

FORESTS

TREES & WOOD

Study Guide

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INTRODUCTION

Our children have a strong desire to learn about forests and trees. This is not surprising since forest resources touch our lives everyday. Many resource workers choose their careers to be close to nature. They use a combination of natural examples and scientific techniques to provide the wood products we all need.

Learning about natural resource management is the first step in learning to respect nature's importance. This study guide has been prepared by Red Tail Publishing as a companion tool for FORESTS, TREES & WOOD. The parent or teacher may wish to adapt the material in this guide to suit the learning level of the children.

STUDY IDEAS

- ◆ Invite a forester to your class. Many resource educational organizations have forester contacts who are willing to come into a class or provide other educational services. Contact the resource organization on page 6.
- ◆ Identify native trees in your area. What kind of uses do these trees have? What kind of products do they provide?
- ◆ After research on tree uses, students may want to plant a tree. Make a sign with the name of the tree, date planted, its product uses, wildlife uses and how it enriches our lives. Don't forget to take a group picture.
- ◆ Do a study center on photosynthesis.
- ◆ Have students search their home for wood items. The list on pages 3 and 4 may be helpful. They may wish to write or tell about unusual or interesting items they found.
- ◆ Make recycled paper. Recipe is on page 2.
- ◆ Contact resource organization listed on page 6 for more resource education material.
- ◆ Use your imagination, this study guide, and questions from children to do other projects.

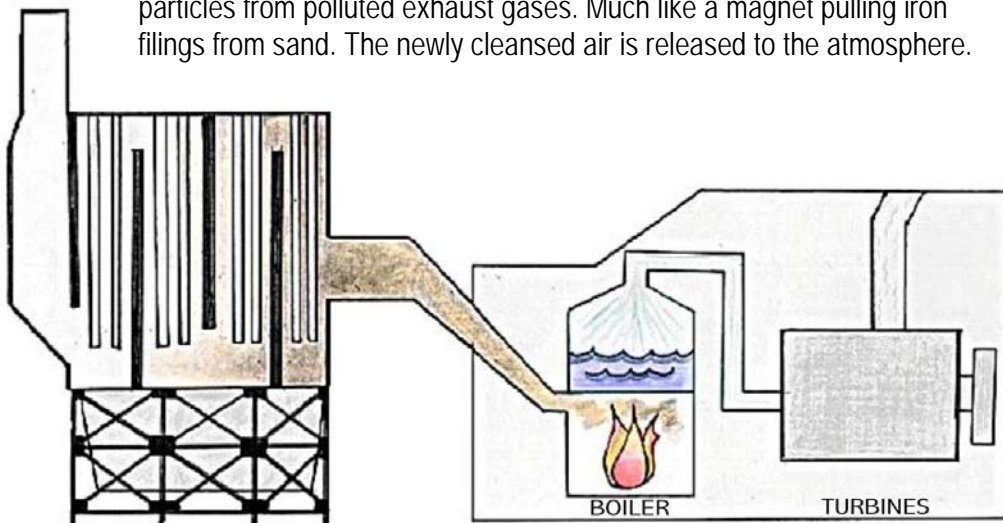
COGENERATION

BOILER

Wood scraps, chips and sawdust are burned in the boiler where water is super heated to a high-temperature, high-pressure steam. Exhaust from burning fuel goes to the ESP for cleaning. The steam goes to the turbines.

ELECTROSTATIC PRECIPITATOR (ESP)

In the ESP polluted smoke from the boiler weaves its way through a maze of positive charged electrode surfaces. These electromagnets pull ionized particles from polluted exhaust gases. Much like a magnet pulling iron filings from sand. The newly cleansed air is released to the atmosphere.



ELECTROSTATIC PRECIPITATOR ESP

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TURBINES

Steam turns turbines to generate power. More than enough electricity is made to run the industrial facility. Extra electricity may be sold to power companies for community use.

HEAT

Exhausted steam from the turbines provides a heating source. This leftover heat is transferred directly to the industrial heating system. Sawmills may use this moist heat to slowly dry lumber so that the wood doesn't crack.

RECYCLED PAPER

This recipe will yield a 100% recycled paper product. Consistency will vary with technique. Experimentation is recommended. Small groups are best. This project can be very messy.

MATERIAL:

- PAPER STOCK: newspaper, egg cartons, paper bags, etc.
- WATER - DISH PAN - OLD BLENDER - FRAME: inside size equal to paper size.
- SCREEN: tighter than window screen, should be slightly larger than the outside frame size.
- FELT: two pieces for each piece of paper planned at a time.
- ROLLING PIN - IRON - NEWSPRINT: for ironing step.
- SHALLOW PAN OR TRAY- GELATIN: for sizing the finished paper.

1

Tear paper stock into small strips or pieces. Place in warm water; soak over night. Use a dishpan for this and other steps. Do not use the sink because it will clog.

2

Place pulp mixture in OLD blender. Pulp is hard on the motor. Add small amounts of warm water as needed. Blend until relatively smooth. Place blended pulp in dishpan. NOT in the sink. Add warm water and stir until soupy.

