



# Lesson 3

## Nature's Treasure Chest

### Objectives:

1. To understand and appreciate the variety of forest products that we all use in our everyday lives.
2. To appreciate wood as one of earth's renewable, recyclable, and biodegradable resources.
3. To learn how paper is made.

### Subjects:

1. Consumer Awareness
2. Science
3. Reading / Language



### Vocabulary:

1. **Natural Resource:** material we use from our environment for housing, clothing, food energy, etc. Natural resources can be classified as renewable or non-renewable.
2. **Renewable Resource:** has the capability of replenishing itself in a human lifetime. For example, if a tree is harvested, it will regenerate from a seed that was dropped from a cone or planted by a human.
3. **Non-Renewable Resource:** exists in a limited amount that takes thousands of years to replenish. Examples are fossil fuels like coal, oil and natural gas.



### Focus:

1. Establish the concept of the word "paper" by identifying the Latin word "papyrus" named after the Egyptian reed from which paper was first made. Ask the students if they can guess how paper is made today. Ask them to think of some of the things they know are made from wood. Make a list of their answers on the board.
2. Establish the value and variety of forest products by having the students read the story **Nature's Treasure Chest**. After they have finished reading it, have the students circle or highlight all the wood products that they can find in the story. Review with the class the answers and explanations of the many surprising products derived from wood.



Did you know that each year, each Californian uses the equivalent in wood products of a 100 foot tall tree, 16 inches in diameter? California foresters follow strict laws that ensure we do not harvest more trees than we grow. This is called **sustainable forestry**. We actually plant an average of 5 to 7 trees for every one harvested.

4. **Recyclable:** being able to be utilized again, often by being restructured into something else.
5. **Biodegradable:** being able to be broken down or decomposed by natural means.
6. **Cells:** the basic building blocks of living things.
7. **Cellulose:** the material that makes up plant cell walls.
8. **Fiber:** thin threads that bind together to form animal and plant matter.
9. **Lignin:** the sticky substance that binds plant cells together.
10. **Pulp:** the mash that forms when wood chips are cooked.

## VOCABULARY

# Enrichment Activity:

1. Make recycled paper as a class project. Instructions are included below. The students may take home the instruction sheet and work the project at home with their families.
2. Make a greeting card out of recycled paper. Students can draw designs on their finished paper. Use a glue pen to write a message or design a border and then sprinkle with glitter. Punch a hole in the corner and run curly ribbon through it to form a gift tag, if preferred.

**ASK STUDENTS:** Is paper made from a renewable or non-renewable resource? Explain your reasoning.  
\*Recycling or reusing resources decreases waste in landfills and decreases the demand for that resource.

## Making Recycled Paper...

### ~Ingredients~

- Large square pan, about 3 inches deep
- 3 cups of water
- A whole section of newspaper
- A rolling pin, or a liter glass beverage bottle, or...
- a plastic pipe, tube, or any cylinder to roll with.

### STEP 1

Tear 1-2 pages of newspaper into small pieces of 1 inch or less.

### STEP 2

Put the paper chips into a large bowl and add all the water to it. Keep adding paper, tearing it and squeezing it, until the mixture looks like thick oatmeal.

### STEP 3

With the pan turned UPSIDE DOWN, place about 1 cup of the blended pulp over the bottom of the pan. Spread it with your fingers evenly across the entire area.

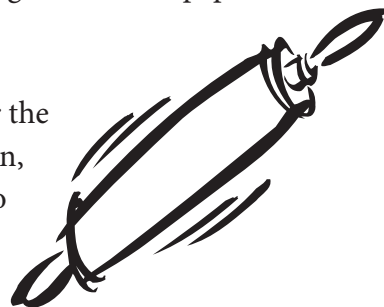


### STEP 4

Lay several sheets of newspaper over the pulp, then carefully turn the pan over. Remove the pan. Your pulp "square" is now sitting on the newspaper.

### STEP 5

Close the newspaper over the pulp. Using the rolling pin, roll over the newspaper to blot out the extra water.



### STEP 6

Uncover and let the new "paper" dry COMPLETELY. When it is thoroughly dry, peel your new "recycled paper" away from the newspaper.

