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A Tree Study Curriculum for Second Grade

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**A TREE STUDY CURRICULUM
For Second Grade**



By,

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**Submitted in partial fulfillment of the requirements for
The degree of Masters in Science in Education
Bank Street College of Education
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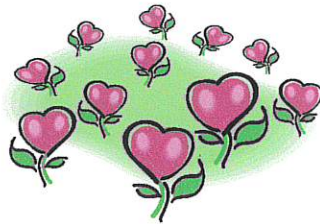
ABSTRACT

A TREE STUDY: For Second Grade, was designed to give students the opportunity to experience and explore first-hand the life cycle of a particular tree in Central Park. Trees are a natural topic for young students to study. They are part of the basic life cycle here on earth. Children are familiar with them having seen or been around them since birth. In my case, because of my school's close proximity to Central Park, the students had the luxury of being able to basically go out in their own backyard any time they wanted a first hand view of what was going on with their trees. Furthermore, that the tree was *their* tree, made the study much more concrete for them.

Acknowledgments

**To Vanessa-Wyser Pratte
And the
Spence School Class of 2012**

Thank you



**“While we are born with curiosity and wonder...
such inherent joys are often lost. I also know that, being
deep within us, their latent glow can be fanned to flame
again by awareness and an open mind.”**

Sigund Olson

**Northern Minnesota explorer and
Naturalist**

**Teaching Kids to Love the Earth,
p. 1**



(For Mrs. Henry Mills Alden)

*I think that I shall never see
A poem lovely as a tree.*

*A tree whose hungry mouth is prest
Against the earth's sweet flowing breast:*

*A tree that looks at God all day,
And lifts her leafy arms to pray:*

*A tree that may in Summer wear
A nest of robins in her hair:*

*Upon whose bosom snow has lain;
Who ultimately lives with rain.*

*Poems are made by fools like me,
But only God can make a tree.*

By, Joyce Kilmer

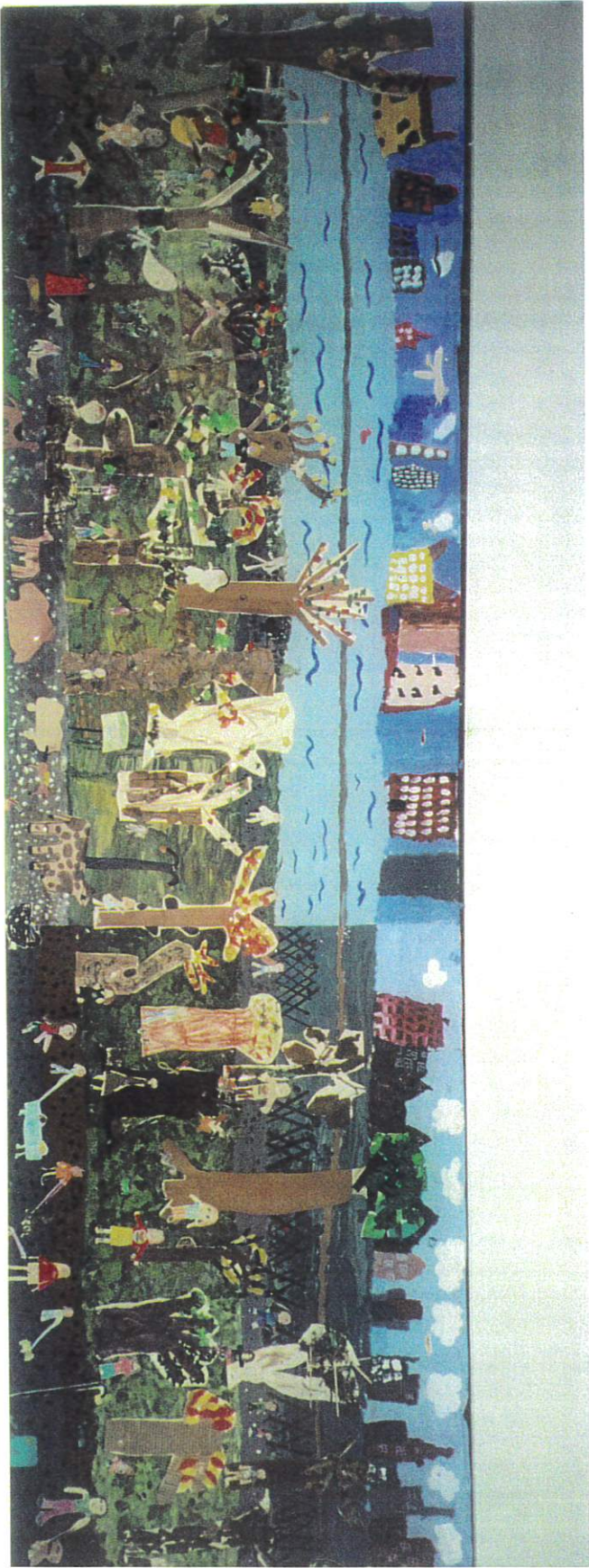
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ABSTRACT

A TREE STUDY: For Second Grade, was designed to give students the opportunity to experience and explore first-hand the life cycle of a particular tree in Central Park. Trees are a natural topic for young students to study. They are part of the basic life cycle here on earth. Children are familiar with them having seen or been around them since birth. In my case, because of my school's close proximity to Central Park, the students had the luxury of being able to basically go out in their own backyard any time they wanted a first hand view of what was going on with their trees. Furthermore, that the tree was *their* tree, made the study much more concrete for them.

PURPOSE

The focus of this curriculum was to engage my second-grade classes in an in-class and fieldwork study of a particular tree of each child's choosing in Central Park. The study was planned to take place during the 12 weeks of the fall term. Their science teacher and myself wanted the children to notice the changes that took place as part of the seasonal life cycles of their trees. We also designed the study so as to allow them to further develop and strengthen the various skills that they use when engaging in science projects. These included:

- sharpening observational skills
- being able to predict and infer through the use of deductive reasoning
- developing oral and written language when recording their findings
- helping to further along their fine motor coordination

These are key areas to develop when exploring science in the classroom.

SETTING AND CONTEXT

The participants in the study were the entire second grade class of 40 at The Spence School, an all-girl independent school on the Upper East Side of Manhattan, across and down the street from Central Park. The school's motto is, "For Life We Learn." To that extent, the school strives to imbue a student's learning with a strong sense of belonging to a community and responsibility for the environment in which they live. Their education is not just education for education's sake. The purpose of their education is to help create smart, independent thinking young women whose education has prepared them for a life beyond their schooling.

There were two second grade classes at Spence, 20 in one class and 21 in the other. Science was taught in a one hour and a half block, once a week for each class. The science teacher, Vanessa Wyser-Pratte and myself conducted the classes. Science was taught in the homerooms so we made sure to have a designated science table and bulletin board in each classroom that was maintained by me on a permanent basis.

We chose to do this study as a means of conducting a scientific experiment that promoted the school's goals of integrating the community and their physical environment within the classroom. The community and the environment in this case were represented by using Central Park as the basis for the bulk of our fieldwork. We also chose to have each girl responsible for the study of one tree so as to develop a sense of responsibility for their tree and thus

ensure their investment in the project. Furthermore, the girls were at the right age developmentally to work on strengthening their observational skills and the supporting skills that go along with them. Finally, by allowing the students to explore, observe, predict and draw their own conclusions we helped enable them to, as Vygotsky suggests, construct their own knowledge.

TEACHER PREPARATION

Before the tree study began, Vanessa and I sat down to discuss what we wanted to accomplish from our study and how we wanted to accomplish it. We knew we wanted to give the students the opportunity discover things about their trees by giving them ample time for field work. We also were committed to giving an equal amount of classroom time for reflection and hypothesizing. We then worked out a schedule that accommodated both. We also knew that we wanted to do an all-grade mural of the area of the park where the trees were located. It was decided that Vanessa would supervise the painting of the background for the mural while I supervised the construction of each girl's tree as well as other features of the park (people, dogs, horses, etc.). We also designed worksheets that emphasized various observational and deductive reasoning skills that we used inside and out throughout the course of the study.

Vanessa and I had plenty of prior knowledge upon which we based our study. However, we chose to re-familiarize ourselves about various tree facts by reading many books that dealt with trees written for adults as well as those written for children. I also supplemented my knowledge by reading several child development books including several I used in my Bank Street science class. Most importantly, though, Vanessa and I remained in constant contact, which allowed us to assess what we achieved in previous classes and what changes needed to be made going forward.

RATIONALE

Through their work with science and nature in previous years, the girls had a strong foundation on which Vanessa and I could build their tree study. Their curriculum in kindergarten included a visit to a pumpkin farm. In first grade, the girls went apple picking. The apple and pumpkin studies involved not only visits to farms but "dissecting" apples and pumpkins, recording their observations through words and pictures, and finally preparing foods with items they were studying. The latter activity also had the additional benefit of helping the girls to understand where their food comes from.

The reasoning for all aspects of the Tree Study was soundly rooted in established child development theories. In her book, Science Experiences for the Early Childhood Years, Jean Harlan states that "understanding the environment by interacting with it is the natural work of young children." (Harlan, p.3) An active interaction with a child's environment helps a child to make sense of his world and his place in it. A child's whole sense of self is derived from his experiences with the people he meets as well as his encounters in the natural world. (Mitchell and David, Explorations with Young Children, p.17) Furthermore, children need concrete and observable experiences upon which they can begin to construct their own learning. Dorothy Cohen in The Learning Child, says that elementary school age children are "natural explorers, investigators, experimenters. They are ready to develop techniques of fact-finding and relationship-thinking while struggling with standards of workmanship.

