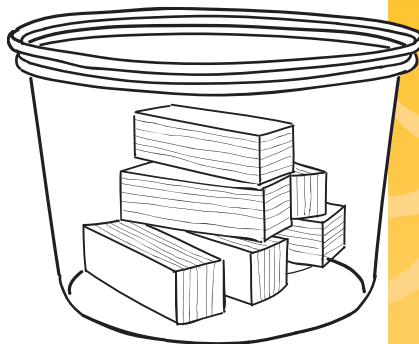


OVERVIEW

WOOD AND PAPER



GOALS

The modern world is a wonderland of different materials for early-childhood students. Two of those materials are wood and the paper that is derived from it. Scores of different kinds of wood and paper fill students' environment. In the **Wood and Paper Module** students are introduced to a wide variety of woods and papers in a systematic way. They will observe the properties of these materials and discover what happens when they are subjected to a number of tests and interactions with other materials. Students learn that wood and paper can be recycled to create new forms of paper or wood that have new properties. Finally, they use what they know about the properties of these marvelous materials as they change wood and paper into a variety of products. Throughout the module, students have ample opportunities to make comparisons between different kinds of wood, different types of paper, and wood and paper. The concept of trees as natural resources is introduced.

FOSS EXPECTS STUDENTS TO

- Develop a growing curiosity and interest in the physical world around them.
- Observe and describe the properties of different kinds of wood and paper.
- Compare different kinds of wood and paper to discover how they are alike and how they are different.
- Observe interactions of wood and paper with water and other substances.
- Become aware of natural resources in our world.
- Communicate observations.
- Acquire the vocabulary associated with the properties of materials.

OVERVIEW CONTENTS

Goals	1
FOSS and National Standards	2
Science Background	3
Science for Young Children	6
Assessing Progress	8
FOSS for All Students	9
Integrating the Curriculum	9
Organizing the Classroom	10
Scheduling the Wood and Paper Module	12
Safety in the Classroom	15
The FOSS Teacher Guide Organization	16
The FOSS Investigation Folio Organization	17
Wood and Paper Module Matrix	18
FOSS Staff	20

WOOD AND PAPER MODULE MATRIX

SYNOPSIS

SCIENCE CONTENT

THINKING PROCESSES

1. GETTING TO KNOW WOOD

Students work with five different wood samples to observe their properties. They begin with free exploration, go on a hunt for matching samples, drop water on the samples, and float them in basins. They test the wood to find out how many paper clips it takes to sink it, then organize their results by making a bar graph.

- Wood is a resource that comes from different kinds of trees.
- Some woods are processed and transformed by people.
- Wood is used for many everyday things.
- Wood has many observable properties.
- Wood floats in water. Some kinds of wood sink more easily than others.
- Wood absorbs water.

- Observe a variety of wood.
- Communicate observations about wood.
- Compare properties of different kinds of wood found in the classroom.
- Compare how different kinds of wood interact with water.
- Sort wood samples by their properties.
- Organize results to discover which wood is harder to sink.

2. CHANGING WOOD

Students use sandpaper to change the shape of wood. They compare sawdust and shavings and how they interact with water. They simulate the manufacture of two kinds of wood they observed in Investigation 1, particleboard and plywood.

- Wood has many observable properties.
- Wood that is waterlogged sinks.
- Sanding can change the shape of wood.
- Sawdust can be recycled into usable wood.
- Gluing (laminating) thin sheets of wood together produces much stronger wood.
- Some objects occur in nature. Others are made by people.

- Observe how wood can be changed by sanding.
- Compare sawdust to wood shavings.
- Observe the transformation of sawdust into particleboard.
- Compare the strength of a single piece of wood to several pieces that have been glued together.

3. GETTING TO KNOW PAPER

Students observe and compare the properties of ten kinds of paper and go on a hunt for matching samples. They test the papers for different properties, comparing how well each folds and which have the best surface for writing. They drop water on the samples to compare absorption, then soak the samples overnight.

- Paper has many observable properties.
- Some kinds of paper absorb water while others do not.
- Many objects are made from paper.
- The properties of different papers determine their use.
- People make paper from wood. Wood is a resource that comes from trees.

- Observe a variety of kinds of paper.
- Communicate observations about paper.
- Compare properties of different kinds of paper, including how they fold or whether they are useful for writing surfaces.
- Observe how different kinds of paper interact with water.