3

Place the screen under frame. Submerge frame and screen in pulp mixture. Raise frame and screen allowing water to drain. Remove frame. Paper mass will remain on screen. To personalize their paper, students may add thread, glitter, leaves, etc.

4

Lay screen and paper between two felt sheets. Place on a hard, flat surface. Roll out excess water with rolling pin. This is a messy step and should be done in an area that is easy to cleanup.

5

Protect surface with extra newsprint. Keep felt in place, put screen and paper on ironing surface. Press hot iron. Remove screen after a few passes. Iron paper between felt until desired smoothness. Paper may also air dry.

6

Sizing keeps the paper from being too porous. Dissolve a teaspoon (+ or -) of gelatin in one cup of boiling water. Use a shallow 2" tray or pan with 1" of water in it. Add boiled solution to water in tray. Dip 1 sheet at a time. Handle carefully when wet. Let paper dry.

IT'S READY!

TREE PRODUCTS

"A forest gives us many things."

How has a forest touched your life today? You may be surprised. The obvious being paper, lumber, and furniture; all are tangible things we directly associate with the wood of a tree. The following list is of some less obvious tree items. Some you will recognize as everyday items. As you can see,

"People try to use all parts of a log."

CELLULOSE FIBER FILLER is the principal component of wood flour and melamine resins. It is used primarily in plastics for bonding and added strength.

appliance casings	impact resistant additives	plastics for toys
ball point pen tubes	insulation	sanding sealers
buttons	irrigation piping	skull reconstruction plates
counter tops	molded simulated wood	sound proofing material
domino tiles	molded luggage	street lamp shades
eye glass frames	packaging	thermoplastic molding
eye glass lenses	plastic tool handles	urethane
floor tiles	plastic twine	

CHEMICAL CELLULOSES such as **ETHYL CELLULOSE** is used to create a variety of products from acetate to straws.

acetate	photographic film	sandwich bags
carbon paper	photographic paper	sausage casings
laminating adhesives	pressure sensitive adhesives	straws
mylar	rayon	
packaging	rayon cording for tires	

NITRO CELLULOSE, another chemical based cellulose, is used in explosives and solid rocket propellants.

TREE PRODUCTS, *continued*

ETHYL ALCOHOL and TORULA YEAST come from wood sugars. Torula yeast is a high protein nutritional supplement found in some human and animal foods.

baby food	cereals	fish supplements
cattle supplements	chicken supplements	pet foods

LIGNOSULFONATES come directly from the pulping process. These spent pulping liquids are used in many products.

adhesives	dust abatement	medicines for
ammonia	emulsifiers	high blood pressure
binders for ores, charcoal, & animal feed	fertilizer	& Parkinson's disease
cement	gummed tape	printing inks
ceramics	improved concrete	rubber products
cleaning compounds	insecticides	soaps
cosmetics	latex products	soil conditioners
drilling fluids	lead storage batteries	soil erosion controllers
	leather tanning agents	vanillin
		water treatment agents

Wood EXTRACTIVES and RESINOUS materials provide ingredients for the following products. Some in this category are recovered during the pulping process.

aromas	fragrances	soaps
bacterial agents	fungicides	solder fluxes
chewing gum	household cleaners	solvents
citrus oils	lacquers	spice oils
cutting oils	lime scents	spirit varnishes
deodorizers	odorants	tempering oils
detergents	oil varnishes	toothpaste
disinfectants	paint	turpentine
driveway cleaners	paint removers	varnishes
enamels	preservatives	wood preservatives
essences	sanding sealers	
floor polishes	shampoo	

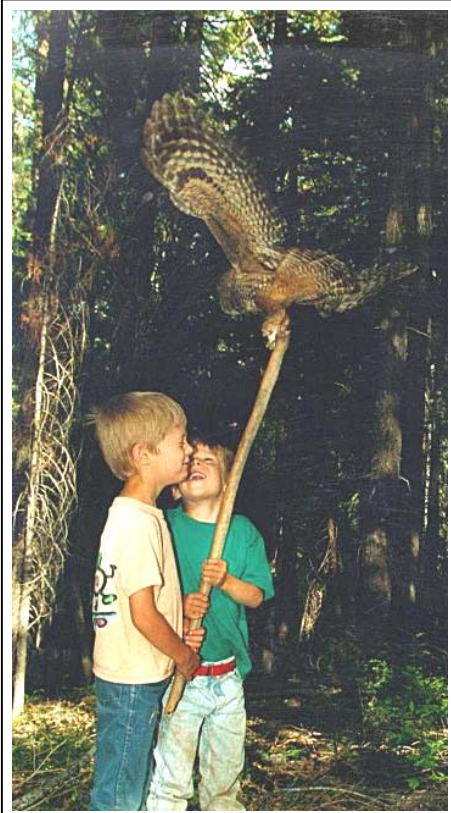


Photo by Mary Livingston

HABITATS

An introduction to a child's own habitat will help make the transition to habitats of others. Children may discuss where they live, learn, and play.