But they also must be active participants, even in a bodily way, in their learning.”
(Cohen, The Learning Child, p.149)

Why choose science as a means for laying the principles of integrated and constructivist learning? In The Learning Child, Dorothy Cohen says that, “The natural sciences lend themselves to possibilities for individual and or group observations and experimentation that allow for sharing and exchange among the children.” (Cohen, p.152) They also allow for children to have deep personal feelings about what they’ve studied. (Cohen, p.152) In her article, *Science in Early Childhood* (cited in Mitchell and David, 1992), Judy Jablon makes the case that those children, working as “scientists” are in essence mimicking the work of their older counter parts. She maintains that as adult scientists find out about the world through observation, exploration and experimentation, children do the same. This type of “active” investigation into our changing world forms the basis for scientific thinking in both groups. Additionally, children naturally experiment--- it is how they learn. With each new discovery, each “ah-ha” moment, children then become even more open to new discoveries about the world around them. Through positive scientific experiments, children will form the basis for a life-long connection with their natural and physical worlds. (Mitchell and David, pp.189-190) Finally, “through their explorations they make discoveries about cause and effect, an important scientific discovery.” (Mitchell and David, p.190)

According to Jean Harlan, science is, at its essence, “a way of thinking and gaining knowledge.” (Harlan, p.4) This acquisition of knowledge, says Harlan, is achieved by following these four steps:

- “1. Becoming aware of a problem (noticing)
2. Hypothesizing, proposing an explanation (wondering why)
3. Experimenting (finding out)
4. Communicating the results (talking about it.” (Harlan, p. 4)

“Discovery Science,” a term Harlan uses, incorporates all of the above. It is meant to teach children how to think and how to do that thinking in a creative manner. Through “Discovery Science”, children’s problem solving skills become stronger and the child has better retention of what he has learned. However, this manner of learning science requires the active participation of children “as well as gaining knowledge from first hand experiences.” (Harlan, p.5) Dorothy Cohen supports this method of approaching science when she says that children need to be able to “figure things out, to be challenged, and to solve hard problems.” (Cohen, p.40)

In constructing our study, we were mindful of advice from several theorists. Jean Harlan advises teachers to choose a topic that they have a real interest in. “When the teacher’s own sense of wonder is alive and active, curiosity behavior is modeled for the children.” (Harlan, p. 4) Jablon also advises teachers to not only pick topics that they are interested in but also ones that children have an interest in. Topics should be chosen that allow for multiple opportunities for exploration and experimentation as well as being designed so as to allow a child to feel real ownership of his participation in a project. A good topic is one that provides opportunities for children to make sense of their everyday worlds. Basically, it calls for the ability to work in one’s own back yard.

In our case, Central Park was not only the school's backyard but also the backyard for almost all of the students participating in the study. By allowing our students as much active involvement in the tree study as possible, starting with choosing their own tree to study, the children came to feel a true sense of ownership about their own work as part of the study. Finally, it seems somewhat obvious but still important to note that there should be easily accessible supporting materials---books, videos, photographs---that will help to supplement the actual work done in a study. (Mitchell and David, p.146)

After deciding on our topic, we asked ourselves what was it that we wanted our students to know. What was the big picture idea we wanted our children to walk away understanding? Judy Jablon says for teachers to ask themselves what is it that they want their students to learn from an experience and then to anticipate the questions their students will ask. (Mitchell and David, p.150) In preparation for asking those questions a teacher needs to become the in-house resident expert on a subject. That means, according to Jablon, finding out all one can about the topic for study. Visit museums, read books, go to the actual fieldwork site, explore the Internet---anything that will help the teacher to provide the information and experiences he or she wants their students to have. (Mitchell and David, pp.148-151) In our case, we decided that we wanted our students to walk away from the study with a good understanding of the life cycle of trees. Everything we chose to do after that decision always referred back to that goal for the study.

Experience had shown us the most successful studies required a mixture of small group and independent work. By the time children are in the second grade, as the students participating in our study were, they are increasingly able to think and plan together as a group. (Cohen, p. 164) We made sure that each group was large enough (4-6 girls) for each child to have a friend as well as a work partner when they needed to work together. The groups were also small enough so that Vanessa and myself got to know not only the girls but also the inner dynamics of each of the working groups. (Cohen, p. 36-37) Cohen says that it is key for teachers to provide time and space for quiet reflection as well as for “the ebb and flow of pairs and small groups for movement and physical activities; for noisy and messy activities for the study of animals and plants.” (Cohen, pp.35-36) This was the whole idea behind our study—to provide individual thinking time as well as group time to work on hypothesizing as well reflecting on what the girls were observing as detailed in their mural.

One of the results of this collaborative work was, at times, a very noisy classroom. As Harlan said, teachers need to “be able to tolerate messiness, try new experiences and [have] a willingness to learn from mistakes.” (Harlan, p.14) The noise I heard in my classroom was not just noise; it was the sound of learning. It was the sound of children exchanging ideas, of sharing their knowledge, of making discoveries. It was a sound that as a teacher gives me the most gratification.

In allowing our students to make their own discoveries, we were careful observers and listeners to what the girls were doing. When misconceptions

arose, we tried to help redirect the girls by asking questions that would lead to looking at a problem in another way. Harlan maintains that teachers should try to “minimize intervention with children’s active explorations.” (Harlan, p. 21) A helping hand should be a guiding one, not one that tells the answers. We also listened to their conversations so that we could get a good sense of what they were learning. The role of the teacher, says Judy Jablon, when a study like the Tree Study is undertaken, “is to guide children [so] that [they] will keep them in charge of their investigation.” (Mitchell and David, p.190) As children begin to develop and evaluate their own theories, teachers need to remember that their role is not to say whether something is right or wrong but to allow a safe place to work out those theories. (Mitchell and David, p.191)

In addition to working on the mural, we knew that individual record keeping was essential. Developmentally, our students were at the right age to embark on maintaining individual scientific journals. By second grade, a child is able to place things in different classifications by noting similarities and differences. In The Piaget Primer, Ed Labinowicz maintains that children can respond to “class inclusion tasks in the presence of objects.” (Labinowicz, The Piaget Primer, p.74) They can also establish a hierarchy of classification distinctions. (Labinowicz, p.75) We showed this in our students’ work with the **Clue Climb**. (p. 28) Through proper modeling by teachers, students can come to appreciate that record keeping is an important part of scientific investigations. Children at this age should be encouraged to, as much as possible, put ideas into words as well as drawings and to begin to develop a scientific vocabulary

with which they can work. (Mitchell and David, pp.193-194) Dorothy Cohen says that, "Children need materials that encourage them to manipulate, order serially, count, contrast and reorganize deliberately or accidentally." (Cohen, p.204) In our case we made sure through the use of various worksheets and graphs as well as with their model trees to provide our students with a variety of mediums to reflect upon what they were observing.

It was also important for Vanessa and myself to constantly assess the students' level of participation in the study. If we noticed the girls' enthusiasm or interest falling off, we changed our focus for a week or two. We tried to prepare lessons with enough variety in difficulty so that all of the 41 girls had interesting problems to work out whatever their academic capabilities. (Cohen, p.204) We encouraged the girls to collaborate whenever possible. This included bouncing ideas off of one another, sharing successes and failures in their work, and working with each other to define the goals of *their* studies. (Mitchell and David, p.155) We presented various problem-solving strategies to the girls by constantly asking them open-ended questions: What can we do? What do you think? Who has an idea? We made sure to allow enough time in each science lesson for scientific investigation and experimentation. Finally, we provided a non-judgmental environment in which the girls could give voice to the theories they were formulating in their heads. (Harlan, p.19)

As we prepared to end the project, we used Jean Harlan's standards of assessment to help us to understand what our students had gotten out of the study. Areas to assess, says Harlan include:

1. The student's completion of activities
2. The kinds of questions the student asked
3. The student's general attitudes of interest or disinterest
4. The student's satisfaction with knowledge gained from the experience
5. Amount of relevant and accurate information the student supplied to class discussions (Harlan, p.9)

We also made sure to provide a culminating project that served to tie together everything that they learned all together. (Mitchell and David, p.154) In our case, we provided two such projects. The first, of course, was the class-wide creation of the tree mural. The second was for the girls to design and make their own book to house all of the information that gathered relevant to their tree study. This was then theirs to take home a share with their families.

A TREE STUDY: For Second Grade

BEGINNING THE PROJECT

At our first science class of the school year, we sat the children on the floor in a circle surrounding Ms. Wyser-Pratte and myself. On the big clipboard at the front of the room, we wrote the words "Tree Study". We told the girls our project for the fall term was going to be a tree study culminating in an all-second grade mural representing the area of the park where they were going to begin the study of their trees. When we announced the project, the girls responded by applauding. They also had many questions, such as, "Are we going to the Park right now?" "How do we pick our trees?" "What if someone else in the other class picks my tree?" (Answer: "We won't be there at the same time so it won't be a problem.") "Will anyone else have mine?" "How often can we visit it?" "Will it always be mine?" "What happens if my tree is cut down?" And so on. We answered some of their questions and told them others would be answered as the tree study progressed.

