



Would You Believe It's from a Tree?

Middle School Food and Agricultural Literacy Curriculum

Precepts

- I. Professional Growth
 115. Demonstrate exemplary employability skills.

National Standards

- NRS.03.01.02.a. Describe uses of tree species
- NL-ENG.K-12.4 – Communication Skills
- NL-ENG.K-12.12 – Applying Language Skills

Student Learning Objectives

- As a result of this **unit** the students will...
- Explain the basic concepts of the forestry industry.
- As a result of this **lesson** the students will...
- Describe forestry products.

Content Outline

- Objective 1. Describe forestry products.

I. Forestry products and their sources

- A. Wood products
- B. Cellulose products: cellulose is a complex carbohydrate that constitutes the chief part of the cell walls of higher plants and yields fiber for many products.
- C. Bark products
- D. Sap products
- E. Fruit, leaves, and seed products

Interest Approach

This interest approach will introduce the topic of the class objective, description of forest products, while helping students to realize some of the opportunities and activities the FFA offers that can help them to grow and build skills. Before class, write the following on the board: "On one side of your note card, develop a personal list of six or more forest products you use that directly affect your life." As students enter the room, hand them an index card.

Time

Instruction time for this lesson: 45 minutes.

Resources

Forest Science II Unit 6 Harvesting and manufacturing forest products Lesson 3 Manufacturing forest products. Retrieved August 10, 2009. From Georgia Ag Ed Curriculum Web site. — <http://www.gp.com/educationalinnature/fromforest/download.html> — From the forests. Retrieved August 10, 2009. From Georgia Pacific Educational In Nature Web site. <http://www.gp.com/educationalinnature/fromforest/download.html> — National FFA Organization. (2003). LifeKnowledge Precepts and Signs of Success. — (2009). Project Learning Tree: PreK-8 Environmental Education Activity Guide. Washington, D.C.: American Forest Foundation. — Wood you believe we get so much from trees. Retrieved August 10, 2009. From Idaho Forest Products Commission Web site. <http://www.idahoforests.org/woodyou.htm>

Tools, Equipment, and Supplies

Writing surface
Note cards – one per student
Flip chart paper
Markers
Box or boxes with forestry products– one item per team
MS.NR.5.2.AS.A – one per teacher (contains the list of forest products needed for team work)
MS.NR.5.2.AS.B – one per source location (will be cut into sections)
MS.NR.5.2.TM.A – one per teacher (blank tree map)
MS.NR.5.2.ASSESS.A – one per student

Key Terms

The following terms are presented in this lesson and appear in **bold italics**:

Cellulose

Welcome back to class! Wow, yesterday we made some cool discoveries as we learned the parts of a tree and how those parts function.

We will be amazed today as we continue our discovery about trees and discover some useful products that come from our forests that you use every day! Knowing where these products come from will help you to make wise consumer decisions throughout your life and you will be even more amazed when you learn about all of the products you did not even know came from trees. So let's be focused and eager learners as we begin a mission to understand how trees are such an important resource that we need and use their products every day.



Lesson Number: MS.NR.5.2

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Summary of Content and Teaching Strategies

Objective 1. Describe forestry products.

Students are probably aware of many of the products that come from trees but there are many everyday items that contain wood products that they will be surprised to learn about in this lesson. Be aware that some of the products listed can be made from trees but they aren't always made in that manner. Before class, secure boxes or containers and fill them with items from the list on **MS.NR.5.2.AS.A** (list of forest products). Be sure you have at least one item for each pair of students and that these items equally represent the five sources for products from a tree. (1. wood products; 2. cellulose products; 3. sap products; 4. bark products, and 5. fruit/seed/leaves products). Or write the name of the product on a large sticky-note.

In addition, before class you should post flip chart pages titled with the above five sources around the room; also title one page with "Not from a tree" and provide a section cut from **MS.NR5.2.AS.B** (read aloud handout) to represent each source on the chart pages. At the end of the lesson students will discover that every item was from a tree but at this point many may not be sure!

I. Forestry products and their sources

- A. Wood products
- B. Cellulose products: cellulose is a complex carbohydrate that constitutes the chief part of the cell walls of higher plants and yields fiber for many products.
- C. Bark products
- D. Sap products
- E. Fruit, leaves, and seed products

Trees provide us with over 5,000 useful materials either from the wood itself or from the many wood byproducts. Some of these products are very familiar such as lumber to build homes or wood furniture, but other products are made from the bark, sap, fruit, leaves, seeds, and even the tree's **cellulose** (the tiny fibers making up the wood) and **lignin** (the chemical that binds the fibers together). As you look around the room, observe areas designated by flip chart paper for each. Keep them in mind as we continue on our mission to discover the products that forests provide for mankind.

