More

Marginalia

to accompany

Environmental Experiences for Early Childhood

Indexed to PLT EEEC Activity Name and Number

By

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More Marginalia

What is a Beaver Ball?

This is a beaver ball or a very short piece of a tree trunk shaped into a ball by a beaver. We do not yet understand why beavers periodically make these but my favorite explanation came from a young girl who immediately suggested, "beavers play water polo!" Best thought to date is that it is an incidental creation without a purpose. If you know a beaver trapper ask them to be on the lookout for one for you. This is a great natural shape for the first activity, and would help develop problem solving skills!

Introduction

I could not be more excited with *PLT Environmental Experiences for Early Childhood*. Many years ago I jumped at the opportunity to accompany Mississippi PLT Coordinator Harold Anderson when he was doing a standard PLT workshop for early childhood teachers at the St. John's Episcopal Church Preschool in Ocean Springs, MS. After our first activity on our way back into the building a teacher grabbed a handful of brown dry resurrection fern and while pulling it off a tree exclaimed, "we really should clean up our grounds." I immediately stopped her and suggested she bring the dry plant material inside where we placed it in a bowl of water. By the end of the day it had revived much to the delight of the principal. She had spent the entire day with us, and she declared it the best workshop her teachers had ever had and a great religious experience!

Over the years I have taken great license from PLT's Mission of using the forest as a "window on the world" to infuse a plethora of forest fun facts and activities into my PLT lessons. The excitement of friends and colleagues with the *Marginalia from my old PLT Guides*, presented at the International PLT Coordinators Conference in Mississippi, was certainly enjoyable. When Harold gave me an advanced photocopied version of the *PLT Early Childhood Environmental Experiences* to use in a pre-release workshop I was overjoyed to see so many activities from Marginalia had been incorporated.

Overhearing a child tell their friend something they know about the forest is the absolutely best evaluative assessment of a learning experience or program. *PLT Environmental Experiences for Early Childhood* will produce many of these experiences and I hope these extensions will further contribute to their connection with the woods and outdoors!

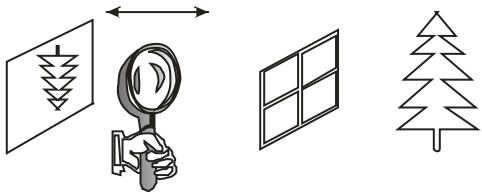
John Guyton

Section 1. Exploring Nature with Five Senses

1 The Shape of Things

How the Eye Works

While inside, arrange a piece of paper and a magnifying glass as shown with a tree outside the window in the distance.



An inverted image of the tree is projected onto the paper just as the lens in the eye projects an inverted image on the retina. By varying the distance between the paper and the magnifying glass you can focus the image and simulate nearsighted and farsighted vision.

Rods and Cones

The difference in color vision provided by the rods and cones can be demonstrated by having someone slowly bring a piece of colored construction paper from behind a student's head into their peripheral vision while they are looking straight forward. When they can just see the paper its image is registered by the rods, located on the sides of the retina, and it appears as a light or dark object, and not colored. The cones are in the center of the retina and require more light energy to activate.

Be sure to compare the shapes of evergreen and deciduous trees.

There are some excellent photo sensitive paints that can be used to make shadow prints on t-shirts or bandanas.

Pictures or silhouettes of birds could be placed in the trees for students to use their toilet paper, (TP) binoculars to spot. If you have several bird guides on hand, or silhouettes keys, they may be able to identify the birds they spot in the trees.

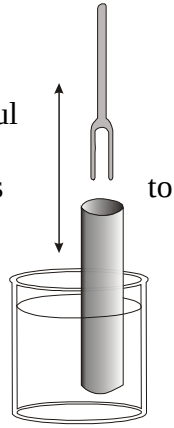
TP binoculars are good for helping children learn to sketch. They eliminate the distraction of too much information. If you have them sketch a bird nest in fork of a limb you will often be pleasantly surprised at the details they incorporate.

