Lesson 1:  
The Contribution of Forest Enterprises to Virginia

TEACHER:  

SCHOOL:  

GRADE LEVEL: 9-12

TASKS/COMPETENCIES

ANR8040.088  Locate markets for forest products.
ANR8044.001  Explain how urban forests fit into an urban ecosystem.
ANR8044.002  List and identify benefits of urban forests.
ANR8046.190  List and identify benefits of urban forests.
ANR8046.195  Calculate cost of a “new” rehabilitated urban forest.

OBJECTIVES AND GOALS

• The student will define the term forestry.

• The student will describe the composition of Virginia forests and their ownership.

• The student will identify trends of change in Virginia forests.

• The student will determine the economic importance of forestry enterprises to Virginia.

• The student will list products and benefits obtained from forestlands.

• The student will predict future trends in forest production in Virginia.

SOL CORRELATIONS

Civics and Economics
CE.9    (economic decisions in the marketplace)
CE.10   (structure and operation of U.S. economy)

Virginia and United States Government
GOVT.15 (U.S. market economy)

English
9.2    (planned oral presentations)
9.6    (technical writing)
10.7   (expository writing)
11.8   (personal and business correspondence)
12.1   (formal oral presentation)

Biology
BIO.8   (changes in populations over time)
BIO.9   (dynamic equilibria within populations, communities, and ecosystems)

Earth Science
ES.7    (renewable and nonrenewable resources)
ES.9    (freshwater resources)

EQUIPMENT NEEDED

• Overhead projector
• Overhead transparencies (included)
**ACTIVITIES**

**Preparation**

**Lesson Approach**
Display a map of Virginia in the classroom. Ask students to identify national forestlands and national park lands on the map. Ask the questions: What percentage of Virginia is considered forestland? Who owns most of the forestland in Virginia? Has the amount of forestland in Virginia changed since 1940?

**General Situation**
Students should read pages ii-iv in *Common Forest Trees of Virginia: How to Know Them* and make a list of reasons why forest enterprises are critical to Virginia’s economy.

**Application**

**What is forestry?**
Forestry is the art, science, and business of managing forestland.

**How much land is considered forest in Virginia and who owns it?**
- 16 million acres of Virginia is forestland.
  - 77% is privately owned.
  - 10% is owned by forest industry.
  - 13% owned by federal, state, and local government.
- 15.4 million acres of land in Virginia is considered commercial forestland.
- 61% of Virginia’s landscape is considered commercial forestland.
- 79,000 acres are considered parks, wilderness, scenic, and historical areas.

**What types of forest are in Virginia?**
- 78% are hardwood; yellow poplar is the most abundant.
- 22% are pine types.
- Pine plantations comprise 44% of pine acreage; loblolly pine is the principal planted tree.

**How has Virginia forestland changed over the years?**
In 1940, 58% of the state was forested. In 1956, this increased to 63%. By 1980, the amount of forestland in Virginia had increased to 64%, and today it comprises about 67% of the total acreage. Reforestation efforts and forestland management practices have led to this increase.

**What is the economic significance of forestland to Virginia?**
From the strong industrial base worth $25.4 billion in annual total economic output to a wide-ranging array of forest-related values worth $5.1 billion annually, forests in Virginia are healthy and diverse, yet are changing due to population and other socio-economic pressures.

The forest resource of the Commonwealth
- contributes $30.5 billion annually to Virginia’s economy.
- contributes $345 million back to Virginia landowners for selling their timber.
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- generates over 248,000 jobs.
- generates an estimated $60 million through specialty forest products.
- protects Virginia’s watersheds from erosion and sedimentation.
- provides long-term carbon sequestration through forest management on 16 million acres of forestland, which contributes to clean air and enhances our quality of life.
- provides important social benefits including attractive sites for homes, scenic beauty, wildlife habitat, and serves as a draw for visitors and potential new residents.

The growth of the forest products industry has resulted in a strong economy. A continuing high level of management and protection is needed to maintain this invaluable forest resource now and for future generations.

The importance of forests to our economic health is well documented. We must recognize now, more than ever before, Virginia’s forests are . . . *Our CommonWealth*. 
To many landowners, a growing timber crop is “money in the bank.” Also, landowners need fence posts, lumber for buildings, and other forest products. By growing them on their own land, they can save money.

The forest dollar is new wealth created from a renewable natural resource. It helps support the noncreative businesses and services.

