

Unit Conversions

Read from **Lesson 4 Calculations in Chemistry** in the **Chemistry Tutorial Section, Chapter 1 of The Physics Classroom**:

Part 4a: [The Factor Label Method](#)

Part 4b: [Unit Conversions](#)

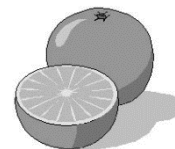
Part 4c: [Significant Digits Revisited](#)

Unit Conversions:

Chemists must show their work to validate data and research. Chemistry students must show their work to receive credit for their answers. Use factor label method or dimensional analysis to make the following conversions – whichever method is preferred by your teacher. Include the answer you get with your calculator and then write the answer with the correct number of significant digits. Don't forget to include units!

1. An orange has 75 mg of vitamin C per serving. Convert this amount of vitamin C to kg.

Work:



Answer from calculator: _____

Answer with the correct number of significant digits and correct units. _____

2. How many grams of sugar are contained in a 5-pound bag of sugar? (1 pound = 453.592 g)

Work:

Answer from calculator: _____

Answer with the correct number of significant digits and correct units. _____

3. Buzz drinks an energy drink before his chemistry test. If one 8.4-ounce energy drink contains 80. mg of caffeine, how many grams of caffeine would be contained in a gallon of this energy drink? (1 gallon = 128 fluid ounces)

Work:

Answer from calculator: _____

Answer with the correct number of significant digits and correct units. _____

4. The price of gas in Paris, France is currently \$2.05 per liter. What is the price of gas per gallon? (1 L= 1.06 quarts)

Work:

Answer from calculator: _____

Answer with the correct number of significant digits and correct units. _____

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5. A washing machine has an approximate volume of 107 L. Convert this volume to mm^3 .

Work:

Answer from calculator: _____

Answer with the correct number of significant digits and correct units. _____

6. The recommended maximum speed on Germany's Autobahn is 130. km/h. What is this speed in m/s?



Work:

Answer from calculator: _____

Answer with the correct number of significant digits and correct units. _____

7. The movement of tectonic plates is known as continental drift and is about 1.5 cm per year. How many meters per second is this rate of continental drift?

Work:

Answer from calculator: _____

Answer with the correct number of significant digits and correct units. _____

8. Sea water has 0.013 milligrams of gold per cubic meter. (This amount changes over time.) How many grams of gold could be found (theoretically) in 1 Liter of this seawater?

Work:

Answer from calculator: _____

Answer with the correct number of significant digits and correct units. _____

9. Fabio needs to move a 20-gallon fish tank. If the density of water is taken as 1.00 g/cm^3 , what is the mass in pounds of the fish tank? (1 pound = 453.592 g, 1 L = 1.06 quarts)

Work:

Answer from calculator: _____

Answer with the correct number of significant digits and correct units. _____