Eye Adaptations are really neat, so I have included a variety to pick from for examples.

- Eyes to the front – eyes to the side: rabbit eyes on either side protect them from predators like the bobcat with eyes in the front (binocular vision) that enable them to estimate the distance necessary to pounce on rabbits. Most birds have binocular vision.
- Photosensitive cells (eyes of snails) are sensitive to light and dark ... Have children close eyes and tell if flashlight is on/off.
- Compound eyes in arthropods – You can purchase a plastic sheet of many lenses in science shops. The image insects see is not sharp (focused is behind the retina – otherwise sun would burn the retina!). They are more sensitive to movement than stationary objects.
- Cephalopods, amphibians, fish and snakes focus their vision by telescoping their eyes lenses like binoculars.
- Snakes have tertiary spectacles over eyes to protect them from dust and sand. Pit vipers also have infrared, or heat, sensitive pits that enable them to see your heat signature in the dark.
- Deer double light by reflecting it back through sensitive layer!
- Mayflies use parabolic surfaces inside each facet to focus light on a sensor.
- Spider eyes have polarized light detectors. Fish, crustaceans (shrimp, crab, lobster, wood lice), honeybees, octopuses, crickets, mayflies and waterfowl, have polarized vision.
- Fish clean their eyes by moving forward like a car in the rain ... if windshield is too dirty it doesn't work so well! If the stream is too muddy it doesn't work so well for fish either.
- Land animals have eyelids or windshield washers, or eyeball wipers and tear ducts, similar to cars' windshield washers.

- Nictitating membranes a transparent eyelid: aardvark uses them to protect their eyes from termites; polar bears use them to protect them from snow blindness and harbor seals use theirs to prevent eyes from drying out on land and to protect them from water when chasing prey.

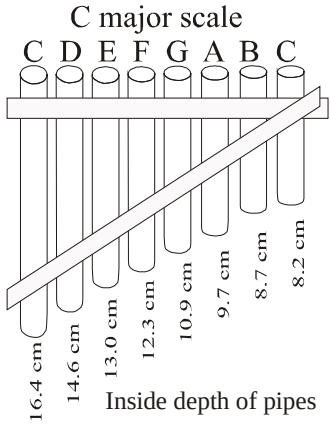
2 Sounds Around



A few conk shells in your workshop box may be useful when introducing sounds. While setting up for a lesson, allow children to listen to the "ocean" in shells to take advantage of idle time and to get them thinking about sound.

A bamboo tube with the nodes removed will resonate when the length of tube above the water is 1/4 the wavelength of the sound produced by a tuning fork. It resonates when the length of tube above the water is 3/4, 5/4, and 7/4 wavelengths long. Bamboo is a grass, of course, and you can discern this by the joints - a common characteristic of grasses.

Children enjoy moving the tube up and down in the water with the tuning fork above it listening for when the sound is loudest.



Pan Flute

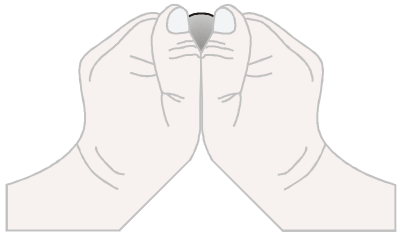
Have a woodworker cut different lengths of bamboo that children, with assistance, can lash together making a pan flute. This is a good activity to ask fathers to assist with.

Hoot up an owl!

Whistles

A woodworker could make whistles that the young children could glue together from bamboo, willow or elderberry stems.

Teach children how to make acorn cap or hickory nut shell whistles. These are very loud and could be a life-saver if lost in the forest or a good way for the leader to reassemble the group. Hold the acorn cap open side up beneath your thumbs and position your lower lip on your thumb knuckles and blow. Move the acorn cap around a little and adjust the angle you are blowing to master the technique. This is a good activity to do last!

