

Learning Dimensional Analysis

(Honors Chemistry)

Using a T-chart, convert the following using "only" the conversion factors provided on your reference sheet. Answers should be in scientific notation with the number of significant digits in the given measurement.

1. Convert 321.7 cm to inches

$$\frac{321.7 \text{ cm}}{2.5 \text{ cm}} \times 1 \text{ inch}$$

$$1.287 \times 10^2 \text{ inches}$$

2. Convert 6.54×10^5 feet to meters

$$\frac{6.54 \times 10^5 \text{ ft}}{3.28 \text{ ft}} \times 1 \text{ m}$$

$$1.99 \times 10^5 \text{ m}$$

3. Convert 1.478×10^3 km to miles

$$\frac{1.478 \times 10^3 \text{ km}}{1.6 \text{ km}} \times 1 \text{ mile}$$

$$9.238 \times 10^2 \text{ miles}$$

4. Convert 6.796×10^2 L to gallons

$$\frac{6.796 \times 10^2 \text{ L}}{3.79 \text{ L}} \times 1 \text{ gal}$$

$$1.793 \times 10^2 \text{ gal}$$

5. Convert 13.49 lbs to kg

$$\frac{13.49 \text{ lbs}}{2.2 \text{ lbs}} \times 1 \text{ kg}$$

$$6.132 \times 10^0 \text{ kg}$$

6. Convert 1.781×10^2 grams to ounces

$$\frac{1.781 \times 10^2 \text{ g}}{28.35 \text{ g}} \times 1 \text{ oz}$$

$$6.282 \times 10^0 \text{ oz}$$

7. Convert 3.5 quarts to liters

$$\frac{3.5 \text{ qts}}{1.06 \text{ qts}} \times 1 \text{ L}$$

$$3.3 \times 10^0 \text{ L}$$

8. Convert 3.291×10^6 mg to kg

$$\frac{3.291 \times 10^6 \text{ mg}}{1000 \text{ mg}} \times \frac{1 \text{ kg}}{1000 \text{ g}}$$

$$3.291 \text{ kg}$$

9. Convert 8.31 hm to cm

$$\frac{8.31 \text{ hm}}{1 \text{ hm}} \times \frac{100 \text{ m}}{1 \text{ m}} \times \frac{100 \text{ cm}}{1 \text{ m}}$$

$$8.31 \times 10^4 \text{ cm}$$

10. Convert $2.467 \times 10^7 \mu\text{g}$ to dag

$2.467 \times 10^7 \mu\text{g}$	1-g	1 dag
	1000000 μg	10-g

2.467 dag

11. Convert 7.35×10^2 hours to seconds

$7.35 \times 10^2 \text{ hrs}$	60 min	60 s
	1 hour	1 min

$2.65 \times 10^6 \text{ sec}$

12. Convert 1.73 kg to cg

1.73 Kg	1000 g	100 cg
	1 Kg	1 g

$1.73 \times 10^5 \text{ cg}$

13. Convert 4.72 km/h to m/s

4.72 km	1000 m	1 hr	1 min
h	1 km	60 min	60 sec

1.31 m/s

14. Convert 4.00 g/cm^3 to kg/dm^3

4.00 g	1 Kg	1000 cm^3
cm^3	1000 g	1 dm^3

4.00 Kg/dm^3

15. Convert $6.72 \text{ dm}^3/\text{s}$ to L/min

6.72 dm^3	1 L	60 sec
s	1 dm^3	1 min

$4.03 \times 10^2 \text{ L/min}$

16. Convert $5.98 \times 10^{-3} \text{ mg/mL}$ to g/L

$5.98 \times 10^{-3} \text{ mg}$	1 g	1000 mL
mL	1000 mg	1 L

$5.98 \times 10^{-3} \text{ g/L}$

17. Convert $7.12 \times 10^{-2} \text{ cm/s}$ to km/h

$7.12 \times 10^{-2} \text{ cm}$	1 m	1 km	60 s	60 min
s	100 cm	1000 m	1 min	1 hr

$2.56 \times 10^{-3} \text{ km/h}$

18. Convert $9.00 \times 10^{-1} \text{ kg/cm}^3$ to mg/mm^3

$9.00 \times 10^{-1} \text{ kg}$	1000 g	1000 mg	1000 cm^3	1 dm^3
cm^3	1 Kg	1 g	1 dm^3	1000000 mm^3

$9.00 \times 10^2 \text{ mg/mm}^3$

19. Convert $1.21 \times 10^2 \text{ cm}^3/\text{s}$ to L/h

$1.21 \times 10^2 \text{ cm}^3$	1 dm^3	1 L	60 sec	60 min
s	1000 cm^3	1 dm^3	1 min	1 hr

$4.36 \times 10^2 \text{ L/h}$

20. Convert $3.4 \times 10^{-1} \text{ kg/mL}$ to $\text{mg}/\mu\text{L}$

$3.4 \times 10^{-1} \text{ Kg}$	1000 g	1000 mg	1000 mL	1 L
mL	1 Kg	1 g	1 L	1000000 μL

$3.4 \times 10^2 \text{ mg}/\mu\text{L}$