However, prior venturing out of the building, we wanted to do some exercises that would help to strengthen their observational and recording skills. The first exercise we engaged in was **Characteristic Clues** (p. 27). Earlier, Vanessa had filled a number of brown paper bags with items regularly found in the classroom such as ruler, pencil, marker, crayon, post-its, and so on. We then paired the girls up and gave them several Characteristic Clue sheets. One partner was to write down three important clues about the item in the bag, read

them to her partner and let them guess as to what was in the bag. If they couldn't guess the first time, they could give two more clues as to what was in the bag. Vanessa and I walked around the room, listening to and reading the girls' clues. Sometimes they were stumped and we helped them to see what else they might not have noticed about an item that would better help them describe it to their partners. The girls were very enthusiastic about the activity and kept on trying to guess new items after their initial ones. There was lots of laughter in the room as well as a lot of forehead smacking.

The following week we played **Clue Climb** (p.28). We split the girls up into teams of three or four and asked the teams to select a mystery object in the room and to write up clues about the object on the ladder on their handout. Vanessa and I again circled the room making suggestions and giving direction to the teams who could not either agree on their clues or on the object they wanted to choose. After we reviewed the clues, the teams duplicated their ladders on a large sheet of construction paper, including the name of the item they were describing, which was then hidden by a piece of paper. We hung the giant clue climbs out on the science bulletin board in the hall. There all of the students on the floor took turns guessing what the hidden object was.

Both activities were valuable in setting the stage for the tree study, which was to follow. They made the students focus on the details they observed about their items so that they could describe them as accurately as possible to their partners and classmates. This noticing of details would help them in studying the changes that were to take place in their tree during the weeks to come.

TEACHERS' ROLE/WHAT CHILDREN MIGHT DO OR SAY

Week 1: Week 1 was our visit to the Park to select our trees. Before we left the building, however, we brainstormed about the mechanics of our visit. We asked the girls, "What do you think we'll find in the Park?" "Will the trees have leaves on them?" "What color will the leaves be?" We tell the answers to the questions, but told them to think about their questions as we walked to the Park.

We also asked them how they would remember which was their tree. Olivia said, "I'll remember who is on either side of me." Georgie said, "I'll remember what objects are around my tree." Greta said, "I'll look for something special about my tree, like a hole, and look for that when I go to look for my tree." What ever their method, the girls were told to be very careful in choosing a way that would best help them to remember which tree was theirs.

Finally, as important as what the girls were to do in the Park, was reviewing the rules for getting to and in the Park. We asked the girls to select a partner, to walk in a double row down the street, not to talk while they were crossing the street, and to stay together. Once in the park, we gave them boundaries beyond which they were not to venture.

The methods that the girls used in selecting their trees were as varied as the trees themselves. Some girls selected trees next to their friends. Others did just the opposite. Eve told me, "I want a tree away from everybody so I can think." Some girls wanted trees that were really tall and others wanted trees that were no bigger than they were. Quite a few of the girls were attracted by the

shape and texture of the bark and trunk of a tree. We did have a couple of instances where girls wanted the same tree and could not work it out amongst themselves. In those cases, Vanessa and I tried to help the girls see the relative merits of another tree.

After they chose their trees, the girls were given a clipboard, a pencil and a sheet entitled **Picking My Tree** (p.29) and were asked to fill it out while looking at their trees. The sheet included a word box at the bottom containing descriptive words that helped the girls in working with the sheet. After filling the sheet out, the girls said goodbye to their trees and returned to the classroom. The girls then filed their sheets in their science folders.

Week 2: We returned to the Park with clipboards and the sheets from the previous week. We had a giant bag filled with colored pencils. Vanessa and I handed out a new sheet entitled **My Tree in Early Fall** (p.30) and asked the girls to review their sheets from the previous week and to see what they were looking for in the details of their trees. I stressed to the girls that they were artists and scientists and what made both good ones was attention to detail. We asked them to find a quiet spot to observe and draw. We also asked them to draw themselves in relation to their tree and discussed the concept of scale. (“If your tree was as high as the sky, would you make yourself the same size?”) The girls for the most part, spent several minutes studying their trees and walking around them before they started to use the colored pencils to draw. After we returned to the classroom, we attached the sheet from week 1 to the sheet from week 2 and hung them on the bulletin boards in each room.

Week 3: We stayed in the classroom this week and began a discussion about seeds. I asked the girls, "How do you think seeds get from place to place when no one plants them?" Sammy said, "The wind blows them." Olivia o. said, "I think they get caught on animals and they take them around." Bettina said, "I think that when an animal goes to the bathroom, the seeds he ate in his food come out and that's how they get from place to place." Vanessa then split the girls up into groups and gave each group an assortment of seeds. They were given acorns, milkweed and milkweed pods, bittersweet berries, maple tree "polliwogs" (the things that you split and put on your nose), and some kind of very sticky seeds. The girls were asked to study the seeds and then come to a conclusion as to how they traveled. The answers included many of the ideas they had before actually seeing the seeds as well as a few new ones (pp. 31-32). Human beings were also included as a method of spreading seeds.

That week's study also brought an unexpected development. I brought an avocado plant I had started from a pit into the classroom. The pit was still in water supported by toothpicks but needed to be transplanted. That led to a discussion as to how long it took to grow a plant from seed or pit. Could you grow a plant from any seed? And how long would it take us to grow another avocado plant? We agreed that the following week I would bring in an avocado that we could split open, study and then plant in water. Emmy was curious about whether a peach pit would grow into a peach tree in the classroom and volunteered to bring in a peach for us to study. This also provided a perfect

segue to our field trip the following week to the Planting Fields Arboretum in Oyster Bay to study seeds and trees.

Week 4: We had two science sessions this week. The first was a second grade class trip to the Planting Fields. The second was a continuation of our seed study in the classroom.

I had scheduled the visit to the Planting Fields after I learned that the curriculum for second grade science included a tree study. I grew up in Port Washington on Long Island, not far from Oyster Bay. I remembered the Planting Fields from my childhood as a beautiful place to visit with an extensive selection of trees and flowers to study. The organization also has a well-developed education program including a 3-hour program geared specifically for students in the second to third grades.

It was a fabulous day. Every activity we had was conducted outdoors. We were given a tour of the extensive and beautiful grounds. The girls were broken up into groups to study the seeds of various fruits and vegetables. They dissected the produce and were asked to count the seeds from each item. They were amazed to discover that an avocado had only one seed while a strawberry had hundreds. We also saw the stump of a giant maple tree that had been cut down. The girls could see the rings inside the trunk and were asked to estimate how old the tree really was. They also played a kind of musical chairs involving the factors needed or not needed for the successful growth of a plant (good: light, air, soil, water, food; bad: none of all or only some of the preceding as well as lawnmowers, gophers, etc.) They learned the differences between palmate

and pinnate leaves. We concluded the day with a picnic in the pine forest sitting on soft beds of pine needles. The girls were curious, enthusiastic and involved (pp.33-34).

In the classroom, our seed study continued. Vanessa gave each girl a lima bean that had been soaked over night. She asked each child to draw a picture with as much detail as they could of the bean. They were encouraged to break the seed apart to see what was going on inside the plant. They were also asked to describe with words what they had noticed about their seeds. "Look what I found," was the exclamation heard most often during this exercise. The detail in the drawing was outstanding (pp. 35-36). As thorough as their initial tree drawings were, our continued work on observation yielded much more sophisticated work. We then met in a circle to discuss the girls' observations.

I also continued with our unexpected project. We cut open the avocado I brought in giving all of the girls who wanted one a taste of the plant. I took out the pit, stuck toothpicks in it, rested it at the top of a glass milk bottle, and put it on a sunny ledge to watch grow. I also planted Emmy's peach pit. "What do you think will happen to the peach pit," I asked the girls. Emmy said, "I think it will grow into a small plant." Stephanie said, "I don't think anything will happen to it." We decided that the weekly gardener, a class job, would observe and record the changes in both plants. Additionally, in a terrific illustration of children constructing their own knowledge, Stephanie, Evelyn and Lindsay all brought in bean plants that they had decided to start from seeds during a play date. They

presented their plants to the class and explained how they started their plants. They agreed to monitor their beans' progress for the class.

Week 5: We revisited the girls' trees in the Park. This time we asked them not to just look at their trees but to look at all that surrounded them. We asked them to keep in mind that the tree mural would not just include their trees but the entire area of the park that their trees were located in. We gave them a sheet entitled **Tree Mural Ideas** (pp.37-39) and asked them to write down all of the things they wanted to include in their mural. The items they noticed were quite varied. They included the reservoir, buildings across the park, dogs and dog walkers, horses, street lights, water fountains, stop signs, squirrels and chipmunks, birds (including a dead one someone saw), the bridle path, fences, etc. One girl even saw her mother jogging and decided to include her in the mural.

Week 6: We revisited the Park specifically to look at the changes in the trees from the first time we saw them. Again, they were given clipboards, colored pencils and a sheet entitled **My Tree in Fall** (p.40). We asked them to take extra special care in noticing the size, shape and color of the leaves that came from their trees. The girls were also given plastic Ziploc bags in which to put three leaves from their tree. While outside, Julia came to me very distraught. "I can't find a leaf on the ground the same shape as the ones on my tree and the ones on my tree are too high up for me to get." When the other girls heard her complaint, a group of them got on their hands and knees and combed the area around her tree to find her three leaves. They held up leaves and rejected ones that were the wrong shape, wrong size, wrong colors, etc. I loved this, as they all

were involved with getting the exact right leaf for Julia's study and used good observational skills in trying to find the right one.

