

Unit 1 Study Guide

1. Match the description on the right to the appropriate quantity on the left.

2 m ³	(a) mass of a small paper clip
0.5 g	(b) length of a small paper clip
0.5 kg	(c) length of a stretch limousine
600 cm ²	(d) volume of a refrigerator compartment
20 mm	(e) surface area of the cover of this workbook
	(f) mass of a jar of peanut butter

2. Use the equation for density in your notes to solve the following.

- a. An unknown solid has a mass of 1.846 lb. The volume of the solid is 3.17 fluid ounces. Calculate the density of the solid.

- b. Use the chart of the densities below to determine which element is most likely the unknown solid from (a).

3. Use the table below to identify the following samples.

- a. You have a white powder with a mass of 50.0 g and a volume of 23.1 mL. What most likely is the powder?
- b. A beaker of a clear liquid sits on your desk. The liquid has a volume of 180mL and a mass of 142 g. What is the liquid most likely to be?
- c. You have a metal pellet. It has a mass of 80.0g and a volume of 10.18mL. What is the material the pellet is composed of?

SUBSTANCE	DENSITY (g/ml) AT 25°C
Gold	19.3
Copper	8.94
Iron	7.86
Aluminum	2.70
Table salt	2.164
Sucrose	1.587
Water	.997
Ethanol	.789

4. Identify which number in each of the following pairs has the greater number of significant figures by circling it. Then tell how many significant figures are in each measurement.

- | | |
|---|-----------------------|
| a. 8.9100 kg or 8910 | c. 310m or 301m |
| b. 1.5×10^{23} atoms or 105 mol (1 mol = 6.02×10^{23}) | d. 4.000 km or 4000 m |
| | e. 1.21 L or 1200 mL |

5. Determine the number of significant figures in each of the following measurements.

- | | |
|---------------|-------------|
| a. 503 m | d. 2.407 μg |
| b. 0.00015 mg | e. 500 mL |
| c. 630 mL | f. 10,001 m |

6. Write the following measurements in scientific notation.

- | | |
|-----------------|------------|
| a. 0.00000154 m | d. 0.1 mL |
| b. 134, 230.4 g | e. 1 L |
| c. 10 g | f. .001 mg |

7. For each measurement. Determine if the first is <, >, or = to the second.

- | | |
|--|---|
| a. 540 nm _____ 5.40 pm | c. 4.5×10^{-4} Mm _____ 4.5 μm |
| b. 35 m^3 _____ $3.5 \times 10^9 \text{ mm}^3$ | d. 135 cm _____ 13.5 dam |

8. In medieval Britain, property was often measured in units such as fardells, nooks, yards, and hides. Using the following conversions, calculate the number of fardells in eight hides. Two fardells = one nooke; Four nooks = one yard; Four yards = one hide

9. Convert 38.75 ft² to square miles, km², and m².

10. If Gasp cigarettes have 5 mg tar and 0.4 mg nicotine per cigarette and there are 20 cigarettes per pack, how many packs of cigarettes would have to be smoked to coat your lungs with 4 oz (1/4 lb.) of tar? How many packs would you have to smoke to introduce your lungs to one gram of the drug nicotine?

11. At one time Rigel IV, a class M planet, had a system of weights and measures called the Bozo system. This system was created and used by the Bozonians, who lived on a continent in the Northern hemisphere, and had all of the deficiencies of the current English system on earth. The relationships between the various units used for length in the Bozo system are given below: 325 cubebs = 1 furbish, 6 furbishes = 1 nautical smile, 20 nautical smile = 1 minor league, 3 minor leagues = 1 major league. Using the mentioned conversion factors determine the number of cubebs a Bozonian would have to walk if his doctor recommended that he walk 2 major leagues each day to maintain cardiovascular health.