

Close to Home: The Wild Things Around Us

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INTRODUCTION

Most of my good teaching ideas have come from children. So when they tell me that they just saw an eagle through the skylight, or that there are deer in the forest across the freeway, or bring me a wildflower or garter snake as a special present, I know they are interested in the flora and fauna of our immediate neighborhood. Over the years, I have capitalized on these interests by planting gardens and raising butterflies, mealworms, or tadpoles as classroom pets. Frequently the children bring in various animals as “presents.” I particularly remember the little boy who brought in the most enormous, terrified-looking toad I have ever seen. His father had just sprayed the backyard with a poisonous concoction and he thought his friend would be safe in our classroom terrarium.

Despite my suggestions that he return the toad to some boggy spot, the boy insisted on keeping him in the classroom for “just a little while.” The toad enlivened our class all day by hurling himself against the glass walls of the terrarium, and escaping through a lid held down by several encyclopedias. He even attracted the attention of our plant operator, an animal-loving person, who suggested putting him out of his misery by transforming him into a dish of frog’s legs. Because of a meeting, I could not release him to some congenial habitat that evening, but the despairing look in his eyes made me resolve to do so the next day. I would have to take him some distance, since our schoolyard offered no cover for him. The next day I was mystified, but greatly relieved to find that he had disappeared. The lid was tightly on the aquarium, but there was no sign of our visitor. Although I questioned the plant operator, he denied all knowledge. The fact that there was no place to let him go on the playground bothered me at the time. I have always believed that he did in fact release the toad, for which I will be forever grateful.

The School

I teach at Whittier Elementary School in Houston, Texas. The student population is 90% Hispanic, with a large number of students who speak Spanish at home. About 75% of our students participate in the Federal Free and Reduced Lunch Program. Whittier Elementary sits on a bare and flat, though slightly elevated, stretch of land beside the I-10 East Freeway. It is a neighborhood school. Children have parents or even grandparents who attended their school, and most students are able to walk to school from their homes. From time to time, there have been attempts to beautify the campus with trees or flowers, which were usually mown down by grounds crews. Only after years of effort did our principal and PTA finally succeed in securing a SPARK (School Park Program) park for the school and community. After school, this park is well used by the families who live nearby. The neighborhood is changing as land is cleared for shopping centers or beer

distributorships. A large brewery looms in the distance. The student population is changing, too, but there are still many links with the past.

East of the school, separated by a high chain link fence, is a small, shady park with some play equipment. Across the freeway, connected to the school by a bridge, is a wood, which adjoins a subdivision. On the other side of the subdivision is a county park, which few of our students and their families ever visit, as I discovered when we took a family field trip there one Saturday. This is a shame, because its ponds and neglected footpaths offer a lot of scope for close encounters with nature. So, there are still many resources in our changing neighborhood for nature study.

The Students

My regular “class” is a group of fourth grade children classified as “gifted and talented.” They are full of energy and questions, and are always ready for the next adventure. As a Title I teacher, I also tutor small groups of children from all grade levels who need special help to catch up. Since part of my duties includes encouraging parental involvement, I also co-teach a family literacy class after school for young (K-2) children and their parents, which often includes lessons in science and math. I also coordinate a very popular Saturday program for families, which offers hands-on activities and field trips in science, math and technology. This year I have also undertaken the duties of science lead teacher, which include teacher training, science fair coordination, and occasional science lessons for other teachers’ classes.

Many of the students at our school lead rather isolated lives. They rarely visit downtown Houston, the museums, or the many parks and wildlife areas that surround our city. Although they may have loving parents who care deeply about them, their experience is very limited. This is reflected in their academic achievement. We can tell from our standardized test scores that our children’s vocabulary needs extending. According to a recent issue of *American Educator* that was focused on the so-called “fourth grade reading slump,” the drastic decline in the fourth grade reading comprehension scores of children from low-income families is directly linked to their limited vocabulary. (Chall 15)

This was brought home to me in a recent third grade reading lesson. I asked a little girl if she saw any unusual or unfamiliar words in a passage about animal camouflage we were reading. She pointed to “sparrow.” “What do you think a sparrow is?” I asked. “One of those long pointy things with a triangle on the end,” (meaning an arrow) she replied. She was quite surprised to learn that it was a little brown bird that she had probably seen hundreds of times. How easy it would have been to take her outside and point one out on the playground. Thoughtful teaching, including out-of-classroom experiences, can enrich lives as well as vocabularies.