A part of the forest dollar supports the grocer, clothier, insurance agent, banker, auto dealer, and many, many others.

**What benefits do we get from forestland?**

**Watershed Value**

All of us depend upon water every day. Our farms need water for crops and animals; our homes for cooking, washing, and drinking; our towns and cities for fire fighting, sanitation, and recreation; and our industries for manufacturing processes. Virginians consume the equivalent of 60 gallons per day for each person.

A well-managed forest provides the best protection for a watershed. The leaves and branches of trees and shrubs break the force of falling rain, and the dead plant material on the ground serves as a “big sponge” to soak up the rain and release it slowly into the soil beneath. The roots help to anchor the soil, preventing destructive erosion that silts the rivers, lakes, and reservoirs.

Forests help prevent disastrous floods and provide water vital to life.

**Recreational Value**

Increasing population and shorter working hours create more demand for outdoor recreation. Virginia’s forests are home to wildlife, which supports a multi-million dollar industry.

Thousands of tourists enjoy Virginia’s forest beauty, spending more than 3 billion dollars annually. Fishing, boating, and other water enthusiasts spend millions for equipment to use on lakes and streams fed from surrounded by forests.

**What We Get From Trees**

Thousands of useful items come from trees, from charcoal for the outdoor grills to medicine to cure our ills. Wood, even in the raw form, has fascinating qualities. It is highly rated as a radiation shield and as an insulator. It is resilient; think of its use as handle stock for pounding tools such as hammers and axes. There is no substitute for the wooden cross tie for railroad construction. Vanilla extract food flavoring is a product of the tree. Rosin used by violinists and boxers comes from our pines. The finest gun stock material in the world is made from America’s black walnut. Wood has beauty, warmth, and strength; it is the favorite material for furniture making. Wood, in its many forms and by-products, is a vital component of the space program.

Not to be overlooked are the simple things, such as shade from the hot sun, food for hungry people or animals, and logs for the stove or fireplace.

Wood, in its thousands of forms, is an integral part of the American way of life.

<table>
<thead>
<tr>
<th>Area of Commercial Forestland, by Ownership Classes</th>
<th>1966 area by 1000 acres</th>
<th>1977 area by 1000 acres</th>
<th>2001 area by 1000 acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ownership Class</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Forest</td>
<td>1,202.8</td>
<td>1,457,989</td>
<td>1,468.1</td>
</tr>
<tr>
<td>Other Federal — Indian</td>
<td>0.5</td>
<td>485</td>
<td>0.4</td>
</tr>
<tr>
<td>Miscellaneous Federal</td>
<td>233.9</td>
<td>245,126</td>
<td>220.9</td>
</tr>
<tr>
<td>Total Other Federal</td>
<td>234.4</td>
<td>245,611</td>
<td>221.3</td>
</tr>
<tr>
<td>State</td>
<td>181.6</td>
<td>183,345</td>
<td>211.4</td>
</tr>
<tr>
<td>County and Municipal</td>
<td>53.1</td>
<td>68,985</td>
<td>82.5</td>
</tr>
<tr>
<td>Forest Industry</td>
<td>1,562.3</td>
<td>1,669,618</td>
<td>1,554.8</td>
</tr>
<tr>
<td>Farmer Owned</td>
<td>6,958.2</td>
<td>6,209,938</td>
<td>3,870.4</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>5,619.9</td>
<td>6,137,309</td>
<td>7,817.7</td>
</tr>
<tr>
<td>Total of All Ownerships</td>
<td>15,809.3</td>
<td>16,218,406</td>
<td>15,447.5</td>
</tr>
</tbody>
</table>

**Presentation: The Changing Forest Picture**

**History**

Forests have played a vital role in making our country a great nation. The harvest of Virginia’s forests began when English settlers landed at Jamestown. Wood products were among the first export goods from the colony, thus laying the foundation for forest industry so important to Virginia today.

As our civilization moved westward, new uses for the tree and its products were developed. The rapid development from a frontier to our present civilization is partly due to our forest resources. This early period was one of exploitation; the virgin forests were heavily cut and burned. It was a time of land-clearing for agriculture and a time of “cut out and get out” for wood industry.

This great expansion era created problems for the forests. But our forests, although exhaustible, can be renewed. Unlike oil and minerals, timberland can be kept in continuous production; it is not necessary to exhaust an area of forest and move to a new location. The course will tell us how to restore and manage woodlands properly. The forest is a renewable resource.

