

We All Need Trees

Students are often surprised to learn how many different products we get from trees. Use this activity to help your students learn just how much we depend on trees in our daily lives.

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2 Activity

Objectives

- Students will examine various products and determine which ones are made from trees.
- Students will describe ways that trees are used to make products and ways that these products can be conserved.



Assessment Opportunities

- For Part A, have students sort pictures of objects into three groups: wood, food, and paper.
- To assess their understanding of trees as a source of products, have students find the following at school or home:
 - › Two things derived from the gum of trees (rubber products, chewing gum)
 - › Two things made directly from wood (furniture, toothpicks, spools)
 - › Two things made from tree resin (violin rosin, soap, varnish)
 - › Two things derived from fruits and nuts of trees (cider, dyes, spices)
 - › Two things extracted from the leaves or bark of trees (astringent lotion, cork, honey)
 - › Two things derived from cellulose (rayon, paper, cellophane, carpeting).

Levels

Part A: PreK-1

Part B: Grades 2-6

Subjects

Science, Social Studies, Visual Arts, Language Arts

Concepts

- Humans use tools and technologies to adapt and alter environments and resources to meet their physical, social, and cultural needs.
- Natural beauty, as experienced in forests and other habitats, enhances the quality of human life by providing artistic and spiritual inspiration, as well as recreational and intellectual opportunities.
- All humans consume products and thereby affect the availability of renewable and nonrenewable natural resources.

Skills

Identifying Attributes and Components, Classifying and Categorizing, Researching, Evaluating

Differentiated Instruction

Realia/Hands-on Learning, Higher Order Thinking, Non-linguistic Representations

Technology Connections

Internet Resources, Graphic Organizer Software, Presentation Software

Materials

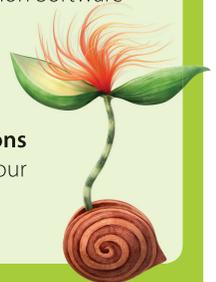
See Getting Ready

Time Considerations

Preparation: One hour

Part A: 50 minutes

Part B: 50 minutes



Background

Products are derived from all parts of a tree. Wood is one of the most obvious: it provides things such as lumber for houses, furniture, doors, picture frames, clocks, paintbrush handles, counters, cabinets, floors, spools for thread, etc. Cellulose is the major component of wood (and most other plant fiber). Paper is made from cellulose, and paper products include books, wrappers, cereal boxes, magazines, newspapers, food labels, etc. Besides being used to make paper, cellulose is an ingredient in many other products. See "Would You Believe It Comes from Trees?" on the next page for a list of just some of the products that come from cellulose and other tree parts.

Getting Ready

For Part A, cut out magazine pictures of products made from trees. You'll need at least one picture per student. You should collect pictures that fit equally into the categories: wood products, food products, and paper products.

If you cannot find old magazine pictures, look for images on the Internet, make a slide show of them, and give the students cards with names and images that correspond to the slide show.

In different parts of the room, display a large picture or actual product to represent each of the three categories: wood products, food products, and paper products. For example, a newspaper could represent paper products, a musical instrument could represent wood products, and an apple could represent food products.

Put up three sheets of chart paper with a label (paper, wood, food) and/or drawing and/or picture to go along with each category. Students can attach their picture under the label once it has been determined to be correct. Display charts.

For Part B, collect as many of the following items as you can:

- Newspaper
- Toothpicks
- Candy bar with almonds



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Would You Believe It Comes from Trees?

Wood Products

Fuel – wood and charcoal
Lumber for building
Furniture
Planks
Packaging
Wood panel veneers
Particle board
Plywood

Bark Products

Cork
Tannin (used for curing leather)
Dye
Drugs and oils
Cinnamon

Cellulose Products

Carpeting
Cellophane
Rayon and other fabrics
Thickening agent (in shampoo)
Suntan lotion
Shatterproof glass
Cosmetics
Paper products such as writing paper, magazines, books, toilet paper, newspaper, wrapping paper, building paper, industrial paper, and wallpaper
Fiber board
Imitation leather

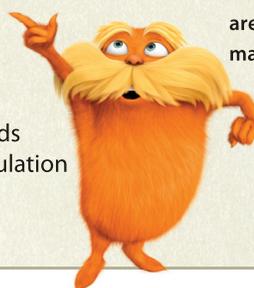
Sap Products (Gums and Resins)

Cosmetics
Paint thinner
Perfumes
Soap
Rubber products
Sugar and syrup
Varnishes
Waxes
Chewing gum
Flavoring
Printing ink
Shoe polish
Crayons
Cleaning fluids
Electrical insulation
Adhesives

Fruit, Leaves, and Seed Products

Fruits (apples, mangoes, bananas)
Nuts (pine nuts, cola nuts)
Spices (bay leaves, nutmeg, mace)
Dyes
Cider

Note: Some of the products listed aren't always—or exclusively—made from trees.