The Rationale

Because of the changing design of statewide assessment in Texas, science, a long-neglected subject in elementary school, is increasing in importance. Beginning in 2003, science is being tested in fifth grade (TAKS 25A). All elementary teachers know that preparing children for such tests is a team effort. It is utterly impossible to teach a child everything he needs to know for a certain test in the same year it is administered. Knowledge depends on a growing body of experience, not only of the paper-pencil-book variety, but even more, of actual hands-on real life learning. Young children, especially from the lower socio-economic strata, need to be able to touch, feel, and smell to retain knowledge efficiently. It is a truism that in the early grades, children are learning to read. Beginning at the third or fourth grade, they are reading to learn, *i.e.*, the expository text of their science and social studies books. Everything depends on previous knowledge. Thus, the fifth grade assessment should be regarded only as the culmination of developmentally appropriate science instruction beginning in kindergarten or before. It is my hope that this unit will help all the children in our school not only do better on standardized tests, but widen their horizons.

I would like to capitalize on the neighborhood connection in this unit for fourth grade, which will be designed to focus on the theme of relationships, specifically the relationship between the human population and the wild things that live in our urban environment. "Wild things" include plants, insects, and vertebrates. Generalizations to explore might be: everything is related in some way; all relationships have a purpose; and relationships change over time. I would like my students to learn that although things have not always changed for the better in our neighborhood, nature can adapt; and that if man is capable of making changes for worse, he can also make improvements. I hope they will come to feel that they can make the world better for all living things, not just for mankind. This broad theme will include more specific objectives in science, social studies, reading/language arts, and mathematics. Although I am listing specific fourth grade objectives, many overlap other grade levels.

This unit will require at least six weeks, but it could be continued throughout the year. I intend to repeat it from year to year with modifications, extending the original wildlife habitat with a butterfly garden, a pond, or wetlands. Thus, a relationship will develop not only between the children and nature, but also between the past and future, the school and community, and the children and their older neighbors and relatives, creating a dynamic process that will touch many lives.

IMPLEMENTATION

For this unit, students will produce projects that incorporate more than one discipline. For example, a history fair project could include oral history interviews, graphs, and pictures of the area contrasting today with long ago, or story-telling with PowerPoint. A science fair project will include graphs and surveys. Although a classroom terrarium or individual

bottle gardens are also appropriate for my fourth grade students, the central project will be the establishment of a schoolyard wildlife habitat.

To achieve this goal, students will need to collaborate with each other, reach out to their community, and put their learning in the four core areas – language arts, mathematics, science and social studies – into practice in the real world. Since the idea of relationships will be a theme of this unit, it is important that the concepts taught in these four areas connect through the central project, the establishment of a wildlife habitat.

Visualizing the Past

The first phase of this unit will be an imaginative restoration (T. Dixon, personal communication) of the neighborhood. A visit from a geologist or paleontologist will provide insight into the more distant history of the Gulf Coast, and introduce the concept of extinction. The idea that where we now live was once at the bottom of a shallow sea inhabited by sea-going dinosaurs is bound to be interesting to a 10-year-old. A visit to the Museum of Natural Science, a normal part of the fourth grade curriculum, will be more meaningful with this kind of preparation. Students would enjoy making a shoebox diorama of the area in the Pleistocene, or molds of “fossils” to reinforce this information.

This also is a good place to begin the study of the properties of different sorts of soils, their formation and degradation, including erosion (*CLEAR*, SCI 11A). According to Mark Bowen in *Habitat Gardening for Houston* (4), the black gumbo soil of the Houston area, while not necessarily a poor one, is not the same soil that existed before the arrival of Europeans. Construction, foot or vehicular traffic, or even leaving building materials and heavy objects on soil can compact it, diminishing its capacity to hold air and water. The soil on a school playground is trampled daily by many little feet. Standing water also decreases the amount of air in soil. When soil is tilled or dug in any way, it also becomes much more prone to erosion. Man’s activities have resulted in a net loss of topsoil in the United States as a whole, especially in urban and agricultural areas. More topsoil is lost each year than is created through natural processes (Bowen 15).