**It can now be cut to any size and used to make a variety of things!**



# Nature's Treasure Chest



Name \_\_\_\_\_

Read the story below then circle the items in it that you think are made from a tree. When you finish, check your answers with the key that starts on the next page.

"Hurry, Randy, or you'll be late for school," Mrs. Carter called out from the kitchen.

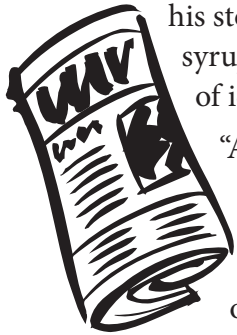
Randy's hand slid over the smooth handrail as he raced down the stairs. He skipped the last three steps and landed with a thud.

"Coming, Mom," he mumbled through the thick sweatshirt that he put on over his new rayon shirt. He walked down the corridor, his shoelaces tapping on the shiny wood floor.



"What's for breakfast? I'm starved," he said. Randy slid across the bench to his place next to his father's chair at the head of the table. The smell of vanilla coming from the stack of steaming pancakes made his mouth water. The

aroma of the spicy sausage on his plate made his stomach grumble. "Pass me the maple syrup, please." Randy reached for the carton of icy cold milk.



"And good morning to you, too," Mr. Carter said, folding the newspaper and setting it down beside him. "Did you finish that report you were working on last night? I've got two tickets to the basketball game this evening and lots

of film in the camera. I'd hate to go by myself."

"No problem, Dad. It's done." Randy drank the last drop of milk then wiped his mouth with his napkin and slid off the bench. "See you tonight."



Mrs. Carter opened the cabinet door and pulled out a box of apple juice and a box of chocolate chip cookies. She added them to the cellophane wrapped sandwich and orange already in the brown lunch sack.



"Brush your teeth before

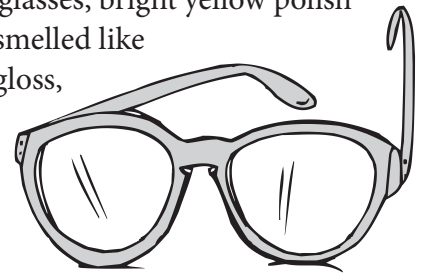
you leave, Randy," she said.

"No time. Besides, I can't find my toothbrush, and I'm out of toothpaste," Randy answered. He picked up his books and pencils, his football helmet, and his lunch sack then headed for the front door. "Bye, Mom."



As Randy closed the door, he saw the school bus round the corner, its shiny, black tires gleaming in the morning sun. He hopped over his mom's planter boxes and ran across the lawn. Down the street he raced—past four houses, three picket fences, two signs, and a telephone pole. He reached the corner just as the bus came to a halt in front of the bus-stop bench. All of his friends were already lined up to get on.

Beth Parker, the funniest girl in his class, was the last in line. Beth wore lavender glasses, bright yellow polish on her nails, and always smelled like hairspray, strawberry lipgloss, and peppermint candy. She turned around and smiled at Randy.



"You were lucky today," Beth said.

"That wasn't luck. That was perfect timing."

"Well, someday you're not going to make it to the bus in time," she said.

"Never," he answered, as he stuck a piece of gum in his mouth. Randy climbed the steps, then walked along the black rubber matting to the wide seat at the back of the bus.

The doors closed with a hiss as the bus rumbled down Hudson Street.

~ The End ~

# Nature's Treasure Chest

"Hurry, Randy, or you'll be late for school," Mrs. Carter called out from the kitchen.

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# Nature's Treasure Chest

Many people know that furniture, lumber for building houses, paper, and books are wood products. But did you know that over 5,000 different products come from trees? Some of them are pretty surprising. Through the magic of modern science, man has learned how to take the fiber from trees and create wonderful items that make our everyday lives better and more enjoyable. How do they do it?

A tree is like any other plant, only bigger. It is built of plant **CELLS** made of **CELLULOSE** that are held together by **LIGNIN**. The lignin acts as a type of glue holding all the cells together in bundles of fibers. If the wood is cut into chips and then cooked into **PULP**, the lignin dissolves. The cellulose can now be separated out and cooked again. Soon it is a stew of fibers and a liquid called **CELLULOSE ACETATE**.

