

We Need Plants!

Strand	Earth Resources
Topic	Plant resources
Primary SOL	2.8 The student will investigate and understand that plants produce oxygen and food, are a source of useful products, and provide benefits in nature. Key concepts include <ul style="list-style-type: none">a) important plant products are identified and classified;b) the availability of plant products affects the development of a geographic area;c) plants provide oxygen, homes, and food for many animals;d) plants can help erosion.
Related SOL	2.4 The student will investigate and understand that plants and animals undergo a series of orderly changes as they mature and grow. Key concepts include <ul style="list-style-type: none">b) plant life cycles. 2.1 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which <ul style="list-style-type: none">d) two or more characteristics or properties are used to classify items;j) conclusions are drawn;k) observations and data are communicated;l) simple physical models are designed and constructed to clarify explanations and show relationships;m) current applications are used to reinforce science concepts.

Background Information

A wide variety and number of products we use every day are in some way derived from trees. However, many tree products are not obvious. Products are derived from all parts of the tree. Wood (lumber) is the most obvious in houses, furniture, doors, picture frames, floors, fences, boats, paddles, crates, thread spools, cabinets, broom handles, toothpicks, and baseball bats. Cellulose is the major component of wood and is the source of paper and paper products, including books, cereal boxes, magazines, newspapers, food labels, toilet paper, coffee filters, stationery, grocery bags, egg cartons, and paper towels. Besides being used to make paper, cellulose is an ingredient in many other products. Paper mills use cellulose from three sources: recycled paper, wood chips, and sawdust left over from making lumber and raw logs. Cellulose can be mixed with certain chemicals and squeezed into fibers that are used to make carpets, wigs, fabrics such as rayon for clothes, and furniture.

Cellulose is also used as a key ingredient in cellophane, sausage casings, explosives, toothpaste, shatterproof glass, sponges, shampoo thickeners, imitation leather, photo film, and many other products. Cellulose may also be used to produce molded plastics for eyeglass frames, telephones, portable CD players, buttons, hairbrush handles, steering wheels, pipes, toys,

counter tops, and packaging such as bubble covers on consumer products. It would be hard to find a part of the tree that people do not use in some way. The bark of many trees is used for many different products, such as soil conditioners, fuel, mulch, and waxes for cosmetics, shoe polish, and cars.

Some trees produce saps, called gums and resins, which are used to make paint thinner, chewing gum, medicines, soaps, floor polish, crayons, perfume, printing inks, insecticides, disinfectants, and fireworks. The sap from the rubber tree was extracted for hundreds of years to make products such as rubber-soled shoes, gloves, and containers.

Maple trees produce a sap that people turn into maple syrup. Trees provide fruits and nuts, such as apples, coconuts, pecans, lemons, and olives, and spices, such as allspice, and nutmeg. Tree leaves, trunks, roots, and other parts also provide ingredients for paints, road-building materials, medicines, tea, adhesives, inks, tar, charcoal, and hundreds of other products.

One cord of wood (i.e., a pile of wood 4' by 4' by 8') can make:

- 7,500,000 toothpicks,
- 1,000 pounds of paper,
- 942 one-pound books,
- 4,384,000 postage stamps,
- 61,370 business-size envelopes,
- 460,000 personal checks,
- 30 rocking chairs; or
- 12 dining room tables big enough for eight people.

Materials

- An example of as many of these plant products as possible: newspaper, toothpicks, candy bar with almonds, piece of wood, tissue paper, synthetic sponge, piece of rayon fabric, baseball, pack of chewing gum, bottle cork, rubber gloves, apple, walnut, plastic comb or brush, piece of cellophane, furniture, toothpaste, shampoo, coffee filter, wig, ink, negatives, film canister, buttons, plastic toy, and soap
- Pictures of animals, such as birds, squirrels, deer, bears, mice, and raccoons
- “Agriculture Map of Virginia” handout
- Paper and drawing/coloring supplies

Vocabulary

plant products, habitat, soil erosion, lumber, oxygen, benefits

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Introduction

1. To introduce this lesson, have students write down everything they can remember using since they woke up that morning, including the bed in which they woke up.

2. After they have completed their lists, have them circle each thing they think is a plant product.
3. As a group, go through several students' lists, discussing which things are plant products. Most students will find that the majority of the things on their lists will be circled.
4. Remind students of the plants they have grown. Ask the students to tell you what the needs of plants are. Create a chart of "Benefits of Plants." Ask the students to classify the benefits as they are identified throughout the lesson. Sample categories include providing food and oxygen, useful products, and benefits in nature (reduce erosion).
5. Return students to their desks. The students will go through each activity as a class. You will need to tell the students what the expectations are for each activity.

Procedures - Activity 1

1. Number the plant products from the material list. Place them around the room.
2. Have students work in groups to decide which products they think come from plants. In each case, they must give their reasons for their decision.
3. Go through the products, discussing how *all* of them are plant products. Explain those that the students did not know were plant products.
4. Have the students classify the products as follows:
 - Two products from the gum of trees (rubber products, chewing gum)
 - Two products from wood (furniture, toothpicks, spools)
 - Two products from fruits and nuts (cider, spices, pecan, apple)
 - Two products from resin (soap, varnish)
 - Two products from leaves or bark (cork, mulch, tea)
5. Gather students together as a group to report their findings and add to the chart that was started in the beginning.

Procedures - Activity 2

1. Provide students with the "Agricultural Map of Virginia" handout.
2. Discuss the map, having the students name the plant products they see and coloring them as they are discussed.
3. Animals are also on this map. Discuss how plants are important for the animal products as well, e.g., as food (grains and hays).
4. Infer how the plant products that are available in an area affect what businesses/development might also be in that area.