Good soil should contain 4-5% humus (digested organic matter), 25 % air, 25% water, and 45% inorganic matter. Many soils in urban areas are likely to be lacking in humus and air. Soils with good humus content are much less likely to erode. Mulch adds air and humus to soil as well as protecting and insulating it, so mulching is a good strategy for minimizing erosion. Composting is another good habit for habitat gardeners. For habitat gardening, Bowen recommends adding compost to soils, rather than purchasing topsoil (13). The benefits that accrue from these practices can be easily demonstrated to children. A recommended activity for fourth graders is testing soil for porosity and water absorption. There are some easy techniques for doing this in HISD’s *Fifth Grade Model Lessons* (Unit 4, Appendix 1). There are also several simple experiments children can perform to illustrate the effects of erosion.

The Human Element

Part of the imaginative restoration of the area includes the human element. Learning about the early Native American inhabitants of this area, the Akokisa (Newcomb 315ff) will provide an introduction to the concept of why human communities grow up where they do, and how they adapted to their different environments. Students will learn how changes in the human population and patterns of settlement affect the environment. A field lesson at the Akokisa village in Jesse Jones Park and Nature Center or at an archaeological dig will allow the children to relate more closely to these early inhabitants. If that is not feasible, they can view such sites over the Internet, or correspond with experts at the Houston Museum of Natural Science, Jesse Jones Park, Houston Archaeological Society, or Armand Bayou. The Jesse Jones Park Web site shows reconstructed Akokisa dwellings. Armand Bayou has an archeological site from prehistoric times.

In the early 18th century, about 3,500 Akoskisas inhabited Harris, Chambers, Liberty, and Galveston counties – not a large population, compared to some other areas. Their villages were located on creeks and bayous, which provided fish and transportation. They were linguistically related to the Atakapan tribes of the eastern Gulf, but also shared cultural features with the better-known Karankawa of the western Gulf coast. They were a hunting and gathering people, who also practiced cannibalism, according to Simars de Bellisle, a French explorer whom they took captive in 1719. He gives a lurid account of this practice. During his captivity de Bellisle not only survived, but was provided a wife by the Akokisa. He escaped in 1721, with the help of some Caddoes. He provided the most complete account of the way of life of this peripheral group. By the 1850s, the Akosisas had disappeared, victims of diseases introduced by the Europeans (Stahl). The idea that a human tribe or culture can become “extinct” relates to that of the environmental changes wrought by man which cause the extinction of other species.

Although the Akokisa were not an agricultural people, other nearby Indian tribes were. The plants they cultivated or gathered are a study in themselves. For example, the Akokisa dug and ate the American water lotus, or Chinquapin root, which survives in nearby place names. Some accounts say they cultivated a superfine maize (Newcomb 315ff), although the geography of the Gulf coast was not as conducive to agriculture as that of areas farther inland. Their northern neighbors, the Caddoes, cultivated corn, beans, squash, and the sunflower, an entertaining plant for children to grow. Carmine Stahl, at Jesse Jones Park, is an expert in edible wild plants who gives fascinating field lessons on this topic.

Oral History

In the second phase of the unit, the students will seek out and interview older inhabitants of the area – grandparents, older neighbors, and former students of our school – who remember what the neighborhood was like in earlier times. My fourth graders study

Texas history, and an important objective for this grade level is differentiating between primary and secondary sources. The importance of using primary sources and eyewitness accounts to support historical research will be emphasized in this unit. Eyewitness accounts will probably be the easiest to come by. There are many human resources for the children to tap. I did a study of the area a few years back that included photos of scenes, which have since changed dramatically. At least two teachers at our school were also students at Whittier forty or fifty years ago. One alumna remembers the present school being built. An elderly neighbor has lived in the same house next to the school practically all her life. She is an expert on plants and animals, and she loves to share her expertise with our students. Our school district also maintains a list of “living history” speakers.

By listening to the stories of an older resident, I myself discovered that the present Little League field in my own neighborhood used to be a swamp where children could still find frogs and snakes to amaze and terrify their teachers. These kinds of stories will help my students reconstruct the environment of earlier times, as well as discover how childhood has changed since their grandparents’ generation. They will also help them relate to previous generations and respect their knowledge. Some questions might include: What plants and/or animals have disappeared from our neighborhood since you were a child? What kind of outdoor activities did you enjoy? The oral history segment of this unit can also lead to meaningful projects for the history fair, Texas history essay contest, or publication on our Web site. Research skills to be taught will also include investigating library, Internet, and archival resources.

