



SCHOOL GROUNDS SESSIONS

Materials provided by speakers from the following sessions:

- **Whoops – We Shrunk the Kids**
 - Organization, Preparation and Safety in Outdoor Learning
 - The Point and name Disease
- **Trees = Healthy Learning**
 - How to Plant a Tree
 - Trees Through the Seasons
- **Green and Healthy Junior Master Gardeners**
 - Lizard Lair
- **Successful Outdoor Classrooms Panel**
 - Ford's Environmental Education Program
 - Worth County Primary School's Outdoor Classroom
- **A Forest in the City**
 - Tree Planting

ORGANIZATION, PREPARATION, AND SAFETY IN OUTDOOR LEARNING

Outdoor Classroom Symposium 2006

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Classroom Preparation for Outdoor Learning:

Everyone does better with some prior preparation. A teacher can organize students in Discovery Teams and these team members can have specific assignments. One team member can check on the weather and make sure the team knows to bring the right clothing. Another team member can be responsible for the clipboard preparation if needed and yet another can make sure all supplies needed are in each backpack. Another team member can make sure the Discovery Parent volunteer can join their class for the activity. Another team member might be asked to write up an article for the school newsletter or provide information for the morning news. The teacher can be sure to prepare the students ahead about the outdoor learning activity and what supplies they will need.

Tools in the Outdoor Classroom

Remind students about the tools they will be using in the outdoor classroom - eyes, ears, nose, and sense of touch. Remind them about quieting while walking so they can use the tools effectively. Do a sensory exercise to practice using the tools.

Sensory Exercises:

Use sensory exercises to quiet your students prior to beginning an outdoor lesson. For example, listen and share: Circle. Ask students to listen for at least 2 sounds. Everyone shares the sound they heard but no one can repeat exactly what another student says. If one student says, "I heard a bird singing", the next student who also heard a bird will have to say it differently such as, "I heard a bird that sounds like this ..." This exercise helps sharpen the students' skills of listening to each other.

Nature Journals:

Have your students make a Nature Journal with a created cover that relates to their natural world and a way to add pages. Have a hole punch handy so students can keep their Nature Notebooks/Journals up to date.

Clipboards:

Clipboards are your desks outdoors. Prepare a classroom set of clipboards and have them ready to go. Put the papers you will need in them ahead of time and each student can carry their own clipboard. Clipboards can be made from foam core and attach papers with pinch clips. They are light weight and fairly rain resistant.

Desk Drawers Outdoors:

Students will have a discovery backpack and it is an important supply. You will wear a vest with many pockets and/or have a backpack that can carry a first aid pack, magnifying lenses, blindfolds, lesson props, field guides, wipes, puppets, bones, insect cases, seeds etc. Get a crow or owl call whistle from a sporting goods store to use as a signal for gathering or ending an activity. Your vest or pockets and fanny pack are valuable desk drawers that you can fill with teaching tools. A cell phone is a good idea for safety especially if you are outdoors as the only leader with your students.

Leading:

You are the leader. You need to make this clear to your students. This is important for outdoor learning safety. If your students crowd you and get ahead of you, you can't stop the group when you need to explain or point out something. If you are on your school discovery path, and there is a rabbit or something on the trail that you want everyone to see, you can stop the group and sign for them to be quiet. If you have classroom trail guide parent helpers, position them at the back of the line for support.

Trail

Keep students on the trail unless you are doing an activity that requires field work in a certain area that you have chosen. Make sure students know where they can and can't be during an activity. Field cones are an easy way to mark off boundaries for field work and can be set up prior to the activity.

Parent Helpers:

Some schools have assigned Outdoor Classroom Parents to each classroom. These parents help with all the outdoor learning and classroom field trips and provide support when students are outdoors. Think about other volunteers. What about grandparents, aunts and uncles?

Sitting on the ground:

Students worried about sitting on the ground, and there are some students who feel very uncomfortable, can learn to be more comfortable by carrying a folded trash bag cut out square. It is light and can be easily folded and returned to backpack or pocket. This is also good when the ground is damp early in the morning.

Dress:

Dress is important. Encourage students to be prepared for outdoor learning which includes proper clothes, shoes, rain gear, jackets, etc. You can lead by example. Keep an extra pair of outdoor shoes at school for outdoor exploration. Collect the clothes needed for the outdoors from unclaimed Lost and Found for students who come "dress" unprepared. Teach students the importance of layering clothes so they can remove a layer when they get too warm or add a layer when the weather is cool.

Role Model:

You are the role model! If you are enthusiastic about being outdoors and making discoveries, demonstrate respect for life, enjoy a walk in the rain, your students will do the same. But if you are annoyed by insects, fearful, and uncomfortable outdoors, your students will be annoyed, fearful, and uncomfortable. Be a role model for students and teachers. Sometimes you find that you are the teacher who feels comfortable outdoors and if you have learned some techniques that work you can share those with other teachers who are fearful or need some encouragement.

You can also role model respect for the site and leave it like you found it. Be careful when you collect and show care when looking at animal. Encourage releasing study items back to the environment.

