

Wood and Paper

Wood and Paper > Investigation 1: *Getting to Know Wood* >

Part 2: *Wood Hunt*, page 15

Outdoor Wood Hunt

When to Go Out

Repeat Part 2 outdoors to look for objects made of wood.

Outdoor Objective

Students will test their understanding of the properties of wood by determining which objects in the schoolyard are made of wood. Students will observe that many useful objects found outdoors *are* made from wood, and begin to explore trees as wood.

Materials

For Each Student	1 Hand lens
For the Teacher	1 Whistle
	1 Container (for sticky notes and pens)
	1 Clipboard with paper
	1 Pencil

Getting Ready

Time: 7–15 min.

Site: Select the area in your schoolyard that contains the greatest variety of wood samples.

Guiding the Investigation

1. Review with students what they have been learning about wood. Ask, *Who can tell me what wood looks like? How can we tell if something is made of wood? What do you think we might find on the schoolyard that is wood?*
2. Tell students that their task outdoors will be to look for objects that are made of wood. The class will be making a list of wooden objects that are too large to pick up, and each student will also look for a small object to bring back into the classroom for closer observation.
3. Gather students in a circle outside. Ask students to look around the schoolyard for things they think are wood. After gathering suggestions, visit each object to test predictions. Ask, *How can we tell if this is made of wood?* On your clipboard, list each object and the evidence students give for whether it is wood.

Outdoor Activities At a Glance

Investigation 1

Part 2: **Outdoor Wood Hunt**

Part 3: **Wood and Water Outside**

Tree Observation Walk

(BSI Extension)

Investigation 2

Part 3: **Making Sawdust Wood**

Investigation 3

“The Story of a Box”

Investigation 4

Part 2: **Papier-Mâché**

Investigation 5

Part 3: **Wood and Paper Sculptures**

Priority activities appear in **green**.

What You Might Find:

Students may not know that trees are made of wood.

Make sure they are aware of this before the end of this activity.

Some schoolyards contain recycled plastic lumber, a composite material made of recycled plastic and wood. The texture typically simulates a wood grain. Have students explore this material to decide whether it is wood.

“My students were able to find more things than I had noticed. They started with trees and ended up looking at the bench in the field, a wooden horse to keep people from parking in certain areas, the wood parts in the building’s structure, and a wooden utility pole. The students did a wonderful job and had fun.”

Michelle Teleau
Science Specialist

- Discuss student observations as you explore the schoolyard. Encourage them to touch the objects (being mindful of slivers) to feel their texture. They may also want to try tapping it to see if the sound offers any clues. Ask, *What does it feel like? Does the wood look like the samples indoors? If not, how can we tell it is wood?*
- Discuss with the class what they found outdoors and whether anything surprised them. Make a chart listing the objects you found. Keep this chart to refer back to in Investigation 2. Ask students to draw the objects they found in their science notebooks.

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Part 3: *Wood and Water*, page 20

Wood and Water Outside

When to Go Out

Following Part 3, take students outside after all groups have finished working to place water droplets on outdoor wood samples. If you are doing Part 3 as a whole class activity, try to do this activity the same day.

Outdoor Objective

Students will discover that because wood absorbs water, wood used outdoors is often treated (with paint or varnish) to protect it from rain and snow.

Materials

For Each Pair	1 Dropper
	1 Cup
For the Teacher	2 Pitchers of water
	Extra droppers and cups

Getting Ready

Time: 15–20 min.

Site: Return to the area of the schoolyard with the greatest variety of wood samples.

Conservation: Always pour the remaining water on a plant or the grass when finishing an activity, so as not to waste water.

