



NATURE REVEALED

Discover Nature Schools Pre-K Instructional Unit



TEACHER GUIDE



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TEACHER GUIDE

By Sherri Griffin



Missouri Department of Conservation

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Acknowledgments

Nature Revealed grew from many revisions of *Conservation Seeds*, which I wrote for the Missouri Department of Conservation in 1984. As I look back on that original publication, I see my own growth as a teacher of young children and a student of nature and conservation. Many people, experiences, and lessons have contributed to this new guide. Over the years, the Missouri Department of Conservation education consultants have listened and responded to my many stories and ideas. The learning experiences presented here would not be as varied or as deeply rooted in conservation and nature were it not for their patient conversations with me. My husband, John, wrote the curriculum's stories and listened to many trial verses to the songs. I appreciate his wisdom and suggestions. But the most important component to this work is the sense of wonder I hope it inspires in teachers and children. This comes directly from the children and families at Millersburg Preschool. They keep me constantly wondering about how to develop my own understanding, as well theirs, of this complex ecosystem in which we live and learn.

Purpose and Overview

Helping you inspire a sense of wonder, meet state early learning goals, and engage families

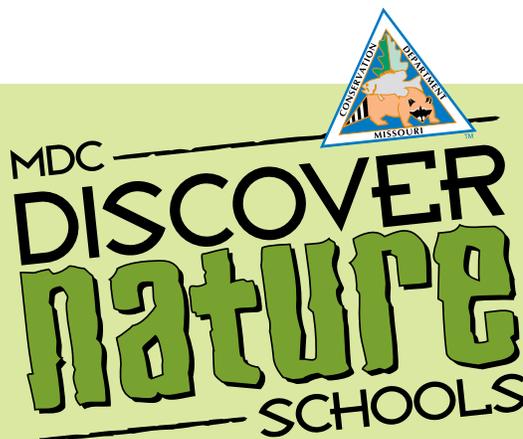
Nature experiences for young children should emphasize feelings rather than knowledge. Rachel Carson called these feelings *the sense of wonder* and authored a book so-titled for parents and teachers. Her message encouraged us to make discovery fun and to stimulate children's natural sense of wonder. Later, when they are ready, children will learn the science and management skills necessary to conserve nature, wherever they live, play, and work. *Nature Revealed*, the pre-K unit of the Missouri Department of Conservation's Discover Nature Schools Program, takes Carson's message to heart and gives teachers and parents the planning tools, activities, and resources they need to stimulate children's natural sense of wonder in nearby nature.

Unit overview

The core of *Nature Revealed* is a rich, diverse collection of developmentally appropriate learning experiences keyed to specific learning centers that will help young learners discover the connections between nature and everyday living. You will also find a wealth of ideas and information to empower you to lead nature activities with confidence, knowledge, and skill. Missouri's *Project Construct* goals and *Missouri Early Learning Goals* will help you meet state requirements and keep children engaged in outdoor learning throughout the year. In addition to the unit's topics, learning experiences, and state goals, you will find materials families can use at home to support classroom learning and field experiences. Thematic lesson plans will further support your efforts to match classroom nature study with state early learning goals. Whether you use a few or all of the unit's activities, tools, and suggestions, you will begin shaping the next generation's lifelong attitudes about nature and the ways we use and conserve it.

Discover Nature Schools

Hands-on experiences in nature can help Missouri students become conservationists for life. The Missouri Department of Conservation's Discover Nature Schools (DNS) program gives Missouri educators the tools they need to get students outside and learning about nature, in nature. Aligned with Missouri Department of Elementary and Secondary Education Goals, DNS instructional units help schools develop a strong conservation ethic in students from pre-K through high school. Browse our primary, elementary, middle school, and high school instructional units at mdc.mo.gov/node/9019.



Principles of Sharing Nature With Children

“It is more important to pave the way for the child to want to know than to put him on a diet of facts he is not ready to assimilate” (Rachel Carson, 1965).

Your approach can be as important as the activities themselves in sharing nature-learning experiences with children. In his book, *Childhood and Nature: Design Principles for Educators*, David Sobel (2008) identifies seven childhood play motifs we can use to help children build relationships with nature.

Throughout all the principles, Sobel cautions us to help children learn about and love their own local nature before challenging them to solve larger environmental problems, such as habitat loss or pollution. “If we prematurely ask children to deal with problems beyond their understanding and control, prematurely recruit them to solve the mammoth problems of an adult world, then I think we cut them off from the possible sources of their strength” (Sobel, 1996, p.5).

I followed Sobel’s advice and used his principles — along with knowledge of developmentally appropriate practice for three- to five-year-olds — to structure the *Nature Revealed* learning experiences. Recognizing and using these design principles will help you shape successful learning experiences for children. They also give you, as a teacher, permission to explore the unknown and experience the joy of learning along with the children, while keeping in mind the outcomes established by early childhood learning goals.

Adventure

Sobel’s first principle involves risk-taking and exploration of the unknown. One winter when my niece and nephews were staying with me, we adventured in the woods and snow on a daily basis. One of their most memorable experiences was “getting lost.” We were hiking in an area of the woods they had not visited before. I pointed out the direction to the house, then walked out to the road, and left them to find their way home. Their sense of adventure was piqued, and they became explorers in a new territory. They talked about and asked that this experience be repeated for months afterward. It was also the fodder for stories and mapmaking when we returned to the house and when they went back to school. Remember to set the stage for adventure as you explore experiences with the children.

