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.

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**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