Ticks, Chiggers and Mosquitoes:

Ticks

Ticks are parasites, relatives to spiders, and they have a movable head with a 2 pronged back which they use to suck blood. They crawl up chosen bodies to a soft spot, then bite. A tick engorges with blood and looks like a large gray berry, then finally drops off. They like high grassy areas. Some ticks carry diseases such as Rocky Mountain Spotted Fever (wood ticks) and Lyme Disease (deer ticks). The odds, according to Todd Ballantine, are about 100 to 1 against catching a disease from a tick bite. Have students check their waste, armpits, head/scalp after hiking in the spring, summer or early fall. If you discover a tick with its head imbedded in the skin, drop rubbing alcohol on its rear end, wait a minute, then pull and twist the tick out with tweezers. Lately I have heard that you can scrap the tick out by going the same direction as the tick and pushing a credit card underneath the body until it dislodges. Sometimes wearing pants with socks pulled over the pant legs helps.

Chiggers

Chiggers or red bugs are mites and are also relatives to spiders. They are nearly microscopic and can be found in pine straw, leaves and tree bark. Red bugs that chew on humans are larvae, not adults, and they like to climb to places where clothes are tight and body heat is high. Showering or wiping skin with soap and water is always a good idea after hiking. You can treat chigger bites with "Chigger Rid," a liquid medication containing collodion, camphor, phenol, and oil of eucalyptus.

Mosquitoes

West Nile Virus (WNV) is a potentially serious illness according to the CDC. WNV is a seasonal epidemic in North America that flares up in the summer and fall. It comes from mosquitoes that have been infected by biting infected birds. Mosquitoes are most active at dusk and dawn and therefore precautions can be taken during those times by applying an insect repellent with an EPA registered active ingredient (children under 2 should not wear Deet) and by wearing protective clothes - long sleeves and pants. Good screens on windows make a difference and emptying standing water in pots, buckets and barrels. An outdoor school program during the day should not be a high traffic mosquito time. Parents should be consulted before mosquito repellent is used.

Eastern equine encephalitis (EEE) is a mosquito-borne viral disease that has a high fatality rate among humans. It is regarded as one of the more serious mosquito-borne diseases in the United States. Symptoms include high fever, stiff neck, headache, and lack of energy. The virus is carried by birds that live in natural wetlands, and it is usually found only in birds and mosquitoes that do not bite people. However, in years when the virus infects large number of birds, it may infect other species of mosquitoes that do bite horses and people.

- Symptoms range from mild flu-like illness to encephalitis (inflammation of the brain), coma and death
- The EEE case fatality rate (the % of persons who develop the disease who will die) is 35%, making it one of the most pathogenic mosquito-borne diseases in the US
- It is estimated that 35% of people who survive EEE will have mild to severe neurologic deficits

INCIDENCE: How many and where have human disease cases occurred?

- 200 confirmed cases in the US 1964-present
- Average of 4 cases/year, with a range from 0-14 cases
- States with largest number of cases are Florida, Georgia, Massachusetts, and New Jersey.
- The enzootic (animal-based) transmission cycle is most common to coastal areas and freshwater swamps.
- Human cases occur relatively infrequently, largely because the primary transmission cycle takes place in swamp areas where populations tend to be limited.

Poison Ivy:

Leaves of three, let 'em be! Poison ivy is a common plant and contact with skin can produce an annoying, itchy rash. The plant tissues are loaded with "urushiol," a poisonous oil similar to carbolic acid, irritating to the skin. The oil can be brushed on the skin from other folks' clothes, or from dogs and cats. Teach students to recognize this plant and avoid touching it. Urushiol takes about 3 hours to get going so washing with soap and water will help. A cloth soaked in apple cider vinegar will help on blisters that have been opened. The vinegar dries up the itch in hours. Poison ivy does produce food for birds and deer. Animals aren't allergic.

Animals:

Establish the rule to observe. Don't touch. Any animal can bite and might bite if it feels threatened. If you see a snake, observe and stay at a safe distance. The snake will make every effort to get out of your way. Chances are the snake will be nonpoisonous but we do have copperheads in our area. Teach students to recognize them. Know which students are allergic to bee stings and make sure they have their medication. You can carry benadryl in your backpack.

Marketing and Public Relations:

Find ways to let others know what kind of learning and excitement is going on in your outdoor classroom. Newsletters, videos, morning news reports, bird counts, animal sightings, classroom projects, gardening news all help provide support for the outdoor classroom and learning. Invite the press to cover your outdoor classroom projects.

Resources:

Parent Teacher Associations can provide a budget and support to add environmental education curriculum for teachers in the Media Center and have classroom sets of field guides available for student outdoor investigations. PTAs can also provide funding for teacher and PTA training for the Outdoor Classroom. Many EE resources are available in Georgia. Go to our Georgia EE Clearing House website to learn more at EEinGEORGIA.org.