Some wood products come directly from the tree. Some come from the cellulose pulp, the lignin, or the cellulose acetate. Many medicines, clothing, foods, cosmetics, paints, even some “plastics” are wood products. So the next time you use a bowling ball, put on your new rayon dress, rinse with mouthwash, eat a cookie, or play your drums—**THANK A TREE**—and thank California’s foresters who keep our forests healthy and growing for all of us to enjoy.

Below are the items made from trees that were included in the story you read about Randy. How many of them did you find? If you got them all, you are...

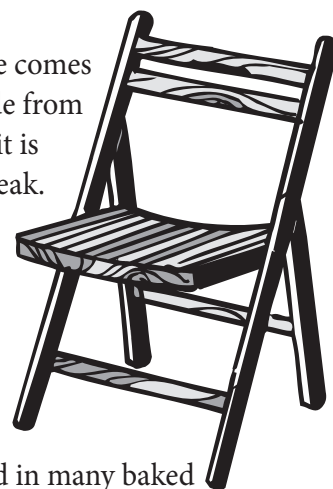
## ***TREE-RRRR-FIC!***

### **HANDRAIL, STAIRS, STEPS, FLOOR, DOOR, CUPBOARDS:**

Many homes have stair parts and floors made of oak, pine, or fir because these woods are sturdy and attractive. Do you have a staircase in your home? What kind of wood was used to make it? Sometimes maple is used for a highly polished wood floor. Doors are most often made of pine and fir, but sometimes they are made of oak or even redwood. Many kitchen cabinets are made of pine or oak. Some are made of cherry. Make a tour of your house. Do you have a wood floor, or does carpet cover it? What kind of front door do you have? Are your cupboards wood? Are they painted or are they natural colored?

**RAYON:** This fabric is very popular because it is light and comfortable and can be made into clothes used for fancy occasions or clothes made for fun. Rayon is produced from cellulose acetate. Check the closets and drawers in your house. How many things do you and your family use that are made from rayon?

**BENCH, CHAIR, TABLE:** Furniture comes in all shapes and sizes and is made from many different materials. Today, it is often made from pine, oak, and teak. Makers of fine wood furniture like using walnut, cherry, and mahogany. These woods do not splinter easily and look beautiful when they are sanded smooth and polished.



**VANILLA:** Artificial vanilla is used in many baked goods that are found in the stores or are baked at home and is sometimes called vanillin. It is made from lignin. Lignin is used in some baby foods, pet foods, and deodorants to help hold the ingredients of these products together. Some medicines that help with high blood pressure and Parkinson’s disease also come from lignin.

**PANCAKES, COOKIES:** Baked goods sometimes contain an ingredient called torula yeast. It comes from the wood sugars that are produced when pulp is made. Torula contains lots of protein. It has five times more iron in it than Popeye’s spinach or good old California raisins. Torula yeast is also found in baby foods, cereals, imitation bacon, beverages, and many diet foods. Torula even seems to make bees and lobsters grow faster! What products in your kitchen have torula yeast or artificial vanilla in them?



**SAUSAGES:** No, meat inside the sausage is not made from wood! But the casings that hold the meat in links usually are cellulose, a wood product. Cellulose is tasteless and comes in several varieties. Sausage casings are made from ethyl cellulose. So are hard hats, combs, brushes, luggage, and fishing floats.

CONTINUED ON REVERSE SIDE

**MAPLE SYRUP:** The ingredient that soaks into our hot pancakes and shines on top of our puddings is the forest product we call maple syrup. It is the sap that flows through the cells of the sugar maple tree. This wonderful treat is tapped from the tree in early spring when the sap begins to move through the tree again after a winter rest.



