**Background:**

 In this lab you will find the mass of the air in your classroom. You will measure the volume of the room and then, using the density of air, calculate the mass of the room’s air. Because of your measurements can never be exact, you will have some error. You will estimate this error with wimple mathematics.

**Materials:**

Meter Stick

**Procedures:**

1. Using a meter stick to measure the length of the classroom three times, starting in a different place each time. Record the value. You should be abler to make these measurements to the nearest .001 m (millimeters)
2. In a similar way, fine the width and height of your classroom three times and record these values. Make each measurement in a different place in the room.

**Data/Analysis:**

1. Make a data table (on the back of this paper) that can record you measurements. Since you are making three trials, have an average column.
2. Give an estimate of how much error is of the length. This is the numerical error.
3. To find what the percent the numerical error is of the length, divide the numerical error by the length and multiple by 100%

$$\frac{Numerical Error}{Length} X 100=Percent Error $$

1. Repeat steps 1-3 for the width and height of the room.
2. Find the room’s volume by multiplying the length x height x with.
3. Find the mass of the air in the room using the density of air as 1.00 kg/m3 +/- 5%.

(The actual density can be calculated more precisely or with less error, but it requires using the temperature atmospheric pressure and humidity)

1. Give your answer with the proper number of significant figures.
2. Estimate the percent error of the mass of the room. (You multiplied two numbers with error so you add the percent error.)

**Conclusion:**

1. Is the total mass of the air in the room a surprise to you? Explain
2. How does the error for the volume compare with the error for the density of the air in the room? Does that mean the errors in measuring insignificant?
3. How would your value for the mass of air different if you took into account the objects and people in the room? Give an estimate of percent change in your values for mass that these things would cause.