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The Point and Name “Disease”

DO YOU HAVE IT? CHANCES ARE, IF YOU DON'T, YOU KNOW SOMEONE WHO DOES, FOR THE DISEASE IS AT EPIDEMIC NUMBERS AND SPREADING! It has found its way across southeastern school campuses and into the hearts and minds of parents and teachers everywhere; it is quite debilitating, keeping teachers in for days on end.

The disease preys on the brain and affects psychomotor movement. The dreaded student question, “What is the name of that flower, tree or insect?” seems to ignite the fever. Another symptom is the desire to LABEL everything in the outdoor learning area creating a museum/botanical garden, NOT an environmental education discovery area. Labels are often visually intrusive in a natural area and are Red Flags for vandals. Labels, quite frankly, impede environmental education and are the mistaken antidote for the Point and Name Disease. If you must have labels to get well, then create a map, a diagram, or a discovery path notebook that can be kept in a media center for reference. Let your students create it and do the research. You can sink a small section of PVC pipe, fill with concrete and number it for a vandal-proof label if you must.

If you really want to get well, BELIEVE that you, as the teacher, are not responsible for knowing the names of all the plants and animals in the natural world. Also BELIEVE that the name is not the most important thing to know about a tree, for example. Much more important are things like how the tree works, how it cleans the air, is a habitat for wildlife, gives oxygen, how its bark feels, the shape and texture of its leaves, etc. The student in exploring these things forms a long lasting relationship with the plant. My fourth grade teacher assigned me a report on a tree with no name. I had to find out everything I could about this tree and then make up my own name for it. I called it the “Dancing Giraffe Tree”. To this day I am prone to dash across creek beds or stop my car and run to the Sycamore Tree that needs a hug.

Students will learn and remember if they touch, smell, see and hear. Feeling the hairy underside of a leaf, touching the rough bark of the pine, counting the needles in a bundle, are marvelous lessons to knowing a plant. Keeping a Discovery Journal, drawing and writing about discoveries further impacts the learning. Seeing a tree labeled stops the learning process and is quickly forgotten. If a student wants to know the name, they can research it in a field guide. Learning to use field guides is an important lesson in itself. Media centers can provide field guide sets for outdoor discoveries. If a student has taken the time to learn through sensory exploration, the student will truly know the plant and be able to recognize it anywhere. If a student has looked at a labeled plant, they may not be able to recognize this plant again in its varied forms. With summer here and fall around the corner, you don't want to be laid up in the classroom. There has been a breakthrough and medicine is available! It's fun and easy and comes in inexpensive capsules of environmental education teacher training.

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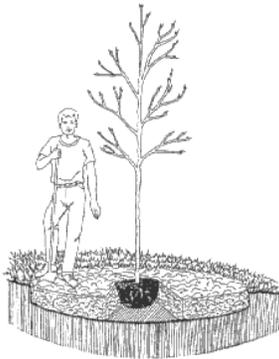
Georgia Department of Natural Resources/EPD/ Nonpoint Source Program

Trees = Healthy Learning

Trees provide many things for our communities and us: beauty; energy conservation from shading and wind protection; reduction of soil erosion; the filtering of air pollutants; raising of property values; a home for wildlife; and a place to hang a swing. Trees are an integral part of our home landscapes and neighborhoods.

How to Plant a Tree

Planting too deeply and under- and over-watering are the most common and serious planting errors.



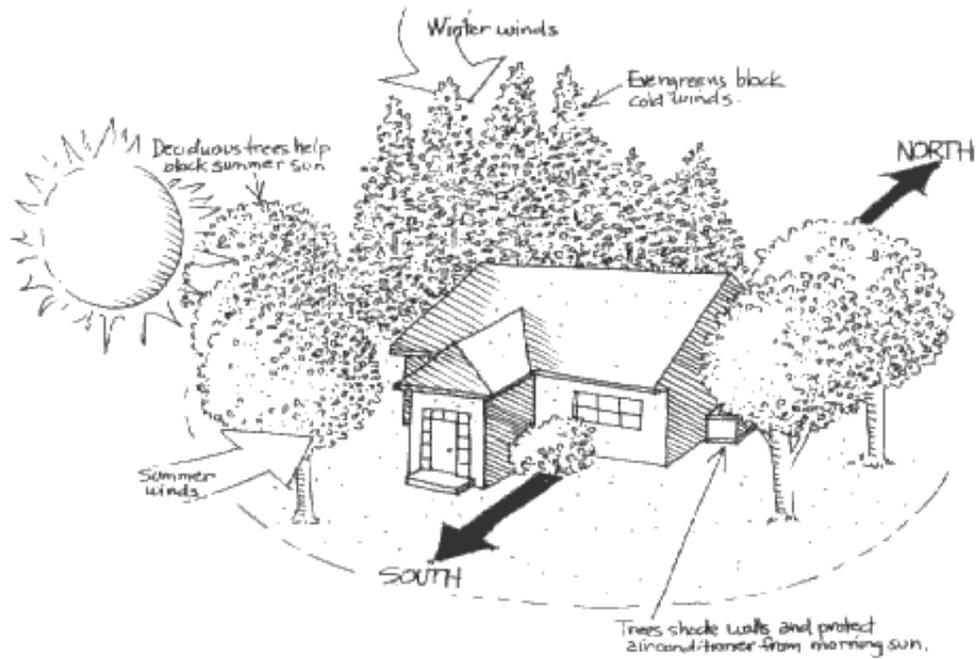
- Choose a tree that is at least a five to six-foot and grown to nursery standards.
- Select a site in full sun with enough room for roots and branches to reach full size. *Avoid overhead and underground utilities.
- Prepare a planting area by digging the diameter of the hole two to three times as wide as the root ball (contain the tree came in), and as deep as the height of the root ball. This will prevent the tree from settling too deeply in the hole. The soil that you dig out of the hole is what you use to backfill around the root ball. No soil amendments are recommended when planting a tree; therefore, no compost, peat moss, or