When I say GO, take two minutes to read the directions on the board and write a response on one side of the note card. What questions are there? GO

Allow two minutes to complete this task. Call on several students to share some of the products they have listed on their card.

Thank you for sharing. Today we will learn how accurate your lists are! Now, when I say BLUE AND GOLD take another two minutes to turn your card over and create a list of how participating in the FFA could affect your own growth as a person. Questions? BLUE AND GOLD.

Allow two minutes to create this list.

Excellent! When I say SHARE use one minute to turn to a partner and tell them what you have on your list and how you believe this will allow you to experience personal growth then swap roles and allow your partner to share their list and why they believe this will cause them to grow as a person. What questions are there? SHARE

Allow time for partners to discuss what is on their lists.

Incredible! Thank you for sharing. Now turn to your partner and say, "Thanks for sharing!"

Great! Now, when called on, please share the item you have chosen and how participating in this FFA opportunity leads to personal growth.

Allow two minutes to have several volunteers share an item that can cause positive personal growth and why they believe that to be true. Have a scribe write these FFA opportunities/activities on the board. You could also use this as an opportunity to tell about upcoming FFA activities that the students could participate in.

Thank you for sharing all of those activities. Just talking about them makes me so excited about how much you will all accomplish this year in the FFA! Please consider this list of our FFA activities and challenge yourself to see what you would like to participate in to build your own skills and experience personal growth!



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When I say TREE, the two partner teams from our previous activity will have one minute to go to one of the containers on the front table and pick one item. Your team will decide which flip chart page title best describes the source of that item and proceed with your item to that area of the room. Wait there silently until all teams are located next to a titled page. What questions are there? TREE

Allow time for all teams to pick up an item and go to the titled chart page they believe represents the origin of that item.

Excellent! Everyone moved so efficiently. Now when I say BEGIN, a volunteer will read the activity sheets while the group silently listens. Listen carefully because you and your partner will use the information at each station later in this activity. When you are finished, you will wait silently for further directions. What questions do you have? BEGIN

Allow a student to volunteer to read and monitor the room to ensure that the students are listening as the reader reads the activity sheet.

Good job, readers; thanks to everyone for listening so intently! When I say ROTATE, every team will have two minutes to move in a clockwise direction to the next station. Carry your item with you and your group's reader will read the next handout as the rest of the group is silent and listens intently. What questions are there? ROTATE.

You will continue this process until the groups are back at their original location.

Wow, great way to gather information! Please turn to your group's reader and say, "Thanks for reading for us!" OK, we have a lot of new information and now you have to make a decision with your original partner. Take 30 seconds and decide with your partner if you still believe the item you are carrying should be categorized on the chart paper where you are located or have you changed your mind and now believe it comes from one of the other sources.

Allow students to discuss.

OK, if you have changed your mind, please move silently to the chart page that represents the source of your item.

Allow students to move.

Excellent! When you hear the word GO, put your item on the surface next to the chart page you have chosen and write the name of your item on the page with the marker. Leave your item and move quickly back to your seat. What questions are there? GO!

Allow students to move back to their seats and display **MS.NR.5.2.TM.A** (blank tree map).

Turn to your partner and say, "Great decision!"

Allow students to congratulate each other on completing the activity.

You have just learned about many of the different parts of a tree that become the products we use. Now is the time to discover exactly where your items should be classified. When I say TREE you will have one minute to copy the "Tree Map" transparency into your notebook. Questions? TREE.

Allow students time to draw the tree and create the organizer outline.

Wow, there are some good looking tree maps! Now let's get some information down to go with them. But before we write, let's see if our choices are accurate. Who will read the items we have listed on the chart page for Wood Products?

Allow a volunteer to read the list of items.

Does anyone see any items listed that they think should be classified somewhere else?

Allow students to respond, and if the class agrees it belongs in another category, cross it off, move the item, and write it on the page for its new category. If there is not complete agreement, leave the item where it was originally listed. Continue this process around the room until all categories and items have been discussed and categorized by the students.

Great work! Now that we have all of the items categorized, let's see how well we did!



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Move around the room reading the list for each category. Cross off any items that are incorrect on each sheet and add any items that should be there. Utilize MS.NR.5.2.AS. A. There should be no items listed under the category "Not from a tree."

