

Products from Trees

*Educational Programs for
Youth and Educators*



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Objectives

- Inspire interest and fascination in forest products
- Teach that forest products are produced from a renewable resource
- Recruit students
- Provide teachers with reference material - products **and how they are made**



Programs & Publications

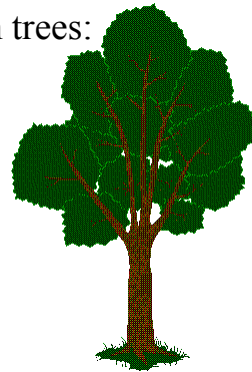
- K-4
 - “All these things come from trees”
 - PLT
- 5-8
 - How trees grow/ products
 - PLT
- High School
 - How trees grow/ Intro to wood anatomy and structure
- New publication!
 - *What’s a tree done for you lately?*



What’s a tree done for you lately?

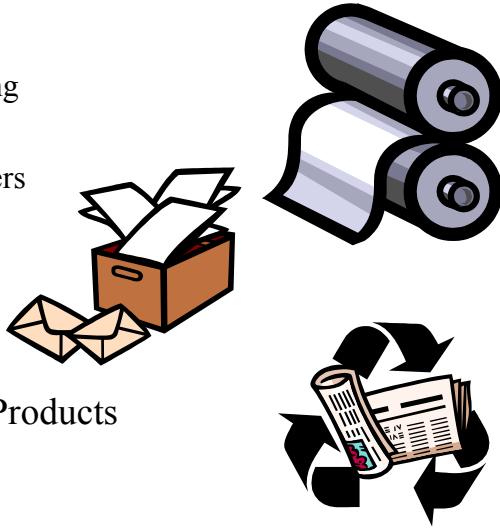
Some common forest products and how they are made

- New publication available from OSU Extension Service
- Discusses numerous products from trees:
 - Fiber products
 - Chemical products
 - Products from fruits and nuts
 - Products from bark
 - Solid wood products
 - Composite wood products



Fiber Products

- Paper
 - general papermaking
 - newspaper
 - corrugated containers
 - notebook paper
 - tissue
 - magazine paper
 - recycling
- Purified Cellulose Products
 - rayon
 - cellophane
 - others



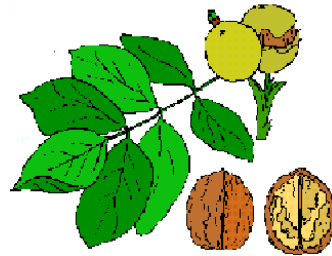
“Chemical” Products

- **Products from resin**
 - additive for citrus-flavored beverages
 - soap
 - turpentine
 - sweetener in toothpaste
 - food additive to fight heart disease
- **Chewing gum**
- **Maple syrup**
- **Natural rubber**
- **Charcoal**
- **Flavoring & food additives**
 - gum arabic
 - cola flavoring
 - root beer flavoring
 - artificial vanilla flavoring
- **Fragrances**
 - camphor
 - cedarwood
 - eucalyptus
 - sandalwood



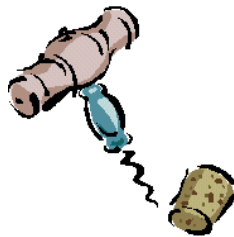
Products from Fruits and Nuts

- Spices
 - allspice
 - bay leaves
 - cinnamon
 - cloves
 - nutmeg
- Edible fruits & nuts
- Chocolate



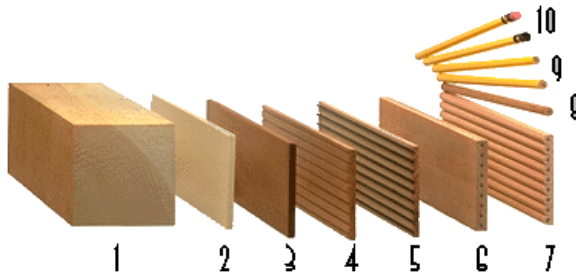
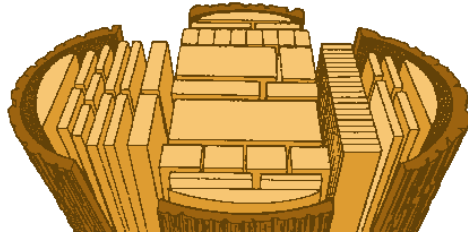
Products from Bark

- Cork
- Mulch



Solid Wood Products

- Lumber
- Pencils

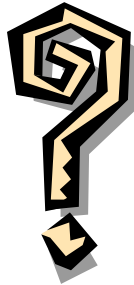


Composite Wood Products

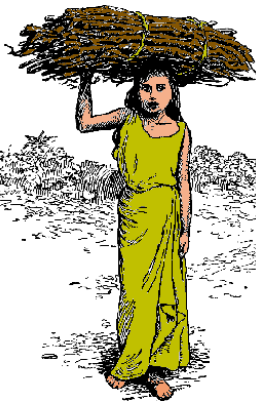
- Plywood
- Oriented Strand Board (OSB)
- Particleboard



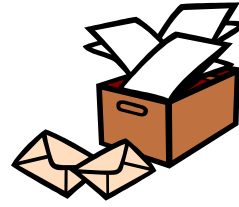
What is the
Number One Volume Use for
Wood Fiber in the World?



