

**1 • Matter and Measurement****MATH PRETEST**

Show your work for each problem.

1. The mass of a paperclip is about 0.525 grams. What is the mass of this paperclip in kg? (Report your answer in scientific notation).

$$0.525 \text{ g} \times \frac{1 \text{ kg}}{1000 \text{ g}} = .000525 \text{ kg}$$

$$\boxed{5.25 \times 10^{-4} \text{ kg}}$$

2. A liquid has a density of 1.48 g/cm<sup>3</sup>. What volume of liquid has a mass of 5.00 grams?

$$5.00 \text{ g} \times \frac{1 \text{ cm}^3}{1.48 \text{ g}} = 3.37837 \text{ cm}^3$$

$$\boxed{3.38 \text{ cm}^3}$$

3. The density of aluminum is 2.70 g/cm<sup>3</sup>. If a cube of aluminum weighs 13.5 grams, what is the length of the edge of the cube?

$$13.5 \text{ g} \times \frac{1 \text{ cm}^3}{2.70 \text{ g}} = 5.00 \text{ cm}^3$$

$$L \times L \times L = 5.00 \text{ cm}^3$$

$$L = \sqrt[3]{5.00 \text{ cm}^3}$$

$$= 1.7099 \text{ cm}$$

$$= \boxed{1.71 \text{ cm}}$$

4. Convert 15 years to seconds. [Use 365.25 days per year to account for leap years.]

$$15 \text{ yr} \times \frac{365.25 \text{ days}}{1 \text{ yr}} \times \frac{24 \text{ hr}}{1 \text{ day}} \times \frac{3600 \text{ s}}{1 \text{ hr}} = 473364000 \text{ sec}$$

$$= \boxed{4.73 \times 10^8 \text{ sec}}$$

5. The number, three hundred fifty thousand, written in scientific notation is best written as

350 000

$$\boxed{3.5 \times 10^5}$$

6. How many cm<sup>2</sup> are in an area of 4.21 in<sup>2</sup>?

$$4.21 \text{ in}^2 \times \frac{(2.54 \text{ cm})^2}{(1 \text{ in})^2} = \boxed{27.4 \text{ cm}^2}$$

Google: "convert inches to cm"

7. In an experiment, you measure the density of aluminum as 2.60 g/cm<sup>3</sup>. The accepted value is 2.70 g/cm<sup>3</sup>. What is the percent error in your measurement?

$$\% \text{ Error} = \frac{|\text{ACCEPTED} - \text{EXPT}|}{\text{ACCEPTED}} \times 100$$

$$= \frac{2.70 - 2.60}{2.70} \times 100$$

$$= \boxed{3.70 \%}$$