Week 7: As a final preparation for actual work on the mural, the girls were each given back the leaves they found the week before. They were asked to study the leaves by looking for the special characteristics of their leaves. We gave them a space to draw their leaf, as well as an area for leaf rubbing and a space to put the actual leaf. We also asked them to list the identifying characteristics they found in their leaf. Again, for Vanessa and myself, the results were fantastic!
(pp. 41-42)

The girls spent significant amounts of time studying and looking at their leaves from all angles. Bettina went to the window with her leaf to see how her leaf looked in a different light. They spent a great deal of time looking for just the right colors with which to color their leaves. They showed extensive detail in their drawings as well as having little problem in listing the characteristics they discovered in their leaves. I do not believe I heard once, "Miss Blankman, I don't know what to draw/write." For Vanessa and myself, clearly our preparation had paid off and the girls were ready to begin work on their mural.

Weeks 8-12: Prior to today's lesson Vanessa and I decided who would be responsible for which part of the mural. She had very definite ideas as to how the painted part of the project should be executed while I had very specific ideas as to how the trees and the details in the park should be created. We gathered the girls in a circle on the floor before our large chart. Together they

brainstormed about what our mural should include. They brought up many of the items they listed when in the Park writing down their tree mural ideas.

Vanessa asked, "What is scale? How should we divide up the paper to allow enough room for all of the things we want to include in our mural?" Sophia, a terrific math student, said, "We should divide up the paper to the fence on the outside, the bridle path, where our trees are, the water, the buildings and the sky." Vanessa pinned up the paper on the board and with a yardstick made pencil marks on the paper as to the amount of room given to each area. The girls then concurred as to how much or if too little room was given each area. Vanessa then drew a quick outline of what should go where and asked 4 girls to go with her to begin painting the background.

For the girls remaining, I asked them to keep in mind the scale of the mural and asked them to look at their notes and drawings of their trees. "All good artists do sketches of their work before they begin," I said and asked them to do some simple drawings of their trees. I also asked them to draw themselves next to their trees (p. 43-44). I then gave them heavy paper on which to draw their trees and themselves. My vision for the trees and the other items in the mural was to have 3-D type of effect using a variety of materials to create a sort of collage on the painted background. I brought in moss, straw, sand, colored tissue, pipe cleaners, felt and other fabrics, construction paper, wrapping paper, feathers and colored raffia. In subsequent weeks, the girls also brought in other materials of their own including bark and leaves from actual trees. After drawing their trees, they applied many of the materials offered in the creation of their

trees. Through it all, I constantly circled the room encouraging them to look at the previous studies of leaves and trees. "How could you best represent the feeling in this part of the tree?" was my constant question. When Annie used only blue feathers to create her tree, I asked her if her tree really looked like that. I suggested thinking about how she could still use the feathers but represent the actual details of her tree.

As the weeks progressed, we gave each of the girls the opportunity to work on the painted part of the mural. Vanessa worked very closely with the painters. She got them to question their color choices, what brushes they chose to use, and how they chose to represent a section of the Park. She also reminded them to keep scale in mind as they were painting things such as the buildings and reservoir. She also encouraged them to look deeper at their choices. "Yes, the grass is green but is it just a flat green? Are there other colors in that green grass?" For my part, I reminded the girls that the object was not to finish their trees quickly but to successfully represent the essence of their trees in their finished products. One student, Georgie, brought in a pinecone which served as the bark for her tree. She took the pinecone apart and one by one applied each little part of the pinecone to her tree trunk to create the scaly effect of her tree. One question the girls all had was, "Do I have to draw myself in my Spence uniform?" "No," I replied, "you can create yourself however you see yourself." (pp.45-46)

As the students began to complete their trees we again brainstormed about the different other things they had seen in the Park. We listed them and to

avoid having, say, only dogs and no joggers, we assigned each girl to creating a specific background piece. As with the trees themselves, they were encouraged to make use of the extra supplies we provided when making their “supporting cast.” Working together to create just the right extras in the mural seemed to jar the girls’ memories about what they had seen. One student, Julia, remembered that she had seen artists at various times in the Park working on their canvases. She chose to do a few of those complete with easels, palettes, brushes, and in one case, a beret.

Finally, everything was ready. The painted canvas was done. The trees and the figures representing themselves and what they had seen in the park were finally finished. We took the girls in groups out to the mural and had them glue their trees and cutout versions of themselves to the area of the mural they remembered their trees to be. I also had them direct me as to where their joggers, dogs, horses, etc. should be placed. They were very excited about seeing their trees and themselves on the mural. “That is so cool,” was the constant refrain.

After everything was placed on the tree (either hot-glued, stapled or pinned) the girls came out to look at the completed project. We asked them what they thought. “I like how the buildings stand out against the sky,” said Aleesha. “I like how all of the trees look so different,” said Emmy. “The trees all feel so different,” said Olivia. “I can see my Mom,” exclaimed Georgie. Stephanie cried, “I see me!” “Remember when the wind was blowing so hard and it blew all the leaves around?” asked Erin. They were so excited. And, because the completed

mural had a very tactile feeling as well as a 3-dimensional effect, all of the girls wanted to physically touch the mural, which they took turns doing (pp.47-48).

CONCLUSION

The completed mural was hung on the ninth floor of Spence directly opposite the elevators between the two second grade classrooms. Also on the floor were three first grade classrooms and one fourth grade. We placed a comment box on a table in front of the mural for students and other visitors to the floor to ask questions about our mural. The mural stayed up for the remainder of the school year.

We continued to visit our trees periodically throughout the year. When the nice weather finally came, we went to the Park, took notes and drew pictures of the changes we noticed in the trees. The girls discovered through their onsite and class investigations that their trees were flowering cherry trees. Some girls even exchanged the fall leaves on their trees on the mural for pink blossoms.

We brought the study to a close by having each girl make her own book about her own tree. In addition to the worksheets they'd been compiling all year, the girls were given a large color photograph of the mural as well as additional photos we had taken throughout the year of the girls with their trees.

I gave the girls lots of construction paper, markers and glue sticks and showed them how they could, in chronological order, assemble their books. I then showed the girls how to bind their books with a twig and a rubber band. Each girl was then able to go home at the school year's end with a book *she made* about *her tree*.

Scientist: Evelyn Date: Sept. 191

Characteristic Clues

Look at the object in your paper bag.

Write down three important clues that describe your object:

1. Spots
2. green
3. fole

Tell your partner the important clues.

Did they guess correctly? NO

If they need more clues, write down two more and tell your partner.

4. you play a game with it
5. its hard

Scientist: Evelyn Donatelli Date: Sept. 21 2001

Clue Climb!

With your partners, choose a mystery object. Think up characteristic clues to write on the rungs of the ladder.

glue

^{squeeze}
You can saeeze it

It's in a tube

It's white

It's something in the art room

stretch

You can strech it

Scientist Evelyn

Date Sept. 26, 2001

Picking My Tree

These are special characteristics which will help me remember my tree:

1. The tree is thick.

2. The tree has a hole.

3. The tree is bumpy.

4. The tree is twisty.

5. The tree is ruff.

This is how I describe my tree in the first days of fall:

The tree is green.

The tree has leaves.

Word Box

Here are some words which might help you with your description:

big	large	thick	thin	small	shape
tall	medium	short	green	brown	
twigs	leaves	branches	smooth	rough	

Scientist Evelyn Donatelli Date October 3rd, 2001

My Tree in Early Fall

Carefully make a drawing of the tree you have chosen to study. Include all the characteristic clues which make your tree special.



Evelyn Donatelli

Fluffystuff	Prickey sticky
1 Travels by wind.	4 Travels by sticking to things.
2 Red berry Travels by people and birds.	Wheat Flowers people picking them and sticking to Animals. White Flowers travels by dropping seeds and then growing.

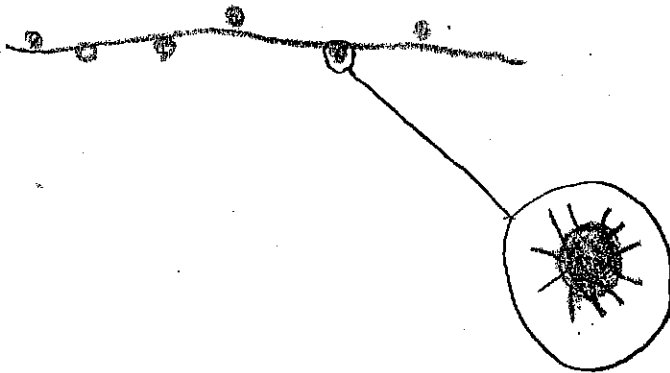
Sophia

10/10/01

Burrs

These seeds stick to passing animals or people. They grow on stems.

magnified view of a burr





Counting the rings



“Musical Trees”



