

# Metric Measurement

## Summary

The students will measure and then convert the distances from metric to customary and from customary to metric.

## Main Core Tie

Mathematics Grade 2

[Strand: MEASUREMENT AND DATA \(2.MD\) Standard 2.MD.1](#)

## Additional Core Ties

Mathematics Grade 2

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

## Materials

- [KWL chart](#) (pdf)
  - Jar
  - Licorice
  - Sticky notes
  - Pencil
  - Yard and meter stick
  - Rulers
  - White board Marker
  - White board eraser
- [Mitch the Metric Monster handouts](#)
  - Crayons
  - Scissors
  - Glue
- [Centimeter Game Cards](#) & [Answer Sheet](#)
  - Centimeter cubes
  - Paper
  - Straws
  - Tape
  - Permanent markers
- [Measurement and Me handout](#)
- [Equivalencies Matchup Game](#)
- [Metric Tic Tac Toe Game](#)

## Background for Teachers

Most countries use the metric system. With the increasingly global marketplace, citizens of the United States are exposed to more usage of this system. It is important for students in the educational system to have a great enough knowledge of the metric system--its components, organization, and common benchmarks--to be able to use the system in the real world.

The metric system is based on powers of ten. This makes calculations and conversions simple. The prefixes are used across the measurement types to denote the magnitude, or power of ten of the measurement.

A measurement always has two parts: a number and a unit. Standard units include inches, feet,

yards, centimeters, meters, cups, quarts, etc. Metric units include: centimeter, decimeter, meter, 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 customary measurement, measurement vocabulary, and length before doing these lessons.

Before the lessons and activities are given students, should be able to answer the following questions:

What are ways we measure?

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

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

### Instructional Procedures

#### Invitation to Learn:

Ask, "what are ways we measure?" (time, length, weight, capacity, temperature) Use a KWL chart to brainstorm. What kinds of objects can you measure with? (length  $\frac{1}{4}$  and  $\frac{1}{2}$  inch, foot, yd) (cm, meter) (body benchmarks). Have the students partner up and find a body benchmark that they think would be equal to a centimeter, decimeter, and meter.

#### Instructional Procedures:

##### Licorice Measurement

Start out by filling a jar with licorice and ask students how long, in centimeters, it would be if they were to line the licorice up from end to end. Give them the hint that a centimeter is approximately the width of a pinky.

Give each student a sticky note and have him/her write their name on it and their estimate in centimeters. Then have students place each sticky note on the board. Have them place them in order from least to greatest.

Show the students a meter stick and ask them how many licorices they think it would take to equal its length.

Pull the licorice out of the jar and line it up end to end. Have the students gather around the licorice and then measure the licorice in centimeters. On the board, list the length in centimeters.

##### Mitch the Metric Monster

Have students make *Mitch the Metric Monster*.

Students start out by coloring each centimeter a different color until they reach the eleventh centimeter. Here they will begin to repeat the previous ten colors, forming a pattern.

Students will then color each decimeter a different color. After students are finished coloring they will cut out the strips and attach them to each other, forming a meter. Finally, they will attach the monster face to the front of the strip.

Explain to students that they will be using Mitch to help them with the *Centimeter Game* they will be doing. To begin the activity the students will need their game strip in front of them ( *Mitch the Metric Monster*).

Students will be given the *Centimeter Game Cards*, which they will shuffle and stack in the middle face down. The first player will take the top card and read it aloud. If s/he is able to answer it correctly, s/he will place a cm cube on the first centimeter mark and keep the card.

The player to the right will do the same thing, and so on.

If a question is answered incorrectly, that player puts the card on the bottom of the pile and does not place a cube on his/her centimeter mark. Play continues in this manner until all of the cards are gone. The player with the most centimeters wins.

##### Paper Measure

Give each student a piece of paper and a straw.

Each student will place the paper at the end of the straw, holding in on the end by sucking in air, and blow it off by pushing air out through his/her mouth.

Wherever the paper lands the student will put a piece of tape with his/her name on it. He/she will measure how far the paper went in centimeters, decimeters, and meters (if it applies).

### Equivalences

Pass out the *Measurement and Me Handout* to each of the students.

Students will measure each object on the activity sheet with their rulers the best that they can. They will then show the equivalences for each measurement.

### Extensions

Students can look at simple equivalences using the *Equivalencies Match up Game* handout. Each student will be given a card and they will find their matching card. Students will use measuring instruments in order to look at equivalences. They will not be expected to memorize conversion charts.

Use the *Equivalencies Match up Game* to play Metric Dominoes. Give each player five dominoes. Place the remaining dominoes in a draw pile. Player 1 places a domino on the table. Player 2 puts down a domino with a metric equivalent. Players continue to take turns putting down dominoes one at a time. If a player does not have a metric equivalent, that player must continue to draw from the pile until a match is possible. The first player to use all of his/her dominoes is the winner.

Introduce the acronym KHDUDCM, or King Henry Does Usually Drink Chocolate Milk. This stands for Kilo, Hecto, Deka, Unit, Deci, Centi, and Milli.

Have students write their own acronym for the metric prefixes.

Have students make visual representations of some of the linear measurements.

Have students play the *Metric Tic Tac Toe Game*.

### Assessment Plan

Have the students look at the body benchmarks that they came up with. Have them assess whether or not they still think that would be an accurate benchmark. If they do not, what do they think would be a better one?

After they have measured themselves students will each be given a card from the "Equivalencies Matchup Game." Instruct them to find their matching (equivalent) card.

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

Since these are practicing 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 these concepts.

Students can hand in black lines of certain 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.

### Authors

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