

Measurement: Capacity and Length

Summary

The students will be able to select and use appropriate units and measurement tools to solve problems.

Main Core Tie

Mathematics Grade 3

[Strand: MEASUREMENT AND DATA \(3.MD\) Standard 3.MD.2](#)

Additional Core Ties

Mathematics Grade 3

[Strand: MEASUREMENT AND DATA \(3.MD\) Standard 3.MD.4](#)

Materials

- A cup for each pair or group of students
- A quart for each pair or group of students
- Gallon jug
- Funnel
- Large jugs of water at each table
- A ruler that measures inches and centimeters for each student
- Roll of tape (12) or pieces of tape for each group
- Buzzers or bells (set of 68) (optional)
- Medals (optional)
- Black lines:
 1. [Practice Recipe Sheet](#) (pdf)
 2. [Recipes for King/Queen of Cups and Quarts](#) (pdf)
 3. [The Rulers of Measuring](#) (pdf)
 4. [Vocabulary Cards & Definitions](#) (pdf)

Books:

- *How Big Is A Foot?*
by Rolf Myller; ISBN 044040495
- *Me and the Measure of Things*
, by Joan Sweeney; ISBN 0440417562
- *Inch by Inch*
, by Leo Lionni; ISBN 0688132839
- *How Tall How Short How Far Away*
, by David M. Schwartz,; ISBN 0823416321
- *Hershey's Mile Chocolate Weights and Measures*
, by Jerry Pallotta; ISBN 0439388775
- *Pigs in the Pantry*
, by Amy Axelrod; ISBN 0590047655
- *Weights and Measures*
, by Jerry Pallotta; ISBN 0545064481

Media:

- *How Long? How Far?*
Available from Media House Publications, Regina, SK (Catalogue No.V981) Suitable for Grades

37.

- *CyberChase*

-- Television program on the educational channels (has many episodes on capacity and measurement)

Background for Teachers

A measurement always has two parts: a number and a unit. Standard units include inches, feet, yards, centimeters, meters, cups, quarts, etc. Nonstandard units include paperclips, bricks, frogs, marbles, pencils, etc.

Today only two systems are widely used. The customary, or inchpound, system is used in the United States. The metric system is used in most other countries.

Students should have been taught measuring with cups and quarts, measurement vocabulary and length before doing these lessons.

The lessons below are great review and wrap up activities for length, capacity and vocabulary.

These activities are great practice for students to master these measurement skills.

Before the lessons and activities are given students should understand what they will be learning.

The enduring understanding that there are appropriate tools and units to estimate and measure length and capacity.

After the lessons and activities, students should be able to answer the following questions:

What are ways we measure?

What kinds of objects can you measure with customary and metric measurements?

How do we measure capacity and with what tools?

How would your life be different without standard types of measurement?

Intended Learning Outcomes

Develop a positive learning attitude toward mathematics.

Become effective problem solvers by selecting appropriate methods, employing a variety of strategies, and exploring alternative approaches to solve problems.

Communicate mathematical ideas and arguments coherently to peers, teachers, and others using the precise language and notation of mathematics.

Instructional Procedures

Invitation to Learn:

Read and share the book *How Big Is A Foot?* By Rolf Myller, and have students make predictions along the way.

Instructional Procedures:

Students should have been taught cups and quarts: length to the inch, $\frac{1}{2}$ inch and $\frac{1}{4}$ inch; and measurement vocabulary. Before you begin the activities, please go over these skills with your students first, so they can practice before the activities begin.

Math Olympics

- The King and Queen of Cups and Quarts

Give each student or small group of students a measuring cup, a quart jug and a gallon jug. At each table, students should have a big bowl of water to measure.

Hand out *practice recipes* where the ingredients are in cups and quarts. Their goal is convert all the ingredients into cups and determine how many cups are in each recipe.

