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Zoology in the Early Childhood Curriculum

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This article details the progress of a zoology program in a Montessori class of 20 children, 3 to 6 years of age. The teacher's diary begins with planning in July and continues through the first two months of school. Described are content and learning experiences about vertebrates and invertebrates. Guiding the program are theoretical principles regarding instruction and learning.

Gregory burst in through the door this morning, grabbed my shoulders and said, "My mom lost the frog in the trunk, Sandy, come quick!" He had the kind or urgency in his voice that just can't be put off, so I left my little chair by the door and followed him out to the parking lot. His mother was standing by the open trunk, a 10 gallon bucket in her hand, pointing and hollering, "It's in there! It's in there!" During the drive the bucket had tipped and the toad (it was not a frog) had gotten loose in the cavernous trunk of their big American sedan. Greg was, by this time, frantically hopping up and down with worry, so I did what any teacher would have done. I kicked off my shoes, climbed in the trunk, and chased the toad until it wedged itself in by the spare tire and I caught it. As I held it up a chorus of little voices cheered -- the kids had followed me outside!

Later we took the toad with us to the backyard to watch it hop on the grass. Instead of hopping, it crawled! Instead of croaking, it chirped! "I wonder what else we don't know about it," mused Kyle. Only a real toad could elicit that kind of reflective thinking.

THE FOCUS OF A ZOOLOGY PROGRAM

What follows is a diary of classroom zoology activities recorded during the first few weeks of the school year. In my Montessori class of 20 students ranging in age from 3 to 6 years, zoology is only a part of what we do at school. The daily activities available to the children range from practical life (snack preparation, table scrubbing, silver polishing), to art (drawing, painting, free form projects), to academics (wide range literacy activities and hands-on mathematics). The schedule of the school day is very loose. We meet for grouptime, work in unstructured free choice for the bulk of the time, play outside for awhile, hear a story, then go home. Our zoology activities take place alongside everything else at working time and at grouptime, extending, of course, to the out-of-doors and into stories.

I am relating a few of our classroom stories to bring out several ideas important to any early childhood zoology program. The first idea concerns the role of the teacher as learner. Maria Montessori spoke eloquently on this topic in many of

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her writings, encouraging us always to experiment and research as we seek to serve the best interests of our students. We need not be masters of the sciences, but we must develop the scientific spirit, awakening in ourselves an interest in natural phenomena (Montessori, 1964). Opening ourselves to the wonders of the animal kingdom will not only enrich us personally, but also will enable us to respond more sensitively to the interests of the children.

A second idea expressed in the stories is the importance of the teacher's respect and love for animals as an indicator of her own values and as a model for the children. The National Association for the Advancement of Humane Education underscores this notion in its curriculum guides, as Savesky and Malcarne (1981) stated:

> Children trained to extend justice, kindness, and mercy to animals become more just, kind, and considerate in their relationships with each other. ...the cultivation of the spirit of kindness to animals is but the starting point toward that larger humanity which includes one's fellow of every race and clime... (p. *ii*)

The next idea is absolutely essential to the lasting success of a zoology program. The program must be spontaneous, building on and keeping pace with the interests of the children. Following the child in this case means sparking an interest in zoology then running to keep up with what happens next. Ready-made classroom materials such as picture cards, classifying games, books, etc. are all fine and good, but it is much more valuable to provide encouragement for children's contributions to the study by providing containers, shelf space, letters home to parents and a welcoming attitude. Jim Roberts (1976) assured us that if you support the efforts of the children to bring in animals, if you encourage careful investigation, observation, and sharing of information with the group, the children will know that you think both they and their studies really count, and you will be supplied with an unending stream of animals to study.