Pretending to be a sprouting seed



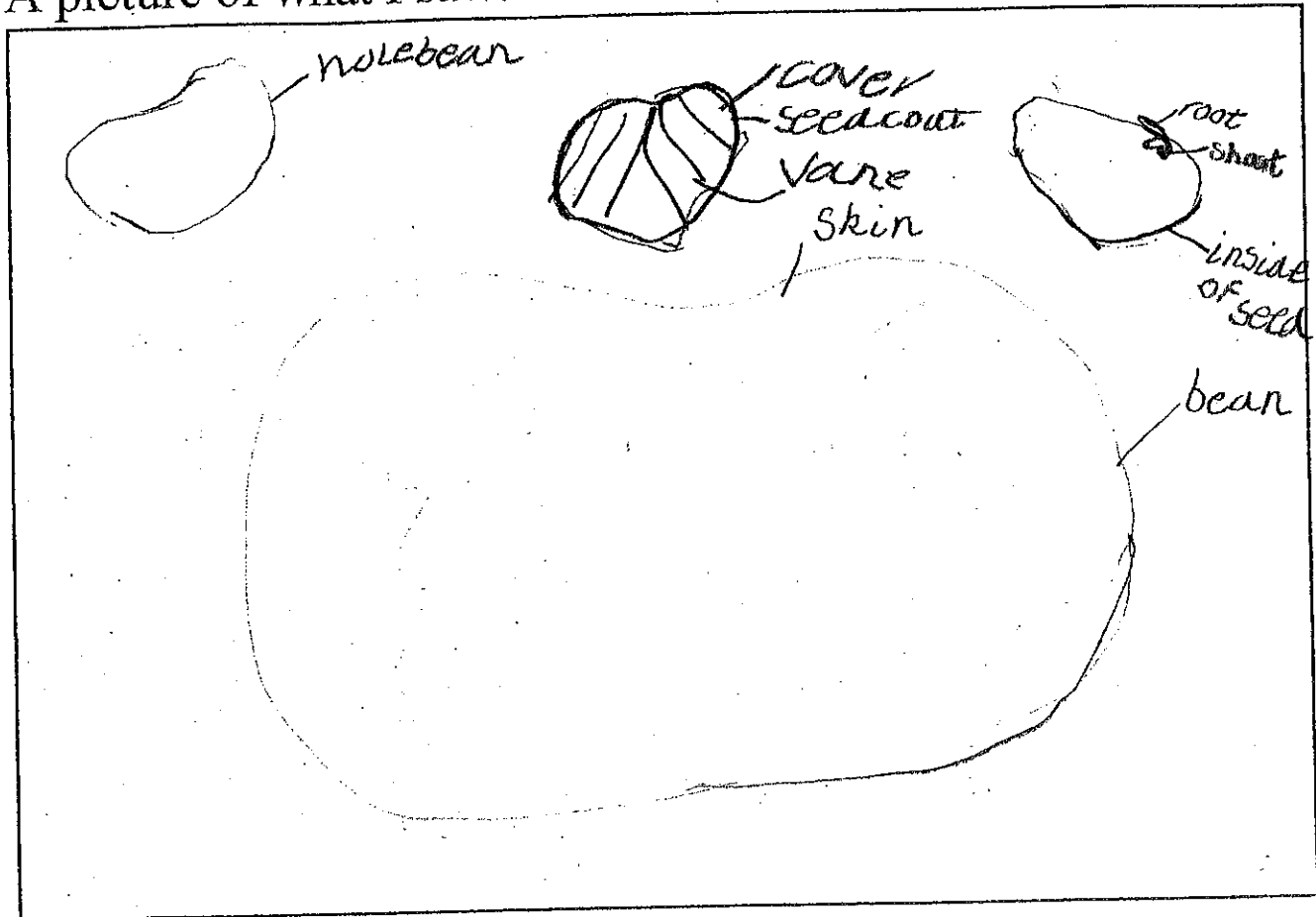
Miss Roosevelt's and Miss Blankman's Second Grade Class

Scientist: Evelyn

Date: October 17, 2001

I looked at: a lima bean

A picture of what I saw:



Here are some things I noticed:

I think that the lima bean travels by moving in the

wind and then getting buried in the dirt.

The seed look like a half moon. It looks like theres

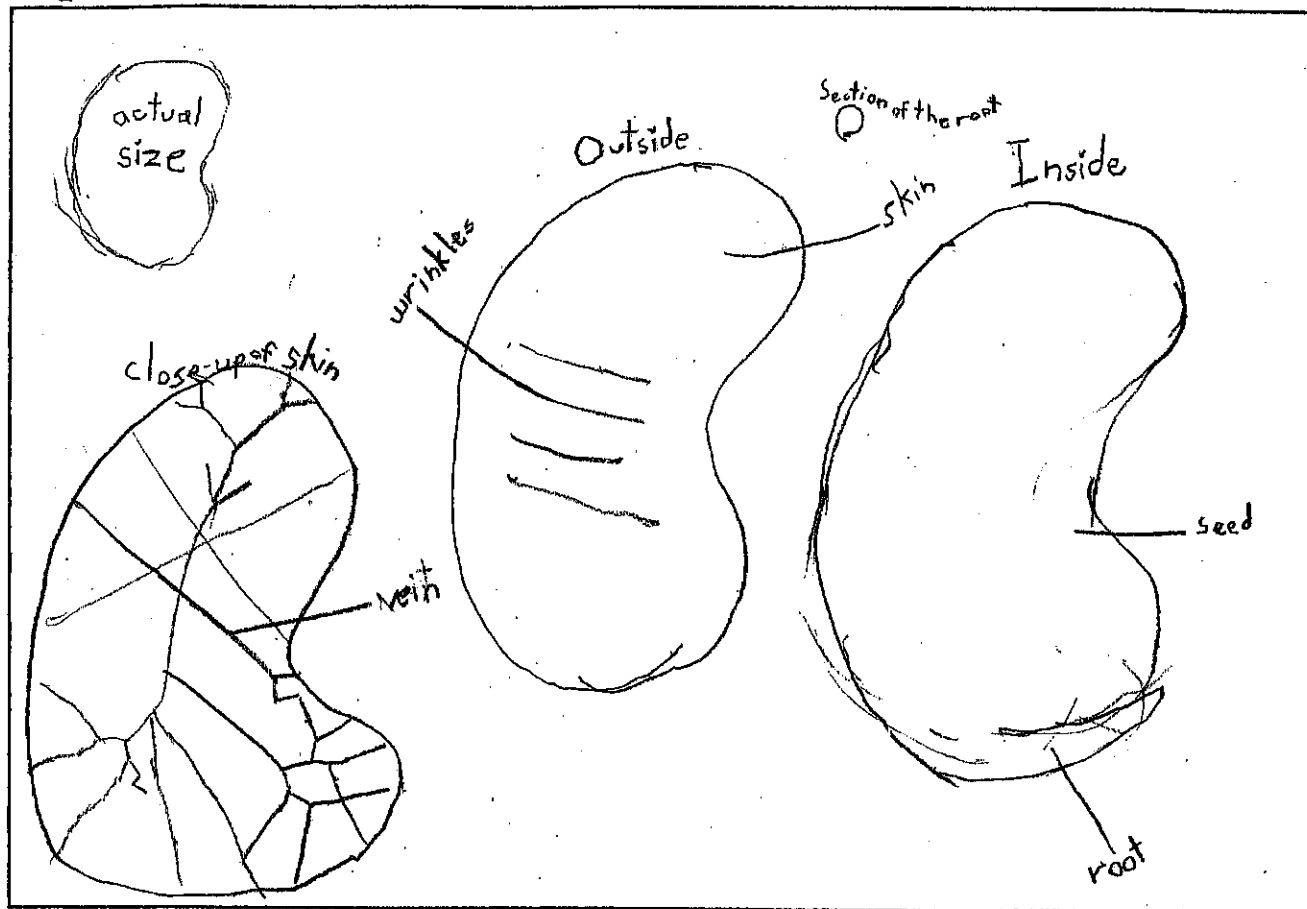
vanes on the skin. It naturally breaks in half vertically.

Scientist: Sophia

Date: 10/17/01

I looked at: a lima bean

A picture of what I saw:



Here are some things I noticed:

The skin keeps the rest together.

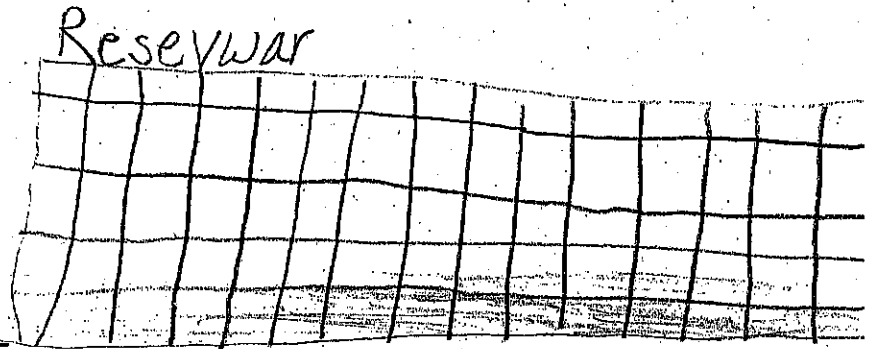
Scientist: Evelyn Donatelli

Date: October 24, 2001

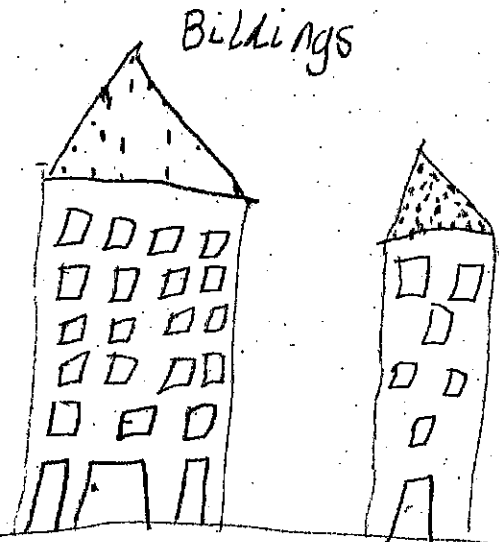
Tree Mural Ideas!