Fantasy and imagination

Sobel’s second principle involves engaging the child’s imagination and encouraging him or her to live the challenge. I often visit a creek with the children and families from the local preschool where I teach. There are a number of large trees that have fallen in recent years. These “jungle-gym trees” have grapevines hanging all around and the creek flowing by them. The children challenge their physical prowess as they climb and balance on these large trees. They become pirates walking the plank or leprechauns hiding their gold. During a visit, one boy climbed into a hole and hid his face. He challenged me to take his picture, and afterward we all looked to see if we could spot him in the photo. Indeed he was difficult to see! Children’s imaginations soar in this unstructured natural environment. Use the experiences in this guide to create worlds for children to imagine and explore, while also accomplishing the tasks designated in the learning goals. The goals guide our teaching and ensure a certain level of competence, but they shouldn’t make learning dull. Engage your imagination as well as the children’s, and everyone will remember the material you want them to learn.

Animal allies

“Animals play a significant role in the evolution of children’s care about the natural world and in their own emotional development” (Sobel, 2008, p.29). In Sobel’s third principle, the best way to understand something is to become that thing: to live, breathe, and play as the animal or plant. Preschoolers are adept at this. They delight and deliberately engage in giving human characteristics to animals. Embrace this and use their natural inclinations to guide them to understand the animals in their environment. After experiencing life as an animal, the idea of habitat becomes real for them. Only after many of these types of experiences can children grasp the plant or animal’s role in the ecosystem. We can’t ask children to conserve nature until they really know it.

Maps and paths

Sobel (2008) describes this fourth principle as “finding shortcuts, figuring out what’s around the next bend, following a map to a secret event. Children have an inborn desire to explore local geographies. Developing a local sense of place leads organically to a bioregional sense of place and hopefully to biospheric consciousness” (p.34).

One year, a shy five-year-old came to me with an activity she wanted to do. She thought we could use the map in her *Tinker Bell* book to find all the Pixie Hollow places at the creek. I was skeptical, but I copied the map and gave her the copies to hand out on our next creek adventure. Amazingly, the children used the maps to locate magical Pixie Hollow places along the creek. I took the maps very literally, but the children used them to delve into the hidden nooks and crannies of our familiar creek world. It was a memorable experience for everyone!

Several activities in *Nature Revealed* suggest making maps with children. Mapping challenges children to consider their space in new ways. It also allows adults to see what is important to them and how they view their immediate environment. Mapping activities will push children to express the internal maps they have of their familiar spaces. For very young learners, this may involve mapping the pretend-play area, the entire classroom, a nook in the play yard, or some other familiar small space.

Special places

In his fifth principle, Sobel notes that children have an innate desire to find and create special places. For the youngest children, this might be building a house from the couch cushions in the living room. Older children may move farther afield. In the classic picture book, *Roxaboxen* (McLerran, 1991), children create an entire village from materials found near their homes, where they retreat to play, be alone, and act out the many puzzling aspects of the adult world. Children create these special places with or without adult assistance. As teachers, why not take advantage of this and work with children to create special places in the play yard? Take *Nature Revealed* learning experiences outside as often as possible, and make learning centers (see the Learning Centers section in the table of contents) available inside the classroom and outside on the play yard. Children will find their special places, but if you make a conscious effort to address and use these as part of the curriculum, the learning experiences will provide even stronger connections for both you and the children.

Small worlds

In Sobel’s sixth principle, children love to create and play in miniature worlds. Playing in these worlds allows children to see and understand the larger picture. “It’s like the one-page organizational chart for the organization, the site map for the website, the logic model that describes the underlying assumptions for a project” (Sobel, 2008, p.46). The trail we use to access the creek is an old wagon crossing. It is still marked on the deed to the property. The path down to the creek is wide with a rocky ledge along one side. Along this ledge are many rocky nooks and crannies. They cry out to be homes to magical creatures. The children designated one of these nooks as a leprechaun house many years ago. It is a routine stop on our treks down to the creek. Over the years the leprechaun sometimes leaves notes and treasure for the children to find. Inside the house, he stores his gold (a small pile of fool’s gold) and his hat. The leprechaun or some of his friends, the raccoons or birds in the area, routinely move the hat. Several years ago the hat completely disappeared. The children speculated that the leprechaun must have taken it back to Ireland. It was a great surprise (to the children but especially to the grown-ups) when the hat reappeared several years later. The exploration of this rocky area has led the children to believe that all of the nooks and crannies are homes to leprechauns and fairies. They explore this miniature world, looking for signs of residence, as well as discovering much about the local flora and fauna. Mosses are left intact as fairy beds, and pillows and shells are added for fairy bathtubs. This magical place inspires respect and consideration for not disturbing the inhabitants, always returning the rocks to where they were found, and leaving nothing behind that isn’t already part of the environment.

Hunting and gathering

In his seventh and final principle, Sobel describes hunting and gathering as an innate characteristic of being human — part of our survival instincts. He suggests that teachers follow these instinctual predispositions and use them to structure learning experiences that will foster a positive relationship between children and the natural world. Children routinely make collections of artifacts they find — rocks, shells, sticks, and flowers. The instinct to hunt and gather is the basis for several of the experiences we suggest in this guide. These activities provide opportunities for the young naturalist to sort, classify, and create, which is how children learn.

In addition, Sobel addresses the idea of hunting and gathering figuratively: “the quest, the search for the elusive” (2008, p.55). During our routine visits to the creek, one of the children’s primary activities is hunting for treasures. No one knows (including me) what we will find along the way. On one drizzly, wet trip to the creek, we stumbled upon a newborn fawn in the grass right next to the trail. When we returned to the classroom, research revealed that the fawn had not been abandoned, as the children thought. The mother stays away on purpose so she doesn’t leave her scent on the fawn. Our hunt led us to research that taught all of us more about the deer, with which we share the natural world.

Leading Nature Experiences With Confidence

“If a child is to keep alive his inborn sense of wonder... he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in” (Carson, 1965).

We recommend conducting many of the *Nature Revealed* learning experiences in learning centers you set up outside in the play yard or in your local neighborhood (read more about this in the Learning Centers section). Familiarize yourself with the outdoor area, making note of places to be avoided. Each time you plan to take children outside, look at the area with the objectives of the learning experience in mind. Try to anticipate what the children will find and what challenges they might encounter. Preparedness will assist you in guiding the children toward discoveries you want them to make and in facilitating their learning.