**The Present Status of Virginia’s Forest Resource**

Here is a table showing the major forest types in acres of commercial forestland:

<table>
<thead>
<tr>
<th>Date</th>
<th>1940</th>
<th>1957</th>
<th>1966</th>
<th>1977</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pine and Oak-Pine Type</td>
<td>6,230.6</td>
<td>5,909.4</td>
<td>5,519.2</td>
<td>5,369.1</td>
<td>3,352.8</td>
</tr>
<tr>
<td>Hardwood Type</td>
<td>8,181.6</td>
<td>9,540.5</td>
<td>10,290.1</td>
<td>10,603.7</td>
<td>12,094.8</td>
</tr>
<tr>
<td>Total</td>
<td>14,412.2</td>
<td>15,449.9</td>
<td>15,809.3</td>
<td>15,972.8</td>
<td>15,447.5</td>
</tr>
</tbody>
</table>

Some of the increase in hardwood acreage is at the expense of pine. Hardwoods, because of their tolerance, often “take over” an area. Source: [http://srsfia1.fia.srs.fs.fed.us/html/tables.htm](http://srsfia1.fia.srs.fs.fed.us/html/tables.htm)

Here is a table showing the volume of timber in Virginia by forest surveys:

<table>
<thead>
<tr>
<th>Date</th>
<th>1940</th>
<th>1957</th>
<th>1966</th>
<th>1977</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Softwood</td>
<td>4,729.1</td>
<td>4,790.9</td>
<td>4,624.4</td>
<td>5,699.7</td>
<td>6,648.4</td>
</tr>
<tr>
<td>Hardwood</td>
<td>9,607.6</td>
<td>12,356.6</td>
<td>13,651.3</td>
<td>17,556.6</td>
<td>19,838.4</td>
</tr>
</tbody>
</table>


**Future Trends in Virginia Forestry**

In 1992, the Virginia Department of Forestry began a long-term assessment of Virginia’s forest resources. This assessment differs from past assessments in its emphasis on population growth and land use changes and the implications of these land use changes to the forest resources. A report on the initial phase, which focused on timber supply, was completed in 1995.

Geographic Information System (GIS) technology was used to overlay population density patterns with forestland cover and land use data. The expert opinions of local department foresters were then used to choose threshold population densities that could be used to separate forestlands into two categories: “rural” forestland, which is likely to remain available for long-term timber production; and “urban” forestland which is likely to become unavailable for timber production through residential or other development, at least by the time the existing forest reaches economic maturity. Hand-drawn revisions were made in a few instances where this approach misclassified significant areas of forest.

Estimates of timber volumes, growth, and removals for rural forestland were derived from the 1992 forest inventory of Virginia. Areas of rural forest unsuitable for harvest because of steep slopes, small acreage, or distribution in narrow strips were removed from consideration to leave the “suitable rural forestland” that is expected to support future commercial timber production in Virginia.
This initial assessment shows that the Commonwealth has 15.4 million acres of forestland, but only 8.5 million acres, or 55%, is likely to remain available for timber production. About 3.2 million acres of forestlands were classified as “urban,” and another 3.9 million acres were classified as unsuitable due to slope, small acreage, or spatial arrangement. Under present circumstances, this forestland is inadequate to support the current rate of harvest on a long-term, suitable basis.

**ADDITIONAL ACTIVITIES**

Arrange a field trip to a local forest-related business. Prior to the trip, have students compose a list of questions to ask the management concerning the importance of that business to the local economy. Sample questions include:

- What products are produced by the business?
- Where are the products marketed?
- How much of the raw materials come from the local area?
- How many persons are employed by the business?
- How much does the business gross in sales each year?

**SUGGESTIONS FOR STUDENT EVALUATION**

- Draw a pie graph to illustrate ownership of the 16 million acres of forestland in Virginia.
- Which type of forest is dominant in Virginia, hardwood or pine?
- Is more of Virginia forested now than in 1940?
- Explain the economic significance of forests to Virginia.
- List three benefits besides economic benefits that we get from forests.

**SUGGESTED RESOURCES**

- *Common Forest Trees of Virginia: How to Know Them.* Virginia Department of Forestry, 2001
- [http://www.dof.state.va.us/resinfo/forest_resources.htm](http://www.dof.state.va.us/resinfo/forest_resources.htm)