Comparison of Metric Measurements

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CONCEPT **1** Comparison of Metric Measurements

Here you'll learn to compare and order given metric units of measure.

Are you familiar with the shot put? Take a look at this dilemma.

When Marcus was in sixth grade he thought that he was a runner. So, he tried out for the track team and his love of running and determination made him an easy choice for the team. All that first year, Marcus ran. Then in the hurdles, Marcus had a fall and hurt his knee. Marcus was devastated. He thought his life of track and field was over.

While his ankle healed, Marcus watched his team mates practice. One day after practice, Marcus picked up the shot put and threw it across the field. His coach was watching and Marcus found a new way to participate.

"Sometimes life is like that," his coach Mr. Samuels said. "You think you are going to be doing one thing and something else crosses your path.

This year, Marcus is on the shot put team. His team is trying to figure out which field they should use to practice in. There are several different fields available, but the team is large, so they are looking for a field with a width of 45.65 meters.

Field A—0.004565 kilometers

Field B—45,650 millimeters

Field C—456.5 centimeters

Field D—456,500 millimeters

Which field should his team choose? Marcus is puzzled and you may be too. This Concept will teach you all about converting units of measure and comparing them. By the end of it, you will be able to help Marcus figure out the best option for his shot put team.

Guidance

Knowing how to convert between metric units of measure makes comparing and ordering measurements possible.

Previously we worked on how to compare decimals.

You line up the decimal points and compare the place values from left to right. Because units of measure often involve decimals, comparing measurements is similar. But to compare measurements, they have to have the same unit!

Compare 4.56 g to 4.59 g.

First, we have to be sure that these are the same unit of measure. Both are in grams, so we can look at the numbers to determine which is larger. 4.56 is less than 4.59, so we have our answer.

The answer is 4.56 g <4.59 g.

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Once you understand how to compare units, ordering them becomes quite simple. Just remember that you always have to convert the units so that they are the same!

Practice comparing metric units of measure.

Example A

45 cm _____ 500 mm

Solution: <

Example B

2 km _____ 400 m

Solution: >

Example C

6 l _____ 60,000 ml

Solution: <

Now back to the shot put and the teams.

Here is the original problem once again.

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Which field should his team choose?

First, we need to look at each unit of measurement to determine the best option for Marcus and his team. This problem asks us to compare the widths of these fields against 45.65 meters. Let's begin by converting the widths of the each field into meters.

- Field A has a width of 0.004565 kilometers. To convert to meters, we multiply by 1,000 or move the decimal point three places to the right. $0.004565 \, kilometers = 4.565 \, meters$.
- Field B has a width of 45,650 millimeters. To convert to meters, we divide by 1,000 or move the decimal point three places to the left. $45,650 \div 1,000 = 45.65 \, meters$.
- Field C has a width of 456.5 centimeters. To convert to meters, we divide by 100 or move the decimal point two places to the left. $456.5 \, centimeters \div 100 = 4.565 \, meters$.
- Field D has a width of 456,500 millimeters. To convert to meters, we divide by 1,000 or move the decimal point three places to the left. $456,500 \, millimeters = 456.5 \, meters$.

Now we can compare the widths of the fields against 45.65 meters. Only Field B has the right width.

The solution is Field B.

Vocabulary

Metric System
a system of measurement developed by the French. Some units include meters, grams and liters.

Customary System
a system of measurement common in the United States. Some units include feet, pounds and gallons.

Estimate
to find an approximate measurement, useful in figuring out a reasonable number and not an exact one.

Equivalence
means equal.

Guided Practice

Here is one for you to try on your own.

Compare 743 km to 74,300,000 mm

Answer

The first thing to notice is that these two units of measure are not the same. Therefore, we have to convert both of them to the same unit to compare them. We can convert both measurements to kilometers.

Multiply kilometers by 1,000,000 to get millimeters.

$743 \times 1,000,000 = 743,000,000$

Our answer is that 743 km >74,300,000 mm.

Practice

Directions: Compare or order the following measurements. Write <, >, or = for each ___.

1. 14 km ___ 56 m

2. 1.23 m ___ 123 kilometers

3. 3.4 km ___ 340 m

4. 18 g ___ .18 kilograms

5. 27 m ____ 2700 kilometers

6. 14 l ____ 2100 ml

7. 5 g ____ .0005 kg

8. 18 mm _____ .18 cm

9. 2.3 km ____ 2700 m

10. 3.48 cl ___ 0.348 l

11. 57.21 kg ___ 572,100 cg

12. 91.17 mm ___ 0.09117 m

13. 4.4 cl ____ 0.44 ml

14. Order the following measurements from least to greatest: 79,282 kg, 7,838,200 cg, 7,938,200 mg, 79,382 g.

15. Order the following measurements from least to greatest: 2,261,000 cl, 21,061 l, 21.06 kl, 21,161,000 ml