A King's Foot Is Always Best

Summary

Students will be able to measure a number of given items with different nonstandard measuring devices such as shovels, footprints, unifix cubes and paper clips.

Main Core Tie

Mathematics Grade 1 Strand: MEASUREMENT AND DATA (1.MD.) Standard 1.MD.2

Materials

About 5 to 6 feet of white poster paper per 3 people

Crayons or markers

Tape

4 or 5 different sizes of toy shovels (different colors also)

10 footprints cut and laminated from railroad board for each size of shoes in the story (men's size 16/ women's size 10/ women's size 6/ and small child's size 10)

200 dimes (plastic are fine)

A variety of nonstandard measurement items from classroom (unifix cubes, links, erasers, etc.) Grid worksheet for recording each activity

Activity Materials:

Poster paper

Shovels

Cardstock footprints of different sizes (cut and laminated)

Dimes

Books:

- Super Sand Castle Saturday
 - , by Stuart J. Murphy; ISBN 13: 9780064467209
- How Big Is a Foot?
 - , by Rolf Myller: ISBN 0440404959
- Inch by Inch
- , by Leo Lionni; ISBN 13:9780688132835

Background for Teachers

Nonstandard measurement is the first step to teaching measurement. It is nice to discuss the history of measurement and how people measured and still measure when they do not have the correct measuring tools. All of us use our hands to measure off something when shopping if we did not bring our measuring tape. It is important that the children be allowed to explore measuring with nonstandard itemsfirst they are taught to be careful to make sure that the items touch, not overlapping or leaving a gap, to get the correct measurement. Second, as they explore they come to realize that nonstandard measurement is good for estimating, but not good in that we all have different sizes. If we want things to be uniform, we need a standard measurement. The book *How Big Is a Foot?* is very good for explaining this.

Intended Learning Outcomes

Demonstrate a positive learning attitude, Understand and use basic concepts and skills. Communicate clearly in oral, artistic, written, and nonverbal form.

Instructional Procedures

Content Connections:

During special days (Pumpkin Day, Apple Day) Read books from the library about the different subjects and then have the students measure with nonstandard measurement; always graph and compare these items. Read books from the library about the whales and then go outside and measure with children (lay them down head to foot) how long the blue whale and other whales are. Let the children chalk out silhouettes of the whales and label them. A wheel measuring tape is very useful.

Invitation to Learn:

Take pictures from the website <u>http://www.flickr.com/photos/sandyfeet/tags/sandcastles/</u> This website shows wonderful pictures of sandcastles. Then read the book *Sand Castle*.

Instructional Procedures:

Read Super Sand Castle Saturday.

Give each group of three or four children a large poster paper and have them make a large sand castle. When done, have them hang it on the wall or in the hall.

Then give each group a different size shovel. Use different color shovels for different sizes. Have them record how many shovels high each sand castle is. Record the findings of each group on a graph and talk about why each group got a different answer. How can we solve this problem? (by each group using the same size shovel)

On another day, read the story of *Jack and the Bean Stalk*. Then discuss the four main characters. Discuss how big their feet probably were. The giant had a huge foot (show a footprint or a size 16 shoe). The mother had a size 6 shoe, and the maid was a larger woman with probably a size 10 shoe. Jack was just a young boy with a small footprobably about a child's size 10. Show the class their footprints (precut from different colored poster board) and have them measure out on the playground different playground equipment (slide, jungle gym, four square, basketball court, etc.), assigning each group a different footprint size. Once again, graph and discuss the differences in what each group found and how that difference could be resolved (by having the same size foot). Give each child a few dimes, and let them use these as markers for every tenth foot. Have them record these in groups of tens.

Let the class use different things in the class for nonstandard measurement. Give each child a worksheet grid to record his/her findings. List on the board five different things that students could use: large paperclips, unifix cubes, erasers, their hands, links, etc.

Read a *How Big Is a Foot?* and discuss the reasons for the bed coming out wrong. Then talk about the fact that the king decided that his foot would be the new standard measurement. Tell them that "Some believe the original measurement of the English foot was from King Henry I, who had a foot 12 inches long" (Internet site).

Lesson Time Schedule:

Discuss Super Sand Castle Saturday (15 minutes)

Make, measure and graph and compare sand castles (30 minutes)

Discuss Jack and the Beanstalk (15 minutes)

Go outside and measure playground with footprints; graph and compare (15 minutes) Read How Big is a Foot and discuss (15 minutes)

Brainstorm the last few minutes on special days and how they could use nonstandard measurements.

Activity for Lesson:

Make sand castles; measure and graph.

Go outside to measure and graph the different playground equipment with the four shoe sizes.

Extensions

On special days, measure a lot with nonstandard measurement. On Pumpkin Day, guess how big the pumpkin is with a string. On Whale Day, go out and measure with a measuring wheel how big whales are, then draw the blue whale with chalk and see how many children long the whale is. On Potato Day, use potatoes for nonstandard measuring of things in the classroom. On Ground Hog Day, go out and draw shadows at different times of the day. Have the children measure with nonstandard measurement (hands or feet) how long their shadows are and compare the differences in their shadow at different times of the day.

Family Connections:

For homework, give each child a copy of the measurement worksheet and have them explore nonstandard measurement at home. Have them measure three things (such as a couch, table, rug, room, garage, driveway, length of car, etc.) in their house with three different people's shoes. See how the three measurements are different.

Have someone measure how tall he/she is three different ways on the measurement worksheet (with spoons, blocks, cups, a doll).

Assessment Plan

Use the worksheet where students may choose, estimate and measure with nonstandard items. Observe the children as they measure during this unit to make sure that they are being careful in their measuringthat they are not overlapping or not touching each item as they measure.

Authors

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