Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Applying Accuracy and Precision to Data Sets

Describe each picture as having high or low accuracy and precision, and classify error.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Comment on the *precision* and *accuracy*, and identify what type of *error* (if any) may have occurred for the following sets of measurements. You will need to calculate the average, range, % error and % difference for each set of data given.

a. A group of students was determining the density of an unknown liquid. They obtained

Avg: \_\_\_\_\_

Range: \_\_\_\_\_\_\_

% error: \_\_\_\_\_\_\_

% diff: \_\_\_\_\_\_\_

the following values: 1.34 g/cm3, 1.32 g/cm3, 1.36 g/cm3. The actual value is 1.34 g/cm3.

\_\_\_\_\_This precision of this data set is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_The accuracy of this data set is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Another group obtained the same results, but the actual value is 1.40 g/cm3.

Avg: \_\_\_\_\_

Range: \_\_\_\_\_\_\_

% error: \_\_\_\_\_\_\_

% diff: \_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. A third group obtained the following values: 1.66 g/cm3, 1.28 g/cm3, and 1.18 g/cm3.

Avg: \_\_\_\_\_

Range: \_\_\_\_\_\_\_

% error: \_\_\_\_\_\_\_

% diff: \_\_\_\_\_\_\_

The actual value is 1.34 g/cm3.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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d. A fourth group obtained the following values: 1.60 g/cm3, 1.70 g/cm3, and 1.40 g/cm3.

Avg: \_\_\_\_\_

Range: \_\_\_\_\_\_\_

% error: \_\_\_\_\_\_\_

% diff: \_\_\_\_\_\_\_

The actual value is 1.40 g/cm3.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Now we will extend this activity to another unit of measure, specifically centimeters. Take a look at a ruler to visualize 1 cm.

Would you agree that one centimeter is not a very big length? \_\_\_\_\_\_\_\_

Can you think of an example of when being off by 1 cm is no big deal? Share your example with me.

Can you think of an instance or event when being 1 cm off with the measurement does matter? Share.

Now, think about one tenth of a centimeter, a millimeter.

Explain a time in which being off 0.1 cm may be acceptable.

Explain another time in which being off 0.1 cm may not be acceptable.