A fourth idea is that the spontaneous study experiences can and should merge beautifully with teacher designed lessons and preprogrammed objectives. The National Association for the Education of Young Children (NAEYC) (1991) document concerning guidelines for curriculum and assessment speaks at length on this point. We can add to this wisdom by understanding that the secret of merging spontaneous activity with teacher determined goals requires creativity and planning regarding the nature of activities provided. Do they provide real work for the hands, accurate information for the mind, quality of reflection, beauty, or orderly progression for the spirit? The second requirement is a large dose of intuition. The dance between facilitating self-development and leading toward an external goal demands timing. The kids should learn that all insects have six legs, but the

teacher must determine the optimal moment for that to happen.

In her exuberant style, Montessori spoke of this balancing act. The task of the teacher, she said, is to stimulate life then leave it free to develop. She further stated (Montessori, 1964, p. 155): "In such a delicate task, a great art must suggest the moment, and limit the intervention...that we shall help the soul which is coming to the fullness of life...this art must accompany the scientific method"

Planning in July

The NAEYC policy statement describes a cycle of learning which moves from AWARENESS to EXPLORATION, INQUIRY and finally UTILIZATION. Following these guidelines allows us to tune in to natural cycles of learning as we plan the curriculum. I am doing some planning now for our zoology study for the upcoming school year, knowing that adventures await us.

Last spring, for example, I stretched my knowledge and experience with snakes, although this was not in my plans. One morning the father of a student found a six-foot gopher snake in his field, placed it in a large aquarium, and brought it to class. The excitement that erupted upon the snake's arrival soon turned into an enthusiastic desire to know more about this particular snake as well as other snakes.

We called for a class meeting with a double purpose: to discover what we as a class already knew about snakes and to voice what we would like to learn. As I talked with the children, I took careful notes. The notes would help me plan lessons, and they would also serve to let the children know that what they were telling me was important.

That evening, I reviewed those notes and developed some ideas about how to approach the study of this wonderful creature. By developing classroom activities that expanded upon the children's existing knowledge and explored their unanswered questions, I enabled them to absorb much information concerning snakes. The children also practiced and expanded their skills in many subject areas, including mathematics and language arts.

But the best lesson by far came the day we made the snake mad. We did not mean to make it angry and indeed tried desperately not to do so, but we did and neither the children nor I will ever forget it. There had been considerable discussion about what its scales felt like, and after some persistent begging, I agreed to pick up the snake so the children could run their fingers over its body. I had held snakes before, even some type of giant python during a field trip with my own daughter's 4th grade class. But I was reluctant to deal with a gopher snake. They are nasty tempered beasts with an equally nasty bite, not at all like the docile little rosy boas that the zoomobile lady brings around.

I gathered the children in a circle, placing the aquarium in the center. Anticipation of opening the cage settled us all into a profound

stillness. We spoke quietly of the need to handle the creature carefully, not only because it was wild and would bite but also because we were more powerful than it and so were obligated to treat it gently. I was honest. I told the children that, although I was afraid, I was certain that I could keep them safe.

The stillness settled more deeply as I removed the screened lid. At the end opposite the head I slowly moved my hand into the aquarium and touched the middle of the snake's body. It reacted by moving that part of itself away from my hand. I touched again, and gently again, searching for a predictable response before I ventured closer to its head. When I did move closer the snake would lift several inches of its front end slightly off the floor of the cage and bend itself around threateningly. I do believe that all human breathing was suspended. Some children were slack-jawed as they stared. After a few more attempts, I knew my nerve was giving out. How could I save the lesson? Deborah, my assistant, suggested that perhaps I could lift a section of its back end have the children touch that, keeping its head safely down in the cage. Remembering then that I had done that very thing with the enormous python, I decided to try it. Waiting until the snake had slithered into a likely position, I carefully yet firmly grasped it near the tail and began to lift.

It was not the noise I reacted to, but the violent pull of the animal's body. The rush of adrenaline actually made me dizzy, eliminating any knowledge of movement. I only noticed that my hand was out and the lid was on the cage. The snake was rapidly coiling, its head was moving back and forth in a way that any living creature would find menacing, and out of its open mouth came a hissing, steaming, malevolent sound. Through the pounding in my ears I heard Michael whisper, "I think that was a mistake, Sandy."

