

Name _____

METRIC CONVERSIONS USING DIMENSIONAL ANALYSIS

Complete each of the following conversions using dimensional analysis. Show all your work using the four steps discussed in class. See the back page for some helpful conversions.

1. 7.5 g to dg

9. 5500 g to Tg

2. 9 cm to m

10. 32.5 km to fm

3. 15 mL to L

11. 14.5 pL to mL

4. 2.3 km to m

12. 55.8 mm to nm

5. 8.9 dg to g

13. 43 dm to dam

6. 10 nm to m

14. 2.5 Gg to kg

7. 81 dag to g

15. 0.6 cg to mg

8. 35 Mm to m

16. 0.068 kL to L

17. 0.0995 mm to cm

22. 0.089 km³ to mm³

18. 0.095 ng to mg

23. 45.8 mm³ to dm³

19. 0.00805 hm to m

24. 0.35 dam³ to hm³

20. 0.0458 dm³ to cm³

25. 0.0046 Tm³ to km³

21. 0.0011 mm³ to cm³

Some helpful conversions!! In these conversions meters were used, but the meters can be exchanged with grams or liters.

tera (T) 1 Tm = 1 x 10¹² m

deci (d) 1 m = 10 dm

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centi (c) 1 m = 100 cm

mega (M) 1 Mm = 1 x 10⁶ m

milli (m) 1 m = 1000 mm

kilo (k) 1 km = 1 x 10³ m

nano (n) 1 m = 1 x 10⁹ nm

hecto (h) 1 hm = 1 x 10² m

pico (p) 1 m = 1 x 10¹² pm

deka (da) 1 dam = 1 x 10¹ m

femto (f) 1 m = 1 x 10¹⁵ fm

METRIC CONVERSIONS USING DIMENSIONAL ANALYSIS

Complete each of the following conversions using dimensional analysis. Show all your work using the four steps discussed in class. See the back page for some helpful conversions.

1. 7.5 g to dg

$$7.5 \text{ g} \times \left[\frac{10 \text{ dg}}{1 \text{ g}} \right] = \boxed{75 \text{ dg}}$$

2. 9 cm to m

$$9 \text{ cm} \times \left[\frac{1 \text{ m}}{100 \text{ cm}} \right] = \boxed{0.09 \text{ m}}$$

3. 15 mL to L

$$15 \text{ mL} \times \left[\frac{1 \text{ L}}{1000 \text{ mL}} \right] = \boxed{0.015 \text{ L}}$$

4. 2.3 km to m

$$2.3 \text{ km} \times \left[\frac{1000 \text{ m}}{1 \text{ km}} \right] = \boxed{2300 \text{ m}}$$

5. 8.9 dg to g

$$8.9 \text{ dg} \times \left[\frac{1 \text{ g}}{10 \text{ dg}} \right] = \boxed{0.89 \text{ g}}$$

6. 10 nm to m

$$10 \text{ nm} \times \left[\frac{1 \text{ m}}{1 \times 10^9 \text{ nm}} \right] = \boxed{1 \times 10^{-8} \text{ m}}$$

7. 81 dag to g

$$81 \text{ dag} \times \left[\frac{1 \times 10^1 \text{ g}}{1 \text{ dag}} \right] = \boxed{810 \text{ g}}$$

8. 35 Mm to m

$$35 \text{ Mm} \times \left[\frac{1 \times 10^6 \text{ m}}{1 \text{ Mm}} \right] = \boxed{3.5 \times 10^7 \text{ m}}$$

9. 5500 g to Tg

$$5500 \text{ g} \times \left[\frac{1 \text{ Tg}}{1 \times 10^{12} \text{ g}} \right] = \boxed{5.5 \times 10^{-9} \text{ Tg}}$$

10. 32.5 km to fm

$$32.5 \text{ km} \times \left[\frac{1000 \text{ m}}{1 \text{ km}} \right] \left[\frac{1 \times 10^{15} \text{ fm}}{1 \text{ m}} \right] = \boxed{3.25 \times 10^{19} \text{ fm}}$$

11. 14.5 pL to mL

$$14.5 \text{ pL} \times \left[\frac{1 \text{ L}}{1 \times 10^{12} \text{ pL}} \right] \left[\frac{1000 \text{ mL}}{1 \text{ L}} \right] = \boxed{1.45 \times 10^{-8} \text{ mL}}$$

