

## Chemistry 121 Conversion Practice (off the web)

1. A certain medication is set to deliver through an IV at a rate of 3.0 mg/min. What is this rate in ng/s?
2. A drug is administered at a rate of 14.5 cL/hr. What is this rate in  $\mu\text{L/s}$ ?
3. An automobile tire has a pressure of 32 psi (pounds per square inch). What is this pressure in  $\text{g/cm}^2$ ? ( $1 \text{ lb} \sim 454 \text{ g}$ ,  $1 \text{ in.} = 2.54 \text{ cm}$ )
4. The density of propane is  $36.28 \text{ lb/ft}^3$ . Convert this to  $\text{kg/m}^3$ . ( $1 \text{ lb} \sim 454 \text{ g}$ ,  $1 \text{ in.} = 2.54 \text{ cm}$ )
5. A radio station announcer reports the atmospheric pressure to be 99.6 kPa. What is the pressure in atmospheres? In millimeters of mercury?
6.  $20 \text{ }^\circ\text{C} = \text{_____ } ^\circ\text{F}$
7.  $0 \text{ }^\circ\text{F} = \text{_____ } ^\circ\text{C}$
8.  $98.6 \text{ }^\circ\text{F} = \text{_____ } ^\circ\text{C}$
9. Convert the following measurements into mL.
  - a. 0.75 liters
  - b.  $3.2 \times 10^4 \mu\text{L}$
  - c.  $0.5 \text{ m}^3$
10. Which is greater: 45 miles or 63 km?
11. How many cubic feet are there in a room measuring 5m x 10m x 2m?
12. What is the volume of a 12-oz can of soda in mL?
13. What is your mass in kg?
14. What is your height in meters?
15. 6 gallons of gasoline costs \$21.00. How much does a liter cost?
16. A man makes a 27.0 km trip in 16 minutes.
  - a. How many miles did he travel?
  - b. If the speed limit was 55 miles per hour, was the driver speeding?

sources: <http://www.getchemistryhelp.com/chemistry-practice-problems-compound-unit-conversions/>  
<http://chemistry.about.com/cs/workedproblems/a/b1110903a.htm>  
<http://chemistry.about.com/od/convertcalculate/a/conversions.htm> <http://chemistry.about.com/od/chemistry-test-questions/tp/Unit-Conversions-Test-Questions.htm>

## Chemistry 121 Conversion Practice KEY (Do correct me if I'm wrong!)

1. A:  $3.0 \text{ mg/min} = 5.0 \times 10^4 \text{ ng/s}$
2. A:  $14.5 \text{ cL/hr} = 40.3 \text{ }\mu\text{L/s}$
3. A:  $32 \text{ psi} = 2200 \text{ g/cm}^2$
4. A:  $36.28 \text{ lb/ft}^3 = 581.1 \text{ kg/m}^3$
5. A:  $99.6 \text{ kPa} = 0.983 \text{ atm} = 747 \text{ mmHg}$  [Note, however, that stations do not report the actual atmospheric pressure. What they report is an altitude-adjusted atmospheric pressure. This is so that a “nice day” in Denver has the same pressure reported as a “nice day” in New York. If they reported actual atmospheric pressure, the report in Denver would be way, way lower than the one for New York. Basically, a report in Denver is saying, “If we were at sea level, our atmospheric pressure would be this...”]
6. A:  $20 \text{ }^\circ\text{C} = 68 \text{ }^\circ\text{F}$
7. A:  $0 \text{ }^\circ\text{F} = -18 \text{ }^\circ\text{C}$
8. A:  $98.6 \text{ }^\circ\text{F} = 37.0 \text{ }^\circ\text{C}$  [we just round to the same decimal digit for temp]
9. a.  $0.75 \text{ L} = 750 \text{ mL}$       b.  $3.2 \times 10^4 \text{ }\mu\text{L} = 32 \text{ mL}$       c.  $0.5 \text{ m}^3 = 5 \times 10^5 \text{ mL}$
10. A: 45 miles is 72 km, so 45 miles is greater than 63 km. [Wow! Check this out in the Firefox Google search box: “(45 miles)/(63 km)” = 1.14953143]
11. Google: “5m x 10m x 2m in ft^3” and get = 3531.46667 ft^3; to one sig fig here, so the answer is 3000 ft<sup>3</sup>
12. A: 12 oz = 354 mL [OK if you say 350, but a “12-oz can” has implied precision that is certainly at least 1/10 of an ounce. Right?]
13. My weight is 70.3 kg [Some of you, of course, are used to knowing your weight in kg.]
14. My height is 1.8 m.
15. 6 gallons of gasoline costs \$21.00. How does a liter cost? A: 6 gal/\$21 is 92 cents/L. [Google: “(\$21/6 gal) in \$/L” Notice how, when you say “6 gallons of gas,” you really mean *six gallons of gas*. You would not accept 5.6, right? The implied precision is higher than that, so we just round to the nearest penny.]
16. a.  $27.0 \text{ km} = 16.8 \text{ miles}$  b. Yup, he's busted. 63 mph.

**One of the lessons here is that you can get a lot of quick answers for yourself and check your own work just using Google.**