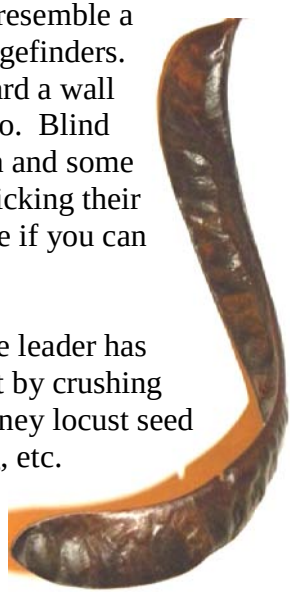


Listen to a tree with stethoscope. Broadleaf trees work well in the spring after a shower.

Make tin can telephones so young children can feel the string vibrating. You can mute the phone by holding the string.

Echo Location

Be on the lookout for those little clickers that resemble a frog or cricket. You can use these as echo rangefinders. Blindfold a child and allow them to walk toward a wall with their “cricket clicker" listening to its echo. Blind children develop a keen sense of echo location and some can even distinguish objects in the room by clicking their tongues! Try it with the cricket clicker and see if you can stop before you hit the wall!



Forest Concert - great activity, especially if the leader has any musical talent! Organize a Forest Concert by crushing leaves, tapping two sticks together, rattling honey locust seed pods, pounding rocks, beating on a hollow log, etc.

Make a giant rain stick with a carpet tube.

If you have a smart phone, there are audio and video recorder apps to capture the moment!

3 Get in Touch with Trees

Walking in the woods at night your feet, in shoes, tell you a lot about the trail you are on. You can feel roots across trail, nuts or sweetgum balls on the trail, sand, soft slushy soil or gravel. Have them describe the texture of the trail from their feet's perspective.

Blindfold a child and have them tell you if they are feeling 1 or 2 points of two honey locust thorns held close together when you touch their fingers, wrist, arm and shoulders. They will be able to feel two points on their fingers but not on their arms and shoulders since we have more nerve endings on our fingers. That is why we do not feel with our elbows.

Help them to learn the name and how to recognize a couple of trees.

Cut chevron shaped slits in a rubber tree trunk to collect latex for children to feel. Note: some may be allergic to latex.

A piece of amber with insect inclusions is not too expensive and you will enjoy having one in your *Marginalia kit*. As children touch sticky sap they can easily imagine how an insect gets stuck to the sap and covered as more layers ooze out of the tree. You could also mentions sapsuckers and ants eat this sap and some birds know the sap attracts insects so they visit trees frequently to dine on ants!

Sandblasting a tree cookie will erode the softer early wood leaving the more dense latewood rings pronounced enabling blind children to feel the rings and determine the age of the tree.

The red cockaded woodpeckers build their nest in live pine trees and peck the bark around their nest holes making the sap run to prevents snakes from dropping in for a visit and staying for a meal!

Enlist the aid of trained certified arborists to assist in helping young children climb trees safely.

4 We All Need Trees

Chipboard or particleboard is a building material made from wood chips and/or sawdust. Mix some white glue and wood chips or sawdust in a coffee can until the chips are coated. Empty the chips on a piece of Kraft paper and spread them out. Place another sheet of paper on top and use a rolling pin to flatten. Or you could press the chips and sawdust into cookie molds. When dry, you have either a sheet of particle board or a wooden object made from an important wood product that once was waste.

Air pressure has a huge influence on smells. If the barometric pressure is low smells are given off from plants better.

Pound flowers onto white t-shirts to use pigments as dyes

Show children cedar waxwing feathers with the yellow tipped tail feathers and red wax like tips on the secondary wing feathers. The orange pigments come from exotic honeysuckle fruit and the other pigments from cedar berries, cherries, mulberries and other plant parts. The function of the red tips is not known but it is thought that their length is useful in determining the bird's age.

Section 2. Experiencing Trees Through the Seasons

5 Signs of Fall

Celebrate the end of the growing season with a fall party featuring things grown in local gardens, as has been the tradition for centuries.

