growth, and resistance to insects and disease. Miguel's area of research is a primary key to assuring an adequate supply of forest products in the future.

Gene works for a tree seedling nursery in the Lake States. He earned an associate's degree in forestry four years ago and is now responsible for supervising seed collection, seeding and management of nursery beds, and lifting (digging) of seedlings.

Carl is a forestry technician for a state forestry department. After completing a two-year forestry program in his home state, he served two years in the Peace Corps. He is now responsible for vegetation management on four high-use recreation areas on state forestlands. He develops work schedules and supervises planting, pruning, fertilizing and other maintenance work of trees, shrubs and other vegetation. Carl has just completed a two-day refresher course in tree fertilization.

Carol works for NASA. With a degree in forestry and specialized training in cartography (mapmaking), she is responsible for analyses of satellite photographs. She has recently developed a computer program to forecast the reactions of sub-arctic vegetation to predicted ozone layer changes.

Kim is a budget analyst for the Office of Management and Budget in Washington, DC. She has a Bachelor's degree in forestry and a Master's degree in public administration. She reviews natural-resource agency budgets to assure technical needs and correct procedures. She works closely with officials of federal agencies and Congress and meets often with special-interest groups and associations. In addition to her knowledge of forestry, Kim is skilled in interpersonal communications, budgeting, management and political science. She is thinking of running for Congress someday.

Danny is a public affairs officer for a large western National Forest. He took this job after spending 19 years as a District Ranger and fire staff officer. His duties include preparing speeches for forest officers, furnishing information about the forest to the public, conducting meetings to provide forest users a chance to express their ideas about the forest's objectives and management, and issuing press, radio, and television news releases. You may have seen Danny on TV during the summer fire season.

There are more such examples. In fact, the Society of American Foresters lists over 700 job categories and nearly 14,000 separate employers among its members. These jobs show not only what foresters and technicians traditionally do, but also give a glimpse of the dynamic nature of forestry and of future career opportunities.

The *South Carolina Forests Forever Foundation* gratefully acknowledges the cooperation of the Society of American Foresters for allowing the use of information from the booklet, *"So You Want to be in Forestry"**.

*Reprinted from *So You Want to be In Forestry* (p. 8-12) published by the Society of American Foresters, 5400 Grosvenor Lane, Bethesda, MD 20814-2198. Not for further reproduction.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