These are some interesting things which I saw on our walk and I would like to include in our class tree mural:

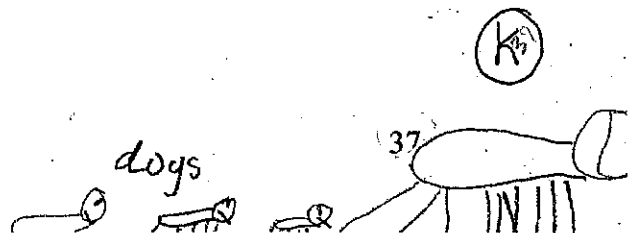
1. Reseywar



2. Buildings



3. Dogs

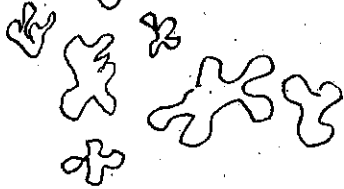


Scientist: Georgie Koepke Date: 10/24/01

Tree Mural Ideas!

These are some interesting things which I saw on our walk and I would like to include in our class tree mural:

1. fungess



2. dogs



3. my mom



Scientist: Sophia Date: 10/24/01

Tree Mural Ideas!

These are some interesting things which I saw on our walk and I would like to include in our class tree mural:

1. the fence by the reservoir.



2. dogs



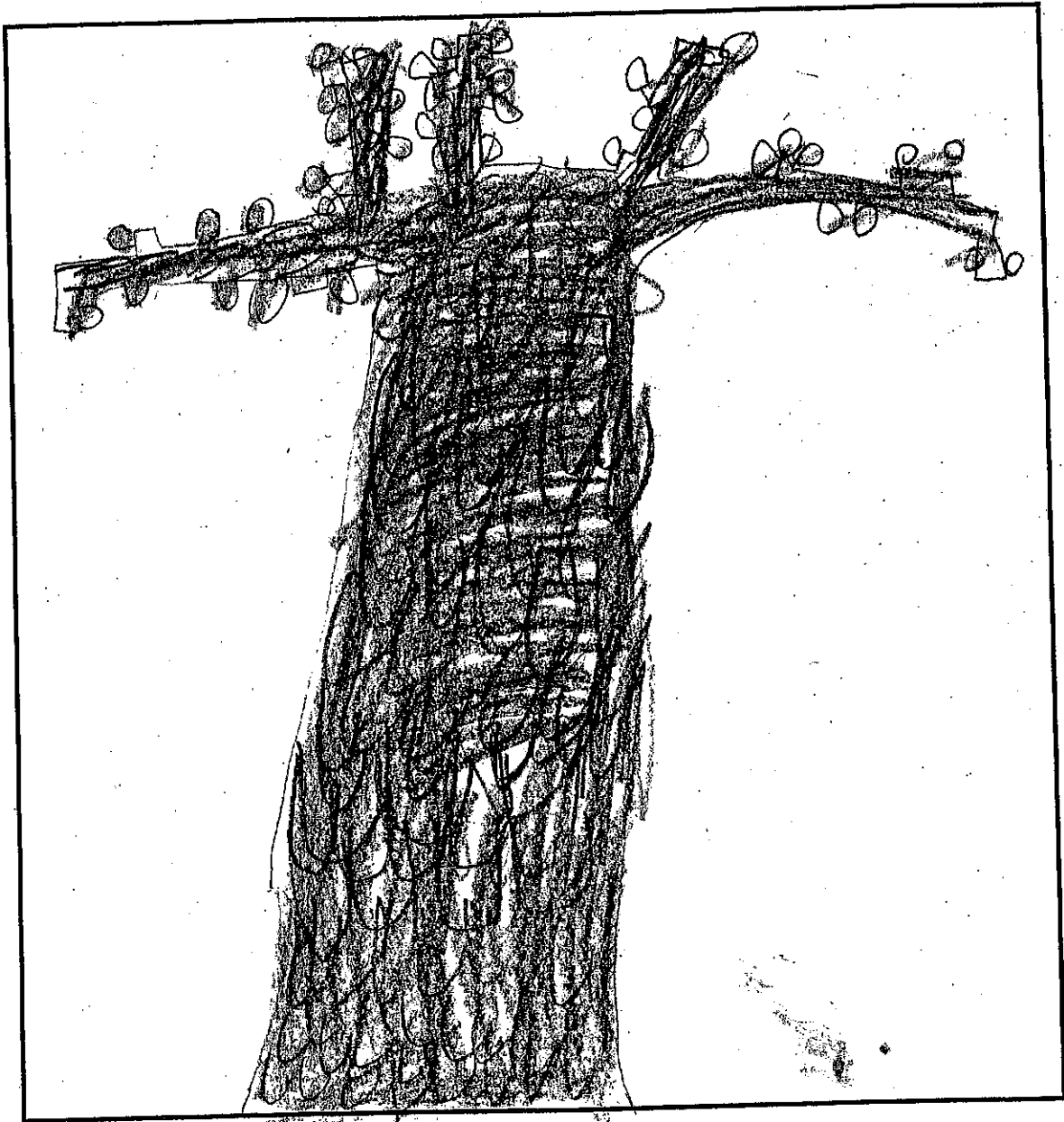
3. squirrels



Scientist George Date 11/14/01

My Tree in the Fall

Make an observation of your tree. Notice the size, shape, and color of your leaves. Look for seeds.

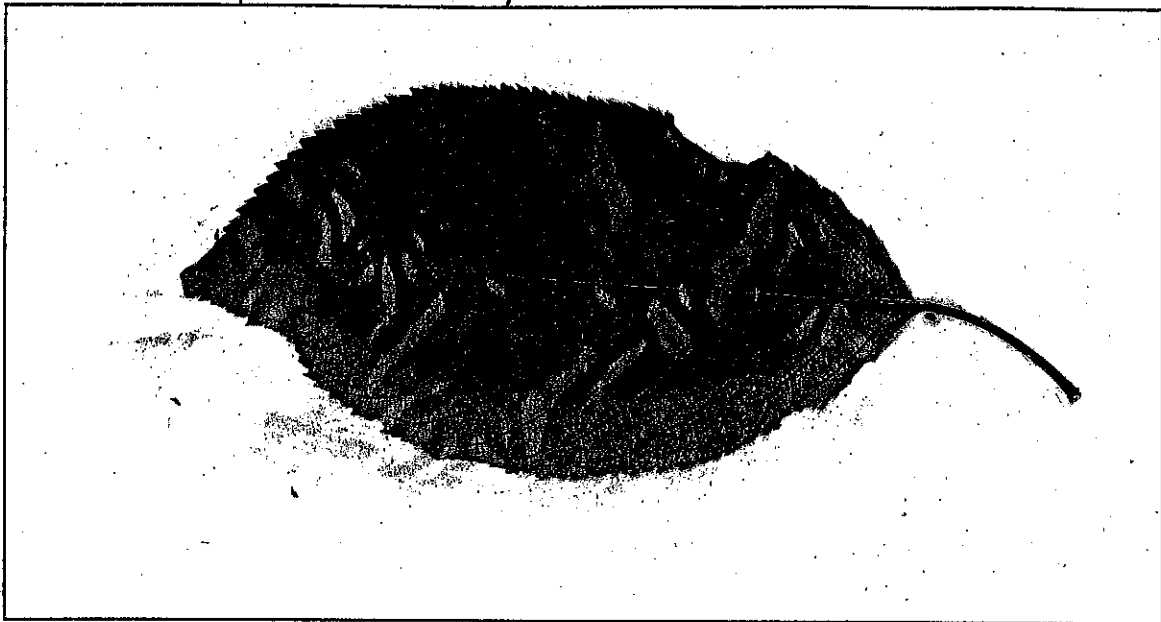


Scientist Beth ma

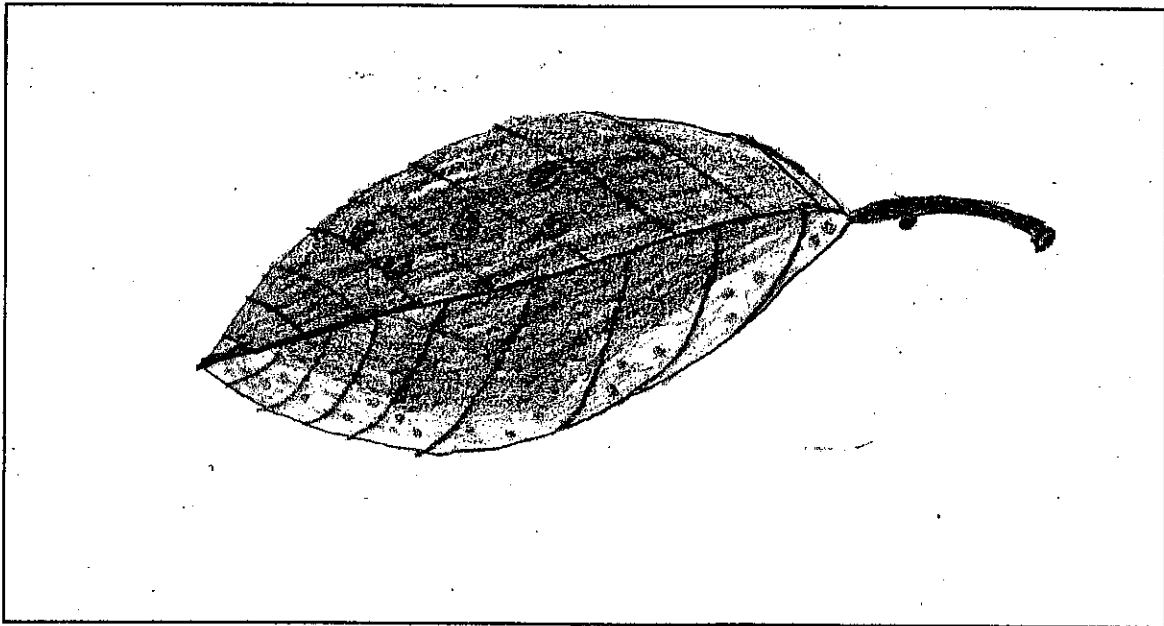
Date Nov, 21, 01

Leaf Identification

This is a sample leaf from my tree:



This drawing shows the special characteristics of my tree's leaves:

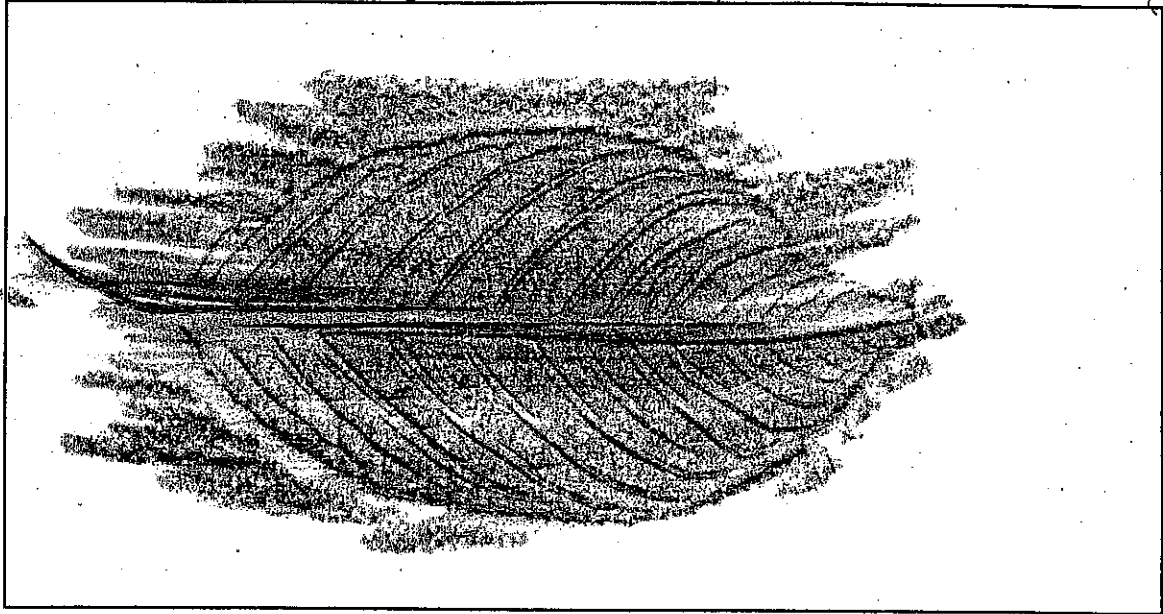


Scientist Bettina

Date Nov, 21, 01

Leaf Identification

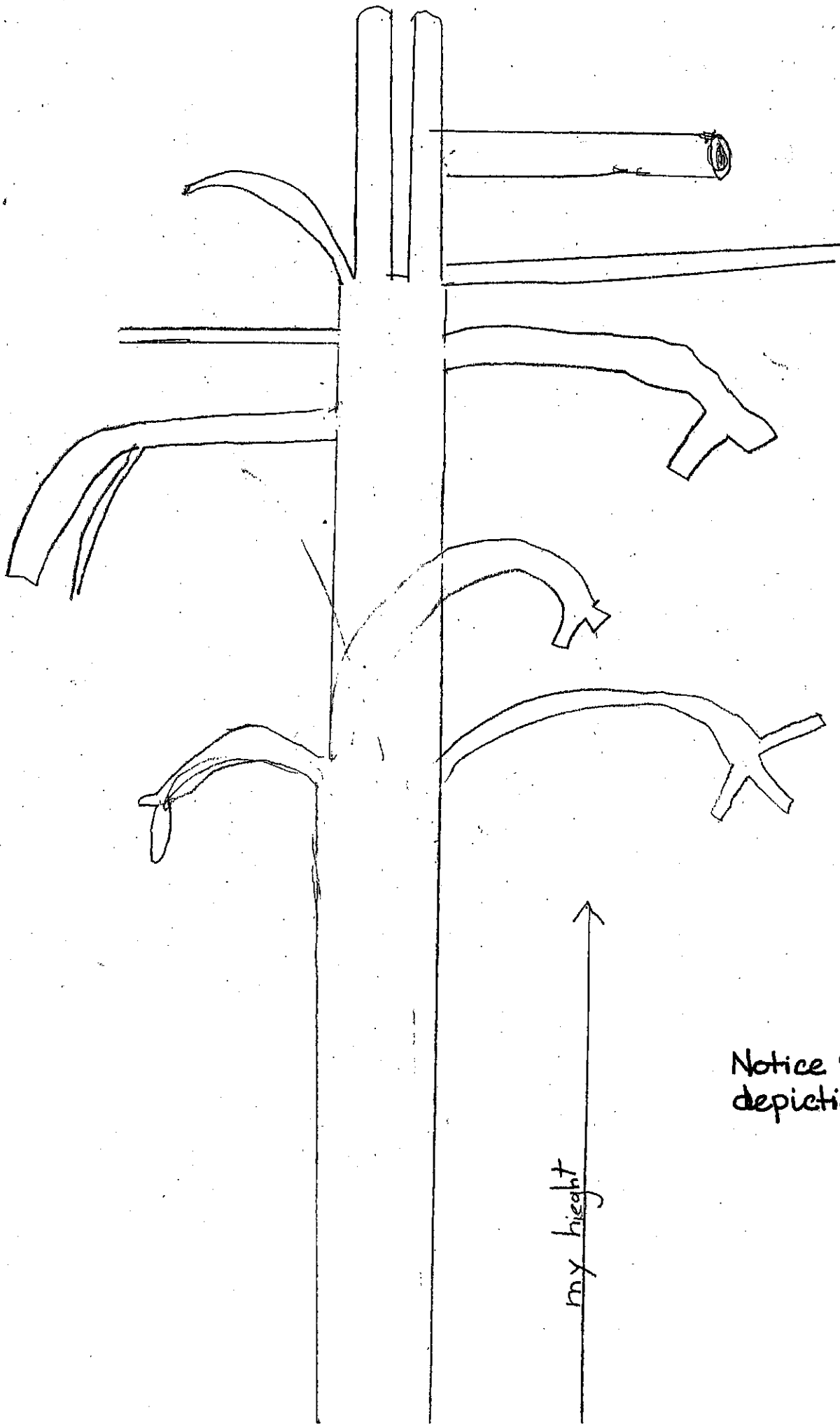
This is a crayon rubbing of a leaf from my tree:



This is a list of important identifying characteristics of the leaves on my tree:

1. My ^{leaf} leaf has five dark spots on the top.
2. My ^{leaf} leaf has 23 light spots on the bottom.
3. My ^{leaf} leaf has a dark brown stem.
4. On my ^{leaf's} leaf's stem there is a lump.
5. On the bottom of my ^{leaf} leaf it is yellow.
6. My ^{leaf} leaf has ^{pointy} pointy edges.





Notice Sophia's depiction of scale.

my hieght



Working on the mural

Working on the trees





More tree work

Sophia and Georgie with their trees





The class and their finished product!

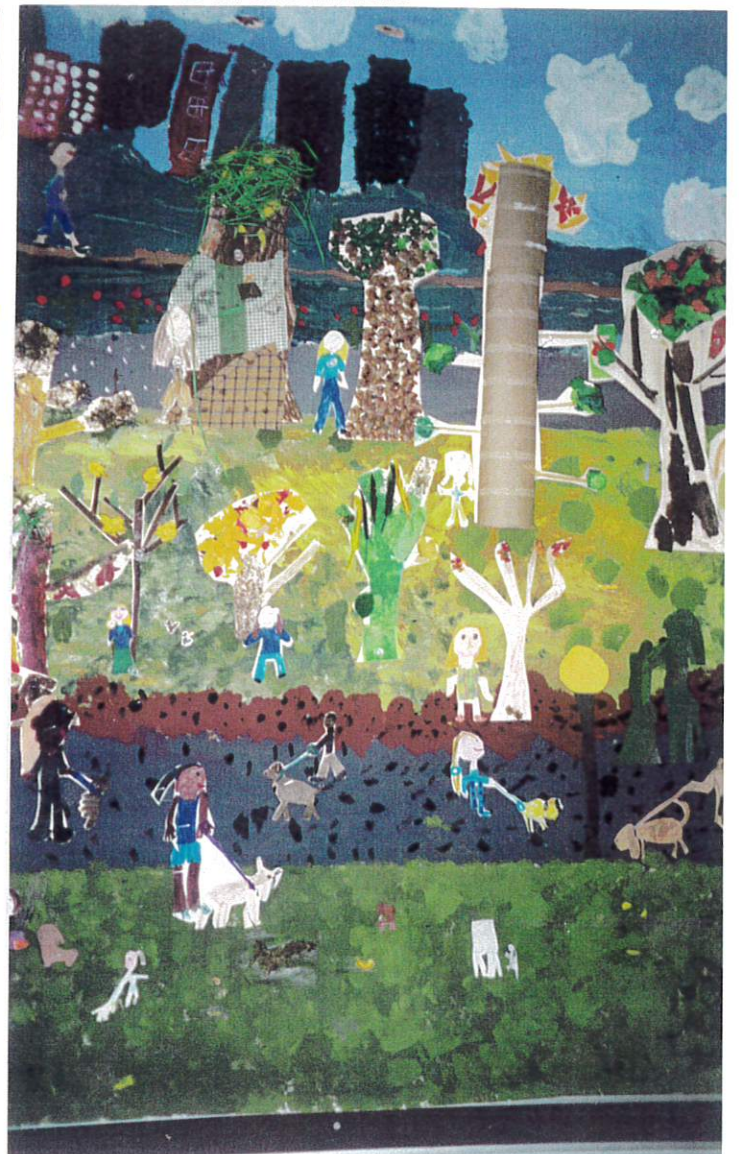
Close-up





More close-ups

Georgie's pinecone tree is in the middle



SUPPORTIVE LITERATURE

I kept a variety of books in our science area that dealt with trees, leaves, and nature in general. Some were fiction and some were non-fiction. The girls were encouraged to explore the books before school and during their free reading times. I also read a few of the books to the class. I used quite a few of these books, especially the children's ones, in working on my preparations for the project. The following is a bibliography of books we used during our tree study.