Choose the right clothing

Make sure children wear the right clothing for the weather and the planned activity. Socks, comfortable shoes, and long pants will help prevent problems during outings in the woods. During the winter, keep extra gloves and hats on hand for those children who come to school unprepared. Of course, weather extremes should be avoided, but much can be learned through observations following or during a light rain or snowstorm.

Keep activity-related tools on hand

Storing routinely needed materials in a readily available outdoor space allows you to take advantage of teachable moments that arise.

Encourage observation

Many of the learning experiences encourage children to explore with all of their senses. Model observing, sketching, and recording data about phenomena as you move through the area with the children. If you don’t consider yourself an artist and scientist, the children won’t think of themselves as artists or scientists, either. Ask direct questions that will help children focus and challenge them to think. Bring the observation to the child’s developmental level. For example, make comments regarding color, size, shape, texture, or smell rather than providing factual information.

Take advantage of teachable moments

These are times when a child or a group of children expresses an interest in something or a phenomenon that unexpectedly presents itself. Seize the opportunity and expand upon the expressed interest — it may not be there when you are ready to do a unit on it. A study that I initiate won’t be nearly as successful or as valuable as one that occurs when I take advantage of the teachable and learnable moment. Children learn best when they are naturally interested in a topic. Following the children’s lead promotes learning experiences where everyone is actively involved in the learning, including the teacher.

Nature Walks

Nature walks are an easy, inexpensive way to share nature with young children. However, adults may be reluctant to lead nature walks if they feel they lack experience or knowledge. The following list of activities is designed to encourage teachers and parents to help children explore and make connections with nature as they walk.

Scavenger or treasure hunts

These can be as simple as challenging children to look for specific colors. Try a different focus each time you take your class out for a walk.

COLOR: Pick up some paint-sample chips at your hardware store in preparation for the walk. Give a different paint chip to each child and challenge him or her to find natural items that are the same color.

PICTURES: Pass out pictures of plants, animals, and other natural items that children might encounter on their walk. Challenge children to find the item on their picture. This works especially well with very young children. However, it can be very challenging for older children when the items in the picture are difficult to find. Hide several along the trail in their natural habitat and challenge children to look for them.

TEXTURE: Assign each child a texture to explore. For example, one child might look for smooth items, while others might look for items that are prickly, hard, hairy, soft, sticky, etc. Older children can feel for opposites in texture.

CONTRAST: Challenge children to look for contrasts on the nature walk. Ask them to find the driest and wettest place, the coldest and hottest, the place that receives the least and most sunlight, the oldest and youngest thing, most scary and most comforting, darkest and brightest, heaviest and lightest, etc.

SIZE COMPARISON: Challenge children to find items of different sizes and then to relate those things to themselves. For example, find a plant as tall as your waist, a leaf as wide as your foot, a rock as long as your little finger, a flower as big as your fist, etc.

SOUNDS: Play a recording of one or two birds whose habitats are at the nature walk. While outside, try to locate and identify the birds making those calls. Go on a silent listening walk and challenge the children to record their observations in science notebooks without talking.

SHAPES: Assign each child a different shape and then challenge him or her to find as many items as possible that share the same shape.

ANIMAL SIGNS: Challenge children to look for signs of animals. These could be places where an animal has eaten, or tracks, nests, etc. Speculate as a group about what the signs tell you about the animal and the evidence it left behind.

PEOPLE-MADE ITEMS: Look for people-made things along the trail. Carry a bag to collect any trash you find.

Explore an area

This type of experience is different from a scavenger or treasure hunt in that children are challenged to focus on a small piece of their environment rather than walking or moving through the entire environment. As with all of these experiences, it is important that the teacher join in the activity and model behavior for the children.

LISTEN TO THE GRASS GROW: Ask children to lie on the ground and pretend to be part of the earth. Be sure everyone lies where they are not touching someone else. If children will allow you, have them close their eyes and lightly cover their faces and bodies with dry grass or twigs so they actually look like the ground. Explain that they must be quiet and blend in with their surroundings if they want to hear and see things. After several minutes, begin a discussion of how they felt and what they heard, saw, and smelled.

CIRCLE OF EXPLORING: Place circles of yarn around a small area in a park, wooded area, or play yard. Provide each child with a magnifying glass and a science notebook or sketch board. Challenge children to find all of the living and nonliving things in their circle. Try this activity in several different habitats and compare the results.

EXPLORE A TREE TRUNK: Challenge children to explore a rotting log or tree trunk in the woods. Again, provide magnifying glasses and science notebooks for sketching and recording their finds.

EXPLORE A HABITAT: Select a specific type of habitat for children to explore (fence row, wetland, creek bank, etc.). Return during different seasons of the year to see how the habitat has changed. Magnifying glasses and science notebooks will help children focus and record their findings.

Collecting Artifacts

Collecting artifacts and taking them back to the classroom is a wonderful way to extend an outdoor experience. Many of the learning experiences suggest collecting specific artifacts for sharing back in the classroom. Go over the following guidelines with your class before embarking on a collection adventure.

Discuss safe and specific items to collect

Young children are often very zealous in their collection process and don't consider safety. Be sure to discuss what the children are collecting and how to make sure it is something safe before beginning the activity.

Respect the area

If you are exploring an area beyond your schoolyard, read and follow any posted rules. Caution the children about taking only what they need for your specific purpose. The rest should be left behind for other visitors to enjoy. Talk about using nature wisely and speculate about the impact the children might leave on the area. For example, when collecting seeds or nuts, it's a good idea to leave plenty for local wildlife. And when collecting wildflowers, it's fair to leave plenty for the next visitors to enjoy.

