

Exploring Fire Safety

Preschool Classroom

Evaluation, Reflection, and Assessment

The classroom environment enables children to demonstrate what they know through a variety of authentic assessment strategies (exhibitions, demonstrations, journals, group discussions, debriefings, interviews, and conferences). Assessment is constant and ongoing so as to identify students' strengths and learning approaches as well as their needs. Teachers observe play, watch children drawing, listen to conversations and ask questions. As children explain their thinking, teachers can assess their level of understanding. "Students points of view are windows into their reasoning. Awareness of points of view helps teachers challenge students, making school experiences both contextual and meaningful. Each student's point of view is an instructional entry point that sits at the gateway of personalized education" (Brooks & Brooks 1993, p. 60).

Documentation is vital for assessment. Documentation includes narratives of child-to-child conversations, child-to-adult conversations, photo portfolios (photo narratives), wall displays, and written summaries. Documentation offers opportunities for children to evaluate their own work, for teachers to keep parents better informed (knowledge web), and for teachers to gain a better understanding of how children learn. Documenting conversations and representations at the beginning and at the end of the project for the group as a whole and for each individual child gives perspectives of growth in all dimensions including vocabulary, concepts, knowledge, skills and dispositions.

Tomlinson's "Planning Model for Academic Diversity and Talent Development" (Tomlinson, 1996, p. 162) is a useful tool for examining how children's responses showed growth. Instead of using the model to differentiate instruction, the teachers have used it to examine how responses to the activities were differentiated among students as well as how they demonstrated growth in students throughout the study. In a project-based classroom, where many activities are open-ended, using Tomlinson's indicators can show growth. Teachers can demonstrate through child portfolios how children have gone from simple to more complex responses; concrete to more abstract understandings, and less independence to more independence in work habits and dispositions.

In an environment of inquiry, teachers look for evidence of children's growth (Klein & Toren, 1998). Children's questions may evolve from general to more specific once children have more knowledge about a topic. They may transfer their learning by making links to other things that they know and with which they are familiar. They may incorporate the new vocabulary into their every day language. Teachers look for growth in fluency of ideas and in ways in which children generate questions, solutions, hypotheses and theories. Teachers look for growth or change in students' understandings by examining artifacts of learning, which include drawings, structures, writings, and conversations. Children may also become more self-directed, more engaged, and may strengthen their dispositions to inquire, to assume responsibility, to persevere, and to take on leadership roles within a group.

The evaluation of a project investigation includes [teacher reflections](#), [student self-evaluations](#), [parent-feedback](#), and an examination of each child's [project portfolio](#) to assess growth and learning. Examples of children's project portfolios are included in this document.

The primary method of assessing what students have learned in project investigations is through the documentation of their experiences. Teachers observed students carefully and provided opportunities for students' thinking to become tangible in order for teachers to see growth. Teachers listened and recorded students' ideas expressed in conversations, brainstorming sessions, interviews, writings, predictions, and representations. Teachers reflected upon class growth as well as individual students' depth of understanding by examining and comparing the documentation from the beginning to the end of the project.

Teacher Reflections

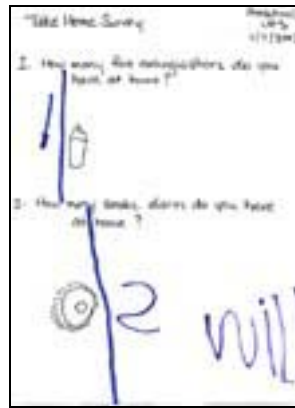
Although the concept of fire and fire safety may have been more abstract than the previous concrete investigation of Bread that students completed at the beginning of the year, students were engaged throughout this project investigation. Students had an enormous amount of interest in fire equipment and what is in a fire station. They enjoyed turning their dramatic play room into a fire station and had a great deal of fun role-playing fire calls. Throughout all of these activities, students increased their basic literacy and numeration skills as they dictated and dramatized stories and counted fire extinguishers and smoke detectors in their environment.

Although students may never have been in a fire, they could relate easily to the topic of fire safety because they connected what they were learning to their own lives. To explore the fire equipment in their homes, teachers permitted students to take home a camera for counting and documenting the fire extinguishers and smoke detectors. When touring one house for fire safety equipment, the parent and child noticed that the smoke detector did not beep, as it should. The parent had to replace the battery for the smoke detector. The student discovered how his safety check may have saved his family!

