Algebra 1

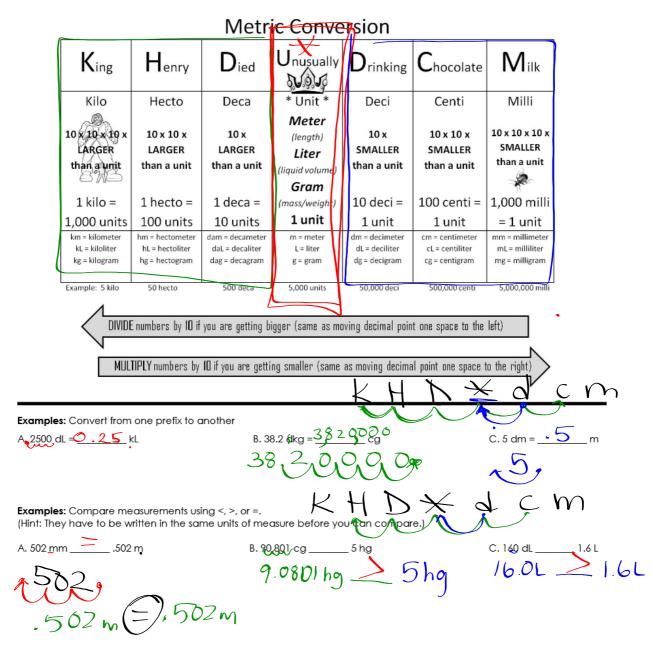
Unit 1: Algebraic Expressions & Equations

Notes

Dimensional Analysis

Metric Conversions

The Metric System of Measurement is based on multiples of 10. The three base units are meters, liters, and grams. The 6 prefixes are kilo (1000), hector (100), deka (10), base unit (1), deci (.1), centi (.01), and milli (.001). A helpful way to remember the order of the prefixes is **King Henry Died Unusually Drinking Chocolate Milk**.



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Customary Units of Conversion

There are many different units of measure specific to the U.S. Customary System that you will need to remember. The list below summarizes some of the most important.

Measurement	Time	Capacity	Weight
1 foot = 12 inches	1 minute = <u>60</u> seconds	1 cup = fl. oz	1 ton = 2000 lbs
1 yard = feet		1 pint =2 cups	1 lb = <u> </u> oz
1 mile = $\frac{5260}{1}$ feet	1 year = <u>52</u> weeks	1 quart = <u>2</u> pints	
1 mile = <u>17 60</u> yards	1 hour = <u>60</u> minutes	1 gal = quarts	
	1 week = days		

In order to convert between units, you must use a conversion factor. A **conversion factor** is a fraction in which the numerator and denominator represent the same quantity, but in different units of measure.

Examples: 3 feet = 1 yard:
$$\frac{3 \text{ feet}}{1 \text{ yard}} \text{ OR} \frac{1 \text{ yard}}{3 \text{ feet}}$$
 100 centimeters = 1 meter: $\frac{100 \text{ cm}}{1 \text{ m}} \text{ OR} \frac{1 \text{ m}}{100 \text{ cm}}$

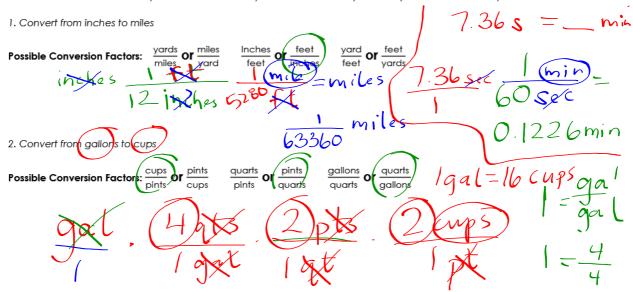
Multiplying a quantity by a unit conversion factor changes only its units, not its value. It is the same thing as multiplying by 1.

$$\frac{100 \text{ cm}}{1 \text{ m}} = \frac{100 \text{ cm}}{100 \text{ cm}} = 1$$

The process of choosing an appropriate conversion factor is called **dimensional analysis**.

Understanding Dimensional Analysis

When setting up your conversion factors, don't worry about the actual numbers until the very end. The key to set up your conversion factors so that they cancel out the units you don't want until you end up with the units that you do want.

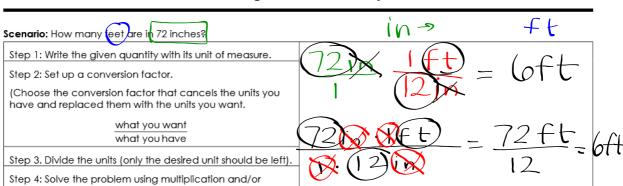


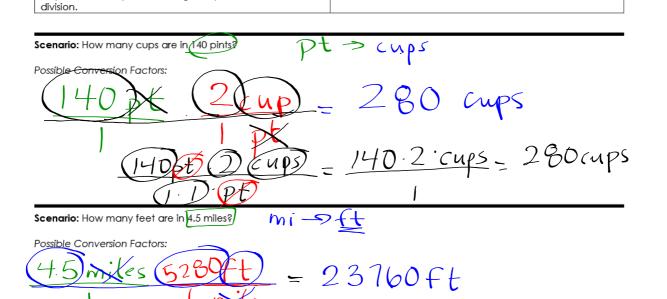
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Scenario: Converti 408 hours to days.

Possible Conversion Factors:

408 hys | day - 17 days