shredded pine bark should be added to the backfill. The reason for not amending the soil is that the roots may not grow out into the surrounding soil, but remain in the hole that was dug. However, if poor drainage is a problem then amendments may be added.

- Use water to settle soil and remove air pockets in planting area.
- Prune only broken or dead branches at planting time. Removing live branches removes a source of stored energy important in overcoming planting stress. Start pruning for good structure in a year or two once the tree is better established. Pruning for a strong tree framework goes a long way in preventing future problems.
- Stake the tree to flex with the wind only if tree is unable to stand up to wind. Wire even if protected with garden hose can damage the trunk. Use broad-banded materials, check frequently and remove after one year.
- After planting the tree, build a 4-inch tall berm around the edge of the hole.
- Spread a two to three inch layer of organic mulch on entire area, but not within six inches of tree trunk. Mulch helps to conserve soil moisture, eliminates harmful competition from turf and keeps lawnmowers and weed whips from damaging the trunk.
- Wait a year to fertilize unless using a slow release fertilizer.
- Do not allow the ball to dry out. Once your tree has begun to establish a root system, keep the soil damp but not soggy. Water deeply. Apply water according to the needs of the tree or as your soil dries out. Check the soil in the root ball for moisture by probing with a finger to assure yourself that the plant needs water. The goal is to wean the tree slowly off of supplemental irrigation, and get the root system large enough for the tree to thrive on natural rainfall. More plants are killed by over-watering than by under-watering.
- Don't forget the most important first step - select the proper tree. Avoid the "it's so pretty" impulse purchase. Do your homework. Select a tree with the correct mature height and one that will easily adapt to the soil and planting site.



Where to Plant Trees for Energy Conservation and More



Planting trees around your home will conserve energy and lower the cost of utility bills. Three well-placed deciduous (leaf-losing) trees on the east, south, and west sides of a home will shade it from summer sun and lower cooling costs by 10 to 50 percent.

Trees Through the Seasons: Spring

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What better way to understand the cycle of nature than by studying trees. Also, becoming a tree watcher is an excellent way to develop strong observational skills. As the seasons revolve noticeable changes are visible, and not so visible, in these towering giants. In the spring buds are bursting forth with new green leaves and trees are loaded with pollen ready to fertilize the female parts of the flower or the cone and form a mature tree seed.

Most of us never stop to think about the many ways trees fit into our lives and the consequences we will face if they were no longer here. Everyone needs to take a closer look why trees are important and not take them for granted. Take a close up look at a tree and discover its many attributes.

Remember to have students record the information in their journals.

Activity: Tree Detective

Skills: Observing, describing, recording, comprehending, analyzing, organizing

Purpose: This activity will provide students an opportunity to gain greater awareness and appreciation of relationships within a local environment throughout each season. By organizing information they have observed about the individual tree they have adopted they will be able to identify relationships between their tree and other organisms.

Setting: Outdoors

Time: 30 minutes – 1 class period several times during the school year

Materials:

- Journal
- Pencils—regular and colored
- Pencil sharpener
- Eraser
- Crayon
- Magnifying hand lens
- Magnifying box
- Measuring tape
- Tree field guide-*optional*

Procedures:

1. Have each student choose a favorite tree to adopt. How they select their tree is up to them. You may wish to have the students work in groups of two or more if there is a shortage of trees. If there are no trees near your school, students may choose trees in their neighborhood or local park. If possible, have students visit their trees before or after school. Have them explain why they have chosen their tree.
2. Explain that each group will observe their tree throughout the school year, or for however long you decide to conduct the activity.
3. In a journal each student will record observations such as where the tree is located and whether it is alive and healthy.
4. Provide tree field guides to help students identify the tree they have adopted.

5. Have them draw a picture of their tree from various locations, noting any signs that animals have used the tree in the past. Look for holes, nests and other animal signs. Also, add a bark rubbing and drawing of a leaf, nut, flower or seed from your tree.
6. Have them determine the age of their tree, its height and the number of its leaves. (See p. ___ for procedures on how to determine this.)
7. Encourage them to write a paragraph or poem describing their tree.
8. Have students visit their trees during different seasons throughout the school year. Each time, have them record observations or make sketches in their journals describing any changes they notice. Also have them note how their tree has remained the same.
9. Have them wonder how it feels to be a tree permanently anchored to one spot in the ground? How many seasons has it lived through? How have animals used it as a home or as a source for food? As your students sit near their trees, have them imagine the entire life of the tree, from a seed in the ground to the tree they see today.