Procedures - Activity 3

1. Remind the students that the previous two activities have concerned plant products and the fact that plant products play an important part in almost everything we do or use throughout our day. Pose the question: "*What are some other reasons that plants are important to us?*" Allow the students to brainstorm a list, prompting them, if necessary, to mention that plants provide us and other animals with oxygen, homes (shelter), and food.

2. Show pictures of a variety of animals. Discuss how each animal uses plants for shelter and food in different ways.
3. Have each student choose an animal and illustrate how it uses plants for food and shelter. Have them write a sentence or two explaining their drawings.
4. When the students have completed the drawings call students to the large group area. Allow students to share their drawings with each other and to ask questions of each other.

Assessment

- **Questions**

Informally assess student understanding during discussions of the various topics, using questions such as the following:

- What are some products made from the gum of trees?
- What are some products made from the wood of trees?
- What are some products made from fruit and nuts?
- What are some products made from plant resins?
- What are some products made from leaves or bark?
- Besides food and shelter, what basic need do plants provide us with?
- How do plants help animals?

- **Journal Prompts**

- How does the animal you chose use plants for food and shelter?
- Explain why bodies of water like a river should have plants either on the banks or in the water near the banks.

- **Other**

- Use students' groupings of plant products and their drawings for assessment.

Extensions and Connections (for all students)

- Have students create books showing and explaining plant products.
- Hold a class contest to list as many ways as possible plants are useful to us and other animals.
- Create a bulletin board of the students' drawings.

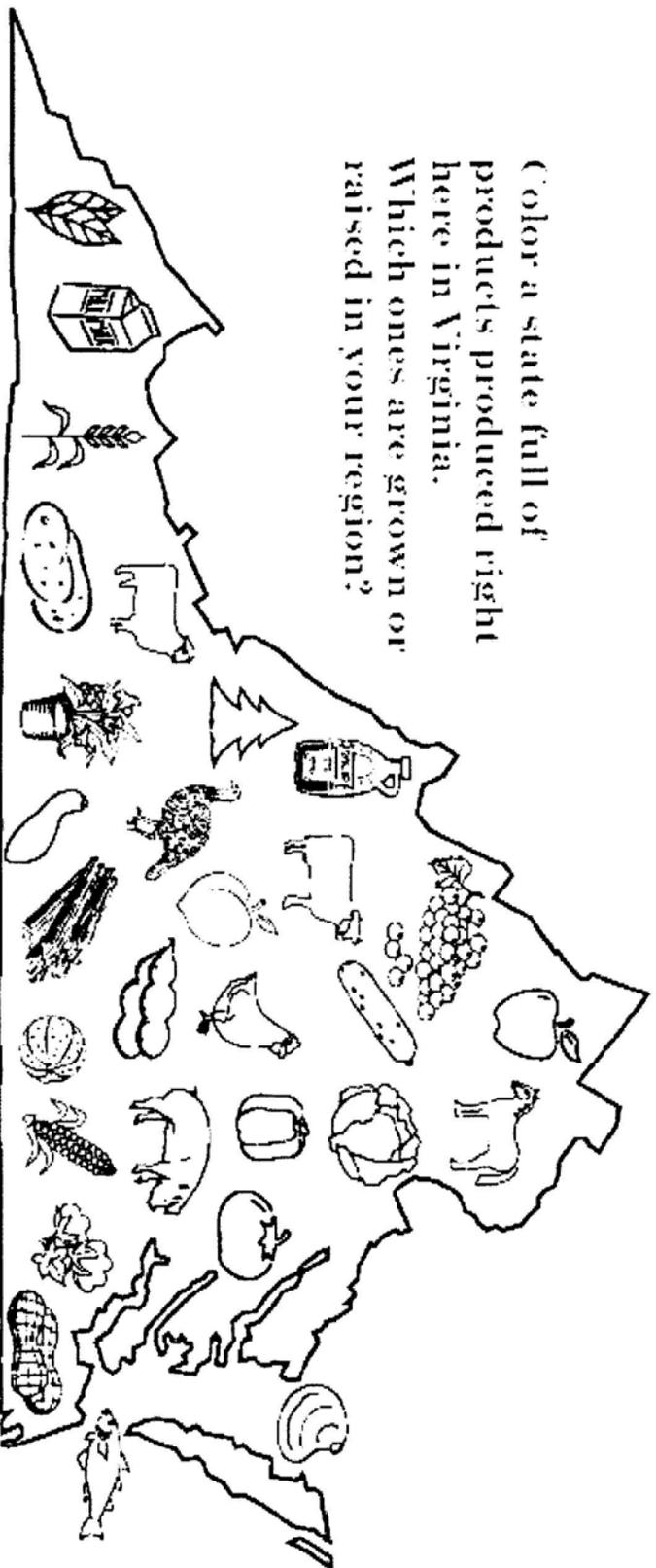
Strategies for Differentiation

- Provide pictures and displays for vocabulary words.
- Provide clip art of possible activities or actions that students might have done throughout the day to facilitate the introduction of the lesson.
- Bring in a potted plant so students understand what a plant is.
- Create groups with strength-based assigned roles.
- Make an overhead of the map to model. Color code plants and animals as a class. Then have students complete a student copy.
- For Activity 3-show pictures of plants and animals to prompt discussion and written responses regarding the importance of plants and animals.
- Create a matching game with plants and their uses to use for assessment.

- Provide a video clip of products made from plants.
- Walk around the school site. Look for products made from plants.
- Put examples of plant products around the room. Have students walk around, observe, and touch the products.

Agriculture Map of Virginia

Color a state full of products produced right here in Virginia.
Which ones are grown or raised in your region?



Virginia Department of
Agriculture and Consumer Services
804-796-2973