Designing the Habitat

The third phase of this unit is the actual design of the habitat. From research and interviews, students can compile lists of plants and animals they want to include as they restore the habitat of earlier times. They will also survey the schoolyard for existing resources, like food, shelter, and water. There is an excellent activity entitled “Home, Sweet Home” to start with, developed by the National Wildlife Foundation (*Get Out! 1*). In this activity, students tag available water, food, and shelter for different species in the schoolyard with flags of different colors for various needs – blue for water, red for food, and so forth. Such activities help children understand in a concrete way what is already available and what is missing. It can also help them identify with animals that are not necessarily cute or fluffy as they imagine themselves to be these animals in their search for food or shelter to survive.

They should also learn that animals do not necessarily like “pretty” gardens. Trees with holes provide nesting places for birds. Rotten trees provide food for woodpeckers. Weeds are a source of food for birds, caterpillars, and other insects that, in turn, are eaten by birds. There are some surprising resources in the schoolyard. Each spring Killdeer nest on the flat gravel roof of the school, alarming us all by allowing their nestlings to fall off. Every year blossoming clover attracts bees, which are regarded as a dangerous nuisance

by the nurse, rather than a learning opportunity. After heavy rains, there is a wonderful crop of tadpoles in the worn ruts and boggy areas around the temporary buildings. Children should know that the greater the diversity of plant life, the greater the potential for diversity of animal life.

This will be the time for biodiversity studies, such as a species comparison between wild and cultivated areas. The mown playground could provide a contrast with the woods across the freeway, or the playground with the immaculately kept yard across the street. The point is, of course, that the well-kept yard is more likely to be a monoculture, while the plants on uncultivated land are more likely to be diverse. Many science objectives come into play at this point. For example, students can identify and describe the roles of organisms in ecological systems, and predict what could happen if part of that system were removed or diminished, harking back to the thematic concept that all relationships have a purpose (*CLEAR*, SCI 4.5.B). Since change over time will be an important related concept, the idea of adaptations will also dovetail with this objective. The idea of evolution will have been introduced in the lesson on fossils, so the fact that a species gradually changes over time to adapt to its environment will not be an alien one.

A source of water is an important concern. Water is essential for attracting wildlife. The use of native plants will reduce the need for water, but as plants are becoming established, and perhaps during periods of drought, watering is necessary. The Water Conservation Branch of the Houston Department of Public Works will provide a Water Wise Landscaping Guide (Caplan 8). In mapping the schoolyard, planners should note possible sources of water. At present, children at Whittier carry water in cans for flowers they grow around their classrooms. If the eventual location of the habitat is far from the faucet, a line may have to be laid. A cistern to store rainwater could also supply this need, and teach a good lesson in water conservation. I would prefer that the children continue to water by hand, because it builds a closer relationship with the plants they care for. “The best fertilizer is the sweat of the gardener,” is true for children as well as adults.

Determining where the sun shines during the growing season and measuring the rainfall and temperature at various locations will bring in other important objectives in science as well as math. Now is the time to invite “consultants” in to advise us on the size and location of the habitat. Possible consultants might include a landscape gardener, a county agent, someone from the Texas Parks and Wildlife schoolyard habitat program, or a member of Urban Harvest. Students can make models of the proposed habitat and give PowerPoint presentations to concerned parties – the principal, the PTA, the City Council, and prospective donors. Throughout the entire process, they will write letters inviting speakers, soliciting donations, and asking for advice.

It is also important that the fourth graders involve students in other grade levels by giving presentations or inviting them to participate in activities. All grades can enjoy the results of this project, and it will enhance science instruction for all grade levels. It will also cut down on vandalism, as all children in the school take ownership of the habitat.

Eventually each class or grade will take responsibility for a part of the area. Watering provides excellent exercise! The more links individual children and classrooms have to the habitat, the more valuable it will be to the school as a whole.

The design process will also involve mathematics, offering opportunities for studies in measurement, statistics and probability, estimation, graphing, and real-world problem solving, such as calculating the cost of the habitat. Not only will students have opportunities to explore the relationship between area and perimeter, they will need to calculate volume, as they decide how much dirt they will need or how much water various species require. Temperature, rainfall, and population graphs will all be germane to the topic. Students will use related technologies, such as calculators, and computer programs like Excel for drawing graphs to illustrate how one change affects an entire system.