The children's enthusiasm grew as they delved deeper into the topic of fire safety. Once the fire truck representation was completed, children put it to use. As soon as the dramatic playroom was designated as a fire station, it became a busy place filled with young fire fighters. Many children chose the dramatic playroom on a daily basis during March!

There was a tremendous amount of transfer in this project. Students became so aware of fire safety equipment in the school and in their homes, that when they visited the College of Education to view their art show, they searched for fire extinguishers and smoke detectors in that building. They were even interested in exit signs. This was an extension of the fire safety investigation. They learned to always look for the nearest exit when they enter a new building. It could save their lives. Students became much more aware of safety measures in public buildings.

In summary, fire safety is an important topic for young children to explore. Most students internalized rules and procedures for being safe if a fire occurs. All students enjoyed participating in the role-playing and dramatic activities that simulated fire safety.



Survey with children's illustrations added to find the number of fire extinguishers and smoke alarms in the home.

The project provided numerous opportunities for children to work in groups that were diverse in ability, age, and gender. Students gained negotiation and cooperation skills through the interactive role-playing and collaborative construction activities. They worked together to build each piece that went into the fire station. There were only two beds to share and one computer. Children took turns sleeping, wearing the fire hats, and cooking meals. The fire pole took planning and major revision when the first fire pole did not work. Once a sturdy fire pole was built, everyone took turns sliding down it. Most of their representations were group products incorporating teaming skills. They learned to value others' ideas, to follow through from planning stages to the finished products, and to gain a sense of group pride in their accomplishments.

Higher level thinking skills became evident through student's problem solving and critical thinking about the fire calls that they role-played. Students analyzed what they found on their "fire calls" and evaluated what they would need to help people and put out fires. They made decisions about what they were going to include in their written reports.

This topic presented interesting challenges for teachers to give students opportunities for first-hand investigations because the teachers could not allow children to experience being in or starting a real fire. The children could not experiment to answer their question, "What can catch fire?" The knowledge gained was mostly factual, and relevant to their own lives. Students conceptualized their increased understandings by articulating fire safety tips. After investigating fire and fire safety, the students brainstormed many safety tips for their second topic web (Student Fire Safety Topic Web 2).

Literacy and Language Development

Opportunities to increase literacy skills are always abundant in project work. In this project, students began with fire memory stories and later gave detailed explanations of what they saw on

their field studies. Notice the memory stories contained an element of fantasy at the beginning of the project.

- KAM: There was a fire and I saw the fire. When I saw the fire I saw a floating heart. It rescued the people.
- IF: There's a fire inside the dirt. It caught on fire through sparks flying through the air.
- NS: Someone was carrying a candle but some fire sneaked out. And someone didn't know how to crawl and they got burnt.
- TM: My friend was holding a candle and some fire got out of the candle and started growing. When I saw the fire, I saw four floating and one small one. And the small one dragged me out of the building. And I saw a hole and the water came down and put the fire out.

Once there was a beautiful fire truck who liked to play. He didn't have any friends to play with. Then he had four beautiful friends. Two friends were lazy and two friends were nice. The fire truck found a house. It was his friend's house. He'd never been to his friend's house. He liked to play with him but they didn't have time to play. So it was too bad. So they waited & waited for their mommies. There was a very big fire. And he never lost his water. He had lots of water. His friends helped him. There was another fire tomorrow. So he sprayed water.

The End.

There was a fire outside. Then a water bucket came and said to the butterfly, "What's wrong with you?"

Then the butterfly said, "I saw fire."

Then the water bucket quickly got some water and put out the fire.

As the investigation progressed, one group wrote the following group story. Notice the story has factual information such as how an axe is used by fire fighters. New vocabulary from the fire project is interjected into the story such as crawl, axe and fire fighters.

Group Fire Story

Firemen help people a lot to get our stuff out. There is a fire in our house. The smoke is high so we need to crawl on the ground. If you are in bed, you need to run outside in your pajamas. Nurses, ambulances, and doctors come. The nurse brings bandages, Band-Aids, and a fire extinguisher to help the fireman. The doctor will bring tools. A vet will help our animals. We have a pony, a cat, and a dog. The horse is on fire. The firefighters save the horse. "There are two horses," said the chief. Two firefighters ran back in the building with their masks and air tanks. The firefighters go to rescue the horses. They put the fire out and had a party at the neighbor's house. The mailman comes to the party and delivers a package from the newsman. The firefighters open the package, and they found a new axe because one of the firefighters lost his axe. It was shiny because it was new. He will use the axe to break windows and doors to help

get people out. Yellow ran away and the police came to help find him. He ran way to the forest and the firefighter could not find him. The firefighters knocked trees and NS and Yellow saw each other. The ambulance came and took them to the hospital. The forest caught on fire. The tree fell down and the fire was gone.

