

Metric Conversions: Preparation for Metric Conversion Skills Test

1. How many hg are in 27.5 g?

$$27.5g \times \frac{1 \text{ hg}}{100 \text{ g}} = \boxed{0.275 \text{ hg}}$$

2. How many dL are in 345 L?

$$345 \cancel{\text{L}} \times \frac{1 \text{ dL}}{0.1 \cancel{\text{L}}} = \boxed{3450 \text{ dL}}$$

3. If a person runs at a speed of 10.3 m/s, what would their speed be in miles per hour?

$$10.3 \frac{\cancel{\text{m}}}{\cancel{\text{s}}} \times \frac{1 \cancel{\text{km}}}{1000 \cancel{\text{m}}} \times \frac{0.6214 \text{ mi}}{1 \cancel{\text{km}}} \times \frac{60 \cancel{\text{s}}}{1 \text{ min}} \times \frac{60 \cancel{\text{min}}}{1 \text{ h}} = \boxed{23.0 \text{ mi/h}}$$

4. How many Mg are in 15.5 µg?

$$15.5 \mu\text{g} \times \frac{0.000001 \text{ g}}{1 \mu\text{g}} \times \frac{1 \text{ Mg}}{1,000,000 \text{ g}} = \boxed{1.55 \times 10^{-11} \text{ Mg}}$$

5. How many cm<sup>3</sup> are in 25.5 m<sup>3</sup>?

$$25.5 \cancel{\text{m}^3} \times \frac{1000 \cancel{\text{L}}}{1 \cancel{\text{m}^3}} \times \frac{1000 \text{ mL}}{1 \cancel{\text{L}}} \times \frac{1 \text{ cm}^3}{1 \cancel{\text{mL}}} = \boxed{2.55 \times 10^7 \text{ cm}^3 \text{ or } 25500000 \text{ cm}^3}$$

6. Convert 69.0°F to °C and K.

7. 5.5 dm = 0.55 m

$$5.5 \text{ dm} \times \frac{0.1 \text{ m}}{1 \text{ dm}} =$$

10. 7.02 mL = 7.02 mL

$$7.02 \text{ mL} = 7.02 \text{ mL}$$

13. 0.03 hg = 30 dg

$$0.03 \text{ hg} \times \frac{100 \text{ g}}{1 \text{ hg}} \times \frac{1 \text{ dg}}{0.1 \text{ g}} =$$

8. 9.35 mg = 0.00935 g

$$9.35 \text{ mg} \times \frac{0.001 \text{ g}}{1 \text{ mg}} =$$

11. 0.32 dam = 3200 mm

$$0.32 \text{ dam} \times \frac{10 \text{ m}}{1 \text{ dam}} \times \frac{1 \text{ mm}}{0.001 \text{ m}} = 3200$$

9. 401 cm = 4.01 m

$$401 \text{ cm} \times \frac{0.01 \text{ m}}{1 \text{ cm}} =$$

12. 24.8 mL = 2.48 x 10<sup>-5</sup> kL

$$24.8 \text{ mL} \times \frac{0.001 \text{ L}}{1 \text{ mL}} \times \frac{1 \text{ kL}}{1000 \text{ L}} =$$

14. 422 ng = 4.22 x 10<sup>-10</sup> Gg

$$422 \text{ ng} \times \frac{1 \times 10^{-9} \text{ g}}{1 \text{ ng}} \times \frac{1 \text{ Gg}}{1 \times 10^9 \text{ g}} = 4.22 \times 10^{-16} \text{ Gg}$$

15. 15 cL = 1.5 x 10<sup>-7</sup> ML

$$15 \text{ cL} \times \frac{0.01 \text{ L}}{1 \text{ cL}} \times \frac{1 \text{ ML}}{1 \times 10^6 \text{ L}} = 1.5 \times 10^{-7} \text{ ML}$$

16. One cereal bar has a mass of 36 g. What is the mass of 6 cereal bars? Is that more or less than 1 kg? (Show your work!)

$$36 \text{ g} \times 6 = 216 \text{ g}$$

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

$$216 \text{ g} < 1000 \text{ g}$$

17. Kobe needs to move 110 kg of rocks. He can carry 10 hg each trip. How many trips must he make? (Show your work!)

$$110 \text{ kg} \times \frac{1000 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ hg}}{100 \text{ g}} = 1100 \text{ hg} = \frac{1100 \text{ hg}}{10 \text{ hg/trip}} = 110 \text{ trips}$$

18. Will a tablecloth that is 15 cm long cover a table that is 1.6 m long? (Show your work!)

$$15 \text{ cm} \times \frac{0.01 \text{ m}}{1 \text{ cm}} = 0.15 \text{ m}$$

$$0.15 \text{ m} < 1.6 \text{ m}$$

NO

19. Circle the two terms in each group that are related. Explain how they are related.

a. Celsius, mass, Fahrenheit

Both are temperature units

b. Kilogram, liter, cubic centimeter (cm<sup>3</sup>)

Both are volume units

### Matching

d 1. Metric unit of length

a. Celsius

f 2. Tool used to measure length

b. liter

a 3. Temperature scale used in lab

c. balance

c 4. Instrument used to measure mass

d. meter

e 5. Metric unit of mass

e. gram

i 6. Instrument used to measure temperature

f. meter stick

h 7. Amount of matter in an object

g. Kelvin

j 8. Amount of space occupied by an object

h. mass

b 9. Metric unit for volume

i. thermometer

g 10. Temperature scale which is an absolute scale

j. volume

Circle the larger unit in each pair of units.

1. millimeter or kilometer

2. decimeter or dekameter

3. hectogram or decigram

4. centimeter or millimeter

5. hectogram or kilogram

6. dekagram or hectogram

Unit Cancellation – Determine the final units for the following unit only calculations.

1.  $m \times m = m^2$

2.  $cm^3 / cm = cm^2$

3.  $g^2 / g = g$

4.  $g / mL = g/mL$

5.  $J \times s \times 1/s = J$

6.  $g/mL \times mL = g$