Children

Aronsky, Jim. Crinkleroot's Guide to Knowing Trees. New York: Bradbury Press, 1992.

A friendly old man of the woods provides a guided tour about trees and their different environments. A sensitive, loving account about how to identify trees, the differences between seeds and seedlings, how trees are home to all kinds of animals and so on. The book also does a good job of raising one's consciousness about protecting our forests and woods.

Aronson, Steven M.L. Trees: Trees Identified by Leaf Bark and Seeds. New York: Workman Publishing, 1997.

This easy to use reference book is part of the Fandex Family Field Guides. Die cut cards representing different leaves of trees fan out to provide all basic information on most of North America's trees. Each card has a visual representation of the leaves; bark pattern, flower or fruit of each tree as well as a full-length photograph of each tree. This book is great for field trips and walks in the woods.

Bernard, Robin. A Tree For All Seasons. Washington, D.C.: National Geographic Society, 1999.

A photographic observation of one special maple tree during the four seasons. The book has glorious photographs and an easy to read text.

Burnie, David. How Nature Works. Pleasantville: The Reader's Digest Association, 1991.

This easy to follow book explores all of the various aspects of the natural world including the world of trees and flowering plants. Best of all, this book is

full of exciting hands on projects and experiments for children that are educational but fun and easy to do at home.

Burnie, David. Tree. New York: Alfred A. Knopf, 1998.

Part of the *Eyewitness* series of books, this time dealing with the life cycle of all different species of trees. The book begins with defining different types of leaves and trees and continues on through how to recycle trees after their life cycle is complete. A very complete, but easy to follow account of the what, why and wherefore of trees.

Carrier, Lark. A Tree's Tale. New York: Dial Books for Young Readers, 1996.

A lovely story of a four hundred year old maple tree as it grows from a tiny acorn to its designation as a national treasure. The simple, lyric words describe the tree and its surrounding landscape through the many changes over several hundred years.

Dorros, Arthur. A Tree is Growing. New York: Scholastic Press, 1997.

Beautiful double page colored pencil illustrations make up this informative book. The book is chocked full of information about leaves, seeds, roots, bark, flowers and fruit of trees, with everything clearly labeled. This is a wonderful book.

Florian, Douglas. Discovering Trees. New York: Charles Scribner's Sons, 1986.

This bright, simple book contains the answers to any child's questions about trees, leaves and roots. Full of easy to understand, primitive-style illustrations.

Gamlin, Linda. Trees. New York: D.K. Publishing, 1993.

Another in the *Eyewitness* series. The book is terrific for the beginning arborist. The book is full of lovely watercolors and great photographs. There is a handy identification table at the front of the book, which can be of great help when trying to find out information about a specific tree.

Gibbons, Gail. The Season's of Arnold's Apple Tree. New York: Harcourt, Brace, Jonavich, 1984.

This bright, colorful book carefully details the seasonal changes of a little boy's very special tree. Delightful.

Gibbons, Gail. Tell Me, Tree. New York: Little, Brown and Company, 2002.

This terrific book contains all kinds of tree facts offered at a kid friendly level. The easy to read text and the clear, colorful illustrations provide a step by step approach to learning about different kinds of trees, how to identify trees, and how trees can be used in an environmentally safe way.

Hester, Nigel. The Living Tree. New York: Franklin Watts, 1990.

Full of photographs, this book is divided into clear concise chapters ranging from the definition of tree, through all of a tree's functions and parts, to how to recognize trees in the wilderness.

Hickman, Pamela. Tree. Buffalo: Kids Can Press, 1995.

This book has plenty of detailed illustrations and easy to understand text that deals with all varieties of matters concerning trees. The book answers such questions as to why leaves change color to how to grow a tree.

Hiscock, Bruce. The Big Tree. New York: Antheum, 1991.

A fictional story of one specific tree, a sugar maple first planted 250 years ago in Upper New York State. As the tree grows, so does the United States. The book successfully intertwines the events that take place in a family and our nation's history with that of the life of a gentle, sheltering sugar maple.

Jaspersohn, William. How the Forest Grew. New York: Greenwillow Books, 1980.

This is a beautifully illustrated book about how a forest is created. The book also talks about the ecosystem of a forest. A very engaging and easy to understand work.

Lauber, Patricia. Be A Friend to Trees. New York: Harper Collins Publishers, 1994.

This book has easy to understand illustrations as well as an easy to understand text about why trees are important and how human beings can protect and preserve them. This fun book explores the recycling and ecology of trees.

Locker, Thomas. Sky Tree. New York: Harper Collins Publishers, 1995.

Lovely, gentle words accompany a series of simply beautiful and surprisingly powerful paintings of one tree over the course of a year. This sensitive book asks the child to think about why things appear as they do as well as to examine their feelings as they peruse the book.

Markle, Sandra. Outside and Inside Trees. New York: Bradbury Press, 1993.

Full of detailed photographs, this book explores the makeup of trees from the inside out. Such details as leaf scars, buds, tree bark and the leaves themselves receive up close and concentrated inspection throughout this informative book.

Maestro, Betsy. How Do Apples Grow? New York: Scholastic, 1992.

The title of the book is self-explanatory. This fun book explores how the fruit of a tree begins with its flowers. Large illustrations make this an easy to understand book for even very young children.

Maestro, Betsy. Why Do Leaves Change Color? New York: Scholastic, 1994.

In this book the author explains the concepts of photosynthesis, pigment, and chlorophyll in easy to understand words. The book also includes activities that children can make and do with leaves as well as the best places to see them with your family.

Oppenheim, Joanne. Have You Seen Trees? New York: Young Scott Books, 1967.

The evocative poetry and soaring illustrations of this book provide a meaningful introduction to trees and the seasons.

Pine, Jonathan. Trees. New York: Harper Collins Publishers, 1995.

This book is a nicely illustrated book of watercolors that describes the many types of trees growing throughout North America. The book also talks about how trees provide the greening of the earth, which keeps us all alive.

Podendorf, Illa. Trees. New York: Children's Press, 1954.

This is a book from many baby boomers' childhoods. Despite the somewhat dated illustrations, this book provides valuable information about nature and the growth cycle of trees. Clear, easy to read text.

Sohi, Morteza. Look What I Did With A Leaf! New York: Walker and Co., 1993.

This book is a fun combination of art and science. It includes advice on how to choose leaves to arrange in animal shapes and images of nature or even preserved as a work of art. A must for every lower school classroom.

Udry, Janice May. A Tree is Nice. New York: Harper Collins, 1956, 1984.

This sweet book teaches children how important a tree is in the world and how important they are to have around. Marc Simont's exuberant illustrations catch the childlike charm of the text.

Wong, Herbert. Our Tree. Reading, MA: The Addison-Wesley Publishing Company, 1969.

This abundantly illustrated book deals with the life cycle of the tree, the various kinds of life that a tree supports as well as observing the changes in specific trees over the course of a year.

Teacher Resources

- Burn, Barbara. North American Trees. New York: Bonanza Books, 1984.
- Combes, Allen J. Trees. New York: Dorling Kindersley, Inc., 1992.
- Cohen, Dorothy H. The Learning Child. New York: Schocken Books, 1972
- Frailberg, Selma H. The Magic Years. New York: Simon and Schuster, 1959.
- Graff, M.M. Tree Trails in Central Park. New York: Greensward Foundation, Inc. 1970.
- Harlan, Jean. Science Experiences for the Early Childhood Years. Columbus: Charles E. Merrill Publishing Co., 1984.
- Harlow, William Morehouse. Trees of Eastern and Central United States and Canada. New York: Dover Publications, 1957.
- Herman, Marina L., Passineau, Joseph F., Schimpf, Ann L, Truer, Paul. Teaching Kids to Love the Earth. Duluth: Pfeifer-Hamilton Publishers, 1991.
- Hutchins, Rosa E. This is a Leaf. New York: Dodd Mead, 1962.
- Labinowicz, Ed. The Piaget Primer. Parsippany, NJ: Dale Seymour Publications, 1980.
- Mitchell, Anne and David, Judy, editors. Explorations With Young Children. Beltsville, MD: Gryphon House, 1992.
- Rogers, William E. Tree Flowers of Forest, Parks, and Streams. Appleton, Wisconsin, 1935.
- Russell, Helen Ross. Ten-Minute Field Trips. Washington, D.C.: National Science Teachers Association, 1993.
- Weaver, Harriet E. There Stand Giants. Menlo Park, CA: Lane Books, 1960.
- Wiggers, Raymond. Picture Guide to Tree Leaves. New York: Franklin Watts, 1991.
- Young, Hugh. Simon and Schuster's Guide to Trees. New York: Simon and Schuster, 1978.

On the Web

Project Learning Tree. A program of the American Forest Foundation.
www.plt.org/