For the next two hours we watched the gopher snake pump its lungs in and out, producing that constant awful sound. The waving head and coiled body were joined by a rattling tail, as it characteristically tried to imitate a rattlesnake. It was convincing performance! No one knows how long it stayed agitated. It was finally time for us to go home.

The foregoing description certainly was an example of the first step in the cycle of learning - awareness, but it also included exploration, the second step. After various activities of inquiry, the children formed conclusions about snakes and utilized generalizations in several forms that demonstrated their new knowledge.

Whatever planning that teachers do must leave open opportunities for learning adventures. I did so as I planned in July for the first day of school in September.

September 18

The first day of school. The returning students enter confidently, happy to see old buddies and the familiar classroom; new children are the usual mix -- some clinging to

mom, some bouncing right in. But nobody can resist a peek into the large plastic, pink box on the table. Out of it comes a strange sound, "like Nintendo!" says T.L.

I did not say a word about it except that the box was full of crickets. Some children were startled, most were fascinated, Tyler said "It's disgusting." Several of the children began to hop around attempting that chirpy cricket sound. A little later children related a few cricket experiences. Gregory said he always hears them in the night. Emily said her mother is scared of them so she better not come to school to visit.

We read Eric Carle's *The Very Quiet Cricket* before we went home. Immediately the children asked me to read it again. What a happy group they were as they left today. School has started with something none of them would have expected.

September 19

The singing of the crickets is such a pleasant backdrop to all of our activities. As we go about our work the children often stop to check on the insects. Today there are more questions -- What do they eat? Why do they sing? (Kyle says so that way we know it's evening). Why do some have long things poking out and some don't? Do they bite? Still nobody tries to play with them.

I want the children, especially the new ones, to feel comfortable asking questions and using me and their classmates as a source of information. To this end we sit in our circle, and I invite the children to say something or ask something about the crickets. In the course of the discussion we learn, among other things, that crickets are jumping insects, that they sing at night, and that they do so by rubbing their wings together. Most of the information I want the children to have is brought out, but much more importantly they have heard that their questions are intelligent and their observations appreciated.

If I were to simply provide them with the cricket information rather than encouraging them to discover it and then share with each other, I would run the risk of disconnecting the children from primary, first-hand observation. At times even the best of teachers tend to organize information too quickly, so that the constructs take the place of nature in reality (Sillick, 1988). Names, labels and information are most meaningful if they describe the child's experience. The children need time simply to observe and gain a feel for what they are observing. First they must know the crickets by listening and watching them hopping about and chirping. Only then is language useful in calling to consciousness what they have taught themselves or come to wonder about.

September 20

Today we decorated plastic food tubs for cricket boxes so each child could take a few crickets home. We have spoken of the importance of letting our crickets out in our yards at twilight. The children ac-

cepted this and talked about where the crickets will live. Sierra wants hers to live close to her bedroom windows. Emily will put hers in the front yard, away from the dog.

The nurturing of humane treatment of animals is a high priority for us. Research has concluded that humane treatment can be learned in the earliest years of life and that this may be the crucial period (Blue, 1986). Because I am so convinced of this, I was surprised and disappointed that the California State Science Framework failed to address this concept as appropriate for young children in their studies of living things. The Framework limits the discussion of interaction of humans and other life to aspects of food and clothing. What a loss to the spirit of the child and the future of our society if we do not view our work in terms other than utilitarian!

September 24

A few days ago Vanessa's mom called to offer me a baby squirrel. She had actually seen this baby fall from an oak tree into a pile of leaves and lay there, helpless. The only thing she could think to do was protect it from the cats and call a veterinarian. The family fed the squirrel with an eyedropper until it graduated to fruit and nuts. It was not ready to live on its own, but no longer needed around the clock care. Of course I said we would take it. Only at the end of our first day with Wiggles did he begin to feel comfortable with us. His flips and circles were much more interesting than the story about a squirrel, so we watched him instead.