**CARTON, NEWSPAPER, REPORT, TICKETS, NAPKIN, BOX, BOOKS, SACK:**

Ordinary paper is most often made from softwoods such as pine and fir. In paper mills, wood chips are cooked in order

to break down and soften the fibers. Next,

they are washed clean and put into a beater. Beating makes the fibers fluffy so that they will hold together better. The mixture is now called wood pulp. At this point, dyes are often added to the pulp to give it color. Then it is spread out very thinly on a wide, wire screen. The pulp moves along a conveyor belt where most of the water drains out through the mesh. The rest is squeezed out by a series of rollers. As the fibers dry, they bind themselves together and become paper. Many paper products that are manufactured today are made from recycled paper. What does recycled mean? The next time you buy greeting cards, toilet paper, paper towels, facial tissues, cereal and other grocery boxes, check to see if they are made from recycled paper. What is printed on your paper grocery store bags? Does it show how much of the paper used to produce these bags is recycled? Making recycled paper is easy and fun. A recipe for making it is included in this lesson.

**APPLE JUICE, ORANGES:** Most of the fruit we eat comes from a tree. We squeeze fruits into juice, cook them to make jams, jellies, and syrups, use them to help flavor other foods such as pies, and eat them fresh. What is your favorite way to enjoy fruit? What job does the fruit do for the tree? Here is a hint: What do we find hidden inside the fruit?

**FOOTBALL HELMETS:** Though they don't look like it, plastics are sometimes made by using wood. Wood flour is mixed together with other ingredients to form the plastic parts to many household appliances, like coffee makers, and sports equipment, like hockey helmets and baseball hard hats. Scientists believe that using wood fiber strengthens the plastic.

**TIRES, RUBBER MATS:** Rubber trees originally came from South America, but now large rubber tree plantations are also found in the tropical areas of Africa and Asia. Workers make a cut



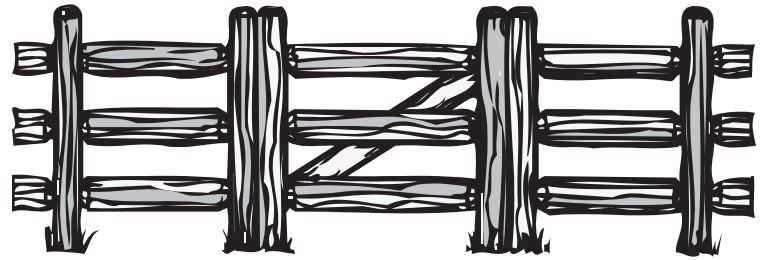
into the bark of the tree and set a cup beneath it to catch the sap called latex. The latex is then made into rubber. What other items can you think of that are made from latex rubber? Can you think of another wood product that comes from tapping into the bark of the tree to catch its sap?

**PHOTOGRAPHIC FILM, CELLOPHANE, TOOTHBRUSH,**

**EYEGLASSES:** These everyday items are made from cellulose. VCR tapes, sponges, and cellophane tape are also made from cellulose. Look at the knives and tools in your kitchen and workshop. Many of the handles are made from regular wood or from the wood product, cellulose.

**NAIL POLISH, HAIRSPRAY, LIPSTICK, PEPPERMINT**

**CANDY, GUM:** The cosmetic and food industries make use of wood oils to give their products scent and flavor. Sandlewood is used in many perfumes and incense sticks. Eucalyptus is the smell we recognize in ointments, cough drops and syrups. Chewing gum uses both of these oils for fragrance along with chicle, an ingredient that is found in the forests of Central America. The drops of chicle that ooze out of the tree are what we find so much fun to chew!



**PLANTER BOXES, HOUSES, FENCES, SIGNS, TELEPHONE POLES, BUS STOP BENCHES:**

The strong smelling oils in the wood are what makes redwood and cedar ideal for outdoor furniture, decks, planter boxes, and fences. These oils help protect redwood and cedar products from insects and also from damage by the rain, sun, and wet soil. Carpenters love to build with redwood and cedar because they have no knots in them. Their grain is straight and smooth. Some houses are made entirely out of wood. In other houses, the framework, the outside covering, and the shingles on the roof are made of wood. Douglas fir, white fir, and ponderosa pine are most often used to build houses. Douglas fir is also used to make telephone poles and bus-stop benches, while ponderosa pine is used to make most wood signs. Does your house have wood siding? Do you have shutters on your windows or decks around your house? Is there a gazebo or a birdhouse in your backyard? Does one of your neighbors have a wooden mailbox or a "FOR SALE" sign in his front yard? Take a walk in your neighborhood. How many things do you see made from a tree?