Guiding the Investigation

1. Briefly discuss what happens when students drop water on the wood samples they have been testing. Ask, *What do you think would happen if we dropped water on the wood we found in the schoolyard?*
2. Explain that students will use a dropper to put several drops of water on three wooden objects in the schoolyard and watch what happens.
3. Gather your students around a wooden object in the schoolyard. Place a few drops of water on the wood and discuss what happens. If the water beads up, ask, *Why do you think it didn't spread out and soak into the wood?* Discuss the fact that much of the wood used outdoors is treated.
4. Fill students' cups with approximately $\frac{1}{2}$ liter of water and review their task. Divide the class into three groups and send each group to test their water droplets on a designated wooden object. After several minutes, rotate groups to the next object. Throughout the investigation, ask, *What happened when you put water on the wooden item? Why do you think this object does or doesn't absorb water?*
5. Be sure students understand that *unlike* the wood samples you tested in the classroom (which absorb different amounts of water because they are different types of wood), the wood objects found outdoors absorb water differently based on whether they have a protective (paint) covering.
6. Have students water a plant (or the grass) with their remaining water and then return to the classroom to discuss discoveries.

“My students were surprised at the reaction of the water on the wood surfaces. On the bench, the water didn't soak in, it just beaded up; on the wooden barricade (the horse), the water beaded for a minute and then soaked in. Some students noticed this difference and one said, ‘One surface was smooth and shiny and the shiny part didn't let the water go in.’ When asked why, she said, ‘To protect it from the rain.’”

Michelle Teleau
Science Specialist

Wood and Paper > Investigation 1: *Getting to Know Wood*

Tree Observation Walk

Boston Schoolyard Initiative Extension

When to Go Out

Take students outside anytime during this module to collect information on the trees in your schoolyard.

Outdoor Objective

Students will discover that all trees are not alike and that different types of trees have different identifying characteristics: leaf shape, bark texture, color, size, shape, and type of wood they produce.

What You Might Find:

Some students may want to try objects that are not made of wood. This is a great opportunity to assess whether they can identify wood, and to let them explore the interaction of water with other materials, such as metal and concrete.

If it has rained recently, the wood may be saturated with water. The water will likely react differently on wet wood. If students do not notice this, make sure you mention it.

Materials

For Each Group 1 Resealable plastic bag containing paper and crayons for rubbings

For the Teacher Tree field guide/identification book (optional)

Note: If you have the opportunity, cut a branch from one or more trees crosswise to show students the inside “wood” of the branch. Enlist extra help from adults or older students if you are sending student groups to work on different trees.

Getting Ready

Time: 20–30 min.

Site: Identify four trees of different species in the schoolyard. Include any trees represented in the wood samples (pine, basswood, redwood) if you have them.

Conservation: Teach students not to pull branches or leaves off of the trees because it damages the tree. Use leaves, twigs, and other parts of the tree that are found on the ground.

Seasonal Tips: In the winter, students will learn that trees can be identified by their bark, or by the few leaves or seedpods still clinging to their branches.

Guiding the Investigation

1. Briefly review the different types of wood students have been investigating and their different properties. Explain that these woods are different because they come from different types of trees. Ask, *How many different types of trees do you think we have in our schoolyard? How can you tell the difference between different types of trees?*
2. Tell students that today they will be going outside to observe trees and learn about how they are different from each other. Each group will be assigned one tree (on which they will become the experts). In every group, each student will have a job: drawing the leaf shape; collecting tree samples from the ground (leaf, twig, seedpod); measuring the girth of the trunk with their hands or arms; making a bark rubbing; and drawing the tree shape. Rehearse each job with students before going outside.

For rubbings: Demonstrate how to do a rubbing to get a “picture” of the texture of an object by using the long edge of the crayon to rub across the paper. Distribute crayons and scrap paper; then have students practice inside on an object they choose. Outdoors, if possible, have one adult hold the

paper steady, while the student completes the bark rubbing to get the most accurate image. It will be easier for students to do the leaf rubbings indoors.

3. Take students outside to observe each of the trees you have selected and assign each tree to a group. Have students put their drawings, tree samples, and rubbings in their plastic bags to use indoors for their posters. Rotate as they work to help with the bark rubbings. Take photos of students with their trees.
4. Before returning indoors, allow each group to share their observations with the class.
5. Indoors, ask each group to make a tree poster or display about their tree including their drawings, samples, rubbings, and words. (My tree is a _____. Its bark is _____ (smooth, rough). The leaves are shaped like _____.)
6. Remind students that wood is another identifying characteristic of a tree, like the wood they have been discovering.