September 26

Zachary walked in the door this morning with a big jar containing a praying mantis. "Look Sandy! It's like the Grouchy Ladybug!" He was referring to the story we read yesterday by Eric Carle in which a grouchy ladybug encounters a variety of animals. John observed that *The Very Quiet Cricket* (Carle, 1990) also had a praying mantis. I suggested that the two boys find the pages with the praying mantis to compare them with the real creature. Exuberant Zachary hooted with delight at the realism of the artwork, but meticulous John carefully compared feature after feature before quietly commenting, "The real one has to be in a jar but he doesn't like it." The two boys decided to show each classmate the insect and the pictures, then let the praying mantis go in the flower garden. How amazed they were when it flew away.

September 27

Wiggles is getting much friendlier, allowing us to pet him and even crawling onto my arm. Part of his care involves cracking nuts for him, so in our Practical Life area we have two nut cracking exercises. One is cracking peanuts with our fingers, the other is using what is called a Quackenbush nutcracker to crack walnuts. Some nuts are cracked for the children to eat, some

for Wiggles. He is a very well-fed squirrel.

Dr. Montessori offered some insights as to what experiences such as the daily care and playtime with animals have to offer the developing child. She felt it was absolutely necessary to place the soul of the child in contact with creation so that he or she may learn directly from nature as a means to develop the intellectual, spiritual, and moral domains (Montessori, 1964). By acting out our role as Wiggles' surrogate parents, we are moving through many of the stages Montessori suggested. The children are learning to observe life, slowly increasing in their ability to care for Wiggles by feeding and watering him and cleaning his cage. They are developing foresight through their observations, anticipating Wiggle's needs without reminders from adults. An initiation into patience and confident expectation is gained as we watch Wiggles grow in size and strength, anticipating the day he will be able to crack his own nuts.

October 1

In preparation for our upcoming Pet Show, we made a chart of all the pets we have at home and how many of each there are among us. It is a way to spark a little interest in numbers, especially for T.L. He seems afraid of numbers, as though someone has been pushing him to learn what he is not ready to learn. He enjoyed this activity and referred to the chart several times today, counting and naming numerals.

Extending one course of study into other areas of learning adds an integrated and whole feeling to the curriculum, and I like to do it whenever it seems natural and reasonable to do so. But I do feel that we can take an integrated curriculum too far and stretch it beyond credibility. I am thinking now of our Wiggles. How much squirrel math can you do? I mean really? Do we put the squirrel away when we have exhausted his potential for language study? My feeling is that we learn about the squirrel, integrate ideas when they are a natural outgrowth, and pursue other areas of learning separately.

October 2

The other day I sent out a call for a tomato hornworm. My own tomato plants at home are miraculously devoid of these pests this year, but I wanted one as another class pet. Mark brought in a huge one, as big as my index finger, still clinging to a clipping from a tomato vine. We watched this fellow munch blossoms for a few days, then we prepared for his first step toward change by filling a gallon jar half full of dirt and placing him on top. Because I had told the children a story about the life of a tomato worm, they knew what to expect and were not surprised when he began to dig. By the end of the day he was settled at the bottom edge of the jar with a little pocket of space around him. Now he will change from a larvae into a pupa and sleep the long winter away. For months we will have

what appears to be nothing more than a jar of dirt on our observation shelf--a lesson in waiting and change.

I value the symbolism in this lesson, especially for the older children. There is something in them that senses a commonality with the caterpillar. Something is changing for them also - a slow, inner change into age 6. This will be the end of Piaget's preoperational stage of development, the end of the age of Montessori's absorbent mind, the age when Christopher Robin was about to do some changing he could not explain, asking, "You will understand, won't you, Pooh?"