(Continued from page 1)

- Scrap of lumber or plywood
- Tissue paper
- Sponge (synthetic, not natural)
- Piece of rayon cloth or clothing
- Baseball
- Wooden chopsticks or a wooden mixing or salad spoon
- Bottle of vanilla (flavoring)
- Book or magazine
- Cardboard box
- Pack of chewing gum
- Empty can of paint
- Bottle cork
- Rubber gloves
- Apple or other piece of fruit that comes from trees
- Plastic comb or brush
- Piece of cellophane
- Wooden chair or other piece of furniture
- Empty and clean can of paint thinner, turpentine, or mineral spirits.

For Part B, make enough copies of the student page for each group of four students and cut sheet in sections.

Doing The Activity

PART A—Tree-Tectives

1. Hold up a small branch and a wooden object. Ask where each of these comes from. (Students will most likely recognize the branch as coming from a tree but might say that the other object comes from a store, house, closet, etc.) If you have one, show students the “tree cookie,” and explain that it also comes from a tree. Have students see and feel the texture of the wood. Can they identify similar texture and grain in various wood products? Do they recognize those products as coming from trees?
2. Ask the students if they know where paper comes from. Describe in simple terms the process by which trees become paper.
3. Ask students if they can think of other things that come from trees. Ask whether they've used anything today that comes from trees.



4. Explain that paper, wood, and food are three of the main kinds of products people get from trees. Hand out the pictures you cut out earlier, one per person. Explain that each picture shows one of these three important types of tree products. Tell the students to decide what type of tree product they have: wood, food, or paper.

5. Make sure the students understand the kinds of products that each category includes. Then give them time to go and stand under the picture representing the appropriate category.

6. Have each of the students name their tree product. Ask if anybody can think of other products that come from trees. Then refer to “Would You Believe It Comes from Trees?” to discuss some unusual tree products. Have students bring in some samples to pass around.

PART B—Tree Treasures

1. Place the items you collected around the room and label each one with a number.
2. Divide the group into teams of four, and tell them that team members will work together to determine which of the products are made from trees. All team members must agree with the team's decision about each product and must be able to explain why each product is on their team's list.
3. Have the students in each team number themselves from one to four. Tell all the "1's" that it's their responsibility to record the information that everyone on their team agrees on and that they'll have to report their group's findings to the rest of the class. Tell all the "2's" that they must make sure that everyone in the group has an opportunity to speak as the team tries to reach decisions. The "3's" must make sure the group stays on track and gets everything accomplished in the time allowed. And the "4's" are the only people who may leave the group to ask you questions. Have the teams move around the room and examine the products. After they have decided if one item comes from trees in some way, they should record it on a list and move on to the next one.

4. Do not let students open any of the product containers. Once teams have established their lists, give each team a set of the readings on the student page. Each student should read the article that corresponds to his or her number and explain the contents to their team members. (For younger students, you may read the articles aloud as a class.)
5. The teams should then re-evaluate the list of products they came up with in Step 4. Are there any products they want to add or delete from their list? Once again, remind them that everyone on their team must agree with the changes and should be able to explain why each item is on their list.
6. Have the teams share their lists with the rest of the group. Discuss the diversity of products we get from trees. Check the students' understanding of the articles by asking them to explain why they included certain products. Students should realize by the end of the discussion that all the products they looked at came from trees.
7. Discuss how this new awareness of tree products might affect students' behavior. Talk about conservation practices where their families use a forest product but could also (1) recycle the product, (2) reuse the product, or (3) reduce its use.

Enrichment

Make a Treasure Tree

Bring in a dead or pruned tree limb (with lots of branches), a used Christmas tree, or a small potted tree. Have the students decorate the limb (propped up), Christmas tree, or potted tree with pictures of tree products. They can draw their own pictures, cut pictures out of magazines, or use the pictures from the activity. They can also use actual small tree products, such as pencils, paper towel rolls, nuts, fruit, cellophane, etc., to decorate the tree.

Find Out the Mystery Product

Cut out tree product pictures from magazines and use clothespins to attach a picture to each student's back. Tell students they must figure out the product on their back by asking each other questions. They can ask each person only two "yes" or "no" questions. For example, "Is this product used in our school?" For more advanced students, you can make this game more challenging by not allowing these questions: "Is it made from paper?" "Is it made from wood?" "Is it used for food?" The students can draw their own pictures, cut pictures out of magazines, or use the pictures from the activity. They can also use actual small tree products, such as pencils, paper towel rolls, nuts, fruit, cellophane, etc., to decorate the tree.

Reading Connections



Dorros, Arthur. *A Tree is Growing.* Scholastic. 1997. Tells about the structure of trees and how they grow, as well as their uses. Grades K-3. ISBN: 0590453009.

Leavell, Chuck and Nicholas Cravotta. *The Tree Farmer.* VSP Books. 2005. A proud grandfather takes his grandson on a magical journey through his tree farm where they discover the majesty of the forest and the many benefits of trees. Grades K-5. ISBN: 1893622169.

Marshall, Pam. *From Tree to Paper.* Sundance. 2002. An exciting photo-essay book explaining how trees are made into paper. Grades PreK-2. ISBN: 082250720X.

