Unit 1- Lesson 8- Measurement

Objectives

* Students use rates between measurements to convert measurement in one unit to measurement in another unit. They manipulate and transform units appropriately when multiplying or dividing quantities.
* Students decontextualize a given speed situation, representing symbolically the quantities involved with the formula .

Unit 1- Lesson 8- Measurement Notes Name:

Identify the ratios that are associated with conversions between feet, inches, and yards.

inches = *foot*; the ratio of inches to feet is .

foot =  *inches*; the ratio of feet to inches is .

feet =  *yard*; the ratio of feet to yards is .

yard =  *feet*; the ratio of yards to feet is .

How many feet are in inches? Make a ratio table that compares feet and inches. Use the conversion rate of inches per foot, or foot per inch.

How many grams are in kilograms? Again, make a record of your work before using the calculator. The rate would be grams per kg. The unit rate would be .

How many cups are in quarts? As always, make a record of your work before using the calculator.

How many quarts are in cups?

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| --- | --- |
| U.S. Customary Length | Conversion |
| Inch (in.) | in. = ft. |
| Foot (ft.) | ft. = in. |
| Yard (yd.) | yd. = ft.  yd. = in. |
| Mile (mi.) | mi. = yd.  mi. = ft. |

|  |  |
| --- | --- |
| Metric Length | Conversion |
| Centimeter (cm) | cm = mm |
| Meter (m) | m = cm  m = mm |
| Kilometer (km) | km = m |

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| --- | --- |
| Metric Capacity | Conversion |
| Liter (L) | L = ml |
| Kiloliter | kL = L |

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| --- | --- |
| U.S. Customary Weight | Conversion |
| Pound (lb.) | lb. = oz. |
| Ton (T.) | T. = lb. |

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| --- | --- |
| Metric Mass | Conversion |
| Gram (g) | g = mg |
| Kilogram (kg) | kg = g |

|  |  |
| --- | --- |
| U.S. Customary Capacity | Conversion |
| Cup (c.) | c. = fluid ounces |
| Pint (pt.) | pt. = c. |
| Quart (qt.) | qt. = c.  qt. = pt.  qt. = fluid ounces |
| Gallon (gal.) | gal. = qt.  gal. = pt.  gal. = c.  gal. = fluid ounces |

If something is moving at a constant rate of speed for a certain amount of time, it is possible to find how far it went by multiplying those two values. In mathematical language, we say Distance = Rate • Time

Distance = Rate Time

Part 1: Chris Johnson ran the 40 yard dash in 4.24 seconds. What is the rate of speed? Round any answer to the nearest hundredth of a second.

Distance = Rate Time

Part 2: We converted units of measure using unit rates. If the runner could keep up this speed at a constant rate, how many yards would he run in an hour? This problem can be solved by breaking it down into two steps.

1. How many yards would he run in one minute?
2. How many yards would he run in one hour?

* We completed that problem in two separate steps, but it is possible to complete this same problem in one step. We can multiply the yards per second by the seconds per minute, then by the minutes per hour.

Cross out any units that are in both the numerator and denominator in the expression because these cancel out each other.

Part 3: How many miles did the runner travel in that hour? Round your response to the nearest tenth.

Cross out any units that are in both the numerator and denominator in the expression because they cancel out.

I drove my car on cruise control at 65 miles per hour for 3 hours without stopping. How far did I go?

Cross out any units that are in both the numerator and denominator in the expression because they cancel out.

On the road trip, the speed limit changed to miles per hour in a construction zone. Traffic moved along at a constant rate (50 mph), and it took me minutes ( hours) to get through the zone. What was the distance of the construction zone? (Round your response to the nearest hundredth of a mile).

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Unit 1- Lesson 8- Measurement Name:

Classwork/Partner Practice

1. 7 ft. = in.
2. 100 yd. = ft.
3. 25 m = cm
4. 5 km = m
5. 96 oz. = lb.
6. 2 mi. = ft.
7. 2 mi. = yd.
8. 32 fl. oz. = c.
9. 1,500 ml = l
10. 6 g = mg
11. Beau buys a 3 pound bag of trail mix for a hike. He wants to make one-ounce bags for his friends with whom he is hiking. How many one-ounce bags can he make?
12. The maximum weight for a truck on the New York State Thruway is 40 tons. How many pounds is this?
13. Claudia’s skis are 150 centimeters long. How many meters is this?
14. Claudia’s skis are 150 centimeters long. How many millimeters is this?
15. If Adam’s plane traveled at a constant speed of miles per hour for six hours, how far did the plane travel?
16. A Salt March Harvest Mouse ran a centimeter straight course race in seconds. How fast did it run?
17. Another Salt Marsh Harvest Mouse took seconds to run a centimeter race. How fast did it run?
18. A slow boat to China travels at a constant speed of miles per hour for hours. How far was the voyage?
19. The Sopwith Camel was a British, First World War, single-seat, biplane fighter introduced on the Western Front in 1917. Traveling at its top speed of mph in one direction for hours how far did the plane travel?
20. A world class marathon runner can finish miles in hours. What is the rate of speed for the runner?
21. Banana slugs can move at cm per minute. If a banana slug travels for hours, how far will it travel?

Unit 1- Lesson 8- Measurement Name:

Exit Ticket/ HW

Jill and Erika make gallons of lemonade for their lemonade stand. How many quarts will they be able to sell? If they charge $ per quart, how much money will they make if they sell it all?

Franny took a road trip to her grandmother’s house. She drove at a constant speed of miles per hour for hours. She took a break and then finished the rest of her trip driving at a constant speed of miles per hour for hours. What was the total distance of Franny’s trip?

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