October 7

Both John and Kayla brought their hamsters to school today. Many children remember our class hamster, Sugar, who died last spring, and they were really happy to have these little visitors. Animals are, of course, great teachers concerning the cycles of life and death. Because most of my students are in my class for 2 or 3 years, they have the opportunity to observe this cycle in our small mammals who live only for a short time. Death of a pet is painful, but sensitivity in walking through the loss with the children will help them when they experience losses later in life (Blue, 1986). Elizabeth actually became teary-eyed as she reminded me how little Sugar liked to eat one raisin everyday.

We have become very attached to Wiggles. He spends a lot of time on my shoulder or uses my whole body for climbing practice. Unfortunately, I cannot allow him to crawl on the children because his claws are terribly sharp. Wiggles does like kids to pet him and, of course, feed him. He has learned to crack peanuts already.

October 8

We have had an amazing variety of animal life enter our classroom during this first three weeks of school, including a black widow spider and a skink. Up to this point our focus has been simply the particular specimens available to us. Now I feel we are ready to begin to organize our knowledge and experience. The idea is to spark interest and build knowledge through direct experience and only then to organize the knowledge into categories and classifications. If the timing is right, the new mental constructs fall right into place, almost as if the children were remembering something that they already knew.

The most basic division in the animal kingdom is that of vertebrates and invertebrates. These children know how to sort out the animals around them according to several qualities, and now we are seeking to add the insight of the big zoological picture. The development of descriptive language in science processes is emphasized in the California State Science Framework, and there is no reason why the vocabulary should be scaled down. Sensitivity to language is so high during these years that the children truly

enjoy the length and the unfamiliar sound of these words. They love to impress friends and family with their scientific vocabulary. Somehow it seems to elicit a response from adults that the child is doing something important (why do so many adults need to be startled into this realization?).

At grouptime I introduced the discussion of vertebrates by having us feel various bones in our bodies, paying special attention to the backbone. After a good amount of horseplay, I wondered aloud what other animals might have backbones. Tyler asked a key question: "Sandy, if an animal has other bones, then does it have a backbone, too?" That bit of four-year old deductive reasoning set the conversation on fire, for everyone knew something that had bones. Now it was easy to introduce the word "vertebrate." We looked through a book about skeletons together, observing skeletal structures of different animals, sometimes guessing about whether or not an animal had bones before I would show the picture. When we came to a part of the book which pictured invertebrate animals, I introduced that term. I was pleased with how quickly the group seemed to gain an understanding, kind of an intuitive feel, for the classifications, even if they sometimes confused the terms. The game lasted far longer than was reasonable to expect, yet the children pleaded to continue. When Mark left this afternoon he suddenly turned back, ran up the stairs and said, "Hey! My mom is a vertebrate!"

October 9

Activities involving miniatures, in this case small plastic animals, are always popular, so I was not surprised to see the clamor for the vertebrate/invertebrate classification game. In the basket are two appropriately labeled cards color coded to match the bulletin board display, and along with them are small scale animals of the type displayed on the board plus a few others. Of course we had lots of playing with the figures both before and after any sorting was done, but it was Kevin and T.L. who got into a rather heated discussion about which animal belonged in which category and what did vertebrate mean anyway -- bones or no bones? All on their own they figured out that vertebrate meant it has bones because a snake has bones and it was on the vertebrate side of the bulletin board (they knew it said "vertebrate" because it started with a "v"). But how do you figure out what a snail is? Travis offered, "I stepped on a snail once and it was real squishy so I guess it's an invertebrate."

October 14

Elizabeth's dad, Tim, has an extensive collection of fossils and asked if he could share them with the children. Although his explanations were frequently beyond their understanding, they enjoyed repeating names like ammonite, copralite, trilobite. At one point John asked if

a trilobite was a vertebrate or an invertebrate. Before Tim could answer I broke in and simply asked John what he thought. "Well," he said, and then he paused because John thinks long and hard before he speaks, "Well, he's showing us lots of shells and stuff that I know are invertebrate but the trilobite has lots of lines that look like bones." A noisy discussion followed until at last William suggested that we needed to see a picture of a trilobite. To our great good fortune we had a book in class that gave us what we wanted, and the children immediately concluded that a trilobite is an invertebrate. How did they know that?

