Which Unit to Use?

Summary

This activity will have students work with both customary and metric units of measurements and determine when it is best to use one over another.

Materials

- *How Big is a Foot?*
  , by Rolf Myller
  Metric rulers
  Meter sticks
- *Metric Measures*
- Which Unit?
- Inch/foot ruler
  Yard sticks
- *Inch, Foot, and Yard*
- Appropriate Measures

Additional Resources

Books

- *How Big is a Foot?*
  , by Rolf Myller; ISBN 0440404959
- *Connect to NCTM Standards 2000, Fourth Grade*
  , by Francis (Skip) Fennell, Honi J. Bamberger, Thomas E. Rowan, Kay B. Samillimeterons, & Anna R. Suarez; ISBN 0762212462

Background for Teachers

Width, height, length and distances can be measured using two different measurement systems. The customary system is used in the United States. Students in the fourth grade need to be familiar with inches, feet, and yards. The metric system is a base ten system, and is used throughout the world. Students need to be familiar with millimeter, centimeter, and meter.

Intended Learning Outcomes

4. Communicate mathematically.

Instructional Procedures

Invitation to Learn

Read *How Big is a Foot*? to your students. Discuss the book and why it is necessary to have measurement systems.

Instructional Procedures

Day 1

Pass out rulers to every student. Show them a millimeter. Have students look around the room to find items they would measure with a millimeter. Share their findings with the class. Explain to your students

Have them look at one centimeter. Explain that for many people, the width of their pinkie is about one centimeter. Have students measure their pinkie and see how close it is to one centimeter.

Have students work with a partner to estimate the length of a few small items in their desks.

Write their estimates in their journals. Review the process of measurement and have students check estimates with a ruler. How close were their estimates? Why did they estimate the way that they did? Have them explain their reasoning in their journals.
Use meter sticks and have students locate a section of their body that is about a meter. It could be their arm span, or the height from the floor to their waist, or any section that will help them remember the length of a meter.
Make sure that students know that 1 meter = 100 centimeter = 1000 millimeter.
Hand out the worksheet, *Metric Measures* .
Have students determine the most appropriate unit with which to measure each item. Have them describe their strategies.
Cut up the worksheet, *Which Unit* . Have a student pick one and read it aloud. In their journals, have students identify which unit they would use (millimeter, centimeter, or meter), and then estimate its length. Have them explain how they decided which unit to use and how they arrived at their estimate. Grouping could occur in pairs, small groups, or as a whole class.
After finishing with the strips, discuss with the class what unit they used for each item, their estimates, and the strategies they used.

Day 2

With students, create a list of six objects and six distances they could measure in the classroom.
Pass out an inch/foot ruler to each student. Review the inch unit with them. Point out the markings for ¼, ½, and ¾ inch. Hold up your ruler. How long is the ruler? How many inches are in ¼ foot?, ½ foot?, ¾ foot?
Hold up a yardstick. Explain that the 1 yard = 3 feet = 36 inches. How many inches are in ¼ of a yard? How many feet are in ½ yard? How many inches in ½ yard? How many inches is ¾ yard?
Hand out the worksheet, *Inch, Foot, and Yard* .
Have them pick eight of the twelve items generated earlier and measure them in inches, feet, and yards.
Hand out the worksheet, *Appropriate Measures* .
Have students choose what unit they would use to measure each item, measure that item, and then record the results.
Discuss the worksheets.

Extensions

Curriculum Extensions/Adaptations/Integration

Weekly, pick a few items from your classroom and show your class. Have them choose what unit they would use to measure the item, then estimate its length.

Family Connections

Have students use the worksheet, *Home Measurements* , and the paper yard stick to measure six items in their bedroom using inches, feet, or yards. Before they measure each item, have them decide the most appropriate unit to use, and estimate the length of the item.
Have students make a list of nine objects around their house. Three objects that they would measure using millimeters, three using centimeters, and three using meters.
Have students find four items from their house. Two that would be appropriate to measure in centimeters or inches, and two that would be appropriate to measure in yards or meters.

Assessment Plan

Informal assessment includes class discussions, *Which Unit?*, and journal entries.
Formal assessment includes the worksheets -- *Metric Measures, Appropriate Measures* and *Inch, Foot, and Yard.*

Bibliography

Bryant, V.A. (1992). *Improving Mathematics Achievement of At-Risk and Targeted Students in Grades 4-6 through the Use of Manipulatives.* ERIC # ED355107. Retrieved December 10, 2005, from http://eric.ed.gov

This document presents a study designed to improve mathematics achievement of students in grades 4-6 through the use of manipulatives. The primary goal was to provide mathematics manipulatives that would assist in helping at-risk and targeted students. Results indicated improvement on test scores, report card grades, and use of mathematics manipulatives.

Reineke, J.W. (1993). Making Connections: Talking and learning in a fourth-grade class. *Elementary Subjects Center*, Series No. 89. ERIC # ED365537. Retrieved December 10, 2005, from http://eric.ed.gov

This report describes a fourth grade classroom where students' thinking was made public through discussions in which students presented and justified their interpretations of, and solutions to, the problems presented in class. Results suggested that the teacher and her students learned to talk about mathematics in ways that made their thinking visible and indicated that they know mathematics in fresh, inventive ways.

Authors

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