

Measurement Benchmarks and Conversions

Summary

Select appropriate units of measure using benchmarks. Convert measures within a system

Main Core Tie

Mathematics Grade 5

[Strand: MEASUREMENT AND DATA \(5.MD\) Standard 5.MD.1](#)

Additional Core Ties

Mathematics Grade 6

[Strand: RATIOS AND PROPORTIONAL RELATIONSHIPS \(6.RP\) Standard 6.RP.3](#)

Materials

Soda can, and 3 or 4 other common objects

Objects for measurement benchmarks

Smart Pal and capacity masters from the Smart Pal book, ruler, weights

TI-73's for each student.

- [Converting Measures foldable pages](#)

for each student

Worksheets: [Metric and Customary Benchmarks worksheet](#)

State Class Reference Sheet for Pre-Algebra

Background for Teachers

Enduring Understanding (Big Ideas)

Measurement is an essential life skill

Essential Questions:

What common objects can be used to suggest units of measurement?

Why is it important to compare measures using the same type of unit? (Ex. Inches to inches rather than inches to feet)

How can I convert from one unit of measure to another?

Skill Focus:

Selecting units for measurement Converting measurements

Vocabulary Focus:

measurement benchmark, convert measures Metric units: gram, liter, meter, deka, kilo, deci, centi, milli, Standard units: ounce, pound, Ton, cup, pint, quart, gallon, inch, foot, yard, mile convert measures

Ways to Gain/Maintain Attention (Primacy):

coop activity, guessing and checking, graphic organizers, writing, technology, music

Instructional Procedures

Post measurement vocabulary in a graphic organizer on the board (see attached).

Post these questions on the board:

What is its length?

How much does it weigh?

What is its capacity? (How much will it hold)

What is its purpose?

Starter:

Start a journal page. Title it "Measurement". Copy the vocabulary mind map neatly on the journal page. (see attached graphic organizer)

Lesson Segment 1: What common objects can be used to suggest units of measurement?

Ask students to mix around the room until you say "freeze". The person closest to them becomes their partner. If no partner is immediately available they hold their hand up high and look for another hand up to be their partner. Have them introduce themselves to each other. Have them arrange themselves so that the partner with the most pets is facing the teacher and the other partner is standing back to back with their back facing the teacher. Tell them the facing-the-teacher partner will be describing an object and the back-to-teacher partner will be guessing what it is. Tell the facing-teacher partner to look at the questions you have posted on the board. They must use these for their clues to get the partner to guess the object. Hold up a soda can or other common object and have them give their clues. Then, have the partners change position, so the guesser now becomes the clue-giver. Have them look at the questions on the board to guide their clues. Hold up a second object.

After this activity, ask the students which of the clues were difficult for them to give. Ask if any used metric measurements. Ask about how many cm the soda can is? Ask about how many gm it weighs when full and how many ml it will hold. These will be more difficult for the students to answer. Point out that this is because they do not regularly use metric units to measure. Read the "Metric Versus Customary" poem.

Teach students the following song. As you sing each verse, choose one or two of the units for a stand and point activity. You will say a unit, for example "centimeter", and have the students stand and point to something in the room that could be measured using a centimeter. Ask a couple of students to tell what they are pointing at. Ask them why the centimeter would be better than trying to use a millimeter or kilometer to measure the object they are pointing to. Repeat this *Stand And Point* activity for each verse choosing one or two units for students to think about.

Knowing which system of measurement and which unit of measurement would be best to use is a vital skill. Selecting appropriate units can be more easily done if we can think of a common object to compare the measurements to. We call this common object a "measurement benchmark".

Work with students to complete the "Measurement: Metric and Customary Common Benchmarks" worksheet, showing some of the objects to the class to help them a visual. You may want to use the capacity pages in the Smart Pal masters book, a ruler, meter stick, some weights, etc for student reference.

Lesson Segment 2: Why is it important to compare measures using the same type of unit? (Ex. Inches to inches rather than inches to feet)

Journal: Give each student a copy of the State Class Reference Sheet that can be used on the CRT tests. Students should keep this reference sheet in their journal for future use.

Hand a student a regular size Hershey candy bar and you hold up a 1lb. Hershey bar. Tell the student can have it if theirs weighs more than yours. Have them read the weight on their package to the class and you look at yours and say, "Oh, no! Mine says it weighs only 1. Q. Why is this not an accurate comparison?"

Have two students come to the front of the class. Choose one that is about 6 ft. tall, and another much shorter. Use the ruler to measure the taller in feet and the shorter in inches and declare, "_____ (the shorter person) is the taller of the two." When the class disagrees, defend by telling them how many inches. Q. Why is this not an accurate comparison?

Obviously, when we are comparing, we need to use the same unit of measure. So, in order to compare, we must often convert units. We could use a Foldable to help us, a proportion, or we could use the graphing calculator. We will learn how to use each of these tools.

Foldable: Fold the Converting Measures foldable so that the type of measure is a pocket inside a folder. Staple or tape the edges of the pocket. Cut out each measurement card. Help the students

use the convert feature on the TI-73 and how to use a proportion to fill in the information on the cards. (In a proportion, one ratio is the number of smaller units in 1 of the larger units. The other is the information given and a variable). Have them practice a few with you.

Staple or glue folded pocket to edge here.

TI-73: Use the \rightarrow to convert measures. From the home screen type the number of units given. Push \rightarrow and select the type of measurement and the unit of measure given. Then select the unit of measure to convert to and press \rightarrow . The home screen organizes the information so students can determine the scale factor used to convert the units. For example asking what 3 was multiplied by to get 108 in this example, will help students find the scale factor.

Lesson Segment 3: Practice

Game: Truth or Dare

In this game questions are posted for the class to see or students are given a page of questions to answer. They may check with their team members for any they are not sure of. Once they have had a few minutes to check with team members, the teacher selects someone from the class to challenge another class member to, "Tell the truth, or take the dare!" The challenger asks one of the questions from the list. The student who was selected to tell the truth or take the dare must tell the truth about the problem or do a dare. The challenger dares the person to do something (that is not illegal, immoral, or extreme) such as sing Mary Had a Little Lamb, or do 5 jumping jacks. The teacher, of course, has the final say as to whether a dare is appropriate or not. (Kids love this game). See the attached "Truth or Dare" page for examples. Students should be able to use their foldables or calculators since they are not required to memorize conversions.

Assign additional text practice where proportions can be used for converting units as needed.

Measurement Units Song

(To Peter, Peter, Pumpkin Eater Lyrics by Linda Bolin)

Inch and foot and yard and mile

Distance measured with a smile

Centimeter, meter too,

Kilometer. How long are you?

Ounce and pound and ton, Oh please

Weigh it all with one of these

Milligram and gram will do,

Kilogram. How heavy are you?

Ounce and cup, pint, quart and gallon

Fill you up 'til you are howlin'

Millileter, liter too

Fill 'er up! How full are you?

Assessment Plan

performance, questioning

Bibliography

This lesson plan was created by Linda Bolin.

Authors

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