Do the children know that the wood in their homes makes the forest a direct part of their own habitat? In what other ways are the forest and its products part of their habitat? Pictures and related sentences may be helpful.

Once they have the concept of their own habitat move onto wildlife habitats. How is the forest important to wildlife? Encyclopedias and other resource books will be helpful. The resource organization on page 6 may be able to name a wildlife biologist that is willing to answer questions.

You may wish to have children do a comparison of their habitat and that of a favorite animal.

These students, ages 5 and 6, were studying a spotted owl pair in an area of young trees managed for wood products. They offered a mouse on a stick to the mother spotted owl. She took the mouse to her fledglings. They learned ways to protect habitat while harvesting trees.

WILDLIFE

Wildlife is one of the natural resources in a forest. Knowing about the animals of a forest is important to the forest plan. Forests that are managed have the capability to work for all types of animals. It is the responsibility of the resource professionals to know about the animals native to their area. A wildlife survey is done before a plan is made to care for the forest. This survey is a part of a forester's job and may involve a wildlife biologist.

The following questions may be answered during a wildlife survey.

- What kind of wildlife is found here?
- What kind of habitat does that wildlife like?
- What kind of food do the animals like?
- How will animals respond to a change in the habitat?
- Do all animals have the same needs?
- Are the animals too crowded in this one area?
- Could this area support more animals?
- Are the animals endangered or threatened?
- What can we do to improve the existing habitat?
- Is this area more sensitive during the breeding season?

Some things that may be done in a managed forest to improve wildlife habitat.

- Prevent wild fires.
- Leave old snags for bird nests and other critter homes.
- Thin areas that are too crowded for animals.
- Use controlled burning techniques.
- Create openings to provide food and corridors.
- Plant new trees.
- Restore meadows and other areas.
- Restrict certain activities in critical areas.
- Restrict activities during critical breeding seasons.
- Encourage responsible recreation by forest visitors.

GLOSSARY of terms as used in FORESTS, TREES & WOOD and this study guide.

archeological - Relating to the study of people and their culture of long ago. An archeological site may be as recent as a railroad grade for hauling logs or as ancient as an early Native American settlement.

cogeneration - The use of a fuel to produce heat and electricity in the same process. See diagram on cogeneration in this study guide.

decks - Stacks of stored logs. Due to geographical and climatic conditions many timbered areas harvest during the warm season. By storing logs mills are able to operate all year.

erosion - Official term for soil washing away. A forest plan must include erosion prevention measures,

forester - A trained professional in charge of the general health of the forest. A forester's responsibilities may include (but aren't limited to) tree growing and planting, animal habitat protection and improvement, soil protection, fire protection, land use management, water protection, and timber harvesting.

forest plan - A plan relating to the general health and welfare of a forest as it pertains to the management of forest resources.

habitat - A place or type of place where an animal or plant grows. People have habitats too, can students describe their own habitat?

harvest - To gather a crop. As used in FORESTS, TREES & WOOD, harvesting trees for wood products.

hoedad - A special tool used to separate the soil for planting seedlings. See pages on planting new trees in FORESTS, TREES & WOOD for an illustration of a hoedad.

landing - A cleared place near the harvest site where logs are gathered prior to loading.

loader - A specially designed piece of equipment for lifting logs. Loaders come in a variety of styles, of which three are shown in the book.

logger - People working in the forest to harvest timber for producing wood products. Sometimes called a lumberjack.

manufacture - To produce something from raw materials according to a plan.

nutrient - A substance which promotes growth.

prescription burn - A technique using controlled fire to clear debris from the forest floor. This forest practice comes from nature. Native Americans practiced this type of forestry.

pulp - Soft mass of vegetable matter in which almost all water has been extracted. Wood pulp is used in making paper. See recycled paper project in this study guide.

sawmill - A place for processing logs into lumber.

scaler - A person who measures and estimates how much lumber is in logs.

seedling - The first stage of a young tree.

Seedling → sapling → mature tree → over mature tree → dead snag.

skidder - A special tractor used by loggers to haul logs. Skidders come in a wide variety of styles, one is shown in the book. The large tires on this skidder are designed to spread out the weight causing less soil disturbance on the forest floor.

slash & debris - As it specifically relates to forestry is the matter, branches, twigs, bark, etc. left on the forest floor from harvesting. Minor amounts of slash and debris provide benefits to the soil of the forest. Too much of this matter can cause a heavy fuel load and raise fire danger.

stewardship - The careful and responsible management of our resources.

thinning - A process to remove selected trees from an overcrowded forested area. Thinning increases the health and growth rate of remaining trees. Nature sometimes thins by using bug infestation to weed out weaker trees in a stand.

timber faller - A skilled person who cuts only trees chosen to be removed in the forest plan.

unit - A predetermined quantity adopted as a standard of measurement.

wildlife survey - A study of the animals living in and around the forest plan area.

RESOURCE REFERRAL

For more information on resource education contact:

Talk About Trees™

(530) 889-1140

www.talkabouttrees.org