Our science shelf is by now a jumble of collected small creatures, a bird's nest, assorted rocks and shells, flowers, the first yellow leaves of autumn and a magnifying glass when we can find it. Again, I resonate with Roberts (1976) in that I could never have come up with such an interesting variety myself, and even if I had, the objects would be mine instead of belonging to the children. Right now the stuff resembles a kind of life science rubbish heap. No doubt some tidy soul will ask to organize it one day and that will be soon enough.

October 21

Natalie arrived with tears in her eyes, a wood spider in a jar, and an exasperated mother with a story to tell. As it happened, the evening before there were two wood spiders crawling on her parents' bedroom wall. Nat ran for a jar, and dad ran for the bug spray. Because Natalie was faster she got back to the bedroom first and caught one of the spiders, but dad was close behind and got the other. When he sprayed they were all surprised by the dispersion of dozens of tiny spiders -- the mom had been carrying them on her back! An orgy of spraying followed and all the spiders, save the one in the jar, were killed. "Sandy", Natalie cried, "We could have studied them and let them go!" Mom said she had no idea that her daughter would react so strongly, and the whole family was miserable.

Several times during the afternoon Natalie remarked about how sad she was that all those babies were dead. She turned her spider loose in a tree and watched it crawl for awhile, pondering these things in her heart. I wonder if Nat will catch spiders or spray them when she is the mom and it is her wall.

October 22

Gregory's mom called me last night to report that their family had captured a parrot that was loose in the yard. They now had it in a cage and were trying to locate its owner -- would we like to have it for the day?

I decided to do a little comparing and contrasting of the parrot and Wiggles. We placed Wiggles' cage in the middle of our circle and set the parrot cage on top of that, providing everyone with a good view of both animals. I said, "I wonder what things are different about these animals?" Immediate

responses included things like one has fur and one has feathers, one has four legs and one has two, one has a beak and one does not. "How about things that are the same?" I prodded. This was harder. Finally we noticed things like they both have eyes, they both have claws, and they are both vertebrates. Somebody said they both have lots of colors, but this was met with protest. Wiggles was just brown, ran the argument. Upon further inspection it was observed that Wiggles does have many colors, but they are all "sort of brown."

I want to encourage the children to become keen observers, to really see what they are looking at, and then to be able to discuss their observations. I concur again with the science framework in believing that these are the optimal years for studying the characteristics of living things. I lead the discussion in the end, with an eye toward our future study of the classifications of vertebrates. With this in mind, I wondered aloud how mama squirrels and mama parrots had babies and how they fed their babies. The children knew about live birth and eggs, but were not so sure about the feeding. The groundwork has been laid for our investigation of mammals.

October 25

This is the day we all knew would come. We knew that squirrels belong in trees, not cages. We knew that Wiggles would grow strong enough to crack walnuts, and he did. We were his guardians, not his keepers. It was time to set Wiggles free.

Our backyard at school is a wonderful place for squirrels with many trees that form squirrel highways. Almond, walnut, and pecan trees provide an abundance of food, making life comfortable for the established squirrels. But would Wiggles know what to do? He had not had climbing practice except for climbing on me -- would he get around all right? He seemed undisturbed when cats would visit his cage -- would he be wary of these enemies? Where would he sleep? Would he find water?

We took him out to the backyard and opened the lid of his cage. He slowly crawled out but did not jump off of the cage. He had been in the backyard before, watching us as we played and, we hoped, getting used to the sights, sounds, and smells. The humane society lady said he would undoubtedly scamper for the nearest tree and be off before we knew what had happened, but this was not to be so. He simply sat and seemed bewildered.

After a time I moved close to him and he jumped to my shoulder. Someone suggested that we just play in the backyard as usual while Wiggles got used to being out. Several of the children dashed off to swings and the sandbox, but most decided to stay close to keep an eye on his progress.