Activity: How Tall Am I?

This activity can first be completed on a small tree, which will allow your students an opportunity to check their results by actually measuring the height of the tree.

Procedures:

1. You need three known measurements to find the unknown measurement of the tree. First, measure the shadow of the tree on flat ground with a meter stick.
2. Then, hold the meter stick vertically on the ground and mark the distance covered by the shadow of the meter stick. Measure the distance.
3. The relationship between the meter stick and its shadow will mathematically equal the tree's height and its shadow. Use the following equation and fill in the numbers.

$$\frac{\text{Measuring stick length}}{\text{Stick's shadow length}} = \frac{\text{tree's height}}{\text{tree's shadow length}}$$

Or

$$\text{Tree's height} = \frac{\text{stick length} \times \text{tree's shadow length}}{\text{Stick shadow length}}$$

If it is a cloudy day and shadows are not available, use this method to estimate the height of tree.

1. Have one student stand at the base of the tree to be measured.
2. Have another student hold a ruler at arm's length with the ruler at eye level and walk backward, keeping their arm straight until the top and bottom of the ruler line up with the top and bottom of the tree.
3. Note where the top of the student's head that is standing under the tree appears on the ruler (i.e. 4 inches)
4. Divide the length of the ruler by this figure (12 inches/4 inches = 3 inches)
5. Measure the partner's actual height and multiply it by the previous result (50 inches x 3 inches = 150 inches or 12.5 feet). This is the approximate height of the tree.

Fast Facts:

- For many species of trees the diameter of the spread of the tree's roots is roughly equal to the tree's height.
- A tree growing in an open space will develop a different shape than will a tree of the same type growing in a more cramped area.
- More than one-third of all forest-dwelling birds and mammals require a hole or cavity in a tree for nesting or shelter.

Activity: Tree Scents

Every leaf has its own special scent. To discover the scent, crush the leaf between your fingers until the green juice comes out. Mix the crushed leaves in a half-cup of water and smell the contents. Remember that some leaves such as privet can be poisonous.

Activity: How Old Am I?

Scientists estimate that mature trees grow at a rate of an inch a year. This activity will allow your students to add another piece of information in their description of a tree. Use a piece of string to measure the **girth** (the distance around the middle) of your tree. It is most accurate if you measure it about 4 ½ feet above the ground. Now measure the string. Every inch around the girth corresponds to about one year in a tree's growth. Do some trees grow faster or slower in a particular year? Why?

Activity: Bark Castings

Materials:

- Modeling clay
- Plaster-of-Paris
- Pieces of poster board
- Pins

Procedures:

1. Divide the students in to groups of 2 or more. Have each group choose a tree.
2. Prepare the tree by flattening out a stick of modeling clay so that it forms a rectangle about half an inch thick. Press the flattened clay hard into the bark of a tree. (Make sure that students push on the back of the clay as hard as they can.)
3. Carefully peel the clay off the bark and roll the sides into a long U shape.
4. Use pieces of poster board pinned into the clay to close off the ends to form a bowl. Mix plaster-of-Paris and pour into the bowl. Let it set. When hard remove clay.
5. Have students group the casts according to similarities and explain why they grouped them the way they did.
6. Have the students or groups exchange casts and see if they can locate the tree that the cast was made from.

Further Activity:

Discuss with students the importance of making careful observations. You may want to have the students paint the casts to make them look like the bark. Be sure that they try to make their colors match the bark and not just paint the cast brown.

Activity: Water Loss

You can't see it happening, but trees are losing water almost all the time. Water evaporates into the air as the **stomata** on the leaves open and allows carbon dioxide in and oxygen out. This loss of water is called **transpiration**.

Each group will fasten a small, plastic sandwich bag on an individual leaf and leave it there for an hour. Placement of the leaf should involve experimentation some should be in the shade, others in the sunlight. After an hour collect the bags. Pour the water into a graduated cylinder and measure the rate of water loss.

Further activity: Put Vaseline on the upper side of one leaf and on the underside of another. Tie a small plastic bag around the leaf (should not stick to leaf). Check leaf every hour and note which leaf has the greatest accumulation of water droplets. The underside of the leaf has more stomata.

1. Where did the water in the bags come from?
2. Which bag of leaves lost the highest percentage of water? Where was it placed for the hour?
3. What variable do you think was responsible for the difference in water loss?
4. What other variable may have affected this experiment?