Consider alternative methods of collection

Collecting artifacts doesn't always mean physically removing them. Your class can also take photos and make sketches. Audio recordings and short videos can also serve as valuable reminders. Reviewing these recordings back in the classroom allows you to notice details you might have missed while in the area.

Don't collect live plant and animal specimens

Creatures encountered during an outdoor learning event should be observed in the natural habitat then released immediately. Tadpoles should be observed in a natural habitat rather than taken back to the classroom to be studied. Plants and animals held in captivity can be exposed to harmful diseases, viruses, and fungi that might be transferred to wild native species when you release them. As an alternative, consider building animal habitat (for example a small pond) in your play yard that will attract the animals or foster the plants you want to share with the children.

DO NOT release purchased tadpoles, insects, or plants into the wild

Many of these purchased species are not native to Missouri and can create difficulties for native species, disrupting local ecosystems. *The Wildlife Code of Missouri* specifically prohibits possessing some species, such as Chinese mystery snails and rusty crayfish, which can be purchased out of state. Several invasive species around the country have been traced back to school-project releases. If you purchase plants or animals to observe and study in the classroom, dispose of them in a proper manner (humane euthanasia for animals or in a plastic bag deposited in the trash for plants).

About collecting feathers

Feathers are wonderful artifacts to study and use in the classroom. However, laws regulate the possession of feathers from certain birds. The Migratory Bird Treaty Act (MBTA) of 1918 establishes a prohibition on the possession, purchase, sale, transport, etc. of any migratory bird and includes prohibition on any bird part, nest, or egg of any such bird. To legally possess feathers of birds protected by MBTA, contact a conservation agent of the Missouri Department of Conservation for assistance with obtaining the federal educational-use permit, which must remain with the specimen. Feathers and other parts (except meat) from legally obtained game birds may be legally possessed without permit. Other bird species, including house sparrow, European starling, and rock pigeon, are not protected under MBTA or state law and feathers from these birds may be legally possessed without permit. Also, feathers from farm-raised birds may be legally possessed as well as those purchased from classroom supply or hobby retail sources.

Learn to recognize poison ivy

Find a color picture and full description of poison ivy in our online field guide at mdc.mo.gov/node/73.

This native plant is common throughout the state. The foliage turns a brilliant red in the fall, enticing young hands to pick it during collection trips. Find the plant at the beginning of your walk or activity and show it to the children. Repeat the identification often. You might teach your class the following song, sung to the tune of *Yankee Doodle*:

*Poison ivy has three leaves.
White berries grow upon it.
It is food for birds and deer,
But people should not get near.
Poison ivy leaves of three.
Poison ivy let it be.
Bush or vine do not touch it
Unless you want to itch, itch, itch!*

The song helps children remember what to look for but also encourages them to see the purpose poison ivy serves in nature.

Always leave the area cleaner than you found it

Take along a trash bag to pick up trash, even when this isn't your goal for the outdoor learning experience. You are modeling responsibility and caring for the environment.

Science Notebooks and Sketch Boards

Science notebooks help young children record their ideas and observations during nature walks and outdoor learning experiences. In addition, they give you insight into the children's thinking, helping you see where to lead the study, or when to help a child clarify understanding.

The notebook can be several pieces of paper stapled together, a small spiral-bound notebook, or something more elaborate. You might consider making each child a science notebook at the beginning of the year (see *How to make hand-sewn science notebooks* below). Notebooks can be introduced in a variety of ways, such as gathering children together and focusing them on a particular experiment, or during a walk. Whatever strategy you use to introduce the notebooks, keep in mind several important points.

Model scientific behavior for the children

When the teacher participates in an activity, then children see it as an important thing to do. I often talk aloud while writing and drawing in my science notebook so children can hear my thinking. Sometimes my notebook entries might be a drawing, chart, recipe, or merely a prediction. Just as the children aren't always correct in their thinking, neither am I. My science notebook is also my place for keeping track of my data, thoughts, and ideas. If I place value on my notebook, take care of it, and write things that have meaning for me, so will the children.

Accept whatever they choose to draw or write in their notebooks

Children may be hesitant about writing and recording their thoughts, so assure them it is all right to pretend to write or draw pictures of their discoveries. Teacher expectations are important in how children feel about their entries. Everything, including drawings, scribbles, strings of letters, and invented spelling, should be accepted and acknowledged as writing. I always record the date and the subject of our experiment or entry in my notebook. The children are provided with a date stamp so they can also stamp the date on their entries. As I look back through their entries, I am often amazed to see how they really did represent the experiment or observation at the time.

Make the science notebooks available for children to use at any time of the day

If we want children to learn to record their questions, observations, and conclusions, they need to have access to their notebooks any time they feel they have something worth recording. Once children learn to use their science notebooks as a tool, they frequently record information and data on their own.

Sketch boards are another tool for recording ideas and observations. I use small, inexpensive clipboards purchased at our local discount store. However, a sketch board could be as simple as a piece of sturdy cardboard and paper attached with a rubber band. I use sketch boards with the children when I want to use their work in documentation or display. However, usually with sketch boards, I provide colored pencils, and the focus is primarily on sketching or drawing.

How to make hand-sewn science notebooks

1. Take a large piece of specially decorated paper (at least $8\frac{1}{2} \times 11$ inches) and lay it face down on the table. I usually use paper from the children's art projects.
2. Glue two pieces of mat board ($4\frac{1}{2} \times 6$ inches) in the middle of the paper, leaving about $\frac{1}{4}$ to $\frac{1}{2}$ inch between the two pieces of mat board and about $\frac{1}{2}$ to 1 inch all the way around the outside. Smooth out the paper. (Mat board is available at most frame shops that will often donate their scraps.)
3. Cut away the corners of the paper to the corner of the mat board.
4. Wrap the paper around the mat board, like wrapping a present, and glue.
5. Take 10 to 12 half sheets of paper. Fold each in half individually. Open the paper and place one on top of the other, like a tent. These can be sewn on a sewing machine using a wide stitch or sewn by hand. If using a sewing machine, skip steps six through eight, moving on to step 9.
6. Take a yarn darning needle (or an awl) and poke three holes in the crease of the papers, one at the top, one in the middle, and one near the bottom.
7. Cut about a yard of crochet cotton. Wax the thread with beeswax (this keeps it from cutting the paper). Thread the needle.
8. Sew up the book like a figure 8 (from the side), starting and ending at the top.
9. Glue the first page to one piece of mat board and glue the last page to the other. Smooth out and try opening and shutting the book several times to make sure it stays in place.

