Dimensional Analysis Worksheet KEY

1. Use Dimensional Analysis to solve the following problems.

a. How many seconds old are you? (Express with 2 sig figs in scientific notation.) [assume 22 yrs old]

$$\frac{22\ yr}{} \cdot \frac{365\ d}{yr} \cdot \frac{24\ h}{d} \cdot \frac{3600\ s}{h} = 693{,}792{,}000 = 690{,}000{,}000 = 6.9 \times 10^{8}$$

b. Convert the distance from school to home from miles to inches. (2 sig figs in sci. not.) [assume 5.2 mi.]

$$\frac{5.2\ mi}{} \cdot \frac{5280\ ft}{mi} \cdot \frac{12\ in}{ft} = 329{,}472 = 330{,}000 = 3.3 \times 10^{5}\ in$$

c. How many kilometers is it from school to home? (Express with 2 sig figs in scientific notation.)

$$\frac{5.2\ mi}{} \cdot \frac{100\ km}{62\ mi} = \text{[illegible]}\ km$$

d. A person's weight is 154 pounds. Convert this to kilograms. (1 lbs. = 454 grams)

$$\frac{154\ lb}{} \cdot \frac{454\ g}{1\ lb} \cdot \frac{kg}{1000\ g} = 69.916 = 69.9\ kg$$

2. Solve using the conversion factors that are listed in the table below.

a. [illegible] How many nautical miles is this?

[illegible]

b. [illegible] Convert this to meters.

[illegible]

c. [illegible] How many kilometers is this?

[illegible]

d. If you are rationed to 20 gills of fresh water a day. How many liters is this?

$$\frac{20\ gills}{} \cdot \frac{pt}{4\ gills} \cdot \frac{qt}{2\ pt} \cdot \frac{1\ L}{1.06\ qt} = 2.35849\ldots = 2.4\ L$$

4. [illegible]

$$\frac{7.4\ m}{} \cdot \frac{100\ cm}{m} \cdot \frac{in}{2.54\ cm} \cdot \frac{hand}{4\ in} = 72.8\ldots = 73\ hands$$

5. [illegible] How many liters would you collect in 1 week?

$$\frac{1.0\ pecks}{d} \cdot \frac{32\ qt}{4\ pecks} \cdot \frac{L}{1.06\ qt} \cdot \frac{7\ d}{week} = 52.83019\ldots = 53\ L/week$$

6. $\frac{3.5\ T.S.}{1} \times \frac{36\ mi^2}{1\ T.S.} \times \frac{(5280)^2\ ft^2}{1\ mi^2} \times \frac{1\ yd^2}{9\ ft^2} = 3.9 \times 10^{8}\ yd^2$