Fast fact:

Scientists have shown that the average person requires a minimum of 360 liters of oxygen per day. A 25-square-foot plot of grass can, on average, produce that much oxygen in one day. *Have students measure a plot of grass that represents their oxygen needs for one day.*

Activity 29:

Lizard Lair



Objective: Distinguish between and understand the benefits of lizards in a garden; construct a shelter to attract lizards to a garden



Time: 45 minutes



Materials: large clay pot (10" or larger), sticks, flat rock or small clay saucer, and golf ball to baseball-sized rocks to fill the clay pot

Lizards are found though the world. They can be some of the most interesting, colorful and beneficial additions to a garden habitat. Your JMG group can welcome lizards to your garden area by creating a Lizard Lair that provides a shelter and even a perfect place to bask in the sun.

Ask the group to describe lizards, how they look, how they act, where they live, what they eat, etc. Have the students share stories of lizards they may have come across, including what colors of lizards they have seen, how big they are, what they saw the lizard doing, etc. During the discussion, point out these cool lizard facts:

- Lizards are reptiles (they are cold-blooded and must rely on the environment to warm or cool their bodies)

- Lizards will often seek shelter in rocks, brush piles or other small, confined areas
- Some lizards can change their color to blend into their surroundings (this is a cool adaptation that has helped them to survive by being better at hiding and hunting!)
- Most lizards commonly found around the home feed on insects and spiders
- Most lizards have the ability to lose and grow back a tail (tails can be lost as they are escaping from a predator)
- Some lizards are legless
- Some lizards can chirp, squeak or make other sounds

Tell the group that they will be creating a home for lizards in their garden. Ask the group of gardeners go on a scavenger

hunt to look for the materials to create the garden's Lizard Lair. They will need to find:

- golf ball to baseball-sized rocks
- any rocks with a flat shape
- thick sticks.

Have students carefully place rocks and sticks in a large pot until full. Gently rock the container back and forth to settle the contents and place the container in a protected area that receives partial sunlight. Place flat stones or small clay saucer atop the rocks to create a basking stone for the lizards. Use additional rocks or sticks if needed to make a firm base for the basking stone.

Ask the group to make predictions about how effective the Lizard Lair might be in attracting more lizards to the garden

habitat. Have the students create a log of lizard sightings in the garden area on a calendar simply by placing a tally mark for each different time a lizard is spotted. Also ask students to make a note of the time of day the lizard siting took place to determine if lizards are more active during certain times of the day.

Multiple Lizard Lairs can be placed around different areas of the garden to attract larger numbers of the reptiles. Remind the group that as they work to include more components of habitat that are meeting the specific needs of specific wildlife, they are more likely to have those wildlife make a home in the garden area!

If acrylic paints are available, allow the students to decorate the Lizard Lairs!

Did You Know?

Lizards and other reptiles do not produce their own heat.

The same light and heat energy that plants and other livings need to survive also provides the heat that lizards and other reptiles need to allow their bodies to function. Lizards will find surfaces, like rocks, that are warmed by the sun and will bask in the sun to warm their bodies.

Ford's Environmental Education Program

We have a unique and successful Environmental Education program at Ford. Through the implementation of the Earth Parent Program and the use of our wonderful Outdoor Classrooms, we are involving students, teachers and parents in hands-on learning experiences which enhance the overall education of our students, especially in the sciences and environment. Our program brings about an awareness which leads to an appreciation of our natural resources, preserving and respecting them. We attribute our success because of the commitment of Ford's Administration, Staff, PTSA and the community to the program.

These are some of the highlights of our program that make it successful:

- Outdoor Classrooms - they include the Children's Garden, the Kindergarten, 2nd and 3rd Grade learning gardens, the Georgia Native Plant Garden, the Nature Trail, the Aquatic Habitats, the Native Tree Arboretum, the Hillside Amphitheater, the Wooded Amphitheater, the Tracking Box, and the Stream/Wetland Observation Platform
- Earth Parent Program - parent volunteers teach a monthly lesson based on the Georgia Performance Standards in science and social studies
- Community Partnerships -we use outside resources such as Cobb County Parks and Recreation Department and Chattahoochee Nature Center, Adopt-A-Stream, Project WET, and Elachee Nature Center, to present additional environmental lessons to our students
- Earth Shakin' Workdays - days devoted to working in the gardens by parent volunteers, students and staff
- Eagle Scout Projects - the Nature Trail, both Amphitheaters, the Georgia Native Plant Garden, Compost Bins, and Picnic Tables behind the school and on the Nature Trail
- Other Scout Projects - each year some of the school Girl Scouts, Brownies and Cub Scouts have contributed community services to the program. They include making and filling birdfeeders, maintaining the Bluebird Trail, planting new or maintaining existing garden spots, and providing litter control.
- Service Learning - through the donations of plant material from VIVA Gardens and other sources, we have students plant gardens specifically for "Plant a Row for the Hungry" and Must Ministries.
- Fundraising - we supplement our PTSA budget through awards, grants and other fundraisers





Worth County Primary School Outdoor Classroom

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www.worth.k12.ga.us/wcps/oc.html

Outdoor Classroom Features:

- 3 acre nature trail
- 55 8'x8' raised bed classroom gardens
- The Lambs Yard: An Adventure in Learning a 20,000 sq. ft. school garden with a gazebo and 9 theme gardens: For The Birds, Butterfly, ABC, Memory, Musical Playscape, Storybook, Time For Weather, Experimental, and Pick Me Flower Bed.