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Part 3: *Making Sawdust Wood*, page 16

Making Sawdust Wood

If there is wind, the sawdust could blow away easily. Refer to the FOSS Teacher Guide for complete instructions.

Wood and Paper > Investigation 3: *Getting to Know Paper* >

Part 1: *Paper Hunt*, page 8

“The Story of a Box”

When to Go Out

Following Part 1, take students outside to read “The Story of a Box” in *FOSS Science Stories: Wood and Paper*.

Outdoor Objective

Students will directly experience all facets of a tree, while learning about the process of how trees are turned into wood and paper.

Guiding the Investigation

1. Bring students out to the most beautiful tree in the schoolyard.
2. Have students comfortably sit under or near the tree to make silent observations.

“My students figured out which trees are widest by hugging them.”

Michelle Teleau
Science Specialist

What You Might Find:

If you choose to do leaf rubbings, do them indoors. Most outdoor surfaces are too bumpy or textured and this will affect the quality of the rubbing.

You may want to introduce tree field guides to students before going outside, so that students can try to identify the trees without your help. This may be difficult for some students, but your more advanced students will enjoy the challenge.

Consider having students make an exhibit for your tree collection display at home with a family member for homework.

“I had students standing under a tree in our city schoolyard. We heard something above us and all looked up to see a downy woodpecker pecking at the tree. It was amazing. The students and I were totally mesmerized watching this beautiful bird 5 feet above our heads.”

Erica Beck Spencer
Science Specialist

What You Might Find:

You may be surprised how long your students can sit and be still when observing the tree. If you have a student who will have trouble sitting on the ground, plan ahead. Some solutions are to have rug remnants or pieces of cardboard that students can sit on.

Taking two minutes of silent observation is a powerful experience with observable benefits for all students. Some teachers repeat silent observation each time they go outside with students.

3. Read “The Story of a Box” in *FOSS Science Stories: Wood and Paper* out loud. Ask, *If we wanted to turn this tree into paper, what would we need to do?*
4. Allow time for students to look closely at their tree and to draw or write about what they see and how it feels to sit under it. Remind them to look at the bark, the shape of the leaves, the size of the tree, and any seedpods or flowers. Ask, *Do you think any animals live in the tree? What makes you think so? Do you hear any sounds in the tree?*
5. End with a discussion on how many things trees offer: shelter for animals, leaves for winter ground cover, shade, and paper and wood.

Wood and Paper > Investigation 4: *Changing Paper* >

Part 2: *Papier-Mâché*, page 14

Papier-Mâché

Part 2 may be conducted outside. Refer to the FOSS Teacher Guide for complete instructions.

Wood and Paper > Investigation 5: *Constructions* >

Part 3: *Wood and Paper Sculptures*, page 18

Wood and Paper Sculptures

When to Go Out

Part 3 may be conducted outside. Bring students outside again later to observe any changes to the sculptures that are left outside. Refer to the FOSS Teacher Guide for complete instructions.

Outdoor Objective

Using their knowledge of the properties of wood and paper, students will build sculptures and observe them over time to see how the materials withstand the weather. Students will also observe that some beautiful wooden objects can be found in nature, and others are made by people.

Materials

For Each Student	1 Bag
	Twigs, sticks, or bark

Getting Ready

Conservation: If you leave sculptures outside to weather, make sure that when the paper items disintegrate that you collect the remaining paper pulp.

Caution: Remind students not to tear branches or bark off of trees; this could damage or hurt the trees.

Guiding the Investigation

1. Go outside with your class to collect twigs, sticks, or bark that have fallen off of trees.
2. Choose an area where students can work, and follow the steps on pages 20–21 in the FOSS Teacher Guide.
3. Once students are finished, consider if it is safe to display the sculptures outside. Students can observe over time how the wood and paper sculptures withstand the weather.

Teacher Notes:

