Teaching Objectives:

Students will convert between English units of measurements using manipulatives to determine quantity using real world problems.

I. MMF: 7.4.a Convert from one unit to another, perform basic operations, and solve real-world problems using standard (English and metric) measurements within the same system. (DOK 2)

II. CCSS: 5.MD.1 Convert different sized standard measurement units within a given measurement system (e.g. convert 5cm to 0.05m), and use these conversions in solving multi-step, real world problems.

Instructional Activities

Day 1

Bell Ringer: (5 minutes)

In your journal, write down everything you know about measurement, such as tools used for measuring or words used to describe measurement.

When students are finished, TTW make a K-W-L chart, which tracks what a student knows (K), wants to know (W), and has learned (L) about a topic, and have students use thumbs up if they wrote the same thing another student shared with the class.

Hook: (15 minutes)

TTW distribute the lyrics to rap song attached below. Play the song to the students first, and then have the students recite the rap together as a class a few times, then allow the students to sing along with the rap.

TTW have the students highlight information that they think is important and make a list on the board. TTW call on students at random to put their information on the board. TTW ask the students why they thought that information was important.

TTW show the students an inch of string, a foot of string, and a yard of string. TTW ask the students, is it easier to walk an inch, a foot, a yard, or a mile. How do they know? Discuss which measurement would be the appropriate measure for taking a step.
TSW work with their neighbor to determine how many inches are in a foot, how many feet are in a yard, using the string, and how many inches are in a yard. TTW will discuss the students’ findings and see if there are any contradictions.

Then TSW try to determine a solution to the problems below. When they are finished the teacher will review the answers by calling on a student to share their solution.

Example problems

1. Tommy and Jason walked to Brad’s house after school to play basketball. Tommy walked 25 yards and Jason walked 45 feet. Who walked the furthest? (Tommy)

2. Emily and Brittany were cutting ribbons for all the cheerleaders for game day. Each ribbon has to be 18 inches. How many yards of ribbon will they need if there are 22 cheerleaders? (11 yds)

Guided practice problems

1. Mrs. Mayfield needs 2 ½ yards of paper to cover her classroom door from top to bottom. How tall is Mrs. Mayfield’s door in feet and inches? (7 feet 6 inches)

2. New Orleans Saints quarterback Drew Brees threw for 3,453 yards this season. Carolina Panthers quarterback Cam Newton threw for 10,050 feet. Which quarterback threw the most yards? (Drew Brees) What is the difference between the amounts of yards both quarterbacks threw? (309 ft.)

Allow students to work the two problems above for a few minutes then share their strategies with their neighbor. Randomly call on students to read the problem and answer the questions.

Group work

TTW distribute the handout attached below to the students. Read over the directions with the students by randomly calling on a student to read the directions aloud.

TTW divide students into groups of 2 before going out to the football field. TTW provide each group with a ruler, measuring tape, and a yard stick.

Once the students are on the field, TTW have the students measure the distance between each of the small dotted lines on the perimeter of the field. Discuss the students’ findings before allowing them to work on their handout.

TSW put measurements in order from least to greatest to determine which student traveled the furthest during the 30 second sprint on the football field.
Closure: TTW allow the students to sing the standard rap song while writing what they learned about measurement or what they are still struggling with after the lesson.

Day 2

Bell Ringer: (3 minutes)

TSW answer the following question: If you are planning a party and you need 20 ounces of meat, but meat is sold by the pound, what operation would you use to determine how many pounds you needed to purchase?

TTW have students share their answers with the class and discuss the different methods students could choose to answer the question. **Answers will vary. They could use a scale if one is available or they could use the conversion equation.**

Hook: (2-3 minutes)

TTW ask the students if they have ever been to a birthday party. Then, TTW ask the students what they need to do to plan a party. (Focus should be on food and drinks and making sure that they have enough for every person.)

**Review** measurement conversions by having the students recite the rap from [http://www.educationalrap.com/song/the-standard-system/](http://www.educationalrap.com/song/the-standard-system/). *(5 minutes)*

TSW explore measuring weight and capacity using manipulatives. Have the students determine how many cups, quarts, pints, and ounces are in a gallon and how many ounces are in a pound using the manipulatives on their tables. Discuss the students’ findings by randomly calling on a student.

Model the following problems using the manipulatives. Be sure to ask probing questions during this time. *(10 minutes)*

1. Luke is planning a party for his best friend Jason. He invited 25 people to the party. He knows 4 of the people are vegetarians and do not eat meat. However, the remaining amount will be served hamburgers. If each person eats 4 ounces of a pound burger, how much meat in pounds would he need to serve his guests that eat meat? **5 ¼ pounds**

2. Luke also needs to provide punch for his guests. He has a recipe for punch that calls for 8 cups of pineapple juice, 3 quarts of orange juice, 5 pints of lemon-lime soda, and 16 fluid ounces of strawberry flavoring. How much punch does he have altogether? **2 gallons**
   Do you think 2 gallons of punch is enough for his guests? Why or Why not?

Tell the students there are different scenarios at each table. Remind students of the rules of working in groups. Pass out the handout to students and read over the directions with the
students before diving students into groups. Once students have been assigned to their groups, dismiss them to their group table. (3 minutes)

Allow 10 minutes at each table. Table 1 will go to table 2 and table 3 will go to table 4 after the allotted 10 minutes. (20 minutes total)

Table 1 and Table 3-same tasks

TSW be given a scale, standard measurement blocks that represent pounds and ounces.

TSW work together using their manipulatives to answer the questions on their handout.

Table 2 and 4- same tasks

TSW be given liquid measurement containers, water, punch bowl, funnel, paper towels and a bucket.

TSW use their manipulatives to answer the questions on their handout.

Closure: (5 minutes)

On the index card on your desk, write down two things that you learned during today’s lesson.

If time permits allow students to share what they wrote down with the class.

Materials and Resources

Day 1

1. Math journal
3. 12- 14 sets of string (Includes 36-inch pieces, 3 feet pieces, and 1 yard piece)
4. Rulers, tape measures, yard sticks
5. Teacher created handout below

Day 2

2. 2 sets of customary weights
3. Scale
4. 2 sets of liquid measuring pitchers
5. Teacher created handout
6. Index cards
7. Water
8. 2-punch bowls
9. 2-buckets
10. 2-funnels
11. Paper Towels

Assessment:

Day 1

1. Observation-TTW walk around during the group work to determine students who are getting it and students who are struggling.
2. Post-journal entry will show if they learned anything new during the lesson
3. Handout with conversions of measurements (evidence)

Day 2

1. Observation-TTW circulate the room using a checklist to determine if students are understanding the concepts.
2. Index cards will determine what students learned during the activity
3. Handout will have actual evidence that demonstrates the student’s ability to convert between customary units of measure.

References

Standard Measurement Rap

Chorus
It's the standard system
Manipulating measurements, take 'em, twist 'em \( \times 3 \)
It's the standard system, no doubt, for sure
Units of conversion no less no more

Verse I
If 12 inches make a foot and 3 feet make a yard
How many inches in a yard? (Man that's kinda hard.)
Nope it's not really it's just \( 12 \times 3 \)
36 inches: one yard exactly
1760 yards in a mile
Trust me, no need to count 'cause that could take a while
A mile is 5280 feet, that's right
We're talking length with strength over the beat

Chorus

Verse II
If 2 cups make a pint and 2 pints make a quart
How many cups in a quart? (That would be 4.)
If 4 quarts make a gallon and 4 cups are in a quart
How many cups in a gallon? (Man that's a challenge!)
Maybe so, but it's just \( 4 \times 4 \)
16 cups in a gallon for sure
That's 8 pints, no less no more
4 quarts, one gallon, let's settle the score

Chorus

Verse III
So there's 16 ounces in a pound
And 2000 pounds in a ton
Now imagine a 10-pound cat on the ground
Who loves to lounge in the sun
What is the weight of the cat in ounces? (That's tough!)
Maybe but that's the way the ball bounces.
16 ounces multiplied by 10 pounds
(160 ounces, how does that sound?)
You look confused, you just need more practice
To keep all your math skills sharp like a cactus
Here's another one, you're almost done
A 4000 pound car is how many tons?
4000 pounds is 2 tons exactly
(That's a heavy car, is it a truck or a taxi?)
2 tons is right, you're really coming along
Learn the standard system by learning this song

Chorus

Verse IV
Now, suppose you've got an area of 1 square foot
How many square inches would you have in that area?
Calm down, no need to cause mass hysteria
I didn't know that units of conversion were scarin' ya
(1 square foot is a 1 \( \times 1 \) square.)
Now transfer that to inches and do it with care
(12 inches squared is 144.)
That's 1 square foot no less no more

Bridge
Try to visualize what the problem is asking
That's a math skill for life, long and everlasting
Paint a picture with your mind, create a visual image
And memorize this song from the start to the finish
How far did they go?

Directions: Read the problem below. Solve. Explain.

During spring training, Coach Bryan kept track of how far each student ran in thirty seconds. He recorded the following distances:

- Ben: 20 yards
- Russell: 18 feet
- Jason: 55 feet
- Adam: 792 inches
- Jamie: 22 yards
- Brad: 300 inches
- Michael: 432 inches

If Coach Bryan could only keep 5 players and he wants the fastest players which players would he keep?

Explain what methods you used to get your answer.

Did any of the players run the same distance? If so, what are their names?
### Table 1 and 3

**Directions:** Use the scale on the table to answer the following questions.

1. Jason bought 2 ½ pounds of meat. He invited 5 people over to his house for dinner. If each person eats 4 ounces, does Jason have enough meat? Explain your answer.

2. Miranda is throwing a party for all of her softball players. She bought 3 pounds of sausage. If each link weighs 8 ounces, how many links of sausage did she get? Explain your answer.

3. Vikki is planning a party. She invited 18 guests. If all of her guests want a burger that weighs 6 ounces, how many pounds of meat will she have to purchase? Explain your answer.

4. Twenty-five people showed up to Vikki’s party. She bought 4 pounds of hamburger meat. If each person wants a hamburger that weighs 3 ounces, does she have enough meat for everyone? Explain your answer.
Table 2 and 4

Directions: Using the containers on your table answer the following questions. Use the water in your bucket to fill your containers. When you are finished pour your punch bowl back into the bucket. If you spill it, clean it up!

1. A recipe for punch calls for 12 ounces of strawberry flavoring, 2 cups of water, 1 quart of lemon-lime soda, and 12 ounces of watermelon flavoring. How much punch does this recipe create?

2. Marco needs 1 ½ gallons of punch. However, when he went to the store they only had quarts and pints on the shelf. Using the fewest number of containers, how many quarts and pints did he buy to get a 1 ½ gallons of punch?

3. Mrs. Smith was throwing a party for her favorite class. She has 27 students in her class. She wants to make sure every student has 20 ounces of chocolate milk to drink. How many gallons would Mrs. Smith have to purchase so all of her students get 20 ounces of chocolate milk?

4. Deriquez is having a party for all of his friends. He invites 20 people but 30 people show up. He only has 20 pints of punch. If each guest has 10 ounces of punch, does he have enough punch? Why or why not?
## Observation Checklist

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Answers conversion questions correctly</th>
<th>On task-discussing questions in group</th>
<th>Uses manipulatives to demonstrate conversions</th>
<th>Draws pictures to represent the problem</th>
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Teacher Name: **Katie Mayfield**

Student Name: ________________________________________

### Journal Entry Rubric

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>4</th>
<th>3</th>
<th>2</th>
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<tr>
<td><strong>Grammar &amp; spelling (conventions)</strong></td>
<td>Writer makes no errors in grammar or spelling.</td>
<td>Writer makes 1-2 errors in grammar and/or spelling.</td>
<td>Writer makes 3-4 errors in grammar and/or spelling.</td>
<td>Writer makes more than 4 errors in grammar and/or spelling.</td>
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<tr>
<td><strong>Capitalization and Punctuation</strong></td>
<td>Writer makes no errors in capitalization and punctuation.</td>
<td>Writer makes 1-2 errors in capitalization and punctuation.</td>
<td>Writer makes 3-4 errors in capitalization and punctuation.</td>
<td>Writer makes more than 4 errors in capitalization and punctuation.</td>
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<tr>
<td><strong>Content Accuracy</strong></td>
<td>The student answers the question completely.</td>
<td>The student answers the question vaguely.</td>
<td>The student attempts to answer the question.</td>
<td>The student did not attempt to answer the question.</td>
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<tr>
<td><strong>Length</strong></td>
<td>The journal entry is 5 or more sentences.</td>
<td>The journal entry is 3-4 sentences.</td>
<td>The journal entry is 2-1 sentences.</td>
<td>The journal entry does not have complete sentences.</td>
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