

Measurement

Summary

Estimate measures using common benchmarks for units. 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

- [Transparency for song overhead](#)

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

1 Measurement Vocabulary Sorting page for each team

One each of three different color sheets of paper for each student to make two foldables. Red, green, blue, yellow squares of paper (see Color Capture game)

TI-73's

State Core Math 7 Class Reference Sheet

16 small squares of paper (4 each of 4 colors-see Color Capture Game) for each team.

Background for Teachers

Enduring Understanding (Big Ideas):

Measuring distance, capacity and weight (mass)

Essential Questions:

Which unit of measurement is most appropriate for a measurement?

Which units of measure are related in a system? (ex. Inch, foot, mile are related, but ounce is not.)

Where do we see benchmarks that suggest a type or size of measure?

How can an equivalent unit of measure be determined using a proportion? Using a conversion factor?

Skill Focus:

Measure objects. Identify benchmarks. Convert measures

Vocabulary Focus:

System, benchmark, units of measure: inch, foot, yard, mile, ounce, cup, pint, quart, gallon, ounce, pound, ton, meter, liter, gram and prefixes: milli, centi, deci, deka, hector, and kilo, convert measures.

Ways to Gain/Maintain Attention (Primacy):

music, movement, lab, writing-foldable, cooperative group discussion, game, word sort

Instructional Procedures

Starter:

After each measurement tool word, write whether you think it measures:

Length or distance,

The amount needed to fill something up (capacity)

Weight (mass)

Temperature

Time
odometer
clock
scales
ruler
measuring cup
thermometer

Lesson Segment 1: Which unit of measurement is most appropriate for a measurement? Which units of measure are related in a system? (ex. Inch, foot, mile are related, but ounce is not.)

Because we have different types of things to measure, we need different units of measure. Sing the following song together. As you finish each verse have the student do Stand and Point where they stand and you say something like, point to something you could measure using a yard. Or, point to something you could measure using a gram. Have each student tell their teammates what they are pointing at. Discuss several units.

Measurement Units

(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?

Lesson Segment 2: Where do we see benchmarks that suggest a type or size of measure?

In order to estimate units of measure and to help us visualize their amounts, we use benchmarks. A benchmark is a common object that helps us remember the measure. Work together to complete the Metric and Customary Benchmarks worksheet. Discuss and show examples wherever possible. The Smart Pal guidebook has some nice pictures for capacity measures. You can show rulers and meter or yard sticks for distance.

Give each team a copy of Measurement Vocabulary Sorting. Have them cut out the words and follow the directions on the page. Discuss the categories teams have chosen with the class. Have each team member write the words sorted in lists on a recording.

Lesson segment 3: How can equivalent measures be determined using a proportion or scale factor?

Help students make a six flap foldable for customary measurements and a second for metric measurements as follows. Both foldables can be made with 3 sheets of paper.

Directions for foldable: Use three different colors of paper for a colorful foldable. Half a sheet of paper will be sufficient for each page of a foldable, so two foldables can be made from 3 pieces of paper.

Cut all papers in half vertically and turn them vertically. Stack three different colored pieces of paper in a vertical position so that the bottom of each page is about 5/8 of an inch above the page beneath it. Fold the top of the stack down towards you, giving you six flaps. Staple at the top to keep the pages together. Clip only the upper 5 flaps to just below the fold as shown by the dotted lines below dividing the Foldable into thirds.

Label the flaps as shown below for customary measures. Make the second foldable like the first, but label the increasing units for metric measures on the small flaps.

Converting Measures Customary Length or Distance Weight Capacity Inch (in or ") Ounce (oz)
Ounce (oz) Foot (ft or ') Pound (lb) Cup Yard (yd) Ton Pint (pt) Mile (mi) Quart (qt) Gallon (gal)
Make the second foldable like the first, but label the increasing units for metric measures on the small flaps.

Converting Measures Metric Length or Distance Mass Capacity Millimeter mm Milligram mg Milliliter ml Centimeter cm Gram g Liter L Meter m Kilogram kg Kiloliter kl Kilometer km Metric Ton T

Lifting up the flaps, students will all appropriate conversion beginning with the smallest unit in that system. For example, on the customary capacity flaps, you might list :

1 ounce (oz)

1 cup = 8 oz.

1 pint (pt) = 2 cups, 16 oz

1 quart (qt) = 2 pts, 4 cups, 32 oz

1 gallon (gal) = 4 qts, 8 pts, 16 cups, 128 oz

The Foldables can be used for reference on class tests, assignments, etc.

Also, give the students a copy of the State Class Reference Sheet that can be used on the CRT tests. Students should keep the reference sheet in their journal for future use.

Show students the procedure for converting units within a system using proportions and by multiplying or dividing by the scale factor (number of smaller units in one of the larger). This use for proportions helps students practice solving proportions and this will also introduce students to the idea of scale factor. You may also want to show students how to use the TI-73 for converting units of measure within a system, since memorizing procedures or conversions is not essential to the core objective or the CRT.

The textbook can provide ample procedural practice for converting measures. To make tedious practice more engaging, play the Color Capture Game .

Color Capture Game: The object of the game is to capture as many of one color square as you can get.

Preparation and materials. Cut out 4 red, 4 yellow, 4 blue and 4 green small squares of paper for each group of four students. Give each team four squares of each color. Number each student on a team 1-4. Have the students work with their team to complete a conversion problem from your text book. Spin a spinner or draw out numbers 1-4 to determine which student from each team will become the Capturer. Then, say "Go". Each Capturer goes to a neighboring team. The Capturer sits with that neighboring team and explains to that team how to do the problem. If the Capturer explains correctly, that neighboring team must give up one of their colored squares to the Capturer. The Capturer may take one of any color he/she wants. Repeat this for several problems. At the end of the time allowed for the game, the team(s) with the greatest number of squares of each color earn a treat. So, the team(s) with the most red squares get a treat. The team(s) with the most yellow get a treat, etc.

Assessment Plan

observation, performance task, word sort, journal

Bibliography

This lesson plan was created by Linda Bolin.

Authors

[Utah LessonPlans](#)