

UNIT CONVERSIONS AND FACTOR-LABEL METHOD

Name _____

Another method of going from one unit to another involves multiplying by a conversion factor. A conversion factor is a fraction that is equal to the number 1. For example, 60 seconds = 1 hour. Therefore, 60 sec/1 hr or 1 hr/60 sec = 1. When you multiply by the number 1, the value of the number is not changed, although the units may be different.

Example: How many milligrams in 20 kilograms?

Solution: Use the following relationships:

$$1000 \text{ mg} = 1 \text{ g}$$

$$1000 \text{ g} = 1 \text{ kg}$$

1. Start with the original number and unit.
2. Multiply by a unit factor with the unit to be discarded on the bottom and the desired unit on top.
3. Cancel units.
4. Perform numerical calculations.

$$20 \text{ kg} \times \frac{1000 \text{ g}}{1 \text{ kg}} \times \frac{1000 \text{ mg}}{1 \text{ g}} = 20,000,000 \text{ or } 2 \times 10^7 \text{ mg}$$

Perform the following conversions using unit factoring.

1. 500 mL = _____ L
2. 25 cg = _____ g
3. 400 mg = _____ kg
4. 30 cm = _____ mm
5. 3500 secs = _____ hr
6. 2 yrs = _____ secs (Assume 1 year = 365 days)
7. 15 m = _____ mm
8. 0.75 L = _____ mL
9. 6.4 kg = _____ g
10. 7200 m = _____ km
11. 4.2 L = _____ cm³
12. 0.35 km = _____ m
13. 2.3 L = _____ mL
14. 4.5 yds = _____ in
15. 50 mm = _____ km
16. 150 mg = _____ g
17. 150 kg = _____ g
18. 23 mL = _____ L
19. 0.156 g = _____ mg
20. 1.25 L = _____ mL

