

## Dimensional Analysis Worksheet – Metrics

Convert the following measurements, using conversion factors, also known as DIMENSIONAL ANALYSIS. You must show conversion factors, with units cancelling. This is the only way to get credit! The first few are started for you. SIG FIGS!

### PART I: 1-step conversions:

Setting up Conversion Factors - **Suggested method:** when converting from one unit to another, always make the larger unit the “1” unit. Then use the multiplier off the metric prefixes chart to determine value for the other unit.

- Ex: I am comparing micrometers ( $\mu\text{m}$ ) and meters (m).
- Meters are larger than  $\mu\text{m}$ , so I write “1m”
- The multiplier for  $\mu$  is  $10^{-6}$ , so I make the exponent positive. “ $10^6 \mu\text{m}$ ”
- The relationship between  $\mu\text{m}$  and m is  $1 \text{ m} = 10^6 \mu\text{m}$

1.  $5602 \text{ cL} = ? \text{ L}$        $5602 \text{ cL} \times \frac{\text{L}}{\text{cL}} = \text{L}$

2.  $802 \text{ g} = ? \text{ hg}$        $802 \text{ g} \times \frac{\text{hg}}{\text{g}} = \text{hg}$

3.  $952.8 \text{ km} = ? \text{ m}$        $952.8 \text{ km} \times \frac{\text{m}}{\text{km}} = \text{m}$

4.  $300 \text{ nm} = ? \text{ m}$       \_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

5.  $610 \text{ pL} = ? \text{ L}$

**PART II: 2-step conversions:** set it up the same basic way, but you will need two conversion factors. Go through base units!!! (g, s, m, L)

6.  $0.0078 \text{ Mg} = ? \text{ cg}$        $0.0078 \text{ Mg} \times \frac{\text{g}}{\text{Mg}} \times \frac{\text{cg}}{\text{g}} = \text{cg}$

7.  $8.18 \text{ daL} = ? \text{ nL}$        $8.18 \text{ daL} \times \frac{\text{L}}{\text{daL}} \times \frac{\text{nL}}{\text{L}} = \text{nL}$

8.  $9.12 \times 10^6 \text{ pm} = ? \text{ hm}$        $9.12 \times 10^6 \text{ pm} \times \frac{\text{m}}{\text{pm}} \times \frac{\text{hm}}{\text{m}} = \text{hm}$

9.  $0.2810 \text{ Gg} = ? \text{ kg}$       \_\_\_\_\_  $\times$  \_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

10.  $6,444 \text{ dm} = \text{dam}$

### PART 3: Setting up conversion factors

Using the suggested method above, show the relationship between the 2 given units.

11. \_\_\_\_\_ km = \_\_\_\_\_ m

15. \_\_\_\_\_ m = \_\_\_\_\_ Mm

12. \_\_\_\_\_  $\mu\text{g}$  = \_\_\_\_\_ g

16. \_\_\_\_\_ pg = \_\_\_\_\_ mg

13. \_\_\_\_\_ L = \_\_\_\_\_ mL

14. \_\_\_\_\_ g = \_\_\_\_\_ dg