# Lab 2: Metric Conversion Lab Response Form

## Name and Course Section:

**Practice which metric unit (meters, grams, or liters) would be appropriate to use in the following scenarios:**

1a. A medication pill/capsule:

1b. A cup of drinking water:

1c. The length of a microscope slide:

1d. The height of a building:

1e. The mass of the human body:

1f. A bottle of liquid shampoo:

**Additionally, are the following quantities greater or less than the base unit?**

2a. Kilogram (kg):

2b. Deciliter (dl):

2c. Micrometer (µm):

2d. Megaliter (Ml):

2e. Nanogram (ng):

2f. Gigameter (Gm):

**Practice writing the following numbers in scientific notation:**

3a. 1 =

3b. 0.03 =

3c. 4000 =

3d. 0.0000372 =

3e. 0.2 =

3f. 4,793,970 =

**Practice using the unit cancellation method by performing the following metric conversions. Please show your work and write your answers in scientific notation.**

4. 50 cg = \_\_\_\_\_\_\_\_ m

5. 4 x 10-1 kg = \_\_\_\_\_\_\_ g

6. 250 ml = \_\_\_\_\_\_\_ l

7. 3.5 x 103 g = \_\_\_\_\_ dg

8. 15 µl = \_\_\_\_\_\_ ml

9. 50 Gl = \_\_\_\_\_\_\_ l

10. 0.000732 nm = \_\_\_\_\_\_\_µm

11. 12 x 103 hg = \_\_\_\_\_\_\_\_ Mg

12. 300 µg = \_\_\_\_\_\_\_ g

13. 175 x 10-2 kl = \_\_\_\_\_\_\_\_\_\_ cl

With this in mind, **practice converting from the imperial system to the metric system and vice versa. Please show your work.**

14. 15 in = \_\_\_\_\_\_\_ cm

15. 300 ml = \_\_\_\_\_\_ fluid oz

16. 7.93 g = \_\_\_\_\_\_\_ tsp

17. 10 gal = \_\_\_\_\_\_\_ l

18. 5 tbsp = \_\_\_\_\_\_ g

19. 140 lbs = \_\_\_\_\_\_\_ g

20. 25 miles = \_\_\_\_\_\_ km

## Word problems

* 1. Over-the-counter ibuprofen is typically 200 milligrams (mg) per pill. How many grams (g) is one pill?
	2. Many treatments for cancer carry the risk of damaging healthy tissue. However, nanotechnology drug delivery enables site-specific treatment, precisely targeting cancer cells within a tumor. Approximately 200 nanograms (ng) of nanoparticles (the drug) can accumulate in a tumor. How many grams of nanoparticles can be delivered into a tumor?
	3. Your laptop died, so you need to buy a new one. You use your laptop for school, and you also store your photos, music, and games on it. While you are shopping, you find laptops with the following hard drive sizes: 500 Gigabytes (GB), 700,000 Megabytes (MB), and 2 x 108 kilobytes (KB) for the same price. Which storage capacity is the best deal?
	4. A forensic scientist is investigating a murder case and collects hair evidence. A root of hair can provide 12 nanograms (ng) of deoxyribonucleic acid (DNA) (Bukyya et al. 2012). However, they need at least 0.025 micrograms (µg) of DNA to perform polymerase chain reaction (PCR) to amplify and analyze the DNA. How many roots of hair will the scientist need to perform PCR?
	5. The recommended dietary protein allowance for humans is 0.8 gram (g) per kilogram (kg) of body weight daily (Ryan-Harshman et al. 2006). If someone weighs 60 kg, how many decigrams (dg) of protein should they eat each day?
	6. One American football field (including the end zones) is 120 yards long. How many meters (m) is this? How many centimeters (cm)?
	7. How many miles do you have to commute to COD? How many km is this?
	8. The average gas tank capacity for a Toyota sedan is 45-55 liters. What is the gas tank capacity in gallons?
	9. Sara is studying abroad in Europe and craves chocolate chip cookies. Her famous recipe requires 5/8 of a teaspoon (tsp) of cinnamon. How many grams (g) of cinnamon will she need to purchase at the market?
	10. A Monster energy drink contains 86 milligrams (mg) of caffeine per 16-ounce can. How many tablespoons (tbsp) of caffeine will a person consume if they drink the whole can?