Mortensen, Lori. *In the Trees, Honey Bees!* Dawn Publications. 2009. This book describes amazing insects that are also critically important to humans. Simple verse engages the young child, while sidebars with fascinating information satisfy the older audience. Grades PreK-3. ISBN: 1584691158.

Neuschwander, Cindy Wayne Geehan. *Sir Cumference and the First Round Table.* Charlesbridge Publishing. 1998. When his knights get together, they sit at such a long table that everyone has to shout to be heard. Can Sir Cumference and Lady Di of Ameter measure up to the challenge of building a better table? The fallen tree provides the perfect answer. Grades K-6. ISBN: 1570911525.

Pluckrose, Henry. *Trees.* Children's Press. 1994. Tree shapes, types of leaves, how trees are fed, why they are green, what animals they house, and the bounty trees produce are all captured in the text and photographs. Grades K-2. ISBN: 0516401211.

Silverstein, Shel. *The Giving Tree.* HarperCollins. 1964. A moving parable about the gift of giving and the capacity to love, told throughout the life of a boy who grows to manhood and a tree that selflessly gives him her bounty through the years. Grades PreK-2. ISBN: 0060256656.





It Came from a Tree

1. Look around you and chances are you'll see a lot of things made out of wood. People use wood to build houses and other buildings; to construct doors, floors, fences, and furniture; and to make many other products including bowls, boats, paddles, crates, baskets, and baseball bats.

To make wood products, people first harvest trees and process them into lumber. After the trees have been cut down, the branches are removed and they are cut into logs. Then, the logs are loaded onto trucks and transported to a sawmill. The first machine at the sawmill strips off the bark. The logs are then measured and then cut into lumber. Depending on how the wood will be used (whether for buildings, furniture, baseball bats, etc.), the trees will be cut in different ways.

What products a tree is used for depends on the type of tree it is. For example, hardwood trees such as oak and maple are often used for flooring and high quality furniture, while softwood (coniferous) trees are usually used for papermaking, lower quality furniture, houses, and crates.

2. All land plants contain a compound called cellulose, which provides them with rigidity and support. It's the number-one component in wood. People use cellulose from wood to make a variety of products besides paper. For example, cellulose can be mixed with certain chemicals and squeezed into fibers that are used to make carpets, wigs, and fabrics such as rayon for clothes and furniture. Cellulose is also used as a key ingredient in cellophane, sausage casings, explosives, shatterproof glass, sponges, shampoo thickeners, imitation leather, and many other products. Processed with certain chemicals, cellulose may also be used to produce molded plastics for eyeglass frames, hairbrush handles, steering wheels, and so on.

3. It would be hard, if not impossible, to find a part of a tree that people do not use in some way. The bark of many trees, for example, is used for many different products. Most bottle corks are made from the bark of cork oak trees, which grow in Europe and Africa near the Mediterranean Sea. The spongy bark of these trees is made into bulletin boards, the inner cores of baseballs, and many other products. Quinine, the drug used to cure and prevent malaria, comes from Peruvian bark and had been used by Native Americans long before the Europeans arrived. Some tree bark has

an abundance of a chemical called tannin. People use tannin to process leather.

Some trees produce saps called gums and resins that are used to make paint thinner, chewing gum, medicines, and many other products. For hundreds of years, South American Indians have extracted the sap or latex from the rubber tree to make products such as rubber-soled shoes and containers. They processed it by heating the rubber and mixing it with sulfur to improve its strength. Maple trees produce a sap that people turn into maple syrup.

Trees provide people with fruits and nuts such as apples, coconut, pecans, lemons, and olives, and spices such as allspice and nutmeg. Tree leaves, trunks, and other parts also provide ingredients for paints, road building materials, medicines, artificial vanilla, adhesives, inks, and hundreds of other products.

4. Paper was made by hand for nearly 17 centuries following its invention in China about 100 A.D. In Asia, plant fibers were beaten into a pulp, suspended in water, and formed into sheets by draining the fibers through a screen. As knowledge of papermaking moved westward, paper makers began to use rags rather than plant fibers to furnish pulp.

Papermaking spread to Europe through the Middle East, reaching Spain from North Africa by about 1200. From Spain, the craft eventually was brought to the North and South America. The Spanish established a European-style paper mill in Mexico around 1580.

Paper mills use cellulose from three sources: recycled paper, wood chips and sawdust leftover from making lumber, and raw logs. When raw logs arrive at the mill, machines strip the bark off and chop the trees into chips. Then the chips (and other sources of cellulose) are "cooked" with chemicals until the mixture becomes a thick pulp. Next, the pulp is "washed." During the washing stage, dirt and other impurities are filtered out, producing clean pulp and, leftover waste and solids called sludge water. The sludge is separated from the water and either landfilled, burned, or applied to the land as fertilizer. The wash water goes into a waste water treatment system. The clean pulp then goes through a series of machines where the fibers get mashed apart so that the pulp will form smooth sheets when dried.