The fire went back to his house. The people all found their homes. They had lunch and dinner and went to bed. The firefighters got to the place where the fire was, all of the people came, and they got the flames out. Everybody was safe and they all went to bed.

The End!

Teachers documented language development through the fire calls that students dictated. Students' stories started out simple and grew more complex. The fire reports became more detailed and in depth as the month passed. Several examples follow. For a more thorough listing of the fire calls, see Student Dictated Fire Calls.

3/06/03

IF: It was a false alarm and we need to put them in jail.

NS: A wire reached up and it burned me but I put it out with a hose and I stop, drop and rolled.

3/10/03

MJ: This was a real one. The kids were hiding in the clay box and toy box. The fire fighters found them. They were scared and nervous. They were okay, but the fire fighters took them to the doctor just in case.

MJ: Fire fighter MJ went out on a fire call. KM fell into a whole pile of cords. Someone had plugged in 20 cords. Two cords snapped into pieces and fire started. MJ unplugged all of the cords, put the fire out and saved KM. He saved all of KM's toys.

3/13/03

MJ: I found ten cords all plugged in together. 99 fire fighters came to fight the fire at the hotel. When MJ got to the scene, the other firemen put it out. They drove back home. Glass hit paper and cut it into two pieces. A light flew on. Paper and a pillow caught fire. MJ put the fire out.

IP and RS: IP and RS saved a dad, a mother, two babies, a brother and a sister. The fire was at a group time place. The first fire was in the computer room. They did not save everybody there. Everyone was dead.

The fire call reports show real tragedy as well as heroics. The students listened to experts and heard many stories about fire and how fire fighters save people. Their fire call reports demonstrated that they understood what could happen on fire calls and the importance of coming back to the station to write a report.

The teachers documented misconceptions by listening to stories that were dictated in the writing area or shared at large group meetings. The teachers designed activities to help students explore and clarify their misunderstandings about fire and fire safety.

Misconceptions

- Only water puts out fire.
- Rocks make fire.
- You put smoke into fire.
- Fire hose water comes from the sink.
- Fire kills everything except water.
- Next year, we need to do a better job of pursuing the misconception or idea the very next day. This is something we will strive to do.

The teachers brought in fire experts from around the community. Each expert did an excellent job of explaining fire equipment and what their job entails. In most cases, the teachers prepared the speakers by giving them the students' questions ahead of their visit. Each speaker brought hands-on materials to share with the children.

The experts distributed hand-outs that covered similar material:

- Check for smoke detectors and if they are working properly
- Have a fire extinguisher near the kitchen or in a basement
- Fire fighters are here to protect and save you
- Know what to do in case of a fire at your house.

The teachers were happy with the information that the children gleaned as they listened to experts talk about fire safety. The students tried a few experiments, gathered and analyzed survey information, and wrote a play that illustrated all the elements of fire safety.

As a result of the inquiry, students still had a few more questions and wonderings that interested them at the end of the project:

- IF: How do you make the special suits for walking through fire?
WK: What about the foam and the foam gun? It's not the kind you use in war.
TK: How does water spray people?
NS: Find out about fire extinguishers. How do they fight fires?
ER: About the clothes the fire fighters wear.
MJ: How do the fires start burning the house and how it falls down. How do the moms and dads get out and what about the baby who only crawls?
IF & WK: Do fighters have moms? WK said no and IF said yes.

The teachers asked children to make a book about what they learned about fire safety to share with parents at the open house. Below is the text of their book entitled, *What Kids Learned About Fire Safety*.

