Sliding Along

Summary

Students will use the "sliding along ruler" to measure different items accurately.

Materials

- *How Big Is A Foot?*
  Basket of different kinds of things to measure with (e.g., crayon, pencil, paper clip)

For each student:

  Ziploc® bag of coins
  Standard/metric ruler
  Plastic tie

- *Sliding Along* worksheet
- *Sliding Synthesis Journal*

Additional Resources

Books

- *Measuring Penny*
  , by Loreen Leedy; ISBN 0805065725
- *Twelve Snails to One Lizard*
  , by Susan Hightower; ISBN 068904520
- *How High is Pepperoni?*
  , by Nancy Solos and Eric Bailey; ISBN 059011526-X
- *How Big is a Foot?*
  , by Rolf Myller; ISBN 044040495-9

Background for Teachers

What:
This lesson reinforces the student knowledge of linear measure and how it works.
Why: Real life situations require a working knowledge of both metric and customary measure.
How: We will be exploring the why in discussion as groups and partners and then practicing measuring skills in the activity.

Intended Learning Outcomes

2. Become mathematical problem solvers.

Instructional Procedures

Invitation to Learn

Distribute a Ziploc® bag of coins to each student and provide a choice of an object from a basket of different items such as a crayon, a pencil, or a paper clip. Ask the students to measure the height of their desks from the floor to the top of the desk using the item they have chosen. They must pay $.10 a length to be able to use that desk for the rest of the day. Have the students write a journal entry about what they discovered, and then discuss it with a partner

Instructional Procedures

Summarize the plot of *How Big Is A Foot?*, highlighting the measurement problem. Then explain what the customary measures and metric measures are. Use a ruler and a yardstick for this. Make sure both standard and metric measures are represented on each.

Explain to the students that sometimes we have to *estimate* the length of an object or a distance. To

help them see the relationship between inches, feet, yards, and miles, and then between millimeters, centimeters, and meters, show them these estimates using parts of the body. A millimeter could be compared to the depth of a fingernail. A centimeter could compare to the width of a little finger. An inch is about the length of your thumb from the tip to the first knuckle. A foot is about the length of a third grader's arm from the finger tips to the elbow. Have the students practice this by demonstrating what an approximate measure would look like by holding up their own arm or thumb, etc.
Many times the measuring tool is relative to what is being measured. For example, when measuring distance on a map, a certain length of a line stands for a specific number of miles. To help teach how to measure accurately from a picture or a line that stands for a certain measurement, we are going to do an activity called *Sliding Along*.

Sliding Along

- Give each student a ruler and a plastic tie. The plastic tie is wrapped around the ruler and pulled fairly tight. Cut off most of the end using scissors, leaving a small point sticking out.
- Have the students slide the tie along the ruler to see how it works.
- Use the sliding along ruler to measure different items.
- Be sure they see that the measuring starts at the end of the ruler and not at the one inch mark.
- Use the *Sliding Along* worksheet to have the students practice measuring with their sliding along rulers.
- Students write a response to the activity.
  - What did they learn?
  - How can they use what they have learned in the future?

Facilitated Journal Activity:
Create a *Sliding Synthesis Journal.*

Extensions

- Have students measure and mark different things each day. They could draw a horizontal line two inches long and put their name on it at the top of an assignment, or measure how many inches it is between lines on an assignment. Doing these activities daily helps reinforce the technique of accurate measuring.
- Turn the tie on the sliding ruler so that the point is on the metric side. Do an activity similar to Sliding Along using metric measure.
- Do this activity in pairs. A student who does not understand, or is struggling with measuring accurately, can still participate and have a successful learning experience.
- Activities such as measuring how far an object will travel when different intensities of force are applied could easily be done with the sliding along ruler.

Family Connections

- Have students create a grid to be used to measure things at home.
- Have family members help students make a map of their bedroom. Students measure between different objects, then decide on a representative line that would stand for a unit of length, e.g., one inch would represent one foot. Students then draw a map using the one inch to one foot ratio. Return the maps to school and share with a partner who tries to figure out the distance between each object.

Assessment Plan

- The *Sliding Ruler* assignment may be used as an assessment tool.
- Journal entries
- Teacher observation

Bibliography

Research Basis

Payne, R. K. (2002) *Understanding Learning the How, the Why, the What*. Aha Process, Inc., Highland, TX.
Mental models are how the mind holds abstract information that has no sensory representation. In math specifically, we know that it is about assigning value and order to the universe. Mental models help us to do this. By using mental models we “collapse” the time it takes to learn and retain something.
Carpenter, T., Blanton, M., Cobb, P., Franke, M., Kaput, J., & McClain, K. (2004). Scaling Up Innovative Practices in Mathematics and Science. Research Report, National Center For Improving Student Learning and Achievement in Mathematics and Science.
“Perhaps the most important feature of learning with understanding is that it is generative: In other words, when students and teachers acquire knowledge with understanding they can apply that knowledge to learn new topics and solve unfamiliar problems. If this does not happen then each topic is viewed as an isolated skill. One way to accomplish this is for a teacher to explicitly teach.”

Authors

Utah LessonPlans