NAME:_____

Significant Figures

1. Determine the number of significant figures in each of the following measurements:

   a. 0.1407 m _____

   b. 21.05 mg _____

   c. 570.00 km _____

   d. 0.0030 cm _____

   e. 250 m _____

   f. 10 035.00 cm^3 _____

   g. 2800 g _____

   h. 5000°C _____

   i. 1.1×10^2 kPa _____

   j. 5.35×10^{-2} m/h _____

2. Express the following in proper form scientific notation. Then indicate the correct number of significant figures in the value.

   a. 4907 L _____

   b. 052 m _____

   c. 7900 g _____

   d. 0.060 30 ft _____

   e. 790.0 lb _____

3. Carry out the following operations and give the answers with the correct number of significant figures. Pay close attention to the units.

   a. 14.6 cm x 12.2 cm x 9.3 cm

   b. 28.0 m x 16.0 m x 7.0 m

   c. 6620 s + 35.7 s + 1.00 s

   d. 0.007 m + 0.100 m + 0.020 m

4. A chunk of nickel has a mass of 9.0 g and a volume of 1.01 mL. What is its density?

5. The density of copper is 8.9 g/mL. What is the mass of a 10.8 mL piece of copper?

ACTIVITY: Connecting Significant Figures with Uncertainty

Question

What is the uncertainty in an area calculation?

Background

A student was assigned the task of determining the area of a small Post-It® note. She were instructed to use a low-precision plastic ruler, marked in increments of centimetres. Knowing it is acceptable to use between one-tenth and one-half the smallest increments on the ruler, the student decided on a range uncertainty of +/– 0.2 cm.

Dimensions	Measurements
Height	4.6 cm +/– 0.2 cm
Width	5.5 cm +/– 0.2 cm

Procedure

1. Calculate the smallest possible area of the Post-It® (keep **all digits**).

2. Calculate the largest possible area of the Post-It® (again, keep all digits).

3. Determine the area as the average of the values calculated in one and two (keep all figures in your calculation).

Results and Discussion

1. Determine an uncertainty that will include the smallest and largest possible areas (note that uncertainty may be expressed *in one place value only).*

2. The uncertain place will determine what place your area should be rounded to. Now express the area of the Post-It™ including the range uncertainty.

3. How does the number of significant figures in your answer compare with what you would have expected based on what you've learned about calculating with significant figures in this section?