

Technical Math for Allied Health
Class notes
Measurement: Converting between Measurement Systems Including Temperature (Module 6)

Simply put, we often have a measurement in one system (like meters) and need to convert it to another system (like feet). The last section's cautionary tale of the ill-fated 1998 NASA space probe reminds us of why it is so important to always keep your units in mind. Let's convert!

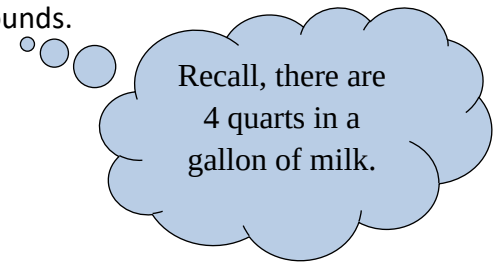
Do get used to the commonly used units for length, weight, and volume used in each system. We'll need some conversion factors.

	Unit (Abbreviation)	**Common Equivalents**
Length		
	1 inch (in)	2.54 centimeters (cm)
Volume		
	1 cup (c)	240 milliliters (mL)
	1 teaspoon (t)	5 mL
	15 drops (gtt)	1 mL
	1 fluid ounce (fl oz)	30 mL
	1 mL	15 minims or drops
Weight		
	1 pound (lb)	454 g
	1 kilogram (kg)	2.2 lb
	1 grain (gr)	60 milligrams (mg)
	1 gram (g)	15 gr or ¼ t
	4 grams (g)	1 dram (dr) or 60 gr

Thinking Metric:
You want to have some idea of these measures in your head.

We want to keep the following in mind.

1. A meter is a little more (about 10%) than a yard (which is exactly 3 feet).
2. An inch is a little more than 2.5 centimeters.
3. A kilogram is a little more (about 10%) than 2 pounds.
4. A liter is a little more (about 6%) than a quart.
5. A kilometer is about 62% of a mile.



expl 1: How many liters of pickled peppers did Peter Piper pick? Recall that a peck is the same as 2 gallons. Do *not* round.

expl 2: Ensure, a nutrient supplement drink, contains 8 fluid ounces per can. There are 24 cans per case. How many liters of the drink is in one case? Do *not* round.

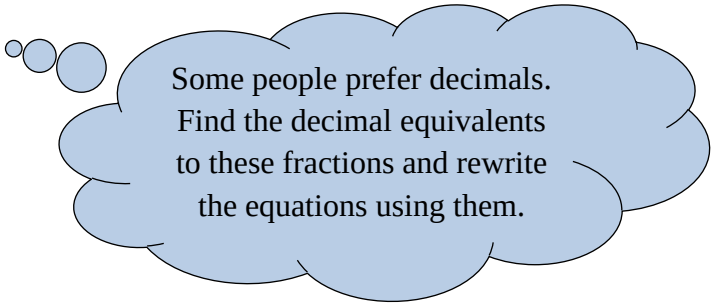
expl 3: Thomas has been doubting his math and he needs your help. He converted gr 420 to kilograms and got 25.2 kg. Is that right? If *not*, what did he likely do wrong?

expl 4: What is your height in feet and inches? Convert that to centimeters and meters. Use appropriate abbreviations. Round to what you think is reasonable.

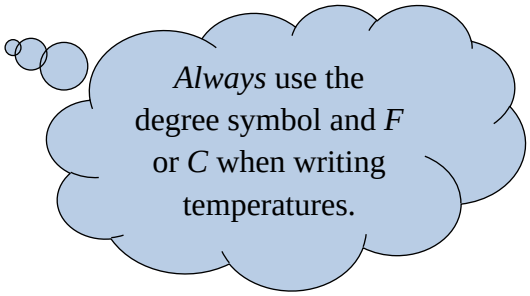
Temperature Conversions:

A couple of Flash Card facts we have had from early days are these equations that help us convert from Fahrenheit to Celsius temperature readings. Let's practice with them now.

$F = \frac{9}{5}C + 32$ $\qquad$ $C = \frac{5}{9}(F - 32)$



expl 5: Simone has measured a patient's temperature to be 100° F. What is that in Celsius?



expl 6: Napoleon was shocked to find that the operating room was 46° C. He tells his boss who freaks out and orders a heater brought in. What was his boss' crucial mistake? Tell me more.