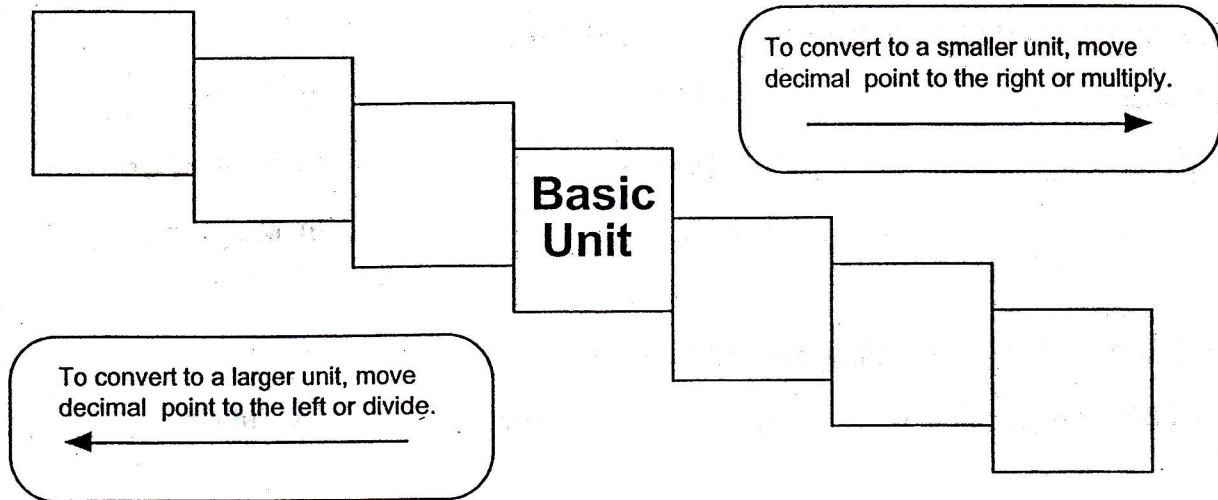


# Metric Mania

## Conversion Practice



1. 5.712 g = \_\_\_\_\_ kg

2. 222.7 L = \_\_\_\_\_ dL

3. 16.45 m = \_\_\_\_\_ cm

4. 39.56 g = \_\_\_\_\_ mg

5. 10.5 g = \_\_\_\_\_ dg

6. 3.54 mg = \_\_\_\_\_ dg

7. 28.6 g = \_\_\_\_\_ hg

8. 910 m = \_\_\_\_\_ dm

9. 0.006700 kg = \_\_\_\_\_ cg

10. 1488 cm = \_\_\_\_\_ hm

11. 42.68 L = \_\_\_\_\_ kL

12. 2.78 cm = \_\_\_\_\_ km

13. 5.44 m = \_\_\_\_\_ cm

14. 15.82 mL = \_\_\_\_\_ cm<sup>3</sup>

15. 0.0568 g = \_\_\_\_\_ mg

16. 0.178 mg = \_\_\_\_\_ g

17. 85.4 cm = \_\_\_\_\_ km

18. 52.13 dg = \_\_\_\_\_ mg

19. 11.50 cL = \_\_\_\_\_ dL

20. 696.7 m = \_\_\_\_\_ mm

21. 7.050 L = \_\_\_\_\_ mL

22. 9.133 g = \_\_\_\_\_ kg

23. 8.24 km = \_\_\_\_\_ dm

24. 43.6 m = \_\_\_\_\_ cm

25. 0.00235 L = \_\_\_\_\_ kL

- Ethan lives at one end of Park Avenue. Brian lives at the other end of the avenue. It is 5.8 kilometers from one end of Park Avenue to the other. If Ethan walks 2.79 kilometers toward Brian's house, how many more METERS does he have to walk to get there?
- Devin had the chicken pox and had to stay inside even though he didn't feel very bad at all. He decided to make a cake to surprise his mother. The recipe said he needed 4 deciliters of milk. How many LITERS of milk did he need?
- Aaron and Noah wanted to have a contest to see which of their paper airplanes could fly the longest distance. Aaron's plane flew 4 meters. Noah's plane flew 79 centimeters. How much further did Aaron's plane fly in METERS?

