

Dimensional Analysis: Factor Label Method

Name: _____ Period: _____ Date: _____

Using this method, it is possible to solve many problems by using the relationship of one unit to another. For example, 12 inches = one foot. Since these two numbers represent the same value, the fractions 12 in/1 ft and 1 ft/12 in are both equal to one. When you multiply another number by the number one, you do not change its value. However, you may change its unit.

Example 1: Convert 2 miles to inches.

$$2 \text{ miles} \times \frac{5,280 \text{ ft}}{1 \text{ mile}} \times \frac{12 \text{ inches}}{1 \text{ ft}} = 126,720 \text{ in}$$

(Using significant figures,
2 mi = 100,000 in.)

Example 2: How many seconds are in 4 days?

$$4 \text{ days} \times \frac{24 \text{ hrs}}{1 \text{ day}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{60 \text{ sec}}{1 \text{ min}} = 345,600 \text{ sec}$$

(Using significant figures,
4 days = 300,000 sec.)

Practice: Show all steps in the conversion for full credit.

EX: 1 - 1.9 miles = _____ yards

EX: 2 - 4.8 gal = _____ cups

1. 500 mL = _____ L

2. 25 cg = _____ g

3. 400 mg = _____ kg

4. 30 cm = _____ km

5. 3500 secs = _____ hr

6. 2 yrs = _____ secs

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