We walked, with the squirrel on my shoulder, to the almond tree, I picked him up and set him on a branch. He immediately jumped back to me! This back and forth game continued for awhile, and all the time the children were encouraging him to climb. They really

wanted him to be independent and free. Eventually he stayed on the branch, but many minutes passed before he was brave enough to climb a bit. Now all the children gathered solemnly around the tree to witness Wiggles' first climb. Slowly he made his way to the top and began to nibble at the bark.

That is how we left him that afternoon. Scared, still, nibbling on a tree. The children went home bubbling with the news that Wiggles was now a tree squirrel, but I hardly slept that night, especially after it began to rain.

October 29

Christina lives out in the foothills which means, among other things, that she encounters a few critters that the city kids do not. Today she brought me one as a Halloween present -- a tarantula!

Almost everyone knew that it was a tarantula, and everyone was afraid of it. I assured the children that the spider was not venomous but that its bite was quite painful. Nobody objected to letting the tarantula crawl on the floor as long as I stayed close with a coffee can to catch it.

As we watched the spider move about, a change in attitude -- my own and that of the children -- became almost tangible. Whatever it was that we expected, it was not the light and delicate lifting of legs, or the grace of using all of those legs at once. As the tarantula explored the rug, it was transformed in our minds from a monster to a creature from an unknown land. Faces relaxed and the lights in our eyes changed from fear to wonder, just by watching all those legs rise and fall in a flow of movement. For the moment, silence was all that was wanted. We needed no talk of habitats or body parts or diet, we just wanted to see those legs carry their owner across the rug. The value of knowledge is not only in assimilation of facts, but also in the change wrought in the knower (Sillick, 1988). The spider had become our own.

November 1

Wiggles came to visit! We were in the backyard picking pomegranates when John noticed him on the fence behind us. He edged a little closer, but it was clear he would not come close enough to be touched. After the children stopped shouting in excitement, I called to him, and he responded by looking at me and straining toward me, although his feet remained planted. Did I catch a look in his eye? Somehow it felt very much like the Velveteen Rabbit coming back to visit the little boy. He was free, he was fine, and he seemed to remember. Elizabeth said, "We all miss you, Wiggles. We love you!" and I began to cry.

LOOKING AHEAD

We have had only seven weeks of school but have come so far in our zoology study. The children are finding creatures everywhere, observing them intelligently, making

comparisons, recognizing distinguishing features, and feeling like the natural world is a knowable and delightful place. By watching my students closely, observing their reactions, listening to the process of their thinking and the nature of their questions, I know what kind of progress is being made. Their stories provide the content for assessment and are recorded in their individual folders, in newsletters and in chats with parents. With this type of content area, where so much of what really matters is in the affective domain or involves process over content, the real test for success is in the sparkle in the eye. I am humbled and thankful when parents tell me how excited their children are to come to school.

Zoology study with a group of young children is a mess. The classroom gets strewn with cedar shavings from the hamster cage, there is never enough space for all the bugs that are brought in, a nervous, visiting pet will urinate on the rug, someone is going to be bitten or scratched by one critter or another, and it is always a scramble to figure out who is going to care for which animals on weekends and holidays. And this is how it should be. A mouse neatly contained on a shelf has little resemblance to the interesting being it really is. It is better to let it out and have a few adventures. The only real way to know an earthworm is to get in the mud and dig around with it.

Connecting children to the world of animals requires a graciousness of spirit beyond the trip to the zoo or maintaining an aquarium. This graciousness must be willing to work with messes and inconveniences and to actually embrace them, realizing that the far reaching good of a zoology program is worth every late afternoon trip to the pet supply store, every lizard lost behind the shelves.

As the year progresses we will study classifications of vertebrates, a few of the classifications of invertebrates, animal habitats, animal babies, and many specific animals as suggested by the interest of the children. In the springtime we will branch out from the work of the house pet and the backyard environment and visit the zoo. Zachary has already told me that he wants to study giraffes. "They're so tall," he said, "that they can see the whole world."

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