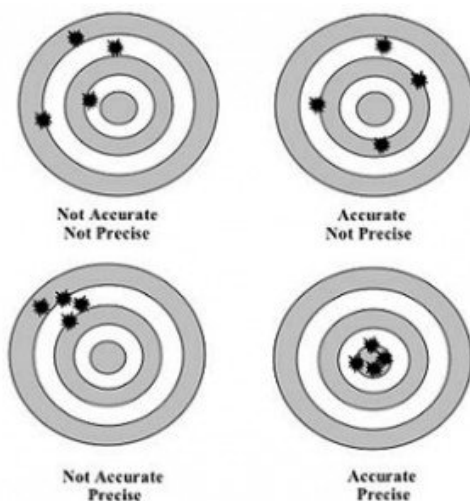# Chemistry Notes   Accuracy, Precision, and Error

I.   Accuracy is how close a measured value is to a known value.

     i. How close are you to the target answer?

II.   Precision is how close the measurements are to each other

     i. Do you get similar values with each trial?

III.   Error
     i. The difference between an experimental value and an accepted value.

     ii. What you got compared to what you should have gotten.

IV.   Percent Error
     i. Just expresses the error as a %
     ii. Errors of less than 1-2 % are usually acceptable in scientific laboratories.

$$\% \text{ Error} = \frac{(\text{Experimental value} - \text{accepted value})}{\text{Accepted Value}} \times 100$$

Example 1:   The accepted value for the density of gold is 19.3 g/mL. In the lab students calculated the masses and volumes of several samples of gold, then calculated their densities. Below is a table listing their calculated values. Determine the % error for each sample.

Student 1	D= 19.1 g/mL	D=19.2g/mL	D=19.1g/mL	D= 19.1g/mL
Student 2	D = 18.9 g/mL	D= 18.7 g/mL	D= 18.8 g/mL	D= 18.9 g/mL

How would you describe student 1 in terms of accuracy and precision?

How would you describe student 2 in terms of accuracy and precision?