Firewood/ Fuel



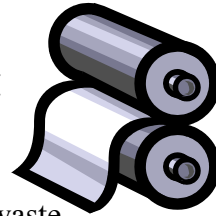
Example: Paper



- Products:
 - books
 - magazines
 - newspapers
 - notebook and computer paper
 - boxes
 - grocery bags
 - egg and milk cartons
 - tissue and toilet paper
- Stats
 - Each year in the U.S., paper is used to:
 - produce 2 billion books
 - 350 million magazines
 - 24 billion newspapers
 - Recycling:
 - ~45% in the U.S.



Papermaking - Basic steps:



- Raw material - cellulose
 - chips
 - logs
 - recycled paper products
 - textile waste
 - plant materials (bamboo, straw, flax, kenaf, bagasse)
- Pulping - separating wood fibers
 - mechanical
 - chemical
- Bleaching
- Forming - turning pulp into paper
 - remove the water

Making specific types of paper:

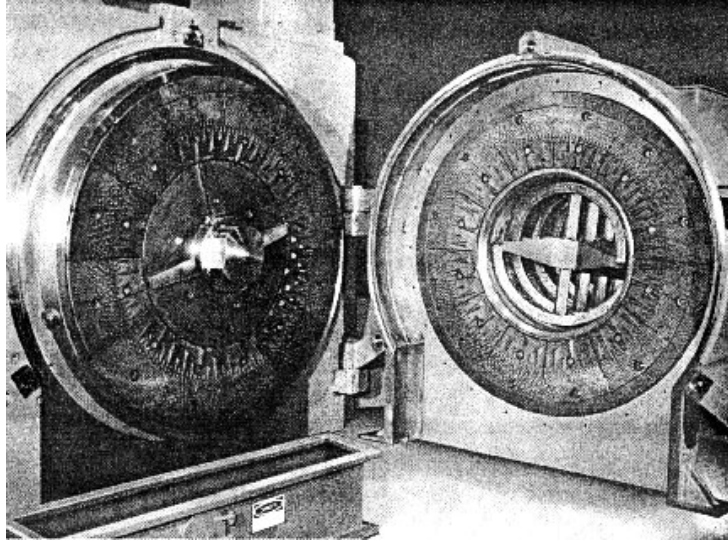
- Basic differences include:
 - raw material (logs vs. chips, species)
 - pulping method
 - bleached or unbleached
 - post-processing
 - additives

Newspaper:

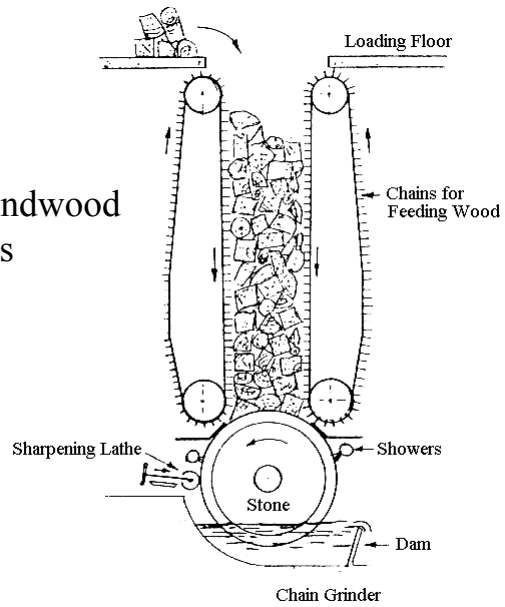
- Common processes:
 - thermo-mechanical (TMP)
 - steam & pressure
 - refine
 - stonegroundwood (SGW)
 - grind logs against stone



Disk refiner

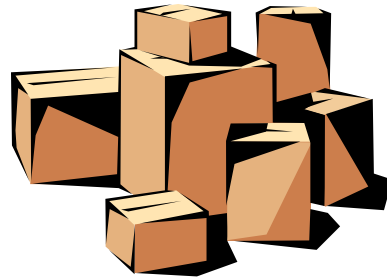


The stonegroundwood process



Corrugated containers (a.k.a. “cardboard”)

- 3-layer product
 - top and bottom = linerboard
 - middle layer = corrugating medium
- Chemical pulping



Notebook paper:

- Process similar to linerboard except pulp is bleached



Tissue

- Made soft by crimping back and forth before winding onto drum
- Recycled content ~60%



Magazine paper

- Mineral fillers (e.g., clay) added to pulp to improve printability and texture, increase opacity, and decrease absorbency



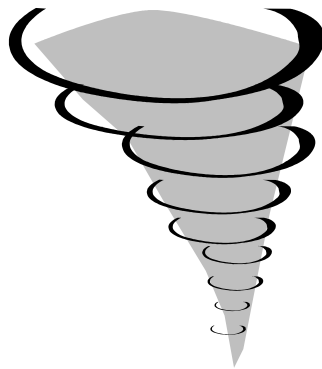
Recycling:



- UNCED estimates recycled fiber accounts for ~20% of global wood fiber consumption
- Primary sources (~80%)
 - corrugated boxes
 - newspapers
 - office papers
- Uses
 - **Non de-inked:** roofing paper, corrugated containers, cereal and shoe boxes, drywall liner
 - **De-inked:** newsprint, tissues, other “bright” papers

Recycling - The Process:

- Re-pulp
- Contaminant removal
 - “ragger”
 - screening
 - cleaning
- Forming



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