Lesson 21: Getting the Job Done—Speed, Work, and Measurement Units

Classwork

Conversion tables contain ratios that can be used to convert units of length, weight, or capacity. You must multiply the given number by the ratio that compares the two units.

Opening Exercise

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

$12$ inches $=$ foot; the ratio of inches to feet is .

$1$ foot $=$ inches; the ratio of feet to inches is .

$3$ feet $=$ yard; the ratio of feet to yards is .

$1$ yard $= $ feet; the ratio of yards to feet is .

**Example 1**

Work with your partner to find out how many feet are in $48$ inches. Make a ratio table that compares feet and inches. Use the conversion rate of $12$ inches per foot or $\frac{1}{12}$ foot per inch.

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**Example 2**

How many grams are in $6$ kilograms? Again, make a record of your work before using the calculator. The rate would be $1,000$ grams per kg. The unit rate would be $1,000$.

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Exercise 1

How many cups are in $5$ quarts? As always, make a record of your work before using the calculator. The rate would be $4$ cups per quart. The unit rate would be $4$.

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Exercise 2

How many quarts are in $10$ cups?

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| U.S. Customary Length | Conversion |
| Inch (in.) | $1$ in. = $\frac{1}{12}$ ft. |
| Foot (ft.) | $1$ ft. = $12$ in. |
| Yard (yd.) | $1$ yd. = $3$ ft.$1$ yd. = $36$ in. |
| Mile (mi.) | $1$ mi. = $1,760$ yd.$1 $mi. = $5,280$ ft. |

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| Metric Length | Conversion |
| Centimeter (cm) | $1$ cm = $10$ mm |
| Meter (m) | $1$ m = $100$ cm$1$ m = $1,000$ mm |
| Kilometer (km) | $1$ km = $1,000$ m |

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| Metric Capacity | Conversion |
| Liter (L) | $1$ L = $1,000$ ml |
| Kiloliter | $1$ kL = $1,000$ L |

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| U.S. Customary Weight | Conversion |
| Pound (lb.) | $1$ lb. = $16$ oz. |
| Ton (T.) | $1$ T. = $2,000$ lb. |

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| Metric Mass | Conversion |
| Gram (g) | $1$ g = $1,000$ mg |
| Kilogram (kg) | $1$ kg = $1,000$ g |

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| U.S. Customary Capacity | Conversion |
| Cup (c.)  | $1$ c. = $8$ fluid ounces |
| Pint (pt.) | $1$ pt. = $2$ c. |
| Quart (qt.) | $1 $qt. = $4$ c.$1 $qt. = $2$ pt.$1$ qt. = $32$ fluid ounces |
| Gallon (gal.) | $1$ gal. = $4$ qt.$1$ gal. = $8$ pt.$1$ gal. = $16$ c.$1$ gal. = $128 $fluid ounces |

Lesson Summary

Conversion tables contain ratios that can be used to convert units of length, weight, or capacity. You must multiply the given number by the ratio that compares the two units.

Problem Set

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. Write your own problem and solve it. Be ready to share the question tomorrow.