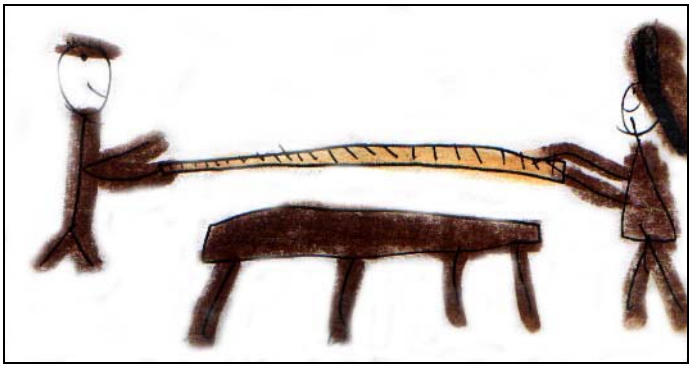
Who Measures What in Our Neighborhood?

K-1 Classroom
January – May 2002

Overview



Beginning the Project

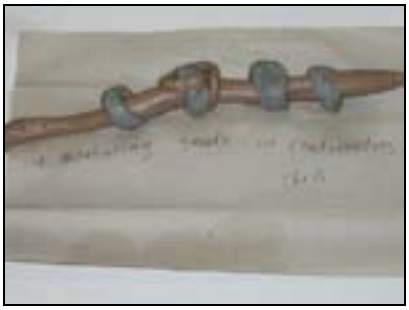
Students in the K/1 classroom at University Primary School became interested in measuring during their investigation of their environment in the fall. During their project entitled, *Keeping our Environment Healthy*, students measured the amount of litter they collected on their playground and the amount of trash from their lunches. Noticing their increased interest in measuring things, and the multitude of authentic opportunities to measure, the teachers chose the topic of measurement for the spring semester. This investigation entitled, *Who Measures What in Our Neighborhood?* not only presented a context for learning many of the basic skills in the math curriculum at University Primary School, but it also met many of the Illinois State Learning Standards in mathematics and science for this age level.

Project work encourages a variety of opportunities for children to make choices, work in informal groups, think about ideas, ask questions, and research to find answers. These opportunities allowed portals for teachers to see children in different venues to learn more about individual dispositions and abilities. In the first phase of a project the teacher focuses on finding out what the children already know about the topic.

The head teacher began the project by sharing stories of the wall in her house where all family heights were recorded. The children shared many stories about being measured by a doctor and measuring to build things. They chose ways to represent measurement that included drawings, surveys, Kid Pix graphics, and models of measuring tools using clay, Legos, blocks, rods, or boxes and junk. The teacher and class brainstormed words associated with measurement that were categorized to form a web. Students had questions about the ideas they generated. Teachers used their questions to guide the students in inquiry:

1. What tools are used for measuring?
2. How do measuring tools work?
3. What things get measured?

4. How do you measure with measuring tools?
5. Why do we measure?
6. Who measures what in our neighborhood?



A student's clay memory representation of a measuring tool

A student's misconception of how he would measure a window.

Developing the Project

The children engaged in field studies and listened to experts answer their questions. Field studies included several neighboring sites: Children's Research Center, Illini Credit Union, ceramics studio, Fire Service Institute, State Water Survey, and sheep farm. Visitors included a mechanical engineer, and a food inspector. Parent experts included an animal researcher, a potter, a pilot, a seamstress, and a father who brought his car to show the children what you measure in a car. In addition, two science undergraduates from the university conducted measurement experiments with small groups of students.

Before each field trip, students predicted what they might see. During field studies the children collected data in various ways. They collected artifacts, made observational sketches, took photographs, counted and tallied, and wrote answers to their questions that they asked the tour guides.

After returning to the classroom, students made representations of some of the measuring tools that they had seen on their field studies. Writing opportunities included experience stories, letters, poems, books, and writing captions for their drawings. Students completed and discussed results of surveys. They compared and organized their findings into charts, and graphs. At large group meetings, students listened, questioned, and commented about each other's work. In this social context, they gained new understandings about measurement that were documented throughout the project.

Students view the gauges on the fire truck.

Students see the different sizes of ladders used for different buildings.

Concluding the Project

The children culminated and shared what they had learned through an informal open house with parents and the preschool classroom next door. Students brainstormed what they had learned about who measures what in the school neighborhood. The teacher gave a survey to parents to find out what they thought their children had learned about measurement. To get ready for the open house, students reflected about what they had learned on a survey, and created a PowerPoint presentation to share their understandings of measurement. Themes emerged and groups of children chose to create murals and write reports to share their new information. The mural topics included:

Measuring is important for making things the way you want.
Measuring is important for good health.
Measuring is important for making maps and globes.
Measuring is important for finding out what is heavy and what is light.

They also applied their new measurement skills of using rulers and comparing sizes and proportions to create their three-dimensional models and representations that displayed what the class had learned about measurement.

Students represent the fire truck that they saw on their trip to the Fire Institute.

Students display their completed fire truck at the open house.

What did the Children Learn?

Through the in-depth study of *Who Measures What in Our Neighborhood?*, the children gained awareness that measurement is a part of everyday life. They became more skillful in framing questions and using measurement terminology in conversation. Their vocabulary extended beyond the typical measurement words in kindergarten and first grade mathematics curriculum. In addition to rulers, scales, and tape measures, students learned about specific types of scales including spring scales, and balance scales. They also learned about trundle wheels, balers, coils, and calipers as tools people use to measure items in various professions.

They became more comfortable using measuring tools and measuring for their own purposes. They used digital photographs to represent measuring tools and their experiences accurately in their drawings and 3-dimensional structures.

Most students listened to each other, shared comments, and discussed their views with others. Many students articulated difficulties working on a team product. They met and often exceeded Illinois Learning Standards by using graphic organizers to analyze and draw conclusions from their data. They gained an appreciation for the complexity of the term measurement.

Students create a mural showing that measuring is important for making maps and globes.

Students display their mural at the open house.