

Name: \_\_\_\_\_ **Answers** \_\_\_\_\_

## Unit 2 Review

### Perform the following conversions:

$5.3 \text{ mm to cm } \underline{0.53}$

$0.0003 \text{ km to mm } \underline{300}$

$17 \text{ cm to mm } \underline{170}$

$828 \text{ cs to ms } \underline{8280}$

$5001 \text{ g to kg } \underline{5.001}$

$4 \text{ cg to g } \underline{.04}$

$0.010 \text{ kg to g } \underline{10}$

$503 \text{ s to ms } \underline{503000}$

$125 \text{ cm to km } \underline{.00125}$

$1 \text{ mL to L } \underline{.001}$

### Indicate the number of significant figures in each of the following:

$12 \underline{2}$

$1.01 \underline{3}$

$1098 \underline{4}$

$1000 \underline{1}$

$2001 \underline{4}$

$22.0403 \underline{6}$

$2.001 \underline{4}$

$525.00000 \underline{8}$

$0.0000101 \underline{3}$

$0.0900 \underline{3}$

### Perform the following calculations, answering with the proper number of significant figures

$\frac{2.00}{3.00} = \underline{.667}$

$\frac{(4.031)(0.08206)(373.1)}{0.995} = \underline{124}$

$55.0001 + 0.0002 + 0.104 = \underline{55.104}$

$\frac{0.15}{28.062} = \underline{.0053}$

$(0.14)(6.022) = \underline{.84}$

$\frac{0.500}{44.02} = \underline{.0114}$

$52.331 + 26.01 - 0.9981 = \underline{77.34}$

$(0.0043)(0.0821)(298) = \underline{.11}$

Nickels are composed of an alloy containing both copper and nickel. A student finds that the mass of a nickel is 4.89 g. She then determines the mass of the copper in the coin to be 3.66 g and the mass of the nickel in the coin to be 1.23 g. Determine the percent composition of EACH metal in the nickel.

$\text{Copper} = (3.66\text{g}/4.89\text{g}) \times 100 = 74.8\%$

$\text{Nickel} = (1.23\text{g}/4.859\text{g}) \times 100 = 25.2\%$

If the accepted mass of copper in a nickel is 3.75 grams, what is the % error from the experiment above?

$((3.66\text{g}-3.75\text{g})/3.75\text{g}) \times 100 = 2.40$

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## Significant Figures Worksheet

For each of the following values, state the number of significant figures. Additionally, circle the digit that is estimated.

1,230 3

2.305 4

0.010070 5

0.0007 1

7.00 3

23.71 4

2.0 2

9.00 3

Round off the following values.

237 to 1 SF 200

71,231 to 3 SF 71,200

63,120 to 2 SF 63,000

0.012345 to 4 SF 0.01235

0.000912 to 1 SF 0.0009

0.00009238 to 3 SF 0.0000924

1,923,100 to 3 SF 1,920,000

14.023 to 3 SF 14.0

Perform the following operations. Indicate the number of significant figures in each number, as well as the number of significant figures in your answer.

$$\begin{array}{r} 12.3 \quad \underline{3} \\ \times 71.5 \quad \underline{3} \\ \hline 879 \quad \underline{3} \end{array}$$

$$\begin{array}{r} 0.083 \quad \underline{2} \\ \times 13 \quad \underline{2} \\ \hline 1.1 \quad \underline{2} \end{array}$$

$$\begin{array}{r} 1251 \quad \underline{4} \\ \times 0.0815 \quad \underline{3} \\ \hline 102 \quad \underline{3} \end{array}$$

$$\frac{16}{5} = 3$$

$$\frac{172}{0.0123} = 1.40 \times 10^4$$

Perform the following operations, following proper significant figures rules.

$$\begin{array}{r} 1700.03 \\ + 90.071 \\ \hline 1,790.10 \end{array}$$

$$\begin{array}{r} 0.083 \\ + 0.07 \\ \hline 0.15 \end{array}$$

$$\begin{array}{r} 7920.1 \\ + 357 \\ \hline 8277 \end{array}$$

$$\begin{array}{r} 1,525,000.123 \\ - 43,250.00 \\ \hline 1,481,750.12 \end{array}$$

$$\begin{array}{r} 17.23 \\ - 5.5 \\ \hline 11.7 \end{array}$$



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## Error Analysis

1. DURING A CHEMISTRY LAB, YOUR GROUP DETERMINES THE DENSITY OF COPPER TO BE 10.02 g/cm<sup>3</sup>. THE ACCEPTED VALUE FOR THE DENSITY OF COPPER IS 8.96 g/cm<sup>3</sup>.

a. Find the absolute error.

$$\begin{aligned}\text{Absolute Error} &= |\text{Measured} - \text{Actual}| \\ &= |10.02 - 8.96| \\ &= 1.06 \text{ g/cm}^3\end{aligned}$$

b. Find the percent error.

$$((10.02 - 8.96) / 8.96) = 11.8\%$$

2. The electrolysis of 18.0 g of H<sub>2</sub>O should produce exactly 16.0 g of oxygen gas. However, when you collect the gas, the mass that you determined for oxygen was 14.9 g.

a. Find the absolute error.

$$\begin{aligned}&= |14.9\text{g} - 16.0\text{g}| \\ &= 1.1\text{g}\end{aligned}$$

b. Find the percent error.

$$\begin{aligned}&= ((14.9 - 16.0) / 16.0) \\ &= 6.88\%\end{aligned}$$