

AR Remediation Plan - Length, Weight/Mass, Liquid Volume and Temperature

Measuring in Inches and Centimeters

STRAND: Measurement and Geometry

STRAND CONCEPT: Length, Weight/Mass, Liquid Volume and Temperature

SOL 4.8a

Remediation Plan Summary

Students create rulers to measure items in the classroom to the nearest $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{8}$ of an inch. This lesson can also be adapted for measuring in centimeters.

Common Misconceptions

Students have a difficult time with measuring. They do not measure precisely. They do not understand how to read a ruler or tape measure. Students need lots of practice measuring objects.

Materials

- Inch rulers (or centimeter rulers, depending on the focus of the lesson)
- 12-inch strips of cardstock
- “Measurement in Inches” worksheets (or “Measurement in Centimeters” worksheets, depending on the focus of the lesson)

Introductory Activity

Have students use their feet, hands, and fingers as nonstandard units of measure to measure various items in the classroom (e.g., desks, chalkboard, textbook, width/length of room). Decide the items to be measured ahead of time, and have all students measure the same items. Also, measure the items yourself, using your feet, hands, and fingers. Have students record their measurements and then share and discuss the measurements. Which measurements were the same or almost the same? Which were noticeably different? What would account for the differences? Students should reach the conclusion that a standard tool for measuring a standard unit is needed because everyone's body parts are not the same length.

Plan for Instruction

1. Give each student an inch ruler and a 12-inch strip of cardstock. Have students share what they already know about the ruler (reading it, measuring with it, etc.). Review the main parts of the ruler, pointing out that a ruler is read from left to right starting at the edge with the zero point. Note the different marker line lengths and what they represent (inches, $\frac{1}{2}$ inches, $\frac{1}{4}$ inches, and $\frac{1}{8}$ inches).

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2. Have students create their own rulers on cardstock, using the real ruler to make measurements for the marks. Start by having them measure and mark with a long marker line the 1-inch increments from the left to the right end.
3. Ask students what measurements would come next. ($\frac{1}{2}$ inches) Have students measure and mark with a shorter marker line the $\frac{1}{2}$ - inch increments.
4. Continue this process for $\frac{1}{4}$ -inch and $\frac{1}{8}$ -inch increments, being sure to review the relationships among the fractions. Also, be sure students are labeling everything correctly on their rulers.
5. Once the rulers are completed, have students draw on a piece of paper, without using the ruler, five lines of various lengths. Then, have them measure their lines to the nearest $\frac{1}{2}$, $\frac{1}{4}$ or $\frac{1}{8}$ of an inch and write the answers on a separate piece of paper. Be sure they draw a variety of lengths that include fractions of an inch, not just whole inches. Have students exchange their five lines with a partner, and have the partners use their rulers to measure the lines to see if they agree on the measurements. Assist students as needed.
6. Have students estimate the lengths of the items listed on the “Measurement in Inches” worksheet (or estimate the lengths in centimeters, using the “Measurement in Centimeters” worksheet).
7. Have students make actual measurements of the items, using the rulers they made. Discuss the students’ measurements.

Pulling It All Together (Reflection)

Have students describe in writing, using words and/or pictures, how to measure an item with a ruler.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

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Measurement in Inches

Estimate the lengths of the items in inches. Then, measure the items, using your inch ruler. When measuring, first determine how many whole inches are needed, and then use partial inches to measure fractional lengths.

Item	Estimated Measure (in.)	Actual Measure (in.)
1. Desk		
2. Piece of notebook paper		
3. Math book		
4. Glue stick		
5. Pencil		
6. Marker		
7. Your shoe		
8. Computer monitor		
9. Chalkboard		
10. Paper clip		

Measurement in Centimeters

Estimate the lengths of the items in centimeters. Then, measure the items, using your centimeter ruler. When measuring, first determine how many whole centimeters are needed, and then use partial centimeters to measure fractional lengths.

Item	Estimated Measure (cm)	Actual Measure (cm)
1. Desk		
2. Piece of notebook paper		
3. Math book		
4. Glue stick		
5. Pencil		
6. Marker		
7. Your shoe		
8. Computer monitor		
9. Chalkboard		
10. Paper clip		