Language Arts and Literature

All Texas fourth grade students are tested on their writing skills, so writing must be integrated into every facet of this unit. Students will keep journals, write research papers, respond to literature, and write to describe, compare and contrast, and persuade. The theme of relationships lends itself to an exploration of point of view, an important objective in fourth grade reading and writing. I anticipate that my students will publish (as they always do) a book for the local “Digital Book Fair,” but this time it might be on a scientific topic. Perhaps a student could write a story from the point of view of an owl, opossum, or other animal that lives in our neighborhood. A good read-aloud for this part of the unit is *The Bat Poet*, by Randall Jarrell, a delightful novel told from the point of view of a little brown bat who is describing his world through poetry. *Insectopedia*, a book of poems on insects, will fit in well at this point.

One of the set reading selections for Houston ISD fourth graders is *James and the Giant Peach*, by Roald Dahl, which not only depends on a theme of renewal (the ancient peach tree magically blooms and produces fruit), but also employs talking insects as characters. These are the fictional equivalents of real insects that will live in our habitat, and part of the response to this novel will be to explore their very distinctive points of view. This fantasy novel actually contains quite a bit of accurate entomological information, which can stimulate cross-curricular discussion and writing assignments on adaptation and interdependence. The students will be able to compare and contrast the real insects with their fictional counterparts. A consoling feature of this story is that the initially frightening and disgusting creatures that James encounters are actually much more sympathetic than his evil human relations. They help James take charge of his life and realize his intellectual potential.

It is amusing, and significant for this unit, that the characters ultimately make themselves at home in the most urban of settings – Central Park in New York City. James lives happily in the pit of the peach, while the insects take up occupations suitable to their

talents. The grasshopper joins the symphony orchestra, the spider and silkworm set up a factory making rope for tightrope walkers and the ladybug marries the Fire Chief and lives happily ever after, no longer haunted by the fear of her house catching on fire. James, once a lonely, abandoned orphan, now has all the children he ever wanted to play with in Central Park (117). Examining the Park via the Web site, *The Wild Side of New York*, will make an interesting extension to *James and the Giant Peach*, and provide another opportunity to compare and contrast our own city with New York.

The contrast between fantasy and reality is also a delightful topic for study with children. One of my favorite picture books, *Tuesday*, by David Weisner, uses very realistic illustrations to tell a whimsical story. While the town prepares for bed, giant frogs rise from their pond on magical flying lily pads and wreak all sorts of havoc with sheets on clotheslines, invading houses, chasing dogs, and mystifying detectives the morning after. There have been many news items about the decline of the frog population. Is this where they go? Is this the revenge of the frogs? Who knows? The frogs in the book remind me strongly of the toad who disrupted my classroom long ago, except that their expressions are much more satisfied. I hope he is flying around on a lily pad somewhere. Students of all ages always find this book just as entertaining and provocative as I do. One of the important functions of nature for human beings is the subject matter it provides us for art.

Parental Involvement

One more vital component of this unit is parental involvement. I now have a commitment to financial support from my principal for a very popular activity at our school – science, math, and technology Saturdays, which presently take place six times a year. On these days, parents accompany their children on field trips or do science experiments together with them. These Saturdays also have a cultural component, and are very suitable for field trips to Armand Bayou or Jesse Jones Park, a species survey on the school grounds or a workday preparing our wildlife habitat. Many parents already volunteer for these events. Depending on plantings, volunteers may be essential for maintenance of the garden during summer, and to prevent vandalism by simply visiting and watching the area. I would like to promote a sense that the habitat belongs to the whole community. I expect parents to buy into this idea because not only will it enhance their children’s education, but also it will improve our school/community SPARK Park, which children, parents, and older brothers and sisters use after school.

However, the development of more formal garden areas is not the only benefit of this venture. In his essay, *The Extinction of Experience*, lepidopterist Robert Michael Pyle contends that the experiences of children in vacant lots and so-called “waste” land are essential for the development of an appreciation of nature. In fact, he theorizes that the loss of close contact with bugs and weeds may explain our national lack of interest in preserving the environment in its natural state. No amount of viewing exotic wildlife on television nature programs can make up for actual physical contact with humbler forms

of life. He writes, “[T]he passing of otherwise common species from our immediate vicinity can be as significant as the total loss of rarities. People who care conserve; people who don’t know don’t care. What is the extinction of the condor to a child who has never known a wren?” (Dixon 263). Later he says, “I have been astonished at the small epiphanies I see in the eyes of a child in truly close contact with nature, perhaps for the first time. This can happen to grown-ups, too, reminding them of something they never knew they had forgotten” (Ibid).