# Metric Mania

## Conversion Challenge

Write the correct abbreviation for each metric unit.

- |                   |                     |                     |
|-------------------|---------------------|---------------------|
| 1) Kilogram _____ | 4) Milliliter _____ | 7) Kilometer _____  |
| 2) Meter _____    | 5) Millimeter _____ | 8) Centimeter _____ |
| 3) Gram _____     | 6) Liter _____      | 9) Milligram _____  |

Try these conversions, using the ladder method.

- |                      |                      |                       |
|----------------------|----------------------|-----------------------|
| 1) 2000 mg = _____ g | 6) 5 L = _____ mL    | 11) 16 cm = _____ mm  |
| 2) 104 km = _____ m  | 7) 198 g = _____ kg  | 12) 2500 m = _____ km |
| 3) 480 cm = _____ m  | 8) 75 mL = _____ L   | 13) 65 g = _____ mg   |
| 4) 5.6 kg = _____ g  | 9) 50 cm = _____ m   | 14) 6.3 cm = _____ mm |
| 5) 8 mm = _____ cm   | 10) 5.6 m = _____ cm | 15) 120 mg = _____ g  |

Compare using <, >, or =.

- |                      |                  |                      |
|----------------------|------------------|----------------------|
| 16) 63 cm ○ 6 m      | 17) 5 g ○ 508 mg | 18) 1,500 mL ○ 1.5 L |
| 19) 536 cm ○ 53.6 dm | 20) 43 mg ○ 5 g  | 21) 3.6 m ○ 36 cm    |

### Negative Exponents

Express 0.006 57 in scientific notation.

Scientific Notation

0.006 57

Each time the decimal place is moved one place to the right,

$$\begin{aligned} 0.006\ 57 \times 10^0 &= 0.0657 \times 10^{-1} \\ 0.0657 \times 10^{-1} &= 0.657 \times 10^{-2} \\ 0.657 \times 10^{-2} &= 6.57 \times 10^{-3} \\ 6.57 \times 10^{-3} & \end{aligned}$$

the exponent is decreased by one.

### Positive Exponents

Express 1234.56 in scientific notation.

1234.56

Each time the decimal place is moved one place to the left,

$$\begin{aligned} 1234.56 \times 10^0 &= 123.456 \times 10^1 \\ 123.456 \times 10^1 &= 12.3456 \times 10^2 \\ 12.3456 \times 10^2 &= 1.234\ 56 \times 10^3 \\ 1.234\ 56 \times 10^3 & \end{aligned}$$

the exponent is increased by one.

A number in which only one digit is placed to the left of the decimal

$$N \times 10^n$$

An exponent of 10 by which the number is multiplied

### Addition and Subtraction

Before numbers in scientific notation can be added or subtracted, the exponents must be equal.

$$\begin{aligned} \text{Not equal} & \quad \text{Equal} \\ (3.4 \times 10^2) + (4.57 \times 10^3) &= (0.34 \times 10^3) + (4.57 \times 10^3) \\ \uparrow & \quad \uparrow \\ \text{The decimal is moved} & \\ \text{to the left to increase} & \\ \text{the exponent.} & \\ &= (0.34 + 4.57) \times 10^3 \\ &= 4.91 \times 10^3 \end{aligned}$$

### Multiplication

When numbers in scientific notation are multiplied, only the number is multiplied. The exponents are added.

$$\begin{aligned} (2.00 \times 10^3)(4.00 \times 10^4) &= (2.00)(4.00) \times 10^{3+4} \\ &= 8.00 \times 10^7 \end{aligned}$$

### Division

When numbers in scientific notation are divided, only the number is divided. The exponents are subtracted.