Dealing With Difficult Questions About Outdoor Activities

"Whether kids live in New York City or other urban areas or in the middle of rural Iowa, helping children reconnect with the natural world sparks wonder and curiosity" (Georgia Heard & Jennifer McDonough, 2009, p.6).

Hunting

As you delve into conservation education with young children, you will sometimes come across controversial issues. Sometimes, hunting is a difficult topic for teachers of young children. Hunting is addressed in *Nature Revealed* because animal harvest — or hunting and trapping — are management tools for wildlife. Several *Nature Revealed* stories characterize hunters as safe, ethical, and responsible. While hunting is not a prominent piece of the unit, it is part of the underlying conservation ethic. Many species of Missouri wildlife owe their health to hunters. In 1937, the Missouri white-tailed deer population was nearly gone. The state officially established the Conservation Commission, funded through sales of hunting and fishing permits. The commission began a comprehensive restoration program that included changes in hunting regulations, stricter enforcement, research, live trapping and distribution, and public-education efforts. As a result of those early efforts, Missouri has a very healthy deer population. Since deer have few animal predators in Missouri, the healthy deer population depends on human hunters. Without an annual deer harvest, deer would quickly outstrip the food supply, causing grave repercussions to its own survival as well as to many other natural resources, including people.

Pretend gunplay

Inevitably, along with the discussion of hunters comes the issue of pretend gunplay. For many years, I did not allow pretend gunplay in my classroom. Although I was married to a law-enforcement officer, I felt nothing constructive could come from children pretending to shoot guns. In the classroom, children continued to make and play with guns but became very adept at changing them to something else when I was in the area. Consequently, I missed many of the details of the play, and children were not given the opportunity or support to safely explore appropriate uses of guns.

One day I was observing two boys from across the room. I saw one move behind the sink in our pretend-play area with a duck puppet. The other had a long stick-like creation that he had made from connecting blocks. The boy behind the sink threw the puppet up into the air while the other took aim and shot his play gun. The duck fell and the boy behind the sink picked up the puppet in his mouth and, crawling on all fours, brought it to the shooter. They then proceeded to the play stove and shoved the duck in the oven. I wasn't quite sure how to respond. This was gunplay in my classroom, but what I observed was really quality play. The children had a purpose, assigned roles, and had to coordinate their efforts. They were exploring what it was like to hunt, retrieve, cook, and eat duck. How could this be bad? Our classroom is a community of learners, and all constructive play should be valued. How could I make the decision about this play being inappropriate? As a result of that experience, I have rethought my pretend-gunplay policy. I still do not allow children to bring guns into the classroom. However, when guns are created in the classroom, we generally have a class meeting to discuss what the children think might be the most appropriate kinds of things to do about this play. Generally, they decide that guns should not be shot at people—good guys or bad guys. We have the opportunity to discuss our classroom being safe for everyone and that guns should not be used to hurt people. As a result, children generally decide to use the guns they create for target practice or hunting purposes.

Fishing

Fishing might also be a controversial topic for some teachers. Responsibly harvesting fish, whether from a river, lake, or the ocean, can promote a healthy population. However, overfishing our oceans has caused depletion of some species to the point of endangerment. Conservation ethic promotes solid reasoning concerning management of each species. People ultimately make decisions about what is the wisest use of each natural resource. Exposing children to the idea of fishing and managing this resource on the small scale of their classroom will someday impact the decisions they make about managing this resource globally.

Tree harvest

In some areas, the harvest of trees is also a controversial and highly criticized practice. Nearly every single person uses some form of forest products on a regular basis. Although it is easy to criticize how this particular resource is managed, it is important to note that it is a renewable resource and, as such, the forest can benefit people and nature. No use at one extreme and unrestricted logging at the other are not wise choices for our forestlands. Selective, managed harvest will ensure the health of the forest — now and in the future. Consequently, it is vital that children be exposed to trees, their ecosystems, and how people use them so they will be able to make future choices concerning the harvest and management of this valuable resource.

Rural versus urban

Rural versus urban understanding of conservation ethic may also become an issue in the classroom. Because children who live in large cities do not have the same experiences as their peers living in rural areas, teachers may believe that conservation concepts should be handled differently. However, people make wildlife management decisions every day in cities as well as rural areas. How to deal with the raccoon in the garbage, the deer eating flowers, geese fouling picnic areas, or trees growing where people want to build homes all involve making a conservation-management decision. Helping children gain an understanding of the many conservation-management decisions made wherever they live is important.

Sometimes it is difficult to know how to handle classroom discussions of these management decisions. It is important to value individual family backgrounds and beliefs, while honoring various practices, such as responsible hunting or logging. Conservation is a philosophy of daily living. As teachers, we have the power to influence that philosophy and to help children understand the interdependence of natural resources and people. Children who are encouraged to explore and value this interdependence will make good conservation choices in the future.

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Project Construct

The Missouri Department of Elementary and Secondary Education developed *Project Construct* to meet a need for an early childhood curriculum and assessment framework. It is designed as a process-oriented approach to working with children ages three through seven, and it supports their characteristic ways of learning. It is based upon constructivist theory, which operates under the premise that children build their knowledge and values as a result of interactions with the physical and social world. All children have an intrinsic desire to learn and make sense of the world. Often, in their hypothesis building and interactions, they make errors. However, those errors are key to developing understanding and, eventually, mastery.

