

How Big is a Foot?

Summary

This activity introduces nonstandard measurement and provides practice with estimating and measuring lengths.

Main Core Tie

Mathematics Grade 1

[Strand: MEASUREMENT AND DATA \(1.MD.\) Standard 1.MD.2](#)

Materials

- *How Big Is A Foot?*
, by Rolf Myller
Construction paper
- [The Apprentice's Problem](#)
narrative mime script (pdf)
Measuring worms
Costume pieces (e.g., crowns, various hats to distinguish a Prime Minister, Chief Carpenter and Apprentice)
- [Guess and Measure](#)
worksheet for each student (pdf)

Additional Resources

Books

- *How Big Is A Foot?*,
by Rolf Myller; ISBN 0-440-40495-9
- *The Long and Short of It*
, by Cheryl Nathan and Lisa McCourt; ISBN 0-8167-5609-0
- *The Fattest, Tallest, Biggest Snowman Ever*
, by Bettina Ling; ISBN 0-590-97284-7
- *Inch by Inch*
, by Leo Lionni; ISBN 0-590-47991
- *Jim and the Beanstalk*
, by Raymond Briggs; ISBN 0-698-11577-5
- *Inchworm And A Half*
, by Elinor J. Pinczes; ISBN 0-439-44710-0

Background for Teachers

This activity is designed to introduce nonstandard measurement. It also provides practice with estimating and measuring lengths using a variety of nonstandard units. The book, *How Big Is A Foot?*, poses a question to the students that provides them with a chance to problem solve, using nonstandard units (their own foot patterns).

You will need to sort your students into cooperative groups of five or six to prepare for this activity. Choose students that will work together and help one another to stay on task. Also, choose one student for each group that has larger feet and one student that has small feet, in comparison. Since this is an activity that requires the students to work in cooperative groups, you may want to prepare them beforehand. Teach students how to work cooperatively prior to this activity by discussing and showing what it should look like and sound like. Then, provide one or two

activities/tasks that give them the chance to practice before beginning this activity.

Finally, this activity allows the students a chance to participate in a narrative mime. Experience with narrative mime is not necessary in order to participate. You will need to discuss the procedure for the narrative mime, however. You also might want to gather props/minor costume pieces for the students to wear.

Intended Learning Outcomes

2. Develop social skills and ethical responsibility.

6. Communicate clearly in oral, artistic, written, and nonverbal form.

Instructional Procedures

Invitation to Learn

Read *How Big Is A Foot?* to the page where the question is posed, "Why was the bed too small for the queen?"

Instructional Procedures

Today, we started reading the story, *How Big Is a Foot?*, by Rolf Myller. It is about a king who thinks of a lovely present to give his wife, the queen. But, there's a problem with the present. Together, we will work to figure out what the problem is and predict what will happen with the king and his gift to the queen. Finally, we will find out what the characters actually did to solve the problem.

Explain to the students that in order to solve the apprentice's problem, they are going to act out the story and try to find out what went wrong.

Put students in their cooperative groups and assign each child a role out of the following parts: King, Queen, Prime Minister, Chief Carpenter, Apprentice and, if needed, Jailer. As you assign roles, be aware that the King and Queen have the most lines. You may want to assign those parts to students who are uninhibited and pay attention well.

Explain the procedure for a narrative mime. The storyteller/ narrator (teacher or student with fluent reading skills) reads the story. The storyteller will cue each actor for his lines by reading them first. For example, the storyteller will read, "Good question," said the Prime Minister."

Then, each child playing the part of Prime Minister will echo, "Good question."

Read through [The Apprentice's Problem](#). Prompt students to participate, verbally and nonverbally, on cue as needed. They can quietly act out some of the action. You will probably want to have each group spread out to different corners of the room.

When you come to the end of the script, pass out construction paper, pencils and scissors to each group. Tell them to trace the "King's" foot and the "Apprentice's" foot in each group. Then, invite them to trace and cut eight more of each foot so that there are nine "King" feet and nine "Apprentice" feet. Students playing the parts of the Prime Minister, Chief Carpenter and Queen can help in tracing and cutting.

Have each group lay out their "King" feet to create a 3 by 6 diagram on the floor. Do the same with the "Apprentice" feet.

Ask the question, "Why was the bed too small for the queen?"

As students give their answers, ask them for a prediction of how the characters in the book might solve the problem.

Finish reading the rest of the book. Refer back to the class prediction. Were we right? Did it work?

Pass out construction paper. Invite each child to trace copies of their own foot. Then, have them find a partner to measure using their own foot to see how many feet long and wide their bed should be.

Students take their own foot pattern home and measure their bed to see if it is the same, bigger or smaller than their body measurement in their own nonstandard feet units (see *Family*

Connections).

As a center or whole class activity, invite students to estimate the lengths of objects in the classroom, based on their foot measurement. Provide students with the [Guess and Measure](#) worksheet to record their estimates and actual lengths. When the page is complete, staple the foot measurement to it.

Provide a new nonstandard unit to measure by (e.g., measuring worms). Invite students to complete a new [Guess and Measure](#) worksheet with this alternative unit.

Have a discussion with the students comparing and contrasting the worm and foot units of measurement. Ask the students to give examples of which objects might be best measured by a foot (e.g., a table, the chalkboard tray, etc.) and which objects they would choose to measure with a worm (e.g., a crayon, scissors, a piece of paper, etc.).

Extensions

Plan your plant unit to integrate with this measurement lesson.

Examine the differing sizes of seeds. Use seeds as a nonstandard measurement.

Example: How many pumpkin seeds long is your pencil?

Plant seeds (e.g., lima beans). As the plant begins to sprout, measure its growth with a nonstandard measure (e.g., seeds or worms).

Measure the leaves of different types of plants with seeds/worms.

Have each student create a discovery journal

Students can record observations of grown plants in the classroom.

Students can record the growth progress of their own plants.

Write about nonstandard measurement units, estimations, and experiences for interactive writing. Encourage students to write their own stories about measuring things with various nonstandard units.

Accommodate for emergent learners by allowing them to work as pairs on the [Guess and Measure](#) worksheet. You may even want to reduce the number of objects you require them to measure.

Differentiate for advanced learners by introducing them to standard measurement. Encourage them to complete the [Guess and Measure](#) worksheet using inches/centimeters.

Write your own narrative mime script for the second half of the book and allow students to perform it in cooperative groups for one another.

Make a T-chart and lay it on the floor. At the top, put a nonstandard foot unit on one side and a worm unit on the other. Provide the students with objects and have them sort the objects by which unit of measure would be most appropriate to measure them by.

Family Connections

Have students measure their own beds with the nonstandard foot measurement they created in class.

Invite family members to trace their feet. Let the family decide which member's foot would need to serve as the "King" foot so that everyone has a bed that is big enough.

Send bean plants home and require the students to keep a measurement log for a week, tracking the continued growth (or nor lack of growth) of the plant. When logs are returned to school, discuss what factors promoted or hindered the growth of the plants.

Assessment Plan

Use the [Guess and Measure](#) worksheet as an assessment to see if the students are able to estimate with and use the worms or their own feet as units of measure.

Observe students as they measure with their feet and worms, etc.

Ask the students to discuss in writing the length of a given object in foot units or worm units. Ask

them to tell how they know whether to use the foot or the worms to measure something.

Authors

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