4. CHANGING PAPER

Students learn two ways to transform paper, making it stronger and more durable. They make a piece of recycled paper, turning toilet tissue into pulp, and pulp into paper. They make papier-mâché bowls to see how paper can be changed from limp and easily torn to stiff and strong.

- New paper can be made from old paper.
- Recycling extends the use of trees.
- The properties of recycled paper can be compared to those of new paper.
- Paper can be soaked in wheat paste to make it soft and moldable when wet, and stiff and strong when dry.
- Objects can be made from paper.

- Observe and compare the properties of paper before and after it has been recycled.
- Compare the properties of paper before and after it has been made into papier-mâché.

5. CONSTRUCTIONS

Students explore a variety of techniques for making things from paper and wood. They learn how boxes are made and weave paper mats. Finally they combine all the processes to make a free-form wood and paper sculpture.

- Knowledge of the properties of wood and paper can be used to make useful or artistic constructions.
- Paper containers we use everyday began as flat pieces of paper.
- Paper can be woven by using an under-over alternating pattern.

- Observe and communicate how paper containers are constructed.
- Compare a tracing of a flat paper container to the reconstructed container.
- Communicate knowledge of paper and wood properties to describe new constructions.

INTERDISCIPLINARY EXTENSIONS

- Begin a wood chart.
- Weigh paper clips.
- List wooden items from home.
- Take a field trip to a lumberyard.
- Peer inside a branch.
- Start a wood study center.
- Play Memory.
- Do another sinking-wood investigation.

- Use science journals.
- Make pictures from sawdust, shavings, and twigs.
- Draw with charcoal.
- Add to the wood study center.

- Use science journals.
- Make a chart of paper properties.
- Construct a paper Humpty-Dumpty.
- Paint on different kinds of paper.
- Examine paper illustration techniques.
- Make collage masks.
- Practice simple origami.
- Explore other kinds of paper.
- Bring in rice paper.

- Use science journals.
- Decorate the papier-mâché bowls.
- Try variation in papermaking.
- Color the recycled paper.
- Make something with the recycled paper.
- Make chipboard.

- Seriate or pair boxes.
- Make new boxes.
- Maintain a workbench.
- Take paper tubes apart.
- Continue the paper-construction center.
- Finish the wood/paper sculptures.
- Set up a classroom post office.

READING CONNECTIONS

- *FOSS Science Stories: Wood and Paper, "The Story of a Chair"*

- *FOSS Science Stories: Wood and Paper, "Are You a Scientist?"*

- *FOSS Science Stories: Wood and Paper, "The Story of a Box"*

- *FOSS Science Stories: Wood and Paper, "Land, Air, and Water"*
- *The Piñata Maker* by George Anacona

- *Mighty Tree* by Dick Gackenbach
- *FOSS Science Stories: Wood and Paper, "I Am Wood"*

HOME/SCHOOL CONNECTION

Students label wooden objects at home, and draw or list the objects they find. They play the game of "I'm thinking of something that is made of wood and it is . . ." with their friends or family. Back in the classroom, the lists of wood uses are consolidated into a class chart.

Students investigate whether a craft stick will become waterlogged and sink. After a few days, they compare it to a dry craft stick.

Students continue their investigations at home with simple instructions that teach them how to make drinking cups for their family.

Students recycle paper found at home by making paper collages or paper-collage masks. They explore cutting and tearing paper, and the effects of water drops on different papers.

Students make paper envelopes from a pattern. They cut, fold, and paste the envelope, and then they write letters or draw pictures to send in it.



FOSS AND NATIONAL STANDARDS

The Wood and Paper Module emphasizes the development of observation and description skills and building explanations based on experience. This module supports the following National Science Education Standards.

SCIENCE AS INQUIRY

Develop students' abilities to do and understand scientific inquiry.

- Ask and answer questions.
- Plan and conduct simple investigations.
- Communicate investigations and explanations.

CONTENT: PHYSICAL SCIENCE

Develop students' understanding of the properties of materials.

- Materials have many observable properties including texture, odor, weight, color, and the ability to react with other substances.
- Objects are made from one or more materials.
- Objects can be described and sorted by the properties of materials from which they are made.

CONTENT: SCIENCE AND TECHNOLOGY

Develop students' abilities to distinguish between natural objects and objects made by humans.

- Some objects occur in nature; others have been designed and made by people to solve problems.

SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES

Develop students' understanding of wise use of resources.

- Resources are materials we get from the environment to meet our needs.
- Many resources, such as wood, can be limited. If used, resources can be extended through recycling and decreased use.