Project Construct is not organized around traditional subject areas because young children do not categorize learning by the various disciplines that adults do. Rather, it is organized according to *four interrelated domains: sociomoral, cognitive, representational, and physical development*. The foundations for academic learning are embedded in the social and physical environment and integrated into contexts that are meaningful to young children and appropriate to their stages of development. Learn more about *Project Construct* at projectconstruct.org.

Project Construct domains, areas, and goals for students

SOCIOMORAL DOMAIN

Social development

- Build relationships of mutual trust and respect with adults
- Build relationships of mutual trust and respect with peers
- Consider the perspectives of others
- Cooperate and collaborate as a member of a learning community

Personal development

- Be inquisitive
- Take initiative
- Be confident
- Be inventive
- Be reflective

COGNITIVE DOMAIN

Mathematical thinking

- Develop logical thinking
- Develop numerical thinking
- Develop geometric, spatial, and temporal reasoning
- Analyze data
- Exchange mathematical ideas

Scientific thinking

- Increase knowledge of the physical world
- Develop and apply scientific reasoning
- Exchange scientific ideas

REPRESENTATIONAL DOMAIN

Language development

- Develop effective listening and speaking abilities
- Develop as a reader
- Develop as a writer
- Use language to communicate in a variety of ways for different purposes and audiences
- Gather and comprehend information from a variety of sources

Symbolic expression

- Represent ideas and feelings through pretend play
- Represent ideas and feelings through music
- Represent ideas and feelings through art and construction
- Recognize that symbolic expression has social, cultural, and historical contexts

PHYSICAL DEVELOPMENT DOMAIN

Motor skills

- Develop motor skills for personally meaningful purposes

Health and safety

- Develop healthy living practices
- Develop safe living practices

Movement and brain development

- Develop socially through regular physical activity
- Develop cognitively through regular physical activity

Missouri Early Learning Goals

Birth to entry into kindergarten

The Missouri Department of Elementary and Secondary Education sponsored and organized committees to create the state's early learning goals. Committee members included early childhood professionals from higher education, elementary classrooms, Missouri Department of Elementary and Secondary Education, early childhood professional organizations, Parents as Teachers, and child-care programs.

The goals were developed as broad descriptions of what the committees felt most children should know and be able to do by the time they entered kindergarten. However, the goals were not intended to determine whether a child is ready to enter kindergarten, but to serve as guidance for adults to use in supporting the development of preschool children. Throughout the eight early learning goals, the content components, developmental goals, and indicators apply to all children from birth to entry into kindergarten unless otherwise noted. Learn more about Missouri's current early learning standards and goals at dese.mo.gov/early-extended-learning/early-learning/publications.



Seasonal Learning Experiences

Detailed activities and references help you
get your preschoolers outside and into
nature every season of the year.



Children are always eager about the approach of fall as seasonal changes trigger changes in plant, animal, and human activity.

Deciduous trees become a blaze of orange, red, and gold as cooler temperatures and fewer daylight hours cause chemical changes in their leaves. Later in the fall, severe frosts or strong breezes carry the flashy leaves to the ground where they eventually decompose.

Deer begin their ancient courtship rituals all over the state. Their movement during the breeding season makes these large mammals easier to spot than at other times of the year.

Preparations for winter are in full swing. Farmers harvest crops, some birds start their seasonal migrations south, and many people and animals begin preparing their homes and storing food for the winter months ahead.

Yellow school buses appear, friendships are renewed, and a new learning season begins. Take advantage of the cooler days with the children in your care. Whenever possible eat lunch, have story time, or provide learning centers outside. Brainstorm with the children all the words they can think of to describe fall. Ask them questions that help them learn the five senses — how fall feels, smells, tastes, looks, and sounds different than at other times of the year. Celebrate the season with a fall event for families. This might be a bonfire, scarecrow building, leaf treasure hunt, fall equinox (when day and night are equal in length) party, or an apple celebration. Whatever you plan, it is sure to be an exciting outdoor event!

Fall learning experience topics include:

- Trees and leaves
- Seasonal changes
- Harvest, both plant and animal
- Seeds
- Food preservation
- Land use



1

What Can You See?

FIELD TRIP: Explore the neighborhood and practice observing and collecting

CHILDREN WILL:

- Investigate the environment around their school
- Predict things they might see in a walk around the neighborhood
- Compare predictions to things they actually saw on their walk
- Collect artifacts during a nature walk
- Explore and discuss different ways that people use land
- Create a collage using artifacts collected during the walk

You'll need:

- Safe route for children to walk near school
- Collection bag for each child (to use on the walk)
- Glue
- Crayons
- Scissors
- Tape
- Camera (optional)
- Chart paper and markers
- Heavy paper, poster board, or plastic foam meat tray for each child

Notes from Sherri:

The children commenting on environmental changes in our small community inspired this activity. Children quickly notice and comment on new construction as well as seasonal changes. With just a few, well-chosen questions, teachers can help children consider how people use land and how that use affects other natural resources, such as plants and wildlife.

Did you know?

Conservation is the wise use of our natural resources. One of the natural resources that people use is the land. This learning experience will help children become more aware of the world around them. It also will encourage them to explore the many different ways people use the land.

Teacher preparation:

- Scout neighborhood to locate best route to see several ways people use the land.
- Locate potential hazards such as poison ivy.
- Draw a line down the center of a piece of chart paper. Write "Things We Might See" to title one side of the paper and "Things We Saw" on the other side.
- Consider rules most appropriate for walking and collecting artifacts.
- Label bags with children's names.
- Gather materials to use in creating the collages.