Programs:

- Outdoor Classroom Committee – At least two teachers from each hall and other interested staff members
- Outdoor Classroom Student Advisory Council – Students elected by classmates provide input into the needs assessment and planning of the outdoor classroom. They serve as tour guides for visitors and explain new installations to staff.
- Second Saturday Outdoor Classroom Family Workdays
- Garden Parents
- Fall and Spring Great Outdoors Clean Up
- Garden Guardians – Middle school students in the full year agriculture class and alternative school students help with classroom gardens.
- Georgia Endangered Plant Species Network (GEPSN) – Students propagate native plants from seed for the garden.
- Nature Trek – DNR and GA Forestry set up stations for all students to visit during one full day
 - Kindergarten Stations: Fish, Animals in the Woods (whole body mounts), Tree Cookies, Forestry Bulldozer and Fire Equipment.
 - First Grade Stations: Tree Products, Pelts, Alligator, and Food Plots.
 - Second Grade Stations: Boating Safety, Wetlands, Camping, and Ants.

Goals:

Through the integration of instruction in a developmentally appropriate manner, the most important goal is to have all teachers reach beyond the walls of their classrooms, go outside, and teach something that has real life meaning to their students.

As a result students will:

- Experience the wonders of nature.
- Understand their relationship to the natural world.
- Develop a respect for all living things.
- Develop an awareness of the environmental fragility of the earth and their role in taking care of it.
- Feel a sense of accomplishment at school even if they are academically challenged.

Objectives:

- Establishing biodiversity around the school grounds.
- Enhancing the natural wooded area for the benefit of wildlife and humans.
- Providing beauty for all to enjoy.
- Providing for hands-on environmental instruction.

School Resources:

- Teacher written lesson plans - integrate instruction in the outdoor classroom areas. Plans are divided by grade level, specific outdoor classroom areas, and subject. They are on the schoolwide network for easy access.
- Media Center Shelf - holds outdoor classroom curricula, environmental education information, and gardening books.
- Web Page - www.worth.k12.ga.us/wcps/oc.html

Awards

- Scotts Give Back To Grow – Classroom Gardeners of the Year <www.scotts.com>
click “social responsibility” at the bottom of the page, click “Community”,
click “Give Back To Grow”
- SeaWorld/Busch Gardens/FujiFilm Environmental Excellence Award
www.seaworld.org
click “Just For Teachers”, click “Environmental Excellence Award”

Resources

- Environmental Education in Georgia <www.eeingorgia.org>
- Kids Gardening <www.kidsgardening.com>
- GA Wildlife Federation Educational Resources
<<http://www.gwf.org/resources.htm>>
- *Planning First to Make Your Outdoor Classroom Last*
<<http://www.gwf.org/bmpindex.htm>>

TREE PLANTING

Program Area: Math and Science

Activity Title: Tree Planting

Process Skills: Calculate needs, application, conservation

Safety Notes: Students will be provided hard hats and will be instructed in handling and use of tools. They will also be taught proper woodland walking techniques and will be supervised by adults. (Video is available.)

Content: Addition, multiplication and division Tree structure, conservation, personal responsibility

Materials: Background Material. Planting site, tree seedlings, and safety equipment will be provided by the U.S. Forest Service.

Procedures:

1. Discuss background material with students.
2. Students will be told they will plant an area of tree seedlings on the National Forest and need to calculate the number of trees they will need for the job. The unit of measurement for land is an acre. One acre is equal to 160 square rods or 43,560 square feet. Example: To plant trees 15 feet apart on a one-acre plot, $15' \times 15' = 225$ sq. ft. $43,560 \div 225 = 194$ trees per acre.
3. Students will be shown the parts of a tree seedling, the function of each, and how a tree grows. They will be instructed how to plant the seedlings using a special tool, called a dibble bar.
4. Students will be told the importance of trees for products and ecological needs, the meaning of conservation and personal community responsibility.
5. Students will plant the trees using the dibble bar. They will most likely work in pairs, or in a team of 3-4.
6. Students will be told that survival rates of trees vary from 50% to 98%, depending on how well the trees are planted, the condition of the seedling when it is planted, rainfall, fertility of soil, etc. Calculate how many trees will survive on an acre planted with 194 trees if the survival rate is 50%, 75%, 85% and 98%. (round to the nearest whole) Ans. 97 trees, 146 trees, 165 trees, 190 trees

Extension:

Activity from Project Learning Tree K-8 Guide, "Every Tree for Itself" gives students an idea of the conditions that trees need to live and grow and helps them understand that trees must often compete for their needs.

Assessment:

Forester will spot check tree planting to assess success. Accuracy of calculations will be checked by teacher. Students will write a report/essay on why we should plant trees.