Student Reflections

- AW: Crawl under smoke and get out quick. You call 911 when there is a fire.
- BL: Don't go back into the burning house.
- CB: I learned everything about fire safety! Get out of the house. Stay out of the house. Go to the new house. Stop, drop and roll when there is fire on your clothes. When there is fire, you call the firemen and they put out the fire. They have to answer to the fire chief. They have to write a report.
- ER: Sometimes firefighters save kids. Sometimes they have their mask on so they can breathe air. Stop, drop and roll if there is fire on you. If there is fire in your house, you need water to put it out.
- EG: I saw some fire trucks. You crawl out of the house. You stop, drop and roll when you see fire.
- ESR: You squirt water out of the hose. If there is a fire, you need to use the hose to put out the fire. Fire Fighters use some hoses to put out the fire.
- EC: You never can touch matches. You never can touch fire without an adult or a fire fighter.
- ES: Fire trucks. Stop, drop and roll. Call the fire fighters. Fire poles.
- IF: Stop, drop and roll when the fire is on your clothes. Crawl when there is a lot of smoke.
- IP: Can't be under the tables. They have dining room and kitchen in the fire station.
- MSJ: Get out of the house when there is a fire. If there is a little fire, use the fire extinguisher to put out the fire. When you hear the fire alarm, get out of the house very, very quickly. You should keep the fire extinguisher at a special place where you know where it is. If you hear the smoke alarm beep once, that means you have to change the battery. Firemen get wet when they are spraying the fire.
- ML: There are some animals, a doggy and a puppy, a horse and a pony. When there is fire, you put on special clothes, gloves and hats to protect you. When there is fire, you stop, drop and roll.
- MP: Don't play with matches. Don't play with lighters. Do not play with stuff that can make fire. Do not play with the hose. Crawl under smoke.
- NH: Always be careful. Go outside. Do not go in for anything. You have to call 911 and the police. The firefighters find the police. There was a stranger once and we called 911 and the police came.
- RM: I get out of the house when there is a fire. My daddy makes a fire where the fire belongs, in the fireplace. No going under the table.
- RS: When you catch on fire, stop, drop, and roll. Get out of the house quickly when there is a fire, and don't hide from the firefighters.
- TM: You need to get out of the house and don't go back for anything. You need to be outside if it's hot or cold.
- TK: I don't like water. I like fire. I call 911 – call right now!
- WK: Never play with matches. You shouldn't leave things cooking on the stove because they can catch fire. Don't leave hot things on the counter because it could cause a fire.

During the culminating activity the teachers distributed a questionnaire to parents asking them to think about what their children had learned about fire safety. Some of the parents took their questionnaire home and returned them to school. Below are the responses to the questionnaire.

Parent Reflections

1. Did you see any evidence of your child's interest in the fire safety project?

- Yes, she talked about fire safety daily and asked lots of questions at home.
- Yes, he loved making the fire engine out of boxes and junk. He also loved the fire station.
- Yes, MJ talked a good deal about fire drills, alarms, and safety. I showed him the alarms we have and where they are located.
- He tends to draw or construct fire-related objects, trucks, hoses, etc.
- Yes, KM wore her firefighter costume many times. She mentioned to "Stop, Drop and Roll" when a fire is spotted.
- We saw a lot of fire station drawings, fire extinguisher "boxes and junk", and heard a lot of stories / facts about fire and fire safety. The field trip was a big highlight.
- Yes, this is a topic JG enjoyed. He talked about alarm systems, how to extinguish fire, etc.
- EG talked about the field trip quite a bit. She incorporated themes about fire into her imaginary and pretend play at home.
- Yes, excited about the field trips; shared fire safety tips
- Yes, she was stop, drop, and rolling a lot. She was also singing the songs, and building a fire truck out of her chairs.
- Very much. IP told us a lot about what he was learning from guest speakers and visits to the station. He told us new things that he learned and was very animated.
- Yes, she let me know about what they did when they visited the fire stations.
- Yes, MP talks about fire safety at home.

2. Did your child talk about any aspect of the topic away from school? Did the conversation or statement reveal new knowledge about the topic?

- Yes, she wanted to know our plan for exiting the house if there was ever a fire.
- Yes, he would say that children shouldn't touch matches or lighters. Also, he talked a lot about smoke alarms.
- He seems to have a better understanding of fire safety.
- Yes.
- Yes, KM wanted to know the locations of smoke detectors and fire extinguishers in our house. And we checked the batteries together.
- Yes, WK showed a lot of interest in the topic and expanded his knowledge of the topic, too.
- Yes.

