

Review: Metric System, Scientific Notation, Significant Figures, Unit Conversion

1. Determine the number of Significant Figures

- a. 1 1
- b. 15 2
- c. 270 2
- d. 152700 4
- e. 14750 4
- f. 20000 1
- g. 100470 5
- h. 5275000 5
- i. 1×10^{20} 1
- j. 1.0×10^{21} 2
- k. 0.052 2

- l. 0.0001010 4
- m. 10000 3
- n. 4.07×10^{-12} 3
- o. 2.73000×10^{10} 6
- p. 0.7 1
- q. 1400.0 5
- r. 1234 4
- s. 500 1
- t. 2.0×10^1 2

2. Give the fundamental unit and symbol for the following

	<u>Unit</u>	<u>Symbol</u>
a. Length	<u>Meter</u>	<u>m</u>
b. Mass	<u>Kilogram</u>	<u>kg</u>
c. Current	<u>Ampere</u>	<u>A</u>
d. Light Intensity	<u>candela</u>	<u>cd</u>
e. Time	<u>Second</u>	<u>s</u>
f. Matter	<u>Mole</u>	<u>mol</u>

3. Convert from one unit to the other

- a. $1000 \text{ mm}^{10^{-3}}$ to 1 m^{10^0}
- b. 10 dg^{-1} to 100 cg^{-2}
- c. 1.25 Mm^6 to 1250 km^3
- d. $14000 \mu\text{s}^{-6}$ to 0.014 s^0
- e. 27 Gm^9 to 2700000000000 m^0
- f. $1.2 \times 10^7 \mu\text{s}^{-6}$ to 1.2×10^{-2} ks^3

- g. $7 \times 10^{-4} \text{ g}$ to 0 7×10^{-1} mg^{-3}
- h. $4 \times 10^{-7} \text{ cm}$ to -2 4×10^{-3} μm^{-6}
- i. $1.5 \times 10^{-3} \text{ m}$ to 0 1.5×10^{-6} km^3
- j. $1428 \times 10^{-3} \text{ g}$ to 0 1428×10^{-1} cg^{-2}

4. Express each of these in Scientific Notation

- a. 1000 1×10^3
- b. 0.04 4×10^{-2}
- c. 1,000,000 1×10^6
- d. 700000 7.00×10^5
- e. 727,000,000 7.27×10^8
- f. 2,052,000 2.052×10^6
- g. 427,000,000,000 4.27×10^{11}
- h. 30000 3×10^4

- i. 0.0503 5.03×10^{-2}
- j. 0.00007280 7.280×10^{-5}
- k. 54.38 5.438×10^1
- l. 0.0000000757 7.57×10^{-8}

5. Write in Expanded Form

a. 4.7×10^8 470,000,000
 b. 1.00×10^{-4} 0.000100
 c. 4.578×10^{10} 45,780,000,000

d. 5×10^4 50000
 e. 428×10^{-7} .0000428
 f. 9.4300×10^{10} 94300000000

6. Solve using correct Significant Figures

a. $5.270\text{mm} + 9.51\text{mm} + 12.731\text{mm}$ $27.511 \rightarrow 27.51$
 b. $57.871\text{ kg} + 17.98\text{ kg} + 12.719\text{ kg}$ $88.57 \rightarrow 88.57$
 c. $17.82\text{ s} - 5.628\text{ s}$ $12.192 \rightarrow 12.19$
 d. $7.2\text{ m} \times 8.47\text{ m} \times 4.2\text{ m}$ $256.1328 \rightarrow 260$
 e. $487.29\text{ kg}^2 / 1.5\text{ kg}$ $324.86 \rightarrow 320$
 f. $427\text{ L} \times 420\text{ mm} / 760\text{ mm} \times 573\text{ k} / 290\text{ k}$ $466.251419 \rightarrow 470$

7. Convert the following to the equivalent units:

a. 3 universal mass units (u) to MeV

$$3\text{ u} \times \frac{9.31 \times 10^2 \text{ MeV}}{1\text{ u}} = 2793 \text{ MeV}$$

b. $4.8 \times 10^{-2}\text{ J}$ to eV

$$4.8 \times 10^{-2}\text{ J} \times \frac{1\text{ eV}}{1.6 \times 10^{-19}\text{ J}} = 3 \times 10^{17}\text{ eV}$$

c. 8.263×10^7 elementary charges (e) to C

$$8.263 \times 10^7\text{ e} \times \frac{1.6 \times 10^{-19}\text{ C}}{1\text{ e}} = 1.32 \times 10^{-18}\text{ C}$$