Tree Planting Background Material

Over 5,000 products we use every day come from trees grown on tree farms, timber company lands, state and national forests. Some of these products are obvious such as lumber but others such as paper, photographic film, imitation vanilla flavoring, and rayon are not as evident. It takes a tree, 100 feet tall and 21 inches in diameter to supply just one person in the United States with the products they use from trees for one year. It takes 60-80 years to grow a tree 100 feet tall. It is very important that we replant trees that have been harvested or destroyed by fire, insects, disease or blow downs if we are to continue to have an adequate timber supply. It is also very important that we practice conservation of our natural resources. This means that we must use the trees we do have wisely by using as much of the tree as is possible, minimize waste, take only what we need from the forest and plant new trees to replace those that are harvested.

Trees are very important for other reasons besides the products they provide. They clean the air, buffer noise, give wildlife homes and sources of food, protect the soil from erosion, protect the watershed, and give us oxygen. It is hard to put a dollar value on these benefits.

The trees you plant at your home will probably be planted differently than the trees you will plant in the forest. First, the site in your yard may be different and would require a different tree species. The tree you plant at home will probably be larger and will have a root ball usually wrapped in burlap. You would use a shovel to dig a hole three times larger than the root ball and one and a half times as deep to plant your tree in. In the forest, you will use a dibble bar which makes a thin straight hole about a foot deep in the soil to gently and slide the delicate roots of the tree seedling in very snugly. It is very important to plant the seedling correctly. Bent roots can make the tree more likely to be blown down years into the future.

The parts of the tree seedling are:

Leaves or needles - photosynthesis takes place here. The leaves take in carbon dioxide from the air, light from the sun for energy and combine it with water and nutrients from the soil and make sugar for the tree to grow. In the process, oxygen is made and some of the water is transpired into the air. This is very important in the water cycle.

Stem or trunk - supports the tree. All growth takes place here, water and nutrients are carried up and down the tree so it will grow.

Roots - anchor the tree and take in nutrients from the soil. The main root is the tap root. It is usually the largest. Feeder roots branch out from it. They hold the soil in place and pump water and minerals into the tree from the ground.

A tree grows the fastest in the spring and summer when there is more light from the sun so the photosynthesis process is carried on more rapidly. In the fall and winter growth slows. The light growth you see in a tree ring is the amount the tree grew during the spring and summer and the dark ring is the fall and winter growth. Together they make up one year in the life of a tree, so you can count the growth rings to determine the age of the tree. (Show a cross section of a tree.)

TREE SAPLING, SHRUB AND WILDFLOWER PLANTING

Program Area: Science and Language Arts
Activity Title: Tree, Shrub and Wildflower Planting
Process Skills: Demonstration, research, application

Safety Notes: Hardhats will be provided by Forest Service partner and instruction in proper tool use. Students will also be supervised by adults.

Content: Written and oral communication, research process, interpreting information

Materials: Plant materials, planting site, safety equipment and tools to be provided by U.S. Forest Service.

Procedures:

Students will be told sometimes trees and shrubs are killed by insects, floods, fires, disease and other disasters. A popular campground on the National Forest was recently attacked by the Southern Pine Beetle which killed hundreds of pine trees. Many of these trees are being "salvaged" for pulpwood which is used to make cardboard and paper. However, cutting will make the campground less pleasant to visit. Leaving the dead trees will be dangerous to campers. Trees that will grow quickly must be planted to provide shade and wildlife habitat, soil protection and to improve the aesthetics (looks) of the campground. Students will plant trees, shrubs and wildflowers in this campground to improve the beauty, provide wildlife habitat, shade, and to restore the ecosystem by working with natural succession.

Large hardwoods (5'-10') will grow faster than seedlings. They are more difficult to plant and to maintain, as they require digging a hole one and a half times as deep and three times as large as the root ball. Watering is also very important especially during dry summers for the first three years.

Only native trees, shrubs, and wildflowers can be planted on the National Forest. This is to protect and sustain the ecological relationships within the ecosystem. Students should research a list of native trees and shrubs and determine which species would be appropriate to plant. These should be native to northeast Georgia, not just to Georgia. Example: Native Shrubs: Mountain Laurel, Dog Hobble, Autumn Olive, Rhododendron, Wild Azelea. Native trees, shrubs and wildflowers play important roles to wildlife, some endangered, or threatened. Students should research these

roles and list at least one endangered or threatened species that would benefit from any of the trees, shrubs, or wildflowers.

Extension:

Activity from Project Learning Tree K-8 Guide "Nothing Succeeds Like Succession" will help students understand that plant species change naturally over a long period of time in an ecosystem and will help students gain the connection between plants, animals and successional stages in local ecosystems.

Activity from Project Learning Tree K-8 Guide "Dynamic Duos" will examine close relationships that exist between different organisms and explain how partners in these relationships help each other survive.

Assessment:

Forest Service personnel will check tree, shrub, and wildflower plantings to assess planting techniques. Students will give a report on the habitat benefits to endangered or threatened species from planting the species chosen on the National Forest.

Resources:

"Important Trees of Eastern Forests" from the U.S. Forest Service