Recent research indicates that the children of parents who are actively engaged in learning themselves are much more likely to excel academically. Parents (or more probably grandparents) may well be among the interviewees in the first phase of this unit. On Saturdays, adults will participate in extensions of the same activities that the children do during the week. Adults will also be invited to participate in the planning, building, and maintenance of the habitat area. As both children and adults learn about everyday local plants and animals, they will come to appreciate their own back yards and vacant lots more. Perhaps more children will be able to have the satisfaction of identifying sparrows, which they are much more likely to see than condors.

Conclusion

Instead of presenting the design of the schoolyard habitat as a *fait accompli*, I am leaving this option open. Three important objectives this unit addresses are: consider advantages and disadvantages, choose and implement a solution, and evaluate the effectiveness of the solution; use a decision-making process to identify a situation that requires a decision; and gather information, identify options, predict consequences, and take action to implement a decision. These cannot be put into effect if the problems have already been solved and the decisions made. I also expect to repeat the unit in different forms over a period of several years, making additions and improvements to the habitat.

It is important to teach children to appreciate the natural world around them so that they will come to cherish and preserve it. I fully believe that the integration of knowledge is an essential part of the maturation process, indeed of becoming human. This unit will benefit my students because it will extend their learning to the wider world of their community and their past, generate empathy for other species – even those not viewed as “cuddly” – and connect the different subject areas they normally study separately. The more curriculum links exist to the habitat project, the more value it will have to the school as a whole. It will also give them a broader view of their world. I anticipate that it will also lead to actual changes in their immediate environment, and give them a sense of worth and accomplishment. It will become a learning resource for all grade levels, as well as a spiritual resource for the whole community.

Children cannot develop a meaningful relationship with something unknown. In *James and the Giant Peach*, James fears the giant insects in the peach until he gets to understand their special qualities. Only then can he appreciate them as individuals. So it

is with children and the natural world around them. Caring for a particular plant or observing a specific bird or insect will not only increase their powers of observation, but also their love for their fellow beings, especially the wild things close to home.

LESSON PLANS

Lesson Plan 1: How has our neighborhood changed?

Objectives

Differentiate between, locate, and use primary and secondary sources; frame questions to direct research; take notes from relevant and authoritative sources such as guest speakers; listen and speak both to gain and share knowledge; collaborate with other writers inside and outside the classroom to compose, organize, and revise various types of texts, including letters; identify the kinds of species that lived in the past and compare them to existing species; identify and observe effects of events that require time for changes to be noticeable, including growth, erosion, dissolving, weathering, and flow.

Materials Needed

Telephone book
Index cards
Writing paper
Tape recorder
A local history
Old pictures and maps
Blown up map of the area for reference

Procedure

After listening to a local history read aloud, the children will brainstorm to compile a list of older people or families who have lived in the neighborhood for many years. Next, they will look up their addresses in the phone book. Then they will collaborate to write a letter describing our project – to find out how the flora and fauna of the neighborhood have changed over the years – and inviting the recipient to visit our class for an interview. The class will also discuss the importance of primary sources in historical research.

Before the guest speaker (or speakers) arrives, the students will generate a list of questions to ask, such as “What kinds of wild animals lived here when you were a child?” “How much time did you spend playing outdoors?” “What do you miss?” “Did your grandparents live here also?” and so forth. The children will write the questions on index cards to jog their memories during the interview, and practice questioning each other before the guest arrives.

During the classroom visit, the children will not only ask questions, but also take notes. With the permission of the speaker, the interview will also be taped. After the visit,

the children will check their notes against the tape recording, and write thank you letters to the speaker. Then they will use the information to write a list of questions for the next phase of the project, such as “What has changed?” “What is the same?” “What would we like to restore?” “What does _____ species need to survive?”

Extension for Families

Invite someone from the local historical society or a long-time resident to speak.

Lesson Plan 2: Taking a Survey

Objectives

Identify and describe the roles of some organisms in living systems such as plants in a schoolyard; identify the kinds of species that lived in the past and compare them to existing species; collect and analyze information using tools, including cameras, hand lenses, rulers, thermometers; use a problem-solving process to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution, and evaluate the effectiveness of the solution; use a decision-making process to identify a situation that requires a decision, gather information, identify options, predict consequences, and take action to implement a decision.

