

Metric Conversions / Factor Labeling Practice

Name: _____

Part I: Factor Labeling (Dimensional Analysis) – ALL UNITS (Non-Metric)!

Conversion Factors:

$1 \text{ mL} = 1 \text{ cm}^3$

$1 \text{ cal} = 4.184 \text{ Joules}$

$1 \text{ mol} = 6.02 \times 10^{23} \text{ atoms}$

$1 \text{ hr} = 3600 \text{ sec}$

$1 \text{ mol} = 22.4 \text{ L}$

$1 \text{ atm} = 101.3 \text{ kPa} = 760 \text{ mmHg}$

$1 \text{ hr} = 60 \text{ min}$

$1 \text{ min} = 60 \text{ sec}$

Example #1: $53.0 \text{ L} = ? \text{ mol} \rightarrow$ _____ mol

Example #2: $3.40 \text{ kPa} = ? \text{ mmHg} \rightarrow$ _____ mmHg

Example #3: $600. \text{ sec} = ? \text{ min} \rightarrow$ _____ min

Perform the following conversions by showing the **FACTOR LABELING METHOD**. Show units in answer!

1) $850. \text{ Joules} = ? \text{ cal} \rightarrow$ _____ (in scientific notation form)

2) $12.0 \text{ cm}^3 = ? \text{ mL} \rightarrow$ _____ (in scientific notation form)

3) $4.20 \text{ atm} = ? \text{ kPa} \rightarrow$ _____

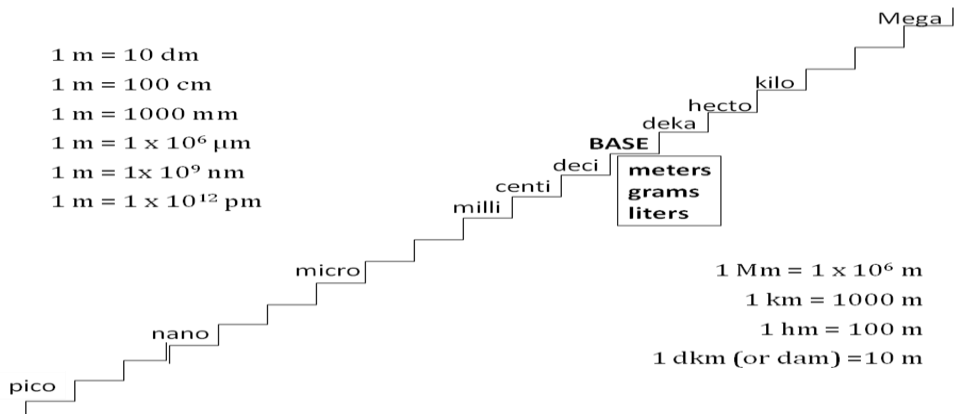
4) $800. \text{ mmHg} = ? \text{ atm} \rightarrow$ _____ (in scientific notation form)

5) $2.93 \text{ mol} = ? \text{ atoms} \rightarrow$ _____

6) $39.0 \text{ L} = ? \text{ mol} \rightarrow$ _____

7) $8.90 \times 10^{25} \text{ atoms} = ? \text{ mol} \rightarrow$ _____

8) $3.20 \text{ min} = ? \text{ sec} \rightarrow$ _____



Part II: Factor Labeling (Dimensional Analysis) – METRIC SYSTEM!

Example #1: 23.0 km = ? m → _____ m

Example #2: 133 cm = ? km → _____ km

Example #3: 0.800 hm = ? mm → _____ mm

Perform the following conversions by showing the FACTOR LABELING METHOD. Show units in answer!

9) 35.0 hm = ? m → _____

10) 180. pg = ? g → _____ (in scientific notation form)

11) 2.50 km = ? dm → _____

12) 964 nm = ? cm → _____

13) 10,340 μL = ? hL → _____ (in standard form)

14) 40.0 mL = ? μL → _____

Part III: Complete the following table using the given information. NOTE: Research may be required for various derived quantities.

Unit Name / Measurement	S.I. Unit Symbol	Concept/Idea	Fundamental or Derived?	Related Unit(s)
	kg		Fundamental	
		length x width x height		dm^3
		temperature: average kinetic energy of particles		Celsius, Fahrenheit
	g/mL		Derived (from mass, volume)	
	m/s^2	gravity		