12. 55.8 mm to nm

$$55.8 \text{ mm} \times \left[\frac{1 \text{ m}}{1000 \text{ mm}} \right] \left[\frac{1 \times 10^9 \text{ nm}}{1 \text{ m}} \right] = \boxed{5.58 \times 10^7 \text{ nm}}$$

13. 43 dm to dam

$$43 \text{ dm} \times \left[\frac{1 \text{ m}}{10 \text{ dm}} \right] \left[\frac{1 \text{ dam}}{1 \times 10^1 \text{ m}} \right] = \boxed{4.3 \times 10^{-1} \text{ dam}}$$

14. 2.5 Gg to kg

$$2.5 \text{ Gg} \times \left[\frac{1 \times 10^9 \text{ g}}{1 \text{ Gg}} \right] \left[\frac{1 \text{ kg}}{1000 \text{ g}} \right] = \boxed{2.5 \times 10^6 \text{ kg}}$$

15. 0.6 cg to mg

$$0.6 \text{ cg} \times \left[\frac{1 \text{ g}}{100 \text{ cg}} \right] \left[\frac{1000 \text{ mg}}{1 \text{ g}} \right] = \boxed{6 \times 10^0 \text{ mg}}$$

16. 0.068 kL to L

$$0.068 \text{ kL} \times \left[\frac{1000 \text{ L}}{1 \text{ kL}} \right] = \boxed{6.8 \times 10^1 \text{ L}}$$

17. 0.0995 mm to cm

$$0.0995 \text{ mm} \left[\frac{1 \text{ m}}{1000 \text{ mm}} \right] \left[\frac{100 \text{ cm}}{1 \text{ m}} \right] = 0.00995 \text{ cm}$$

18. 0.095 ng to mg

$$0.095 \text{ ng} \left[\frac{1 \text{ g}}{1 \times 10^9 \text{ ng}} \right] \left[\frac{1000 \text{ mg}}{1 \text{ g}} \right] = 9.5 \times 10^{-8} \text{ mg}$$

19. 0.00805 hm to m

$$0.00805 \text{ hm} \left[\frac{1 \times 10^2 \text{ m}}{1 \text{ hm}} \right] = 0.805 \text{ m}$$

20. 0.0458 dm³ to cm³

$$0.0458 \text{ dm}^3 \left[\frac{(1 \text{ m})^3}{(10 \text{ dm})^3} \right] \left[\frac{(100 \text{ cm})^3}{(1 \text{ m})^3} \right] = 45.8 \text{ cm}^3$$

21. 0.0011 mm³ to cm³

$$0.0011 \text{ mm}^3 \left[\frac{(1 \text{ m})^3}{(1000 \text{ mm})^3} \right] \left[\frac{(100 \text{ cm})^3}{(1 \text{ m})^3} \right] = 1.1 \times 10^{-9} \text{ cm}^3$$

22. 0.089 km³ to mm³

$$0.089 \text{ km}^3 \left[\frac{(1000 \text{ m})^3}{(1 \text{ km})^3} \right] \left[\frac{(1000 \text{ mm})^3}{(1 \text{ m})^3} \right] = 8.9 \times 10^{14} \text{ mm}^3$$

23. 45.8 mm³ to dm³

$$45.8 \text{ mm}^3 \left[\frac{(1 \text{ m})^3}{(1000 \text{ mm})^3} \right] \left[\frac{(10 \text{ dm})^3}{(1 \text{ m})^3} \right] = 4.58 \times 10^{-5} \text{ dm}^3$$

24. 0.35 dam³ to hm³

$$0.35 \text{ dam}^3 \left[\frac{(1 \times 10^1 \text{ m})^3}{(1 \text{ dam})^3} \right] \left[\frac{(1 \text{ hm})^3}{(1 \times 10^2 \text{ m})^3} \right] = 3.5 \times 10^{-4} \text{ hm}^3$$

25. 0.0046 Tm³ to km³

$$0.0046 \text{ Tm}^3 \left[\frac{(1 \times 10^{12} \text{ m})^3}{(1 \text{ Tm})^3} \right] \left[\frac{(1 \text{ km})^3}{(1000 \text{ m})^3} \right] = 4.6 \times 10^{24} \text{ km}^3$$

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