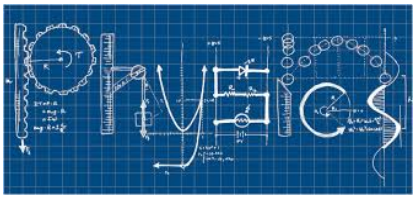
0.1 - Significant Figures, Measurement, and Unit Conversion Review

Side Button for Rabbit Holes!

AP Physics 2



1. Significant Figures Review

What do you remember?
How many significant figures in the following?

0.389 = 3 All non-zero digits are significant. Leading zeros are insignificant.
0.9023 = 4 Zeros between non-zeros are significant.
0.3890 = 4 A decimal makes all ending zeros significant.
480 = 2 If no decimal - ending zeros are insignificant.
480.0 = 4 A decimal makes all ending zeros significant.
5.20 E 4 = 3 Numbers in the exponent don't count.

Converting numbers into scientific notation eliminates ambiguity in significant figuring.

2. Operations and Rounding

What do you remember?
Perform the following, and round appropriately.

482.63 X 4.5 = 2,200
Multiplication and Division: Leave as many figures in the answer as there are in the quantity with fewest figures.

16.086 + 0.021643 = 16.108
Addition and Subtraction: Round answer to match the original value with the highest place. (If your numbers are in scientific notation, make sure they are raised to the same power!)

3. Conversions Review

What do you remember?
Do these problems, and I'll call random groups up to show these. Use your Resources page 1 or 6 for some conversions.

13,487 cm to km

14 L to cm^3

56.0 km/h to m/s

Conversions

Solutions:

$$13487\,cm \times \frac{1\,m}{100\,cm} \times \frac{1\,km}{1000\,m} = 0.13487\,km$$

$$14\,L \times \frac{1000\,mL}{1\,L} \times \frac{1\,cm^3}{1\,mL} = 14000\,cm^3$$

$$\frac{56.0\,km}{1\,h} \times \frac{1\,h}{3600\,s} \times \frac{1000\,m}{1\,km} = 15.6\,m/s$$

Error Calculations

Some labs require error, and percent error calculations:

Error = Experimental Value - Accepted Value

Error is positive or negative: and indicates whether a value was high or low.

Percent Error is as follows (Add to Resources Page 5):

$$\%\,Error = \frac{|Error|}{Accepted\,Value} \cdot 100\%$$

4. Error Example: A student measures the density of an object to be 12,500 kg/m^3, when the true value is 13,100 kg/m^3. What is the percent error of the measurement?

$$\%\,Error = \frac{|12{,}500\,kg/m^3 - 13{,}100\,kg/m^3|}{13{,}100\,kg/m^3} \cdot 100\% = 4.58\%$$

Homework 0.1

0.1 Problems in your Booklets
Due: Next Class