Materials Needed

Plant, bird, and insect identification manuals
Hand lenses
Binoculars
Digital camera
Lists of possible plants and animals for the habitat, gleaned from books (e.g., *Habitat Gardening for Houston*), interviews, and Web sites
Spades or trowels
Sprinkling can or fine-spray hose nozzle
Computer with Excel or other graphing program

Procedure

Examine soil from the playground on an overhead projector for composition. Note living things, vegetable matter, sand, and small bits of rock. Let children examine soil samples in pairs, using hand lenses, and present their findings. Compare soils from different parts of the playground (flowerbeds, playing fields, and paths) for porosity and absorption. Test two different kinds of soil for erosion by setting up two boxes full of sloping dirt, and sprinkling water on it. Record results with digital camera.

Explain that different soils support different kinds of plants. Native plants are best suited to local soils, which might not support alien species. Some plants usually thought of as weeds may have useful properties not yet discovered. Also, they should know that some alien species of plants (like the water hyacinth, for example) may look pretty, but have caused much damage to our environment by choking out native species.

Inventory plants that grow in the two different types of soil tested in the preceding activity by measuring areas of identical size, then counting the plants of each kind in each. Graph native vs. invasive species.

Count the trees on the campus. Collect and press a leaf from each, then use the leaves for identification. Again, graph native and non-native species. There is a good variety of both native and non-native species on the playground. This would also be a good time for a visit from an urban forest ranger.

Count birds, insects and other animals seen on the playground or adjoining areas. If possible, bird counts should be done during fall migration. The Audubon Society is a good resource to contact. Classify and graph the birds, insects, and other animals.

As a class, the students will list advantages and disadvantages of various species to include in the prospective wildlife habitat and formulate lists of the most desirable plants and animals. (Some of this can be done in small groups.) Some criteria to consider might be: whether or not it is a native or non-native species, whether or not it already grows in the schoolyard, cultural requirements, esthetic value, cost, and food value to wildlife.

Lesson Plan 3: Designing the Habitat

Objectives

Apply geographic tools, including grid systems, legends, symbols, scales, and compass roses, to construct and interpret maps; select and use appropriate units and procedures to measure weight and capacity; measure to solve problems involving length, including perimeter, time, temperature, and area; identify the mathematics in everyday situations; use tools such as real objects, manipulatives, and technology to solve problems; use a problem-solving process to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution, and evaluate the effectiveness of the solution.

Materials Needed

Lists of targeted plant species, and their needs

Map of schoolyard

Long steel tape measure

String and stakes

Thermometers

1" tiles of various colors

1" graph paper

Diorama supplies, such as play dough, cardboard, markers, and construction paper

Procedure

Assign each plant one, two, or four tiles according to size, and a color to indicate its cultural needs (shade, sun, etc.) Use the excellent chart in *Habitat Gardening in Houston* (Bowen 39ff) to determine mature size appearance and cultural requirements. After consultation with a landscape architect, decide how much space will be allotted to the project as a whole. Children should take into consideration how much digging and watering they will have to do. In small groups, let the children use their tiles to design the garden. They will have a certain area to work with, and will need to arrange the tiles in different configurations to include all the plants on their lists. They will make a table of perimeters. The area will remain constant. They will need to choose different locations on the campus, depending on the cultural requirements of the plants.

Next each group will stake out its area on the playground with string and measure it to help visualize the completed habitat and make sure that they stayed within their area limitations. They can also check to make sure that cultural requirements of their plantings are met (sun, shade, etc.)

Then each group will make a model of its habitat to scale, and present the proposed design to the group. These models can also be used in the next lesson. This would also be an excellent parent-child activity.

Lesson Plan 4: Persuading the Community

Objectives

Select, organize, or produce visuals to complement and extend meanings; produce communications using technology or appropriate media such as multimedia reports; write to influence, such as to persuade, argue, and request; write to inform, such as to explain, describe, report, and narrate; communicate valid conclusions.

Materials Needed

Laptop computer with PowerPoint or other presentation software
LCD projector, or TV with connection to a computer
An audience

Procedure

In small groups, the students will develop PowerPoint presentations designed to elicit support for the habitat project. Targeted audiences will include the principal, the PTA, the City Council, Scout groups, and various businesses in the area that might donate funds, goods, or services. It is also important that the groups make their presentations to other grade levels, since they will have to build the support of the whole school. Each group will practice, make an appointment to present and give its presentation. Assessment will be by a rubric developed by the teacher and class.

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