

Problem Solving *continued***Additional Problems**

1. Convert each of the following quantities to the required unit.
 - a. 12.75 Mm to kilometers
 - b. 277 cm to meters
 - c. 30 560 m² to hectares (1 ha = 10 000 m²)
 - d. 81.9 cm² to square meters
 - e. 300 000 km to megameters
2. Convert each of the following quantities to the required unit.
 - a. 0.62 km to meters
 - b. 3857 g to milligrams
 - c. 0.0036 mL to microliters
 - d. 0.342 metric tons to kilograms (1 metric ton = 1000 kg)
 - e. 68.71 kL to liters
3. Convert each of the following quantities to the required unit:
 - a. 856 mg to kilograms
 - b. 1 210 000 μg to kilograms
 - c. 6598 μL to cubic centimeters (1 mL = 1 cm³)
 - d. 80 600 nm to millimeters
 - e. 10.74 cm³ to liters
4. Convert each of the following quantities to the required unit:
 - a. 7.93 L to cubic centimeters
 - b. 0.0059 km to centimeters
 - c. 4.19 L to cubic decimeters
 - d. 7.48 m² to square centimeters
 - e. 0.197 m³ to liters
5. An automobile uses 0.05 mL of oil for each kilometer it is driven. How much oil in liters is consumed if the automobile is driven 20 000 km?
6. How many microliters are there in a volume of 370 mm³ of cobra venom?
7. A baker uses 1.5 tsp of vanilla extract in each cake. How much vanilla extract in liters should the baker order to make 800 cakes? (1 tsp = 5 mL)
8. A person drinks eight glasses of water each day, and each glass contains 300 mL. How many liters of water will that person consume in a year? What is the mass of this volume of water in kilograms? (Assume one year has 365 days and the density of water is 1.00 kg/L.)

Problem Solving *continued*

9. At the equator Earth rotates with a velocity of about 465 m/s.
- What is this velocity in kilometers per hour?
 - What is this velocity in kilometers per day?
10. A chemistry teacher needs to determine what quantity of sodium hydroxide to order. If each student will use 130 g and there are 60 students, how many kilograms of sodium hydroxide should the teacher order?
11. The teacher in item 10 also needs to order plastic tubing. If each of the 60 students needs 750 mm of tubing, what length of tubing in meters should the teacher order?
12. Convert the following to the required units.
- 550 $\mu\text{L/h}$ to milliliters per day
 - 9.00 metric tons/h to kilograms per minute
 - 3.72 L/h to cubic centimeters per minute
 - 6.12 km/h to meters per second
13. Express the following in the units indicated.
- 2.97 kg/L as grams per cubic centimeter
 - 4128 g/dm^2 as kilograms per square centimeter
 - 5.27 g/cm^3 as kilograms per cubic decimeter
 - 6.91 kg/m^3 as milligrams per cubic millimeter
14. A gas has a density of 5.56 g/L.
- What volume in milliliters would 4.17 g of this gas occupy?
 - What would be the mass in kilograms of 1 m^3 of this gas?
15. The average density of living matter on Earth's land areas is 0.10 g/cm^2 . What mass of living matter in kilograms would occupy an area of 0.125 ha?
16. A textbook measures 250. mm long, 224 mm wide, and 50.0 mm thick. It has a mass of 2.94 kg.
- What is the volume of the book in cubic meters?
 - What is the density of the book in grams per cubic centimeter?
 - What is the area of one cover in square meters?
17. A glass dropper delivers liquid so that 25 drops equal 1.00 mL.
- What is the volume of one drop in milliliters?
 - How many milliliters are in 37 drops?
 - How many drops would be required to get 0.68 L?