Good work, class! You know some stuff about forestry products! Now let's write the correctly categorized lists onto your own tree organizer for your notes.

Allow students to capture the items on their tree organizer page. After all are finished, the Eyewitness News Moment will be used as a review allowing the students to describe some forest products and what part of a tree they originate from.

Review/Summary

The Eyewitness News e-Moment® is a great way for students to review. You will use the student pairs that have been working together during this class. They will take on the role of a newscaster and a person the newscaster is interviewing. Students create the mock newscast using the information covered in class today. Teams will present their newscasts to the class.

OK, today we have learned about many different forest products that we use in our everyday lives and what part of the tree they come from. When I say ACTION, take four minutes to reunite with your original partner and use that knowledge to create an Eyewitness News report. We will be presenting these newscasts to the class. What questions are there? ACTION

Allow students time to create their newscast. Choose several student pairs to present to the class.

Great job on those newscasts! Give yourselves a round of applause for working so hard. You have certainly completed your mission to learn about forest products today!

Application

Extended classroom activity:

Have students imagine life without forestry products. Have them journal a description of what items they would have to do without and how their life would change without those forest products.

FFA activity:

Tour a saw mill or a tree farm and discuss possible careers.

SAE activity:

Plant trees to start a Christmas Tree Farm entrepreneurship enterprise or seek employment with a local tree farm.

Evaluation

MS.NR.5.2.ASSESS.A

Answers to Evaluation

1. d
2. b
3. d
4. a
5. a



Name _____

Directions: Read each statement and choose the letter for the answer that best completes the statement.

1. _____ different products can be made from trees.
 - a. 200
 - b. 500
 - c. 1,000
 - d. 5,000
2. _____ is a complex carbohydrate that constitutes the chief part of the cell walls of higher plants and yields fiber for many products.
 - a. chlorophyll
 - b. cellulose
 - c. glucose
 - d. wood pulp
3. _____ is a part of the tree that produces edible products.
 - a. sap
 - b. bark
 - c. leaves
 - d. all choices a, b, and c
4. _____ does not contain materials that come from trees.
 - a. peanuts
 - b. Twinkies
 - c. cosmetics
 - d. paper
5. _____ % of a tree is not used for some type of product.
 - a. less than 10%
 - b. 50%
 - c. 75%
 - d. 90%



Forest Products

Wood Products

Baseball bat, pencil, ruler, lumber, plywood, some furniture, railroad tie, particle board, pallets, fuel, charcoal, some flooring

Cellulose Products

Paper products including writing paper, toilet paper, magazines, and books, rayon fabric, carpeting, Twinkies, multivitamins, shatterproof glass, some medications, dinner ware, electrical receptacles, toys, caster wheels, toilet seats, handles for cooking utensils, telephone housings, camera cases, washing-machine impellers, radio and TV cabinets and other appliance housings, photographic films, packaging films, glasses frames, molded packages, combs, brush and mirror backs, sponges, acetate filament yarns, sausage casings, cellophane, knobs and handles, luggage, gunstocks, fishing floats, toothbrushes, plastic pens, football helmets and hard hats, electrical tape, coatings, lampshades, thickening agent in shampoos, suntan lotion, imitation leather, fiber board, solid rocket propellants

Bark Products

Cinnamon, cork, mulches, soil conditioners, bedding for poultry and livestock, plywood adhesives, plastic fillers, lacquers, varnishes, molded products, oil-spill control agents, papermaking fibers, fatty acids, tannins, waxes, vitamins, and tall oil

Sap Products

Bandage strips, perfumes, candles, crayons, paint thinner, chewing gum, syrup, cosmetics, soaps, rubber products, shoe polish, printing ink, varnishes, cleaning fluids

Products from Fruit, Seeds, and Leaves

Oranges, apples, applesauce, bananas, mangoes, pine nuts, pecans, peaches, walnuts, bay leaves, nutmeg, cider, dyes



1. Wood Products

If you look around you will see lots of things made out of wood. Some of those items are very familiar and easy to see like doors, fences, and furniture. We began building houses out of wood due to its many positive construction properties, but did you know that for centuries people only used trees for lumber or firewood? However, as the process for making lumber developed, trees were cut down, branches were removed, and they were cut into logs to be hauled to the lumber mill. At the mill, the bark is stripped off and the logs are cut into lumber. Depending on what the wood will be made into (baseball bats, picture frames, furniture, building materials, etc.) determines how the tree is cut. At first, there was a huge amount of waste in the forms of bark, wood scraps, and sawdust. All of that waste had to be hauled away or burned creating some serious environmental problems. How scientists dealt with this problem began an adventure into what a tree is made of and the tremendous potential it held under its bark!