- She talked about water putting out fire. She also talked about what a smoke alarm does.
- Yes.
- Yes, “Stop, Drop and Roll”; us playing with fire.
- IF and DF have a fire station and trucks set up and hospital with ambulance and have carried out numerous pretend play sequences incorporating new ideas from school.
- Yes, one day the fire alarm sounded when we put on a fire in the fireplace (the smoke came inside due to the cold air in the chimney) and ECG started to shout “stop, drop, and roll” like crazy and rolled across the family room toward the front door.
- Yes, when she sees a fire extinguisher anywhere or fire hydrant on the road.

3. Did your child like this topic?

- Yes, she really enjoyed this topic.
- Yes, he thought it was exciting. I like the safety aspect of it.
- Yes, MJ enjoyed all aspects. Truck, dramatic play especially.
- Yes.
- Very much.
- Yes.
- Yes.
- Yes.
- Yes.
- Not sure. I think she liked the Bread Project more. She loves to cook.
- Yes.
- I think so.
- Yes, she play fire fighter at home with her younger brother.

Student Portfolios

WK (5 years old)

WK turned five toward the beginning of this project. This was his second year in the class as a preschooler. Last year, he chose to play in the block area and the computer room during project activity time. This year, he was active in all phases of the fire project. He wrote stories, participated in surveys and helped create the representations that were displayed in the room. WK was also a student fire fighter who took his job seriously. He was one of the first guest speakers to talk to the group as a “fire expert.” WK shared how to stop, drop and roll.



Two student “Fire Fighters” show off their gear.



WK adds lots of tape to secure the large fire truck representation.

Growth in Initiative and Leadership

WK was a major contributor to the fire station. He planned with the others all the items that should be included in the fire station. WK thought it was important to add fire trucks and doors for them to go out. On the field trip to the fire station, WK noticed huge garage doors. He wanted the same for the classroom fire station. He wrote and hung signs on the wall reminding everyone to dial 911 or be safe. He, also, enjoyed using the “computer” in the fire station.

During other projects, WK had been a participant, but not a leader. In this project, WK lead children in practicing “stop, drop, and roll.” He initiated fire calls, and led other children at role-playing fire fighting. He acted as a fire chief in the dramatic play room.



WK writes out his survey question. The responses are tallied under “no” and “yes” columns.



WK uses the “computer” in the fire station to type up information.

Growth in Literacy Skills

WK’s major area of growth occurred in literacy. WK participated in dictating fire calls that were detailed and intricate accounts of events. Some of his fire calls are listed below.

- 3/6 Too many electric plugs were plugged in. A blender was making a milkshake for dessert. One of the wires snapped and there was paper nearby. The paper caught fire.

In Hawaii a fire plane came and a volcano was in back of a house and exploded and the lava hit the house and it caught fire.

- 3/7 Bonfire in a house. A burglar set the fire with matches. He went outside and got some sticks. He put the sticks in the bathroom. He lit the matches and put it on the sticks. The firemen came first. The police came second. The police threw the burglar in jail.

It was a wild fire. Someone named George was watching the fire. Some poachers started the fire. George forgot to bring his hose. He lost it. Luckily, he got an extra hose. He put out the fire and saved the deer, lions, rhinos and bears.

- 3/10 It was a wild fire. It started because poachers did not build a pit fire. It has a hole in the ground to place your fire. The wind blew the fire off the wood. It went to the ground. WK used a short hose to put out the fire. WK saved panda bears, deer, lion and cubs.

- 3/11 False alarm a short building. I looked on each floor. Someone called 911. I called the police they threw him in jail.

- 3/13 There were some matches and one fell out and lit as it fell. It caught the floor on fire and I put it out with the short hose and went back to the station.

A burglar called 911 for a joke so the police came and threw him in jail and locked him up.

- 3/18 Fire Fighter WK went to a dinosaur fire. It started when a volcano exploded. A tree caught fire from the lava. I USED HOSE TO PUT OUT THE FIRE. (WK wrote the capitalized text himself.)

WK understood that sometimes there are false alarms. He also knew and shared with the other children that matches start fires and that police often go on fire calls, too.

The teacher noticed WK's engagement in writing and his desire to write his own reports. When he made a mistake he asked for "that tape." WK didn't mind making mistakes and fixing them.



WK writes his fire call report on the chart paper.



WK stands next to one of his safety signs displayed in the fire station.

WK wrote this story during the fire project.