What to do:

1. Gather children and prepare them for a walk around the neighborhood.
2. Discuss some of the things they might see on their walk. Record their ideas on the piece of chart paper titled "Things We Might See". As you write down their ideas (even those you know they could not possibly see) introduce the word *predict* and discuss how it relates to what they are doing.
3. Discuss things children might collect on the walk. Be sure to talk about dangerous or inappropriate items for the children to take back to the classroom.

4. Distribute collection bags to the children and take a walk. Encourage children to collect things, such as flower petals, rocks, trash, nuts, leaves, etc. Take photographs of things that can't be taken back to the classroom. Be sure to direct the children's attention to things they might miss, such as stores, telephone poles, electric wires, garbage cans, streets, sewers, fireplugs, clouds, etc. (Caution children not to pick flowers from private or public property.)
5. After the walk, compare the things the children saw with those they predicted they would see. Write the things they saw on the corresponding side of the chart paper.
6. Ask children open-ended questions such as:
 - What things did you see and collect that were living? Nonliving?
 - What are some different ways that you saw people using the land?
 - How do you think the neighborhood looked before people lived here?
 - What animals do you think live in this environment? What animals don't? Why?
7. Encourage children to use the gathered materials to create collages of their experience.
8. Make a classroom display using the completed chart paper, photographs, and the children's work to document their learning.

Related children's literature:

Showers, P., & Brandenburg, A. (1993). *The listening walk*. New York, NY: HarperCollins. ISBN-10: 9780064433228.

This story provides a realistic picture of what children might hear as they walk through a neighborhood. The illustrations by Alike depict natural and people-made sounds.

Bunting, E. (2003). *Anna's table*. Chanhassen, MN: NorthWord Press. ISBN-10: 1559718412. Anna collects beautiful natural treasures that she and her family find. She displays them on a "nature table" and tells the story behind each treasure. It will inspire children to look for and collect their own treasures.

Baker, J. (1991). *Window*. New York, NY: Greenwillow Books. ISBN-10: 0688089186. This picture book illustrates how the view from a young boy's window changes from a wilderness to a city as he grows up.

Additional learning experiences

BLOCKS: Put out various props so children can build houses and neighborhoods in the block area during self-selected activity time. Use green paper for grass, straws and twigs stuck in clay for trees and telephone poles, spools for fire plugs, etc. Display a map and pictures of various types of houses and buildings. Provide paper and pencils for children to create their own maps.

BLOCKS: Take photographs of landmarks along the route you travel. Include the school in the photos. Print the pictures and attach them to unit blocks. As children play, challenge them to use the photos from the walk to build a map of the neighborhood surrounding the school or the route taken on the walk.

FIELD TRIP: Visit other types of areas and compare what the children see. For example, visit a farm, park, wildlife area, and downtown shopping area. Discuss the different ways people use the land in each one.

FIELD TRIP: Take this same walk during the different seasons of the year. Discuss changes in the scenery, collected items, and weather. Refer back to previous documentation for a point of reference.

HOME/SCHOOL CONNECTION: Challenge parents to take their children on walks around their neighborhoods. Encourage them to talk with their children about things they saw that were similar to those seen on the school walk. Ask them to take pictures and send them in for their child to share the discoveries they made together.

PRETEND PLAY: During self-selected activity time put out dress-up props in the pretend play area for the types of stores or community helpers the children saw on their walk (grocery store, flower shop, farmer, logger, police officer, bricklayer, construction worker, etc.).



2

Tree Skin

OUTSIDE: Examine tree bark and create rubbings

CHILDREN WILL:

- Explore different kinds of tree bark
- Create rubbings from different types of trees
- Compare tree bark from different types of trees
- Discuss similarities and differences between people skin and tree bark

You'll need:

- Outdoor area with several different types of trees
- A field guide for identifying different kinds of trees. Check the recommended field guides in Selected Children's Literature and Field Guides in the back.
- Blank newsprint or drawing paper
- Hand lens or magnifying glass for each child
- Camera (optional)

Did you know?

One way we can identify trees is by their bark. Persimmon trees have rough, bumpy bark, while the sweetgum and sycamore have smooth bark. This activity will encourage children to explore, compare, and contrast bark color and texture and discuss some of the effects people and animals have on the bark.

Teacher preparation:

- Locate outdoor area with several different kinds of trees and scout for potential hazards.
- Look for scars or other interesting characteristics of the trees.
- Peel crayons.

What to do:

1. Place crayons and paper near several trees in the play area for use during outside self-selected activity time.
2. As interested children approach the trees, point out the texture of the barks. Model recording the texture of the tree's bark by placing drawing paper flat against the tree and rubbing it with the flat side of a crayon.
3. Encourage children to make rubbings of several different trees.
4. Discuss similarities and differences in the various rubbings. Take photographs of various tree bark and interesting marks on the trees.
5. As children express interest, look for tree scars. Compare the children's scrapes and cuts to scars on a tree. Use the hand lenses to more closely examine the tree scars and irregularities. Discuss the similarities between blood and tree sap.
6. Compare and contrast tree bark with people's skin. Look at colors and textures of both kinds of skin. While discussing the unique features of the trees with the children ask open-ended questions such as:
 - How are tree bark and people skin alike? Different?
 - What causes trees to get scars?
 - Why do trees have different kinds of bark?

Related children's literature:

Gibbons, G. (2002). *Tell me, tree: All about trees for kids*. Boston, MA: Little, Brown Books for Young Readers. ISBN-10: 0316309036. Providing a lovely introduction to trees for young children, Gibbons identifies the various parts of trees and their functions. In addition, she provides an identification guide to common trees, including a painting of tree, leaf, and bark. She also gives directions for making your own tree-identification guide, including bark rubbings.

Additional learning experiences:

DISPLAY: Make a display matching the children's tree rubbings with actual tree leaves and/or pictures of the tree.

HOME/SCHOOL CONNECTION: Challenge families to collect bark rubbings in places where they visit. Encourage them to also collect a leaf from the tree and information about where the collection took place.