Measure the length of the shadow of a fixed object like a flag pole on the equinoxes and solstices so young children can begin associating the sun's angle with seasonal temperature.

Winter deer hair has air chambers that provide better insulation. Ask a hunter, or wildlife biologist to collect some winter and summer deer hair. Use a rubber band to secure each around different film canisters. Push a thermometer through a hole in each cap to see if the one with summer hair heats the fastest when in the sun indicating the winter hair is better insulation.

Collect different shape leaves and drop them one at a time describing how it falls. Dr. Ross Hutchins, a Mississippi naturalist, said he could identify a tree by the way its leaves fall.

Demonstrate how a pine cone closes up during a rain to protect its seeds, and then opens when the weather is dry. The reason is that young pines grow better when the seeds fly away from the tree to a place in the sun. Pine cones work on the tree or off!

Experiment with “varieties” by sampling slices of several different apples.

6 Evergreens in Winter

Show children how to tell the age of a twig by counting the bud scale scars along its length. The tips of twigs are the most recent growth. Each year bud scales that encircle and protect the terminal bud leave scars that can be counted to determine the twig's age.

Peterson field guides have excellent tree silhouettes for showing young children winter trees. Help children make winter tree identification books using stick pictures of different trees. Some limbs droop, some bend in right angles and some have other characteristic shapes.

Make a tree identification book using bark rubbings.

7 Bursting Buds
Learn a few signs of spring's arrival such as watching for red buckeye to bloom followed by the arrival of hummingbirds.

Make a tree identification book using leaf rubbings.

Tape leaves to playground benches with double sided tape and roll paint over them to create leaf silhouettes on the bench. Use a permanent marker to label leaves.

Cotton wood seeds will germinate during the day on wet sand. Use a magnifying glass to see roots and stems beginning to form.

When building a nest many birds include aromatic leaves like mint as pesticides. So, when you build a nest think about things you may want to include in it such as insect repellant!

8 Adopt a Tree
Encourage children to learn some fun facts about their adopted tree. They could take a leaf home or take a picture of their tree and discuss it with their parents and grandparents. Maple trees produce maple syrup, tea can be made from sassafras root bark, aspirin is produced by willows, etc. Every child should know some fun facts about their tree.

A wonderful lemonade can be made from red sumac berries. Place them in a cheese cloth bag, rub to bruise slightly and steep in water for a day. The bag will help you remove the numerous insects and berry parts from the tea. Sweeten with honey.

Compare the rain that reaches the ground under your tree during the summer with the rain that falls in a nearby field.

When the color of trees looks faded or washed out, through amber or blue blocker sunglasses, the tree may be experiencing drought and need watering.

Section 3. Meeting Neighborhood Trees

9 To Be a Tree
Put a plastic bag over the leaves on a branch on a sunny day and note the water that collects in the bag. The leaves “transpire” giving off water. Breathe on a piece of glass or a window noticing the moisture that collects on it. This water is given off by your "respiration," a similar process. Water must absorb heat to evaporate and some of the heat used to evaporate transpired water comes from air under the tree. You can experience this cooling effect by wetting a finger and twirling it around. The coolness you feel is the removal of a little heat from your finger to evaporate the water. So trees provide shade and air conditioning!

Newspaper and masking tape can be used to make tree costumes.

Look for trees that support other plants: vines, mistletoe, lichens, moss, resurrection fern, etc.

Show children how to arrange palm, or other, branches like shingles on a roof to shed water.

10 Trees as Habitats
Look for leaves where leaf miners are tunneling between the upper and lower surfaces. Ask children where the miners started. They start where the tunnel is the smallest and as they eat more of the leaf becoming bigger, so do their tunnels.

Honey tasting – collect honey from different trees such as tupelo, sourwood, orange blossom, etc. for children to taste. Bees often live in holes in trees and the flavor of their honey resembles the smell of the trees' flowers.

Bee keepers will put hives of bees, from which the honey has been removed, near trees just as the trees start blooming so that the honey will have a favor characteristic of the blooms' aroma. When a tree is almost finished blooming they extract and bottle the honey.