2. Cellulose Products

Cellulose is the material that makes up the walls of all plant cells including tree cells. Cellulose is the number one component in wood. It is a very complex compound that can be separated, mixed with certain chemicals and used to create cellulose products and other useful materials. Cellulose from wood is very important in the production of paper. Paper mills use cellulose from three sources: recycled paper, wood chips, and sawdust leftover from making lumber and raw logs. Cellulose is also used in the production of many other useful materials. In fact, when scientists alter the cellulose molecule, plastics can be made that can be spun into fabrics or molded to fit almost any size space. And the same cellulose that could become a plastic toy could also be manufactured to be mighty tasty when it is used as a food thickener in snack food (Twinkies!), milk shakes, ice cream, cake frosting, and pancake syrup! Cellulose is also an important ingredient in such non-edible products as eyeglass frames, shatterproof glass, shampoo thickeners, steering wheels, traffic signs, hairbrush handles, cellophane, toothbrushes, football helmets, explosives, and photographic film!

3. Bark Products

The bark of the tree also gives us some very valuable products. From 13 to 21 percent of a cord of wood may be bark. Much of it is used as fuel to generate energy for forest

industry mills. Some types of bark are used for bottle corks. Other types of trees produce bark used for the inner cores of baseballs. Bark was actually used in the 1700s by Native Americans to produce quinine which is a drug used to prevent and cure malaria. Bark is also a source of papermaking fibers and chemicals such as resins, fatty acids, tannins (used to process leather), waxes, vitamins, and tall oil. Large amounts of bark are used as mulches, soil conditioners and bedding for poultry and livestock. Other uses of bark include plywood adhesives, plastic fillers, lacquers and varnishes, molded products, and oil-spill control agents. The bark for some trees is also used to make medicines.



4. Sap Products (Resins and Gums)

Some trees produce saps and resins. In nature, resin is the goop that forms a protective coating around a plant wound. It creates a hard coating that microorganisms and insects can't penetrate. People gather the resin of pine trees and use it in many ways. We've even classified resin into three categories: hard resins, oleoresins, and gum resins. Rosin is the most important of the hard resins. It is used in paint, varnishes, and in soap making. Rosin also is used to make the bows of stringed instruments sticky so they produce more beautiful music. Rosin is used by bull riders to give them a better grip on their bull rope, and it is used by ballplayers to give them a better grip on balls and bats. Turpentine is the most widely used oleoresin. It is a solvent (meaning that it dissolves other substances) and it is used in paint, varnish, waterproofing, and shoe polish. Saps and resins are also found in chewing gum, medicines, and many other products. Maple trees give us a sap that we turn into maple syrup.

5. Products from Fruit, Seeds, and Leaves

Are you hungry? Trees provide us with many edible products. Fruits such as apples, peaches, pears, oranges, persimmons, mulberries, elderberries, crab apples, bananas, lemons, and olives come from trees. Trees also provide edible nuts such as pecans, black walnuts, hickory nuts, butternuts, beechnuts, pinion nuts, and coconuts. In addition, trees provide spices and flavorings such as allspice, nutmeg, wintergreen, sassafras tea, and sarsaparilla (root beer flavor). Wouldn't a good ole root beer be good right now? But don't forget about the leaves of some trees. They also provide ingredients for medicines and many other products.

6. Not a Tree Product

It is hard if not impossible to find some part of a tree that is not turned in to a usable product in some way! You may possibly find it hard to imagine that your item is not produced from some part of a tree. Remember, more than 5,000 types of products have a forest product as part of its components. What product a tree is used for depends on what type of tree it is. Hardwoods, such as oak trees, are used for high quality furniture while softwoods, such as pine trees, are used for papermaking. Look around you. Tree products are everywhere! Have you eaten any wood today? You may have! And you probably brushed your teeth with it. Chances are you even dressed with wood. Skeptical? Don't be. How can so many different products come from trees? It's because of the tree's structure. Trees are made up of cellulose fibers that are held together with a glue-like substance called lignin. This makes the tree strong enough to use for building houses and furniture. When wood is cooked, the cellulose is separated from the lignin to make wood pulp. This pulp is made into paper. The lignin can be used to make different chemicals that go into products like cosmetics, medicines, and some foods. Since so many products are made from wood and wood fiber, the average American uses the equivalent of a 100-foot tree every year!