OUTSIDE: Go on a leaf-rubbing treasure hunt. Provide children with one rubbing each and challenge them to find the tree it came from.

SCIENCE: Obtain a cross section of a tree trunk or branch (tree cookie), or visit a newly cut stump. Explain how the tree grows a new ring of wood each year. Encourage children to age the tree by counting the rings. Compare center rings with outside rings.

WRITING: Challenge children to make a collection of tree bark rubbings. Encourage them to take a leaf to put with each rubbing. Record information about where the tree was located and identify the tree, if possible. Children and families could also collect rubbings to place in the book with pictures of the families taking the collection. Place them in a binder to create a class tree book.



3

Hang On!

SCIENCE: Discover the importance of tree roots

CHILDREN WILL:

- Explore how roots help trees and soil
- Discuss one of the many benefits of trees
- Record predictions
- Compare predictions with actual results of an experiment

You'll need:

- Tub of soil
- Sticks and twigs
- Water
- Chart paper and marker
- Science notebooks

Did you know?

Trees help hold soil in place and keep it from washing away. This learning experience will enable children to explore this concept.

Teacher preparation:

- Place soil in sensory table.
- Gather materials.
- Place science notebooks and pencils near sensory table.

What to do:

1. Encourage children to experiment and play with the soil during self-selected time. Sticks and twigs can be added to represent trees.
2. As children are playing, discuss what would happen if water were added to the soil.
3. Encourage them to record their predictions in their science notebooks.
4. After recording their predictions, explain to the children that you will conduct an experiment to see what happens when water is added to the soil. Have each child put a hand in the tub of soil, grabbing a handful. Ask them to pretend their arms are trees and their hands are tree roots. Together they make up a forest of trees. A big storm is coming and the trees have to hang on. Add water to the soil, pretending it is a heavy rainstorm.
5. Discuss the results of the experiment. Ask open-ended questions such as:
 - How do tree roots help the tree?
 - What animals use the tree's roots? How?
 - What happens to the soil when there aren't any trees?
 - What other ways are there to keep soil in one place?
 - What other plants help hold the soil?

6. Record the children's thoughts and ideas on the chart paper and compare them with their predictions in their science notebooks.
7. Repeat the experiment as different children visit the area and express interest.

Additional learning experiences:

DISPLAY: Take pictures of the children as they are conducting the experiment. Display the pictures along with their predictions and ideas about the experiment.

FIELD TRIP: Visit a creek bank or a site where a bulldozer has pushed over trees and examine the exposed roots.

OUTSIDE: During outside self-selected activity time, encourage children to look for surface tree roots on the playground.



4

Do Trees Get Drinks?

SCIENCE: Conduct an experiment to discover how water moves through trees

CHILDREN WILL:

- Conduct an experiment to simulate how water travels through plant structures to the leaves
- Record predictions in science notebooks
- Discuss and compare predictions with the actual results of the experiment

You'll need:

- Knife
- Celery stalk with leaves (works best with celery that has been out of the refrigerator for several hours)
- Two clear glasses or jars
- Two colors of food coloring (red and blue work best)
- Science notebooks and pencils
- Chart paper and marker
- Camera (optional)

Did you know?

Trees get water from the ground through their roots. The water travels up tubes in the tree all the way to the leaves at the top. If there isn't enough water, the tree will die.

Teacher preparation:

- Gather all materials and place near the science center for use in small groups during self-selected activity time.
- Prepare chart paper with the title "What do you think will happen to the celery?"
- Make sure science notebooks and pencils are readily accessible.

What to do:

1. With a small group of children during self-selected activity time, trim away the bottom part of the celery stalk and slice halfway through the center of the celery stalk lengthwise. (It takes several hours for the dye to travel through the celery, so do this activity at the beginning of the day or just before the children go home.)
2. Ask children to fill the two containers about three-quarters full of water and add enough food coloring to make a dark solution of one color for each container (red and blue work best).
3. Put the two containers next to each other and place the celery stalk so it has a cut end in the water in each jar. While you are working, ask children open-ended questions like these:
 - a. How do you think celery and trees are alike? How are they different?
 - b. What do you think will happen to the celery? Why?
4. Ask children to make predictions and write or draw in their science notebooks what they think will happen. Also record their ideas on the chart paper and photograph the various stages of the experiment.

5. Compare their predictions with their observations of the experiment. Encourage the children to look back in their science notebooks and compare the results with their own drawings and predictions.
6. Display the experiment, their predictions and conclusions, and pictures of the experiment so children can further discuss their ideas.

Related children's literature:

Kudlinski, K.V. (2007). *What do roots do?* Lanham, MD: Cooper Square Publishing LLC. (Original work published 2005). ISBN-10: 155971980X. This poetic picture book takes readers underground to see what roots do for plants and trees. Share this book after conducting the experiment so children can make life-to-text connections.

Additional learning experiences:

NUTRITION: Provide children with a healthy drink (milk or 100-percent juice) and a straw. Suggest that they are going to be like the tree. The straw is the stem or trunk of the tree. They are the leaves and the bottom of the cup or container is where the roots soak up the nutritious liquid. They should drink through the stems or trunks and consider how it is helping their bodies. This is how the tree sucks up moisture and nutrients that go to the leaves. The leaves, just like their bodies, convert that to energy to help the tree grow and develop. Talk about what happens when the container is empty, when the container holds more than they can drink, or the container is filled with something that isn't good for them. Relate this to what happens to the tree.

SCIENCE: Add a control to the above experiment by placing a trimmed stalk of celery (with leaves) in a dry jar. Notice the difference between the two experiments.

SCIENCE: During self-selected activity time, provide a tub with water and have children soak and play with leaves in it. Discuss what happens to the veins. Compare them to the veins on the children's hands. Include leaves of different shapes and different vein patterns.