

Lesson Plan: Measurement

Grade: 4

Approximate Duration/Time: 40 min

Content Area: Mathematics

NYS Learning Standards:

Mathematics, Science and Technology Standard 1, 2, 3, 7

Objective: Students will be able to select appropriate tools and units (customary and metric) for a length being measured and will learn the basics of equivalent standard units of length.

Rationale: As part of a mathematics unit on measurement, students will already have a general understanding of estimation and measurement, as well as the concepts of length and width. Next, students will begin exploring using formulas to determine measurements of polygons.

Materials:

- Rulers
- Yardstick
- Tape Measure
- 1" x 1" Squares
- Paperclips
- 8 ½" x 11" Paper
- Unsharpened pencils

Procedures:

Aim: How do we measure objects of different sizes? How do we compare one measurement to another?

Do Now: (Have rulers, yardstick and tape measure hanging in front of the class) Make a list of the names of these measuring tools, and how long you think they are. Bonus: Write down the names of any units of measurement that you know.

Motivation: When would it be helpful to know how long something is?

Lesson/Modeling:

- Ask students: Do we have to measure in "inches" and "feet?" Do we have to use a ruler to measure? Let's think about other ways that we can measure things.
- Ask students for other ideas for units of measurement, i.e. "thumb," "hand," "pencil," and record student's suggestions on a large piece of paper or chalkboard.
- Model using your finger to measure the length of a book (It's two and a half fingers long).
- Have students use an informal unit to measure the longest edge of their desktop or table. Each

student or group of students should use the same informal unit, for example each student should use a hand, or a finger, or a pencil as their unit, but they should each use their own finger or hand so that the resulting measurements vary. Have students record their measurement. Move among students to observe and assist if necessary.

- Have students use a ruler to measure the same edge to the nearest inch. Record the measurements.
- Bring the class back to order and compare the resulting informal unit measurements with the standard unit measurements. Ask students what they notice about the results. Ask students why they think we might use standardized unit labels for measurement. What are the pros and cons? Can you think of some situations where it would be okay, or better, to use informal units for measurement?
- Using a ruler, the yardstick, the tape measure and the squares, give students examples of length.
- Demonstrate equivalent measurements (12 cubes = 1 ruler; 3 rulers = 1 yardstick).
- Using an everyday object (a book, desktop, computer monitor, chalk board) ask students to estimate the lengths or measurements of the object. Record the estimates on a large sheet of paper or the chalk board.
- Ask the students to relate their estimates to the measuring tools or to the other objects when making a guess. How many squares long is this textbook? How many rulers would it take to reach the end of the chalkboard?

Guided Practice:

- As a class, lay the yardstick on a table and measure it with the 1" squares (in inches), with the ruler (in feet) and with the paperclip (in paperclips).
- Record the measurements on the board and have the students compare the values. Let's look at these measurements. Which of these is the longest? Is 36 inches shorter than 3 feet? Ask students to use the measurement tools to demonstrate equivalency.
- Let's think about the different units we've learned about. Which is the longest? Which is the shortest?
- Working with the equivalent measurements on the board, ask the students to briefly brainstorm ideas about conversion between units. Then try to identify relationships between units.

Group Work:

- Split the students into groups of 2-3 and distribute the "What's the Relationship?" (attached) worksheet to each student.
- Have the students work with their partner or group to complete the worksheet. Try not to use your measuring tools, but if you get stuck you can use them to help. If you finish ahead of time, try to figure out the bonus question.
- Circulate and observe, offering assistance if needed.
- When most students are finished, reconvene as a class and ask volunteers for their answers, comparing with their classmates, checking for understanding of equivalency between units.

Closing:

- Throughout the class, as students determine rules or methods for conversion and equivalency, make posters displaying the rules for posting in the classroom. Name the rule after the student that suggested it, or give them humorous titles.
- As the class winds down, spend a few minutes revisiting the rules, asking students to explain them in their own words.

Differentiated Instruction:

- During the Group Work phase, partner more advanced students with students who generally have a tough time with math, and encourage students to help one another.
- Prepare study guides for students to take home, geared towards those having a difficult time with the concepts. Give the study guides to all students, but the guide should be designed at a basic level.
- Give an alternate version of the homework assignment (see below) to advanced students, challenging them to also measure and convert the height of the family member or friend who helps them.
- For visual learners, be sure to employ plenty of visual aids and demonstrations during the Modeling and Guided Practice portions of the lesson.

Extension:

- Have students complete the “How Tall Am I?” (attached) worksheet for homework.