The firefighters were in Hawaii and we came to help the Hawaiian fire fighters. The fire started from the volcano and burned one of the houses. We put out the fire all by ourselves with fire hoses. We rescued a snake, a hamster, a gerbil and some spiders. IF rescued two kittens. NH saved 100 kids. The bad guy, the volcano “erupter,” made the volcano erupt. The police caught the volcano “erupter” and sent him to jail.

WK wrote more during the fire safety project than he had during the previous projects. He created signs, stories and labels. He enjoyed the tune to the song about the Chicago Fire so much that he wrote his own words and sang the song during the culminating activity.

Disposition to Inquire

WK asked each expert something that was particularly important to him. He may have gleaned part of the information from a story shared in class or one that he read at home. He asked Fire Fighter Richard “Why are there foam guns?” and “What if there is a fire at the fire station?” He also wanted to know, “What if a fire is on the roof?” and “How do you put out a fire in a tall, tall building?” When a volunteer fire fighter visited, WK asked him, “Why do you go through red lights?” WK read his questions to the guest speakers from the chart paper. He inquired about concepts that furthered his knowledge base.



Fire Fighter Richard answers WK’s question about a fire starting in the fire station.

WK grew in many areas during the fire safety project. He was a major contributor to the designs of the fire truck, fire extinguisher, and fire station representations. WK performed in front of an audience when he dressed as a fire fighter. He sang in front of a group of parents. WK let himself shine during the fire safety project!

Student Portfolio

IF – (4 years old)

Disposition to Inquire

This was IF's first semester in the preschool classroom. Throughout the early part of the semester, he enjoyed playing in the block area. In the first project investigation of the year, IF participated in activities that helped answer other children's questions. In the fire safety project, IF initiated his own question to pursue, "What starts a fire?" He persisted in his desire to find out the answer and asked his question to each expert that came to the class. He learned that people cause fires when they are not safe.

IF was interested in finding the answer to the question, "Does a Clock Start a Fire?" He created a form to survey students in the preschool classroom. IF presented the information in bar graph chart. The teacher displayed his results on the wall for classmates and visitors to read.

Extending the Comfort Zone

IF loved to play in the block area during the first months of school. To encourage growth, the teachers asked IF to explore new choices such as drawing, using the computer, or using art materials. The biggest step for IF was to work in other areas of the classroom. The fire safety project introduced him to a variety of media and IF became a major contributor to the group representations of the fire extinguisher, model house, and the fire truck.

The fire station in the dramatic play room got his attention quickly. IF signed up daily to use the dramatic play room on the activity choice board when it became a fire station. The fire safety project allowed him to comfortably explore the art and writing areas as well as dramatic play room and use his knowledge for fire safety.



IF waits his turn to slide down the fire pole.

During the culminating activity, IF wanted to share his new knowledge. In front of everyone, he said “Stop, drop and roll when the fire is on your clothes. Crawl when there is a lot of smoke.”

Student Portfolio

ML (3 years old)

ML was a young three year old when she entered school in the fall. She was fairly quiet and chose mostly to use the computer or play in the dramatic play room during project/activity time. She stayed close to one particular female friend. During the fire safety project, ML demonstrated an enormous leap in her drawing skills and an increased interest in broadening her social relationships.

Simple to Complex

ML drew pictures that became more detailed as the months passed in the project. Her first fire fighter drawing is shown. Two months later her fire fighter has a hat and two eyes. In one picture she drew herself as a fire fighter holding a cake. The last picture she created has a house that is on fire with smoke coming out. The fire truck is approaching to put out the flames.



ML draws a fire fighter in November.



ML adds a face with ears, a fire hat with a shield to her drawing of a fire fighter in January.

At the end of the project, ML told the class, “You put on special clothes, gloves and hats to protect you when there is a fire. You also stop, drop and roll when there is a fire on you.” Her drawings indicated that fire fighters put on special clothing.

Disposition to Inquire

Designing and conducting surveys was a new activity for ML. She became interested in developing questions for surveys and illustrating icons to represent words on the data collection forms. She added her own question to ask the expert, “Do firemen write letters to children?”

Extending the Comfort Zone

When several students started creating representations, ML began building her own small fire truck out of boxes and junk. She noticed that a group of students were building a large fire truck. She joined the group to help them paint their large truck and suggested that the hose should be pink. She felt more comfortable at the end of the project working with other children and less dependent on one friend for social interaction.