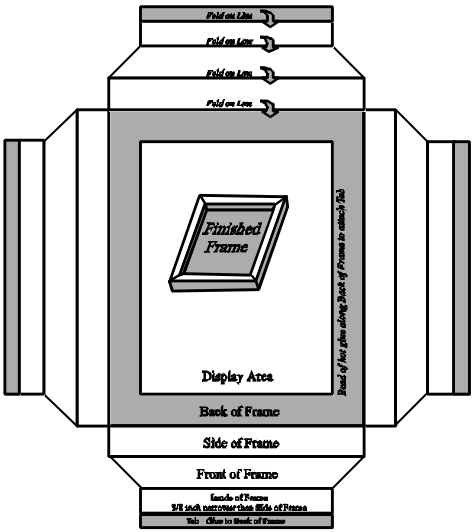
John Muir preferred the flavor of sugar pine sap to maple syrup. Sugar pine cones are very sticky and you will immediately realize where their name came from! You will want to remove the sticky sap before handling them and the easiest way is to bake them! Bake sugar pine cones in a 200° oven for an hour or so to remove the sticky sap. The sap will drip onto your cookie sheet and can be tasted to see what Muir was enjoying. Put some in a metal mint can for use during special workshops.

Collect some artist conk (*Ganoderma applanatum*), a common bracket lichen, that grows on hardwood tree trunks and stumps and let each child scratch a picture on its underside with a nail. Be sure to include the date. As the fungus dries it will become hard like wood, lighter in weight and the lines will darken.

11 Three Cheers for Trees
Make hats using pine needles to pin large poplar leaves together.

Santa Anna of "Remember the Alamo" fame, who was later defeated and captured by Sam Houston, eventually found himself in exile in New York where he imported chicle, from *Manilkara chicle* tree sap. He was unsuccessful in make rubber carriage tires from it and sold a ton to Thomas Adams who used it as the base for "Chiclets" gum. Give each student a piece of Chiclets gum.

Cardboard Frame
Cardboard is made from trees. Make a small cardboard frame from a large cereal box or corrugated cardboard. Corrugated cardboard may be too difficult for children to work with. This activity will help them develop manual dexterity while using tools. You can even enlarge the pattern for larger frames. Attach the enlarged pattern to the cardboard then cut out the perimeter and use a straight edge to help make the folds. Finally, glue the final fold to the base. Use the frame to display an acorn collection or as a background for PLT art.



Paper Mache Piñata

Materials: large mixing bowl, flour, water, all-purpose glue, individually wrapped candy, paint in various colors and string. Optional: combinations of feathers, pipe cleaners, foam, plastic wrap, chicken wire, balloons, string, crepe paper, construction paper, tissue paper and fabric scraps

Rip newspaper into thin strips at least 6 to 8 inches long and 2 inches wide. Balloons make excellent molds for paper mache piñatas. To make paste start with a few cups of flour adding a little water at a time and stop adding water when it feels like glue.

Dip each strip of newspaper in the paste, and squeeze off excess paste with fingers. Apply strips to balloons, until the balloon is completely covered. Apply several layers, and then allow it time to dry. Repeat to get the shape perfected. Make sure the first layers are completely dry (a couple days) before putting on the next layer. Once the body is fully formed and totally dry, apply at least one coat of paint to protect the piñata from moisture.

Encourage children to make a map of neighborhood trees as they learn them. As they learn fun facts about the neighborhood trees they can annotate their map: pecan trees (good place for a snack), oak trees (good place for squirrels to have a shack), willow trees (neighborhood pharmacy - aspirin), tulip poplar (hat store), maple tree (helicopter factory), sweetgum (candy store), any large deciduous tree (a veranda in the summertime!), etc.

Every part of the tree is used, leaves, bark, wood and roots for food, clothing, shelter, energy, medicines, cosmetics and detergents, to name a few!