Have students measure out how many cups are in a quart by putting water in their cups and dumping it into the quart container. (Some students will be able to figure this out without using their measuring equipment.)

Once they have determined how many cups are in the first recipe, have them go on to the

other recipes.

After all recipes have been completed, they will determine that all the recipes have the same amount of cups.

Have students measure the cups into the gallon jug to determine how many cups are in a gallon.

Mix students up and then hand out *Recipes for Kings/Queens of Cups and Quarts*. This time you will have a timer ready.

Students need to show their work on the recipe paper to determine how many cups are in each recipe. Once they have determined the number of cups for all their recipes then they are to raise their hand to determine their time.

Check students' recipes to make sure they have showed their work.

Have students measure their cups into the gallon to determine if they are correct.

You can also have them first measure cups into their quart and then dump the quart into the gallon to determine how many quarts are in a gallon.

Awards can be given out for 1st, 2nd and 3rd place.

- The Rulers of Measuring

Divide students into groups of two. If there is an odd number, there can be a group of three where two students work together.

Hand out rulers to each student. Rules should be both customary and metric.

Determine who will be student A and who will be Student B.

First, have them practice jumping and measuring.

Student A will jump and Student B will mark with a piece of tape where student A landed.

Student B will then measure and record the jump on *Rulers of Measuring* using inches.

Mark the inches on the tape and paper. (A teacher or helper will check the measurement,)

Students A and B will convert the inches into feet and, if possible, yards.

Student B will then jump and Student A will mark with a piece of tape where student B landed.

Student A will then measure the jump using centimeters and mark the centimeters on the tape. (A teacher or helper will check the measurement.)

Student A and B will then convert the centimeters into meters, if possible.

Once the practice round is complete, students can begin the Olympics.

Follow the same procedure from the practice round, but have students work with another set of partners so that partners can check each others' work.

Students will be judged on how far they jumped, but more importantly, how accurately they measure.

Awards can be given out for first, second and third place.

- The Vocabulary Master

Divide students in groups of two. If there is an uneven number, have three students work together.

Pass out *vocabulary cards*.

Go over vocabulary words and definitions as a whole class and have students work as partners to match up the definitions with the words.

Have students play concentration to practice matching the definitions. Once students have practiced, divide the class in half. Half of the students will sit down across from someone they haven't been practicing with and the other half will stand behind someone who is sitting down.

Bells or buzzers should be put in front of each partner sitting down. Round 1 begins with the teacher reading either the definition or the vocabulary word. The first person who knows the match will hit the buzzer or bell. The students behind those sitting down will determine who

hit the buzzer first.

The student who hits the buzzer first will turn around and whisper the answer to the person standing behind him/her.

If the answer is correct, they get a point.

This will continue until all the vocabulary words and/ or definitions have been given out.

The student with the most correct will go on to the second round.

Students then switch places, with those who were standing up sitting down, and those who were sitting down standing behind them.

The process will repeat again until winners from this round are determined.

Rounds 2 will begin with the same process. (12 students)

Round 3 same process (6 students)

Round 4 same process (3 students)

Round 5 is the final round, determining first, second and third place.

Lesson and Activity Time Schedule:

Each lesson is 55 minutes.

Each activity is 30 minutes.

Total lesson and activity time is 90 minutes.

Extensions

Family Connections:

Parents can have their own Math Olympics in their own home.

Students and parents can make up their own activity questions and ideas for each of the activities.

Students can bring back any other activities they made up with their families to share with the class.

Advanced learners can come up with other Olympic ideas for other concepts at home with family and bring it to school to share with the class.

Assessment Plan

By using informal assessment you can determine what your students know or don't know through these activities.

Since these are practice activities, students should already have been taught these concepts; if they are struggling with these activities you can determine what you as a teacher can do to help them understand.

Students can hand in black lines of the activities so you can assess what they are missing.

Have students write in their journals after each activity to assess themselves in these activities.

You can look over their journals.

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