$$\begin{aligned} \frac{9.60 \times 10^7}{1.60 \times 10^4} &= \frac{9.60}{1.60} \times 10^{7-4} \\ &= 6.00 \times 10^3 \end{aligned}$$

1.  $3.83 \times 10^1$
2.  $8.07 \times 10^{-1}$
3.  $3.99 \times 10^{-2}$
4.  $4.95 \times 10^3$
5.  $3.32 \times 10^2$
6.  $7.9 \times 10^0$
7.  $6.01 \times 10^{-2}$
8.  $7.83 \times 10^3$
9.  $5.35 \times 10^{-3}$
10.  $1.58 \times 10^4$
11.  $9.87 \times 10^{-4}$
12.  $7.03 \times 10^{-1}$
13.  $8.36 \times 10^{-3}$
14.  $1.09 \times 10^1$
15.  $2.33 \times 10^0$
16.  $1.5 \times 10^3$
17.  $1.5 \times 10^{-3}$
18.  $3.75 \times 10^{-2}$
19.  $3.75 \times 10^2$
20.  $2.2 \times 10^5$
21.  $3.35 \times 10^{-1}$
22.  $1.2 \times 10^4$
23.  $1.0 \times 10^{-4}$
24.  $1.0 \times 10^{-1}$
25.  $4.0 \times 10^0$
26. 0.563
27. 0.000116
28. 425
29. 6770
30. 0.0974
31. 0.0278
32. 31.8
33. 0.093
34. 72000
35. 0.0177
36. 3350
37. 0.01
38. 0.544
39. 6550
40. 0.005
41. 5050
42. 0.0008
43. 1000
44. 0.25
45. 0.025
46. 0.0025
47. 5000
48. 4,200,000
49. .00000000015
50.  $(1.2 \times 10^5) + (5.35 \times 10^6)$
51.  $(6.91 \times 10^{-2}) + (2.4 \times 10^{-3})$
52.  $(9.7 \times 10^6) + (8.3 \times 10^5)$
53.  $(3.8 \times 10^6) + (5.99 \times 10^1)$
54.  $(9.9 \times 10^7) + (3.14 \times 10^6)$
55.  $(2.78 \times 10^8) + (4.15 \times 10^3)$
56.  $(3.67 \times 10^2) - (1.6 \times 10^1)$
57.  $(8.41 \times 10^{-5}) - (7.9 \times 10^{-6})$
58.  $(1.33 \times 10^5) - (4.9 \times 10^4)$
59.  $(6.74 \times 10^1) - (2.98 \times 10^4)$
60.  $(5.55 \times 10^6) - (4.3 \times 10^{-4})$
61.  $(8.9 \times 10^2) - (2.6 \times 10^3)$
62.  $(4.3 \times 10^8) \times (2.1 \times 10^6)$
63.  $(6.4 \times 10^3) \times (1.5 \times 10^{-2})$
64.  $(4.4 \times 10^{-2}) \times (8.0 \times 10^{-1})$
65.  $(1.2 \times 10^{-3}) \times (3.3 \times 10^2)$
66.  $(9.98 \times 10^3) \times (3.2 \times 10^2)$
67.  $(1.12 \times 10^4) \times (2.11 \times 10^3)$
68.  $(7.8 \times 10^3) \div (1.2 \times 10^4)$
69.  $(8.1 \times 10^{-2}) \div (9.0 \times 10^2)$
70.  $(6.22 \times 10^{-2}) \div (2.54 \times 10^3)$
71.  $(1.8 \times 10^{-2}) \div (5.6 \times 10^7)$
72.  $(8.04 \times 10^5) \div (2.3 \times 10^3)$
73.  $(2.2 \times 10^1) \div (1.3 \times 10^4)$
74.  $[(1.32 \times 10^4)(3.45 \times 10^2)] \div [(5.4 \times 10^{-3})(4.3 \times 10^2)]$