**Physics: Chapter 1 Test Study Guide**

1. What is physics? What is the goal of physics?

Physics is the study of the fundamental laws of nature.

The goal of physics is to gain a deeper understanding of the world in which we live.

1. What are the standard units for length, mass, time, and volume?

L= m, M= kg, t= s, and V= L (cm3)

1. Know table 1.4. This is the table with the common prefixes.

P. 18 Know from 109 to 10-9



1. Know what dimension is being measured by the units being used. (Example: what is measured when you see m2)

M= length

M2= Area

M3= Volume

m/s= Speed

m/s2= Acceleration

In the equation S=a \* M, the units for S=m4/t and the units for a= m3. What would the units be for M? M=m/t

1. When adding scalars do the units need to be the same? Subtracting? Multiplying? Dividing?

When adding and subtracting they do. Not multiplying or dividing

1. Be able to do dimensional analysis. Don’t forget to label the units.
	1. Convert 17kg to mg**- 1.7 x 107 mg**
	2. Convert 8 miles to km- **10 km (is actually 12.87, proper sig figs)**
	3. Convert 4 meters to feet- **10 (13.12)**
	4. Convert 18 m/s to miles/hour- **40. mi/h**
2. Be able to identify the number of significant figures in a number
	1. 200**- 1**
	2. 220. **-3**
	3. 1.7 x 104 -**2**
	4. 0.004- **1**
	5. 17.0005 -**6**
3. Be able to do math operations resulting in the proper answer with the correct number of significant figures.
	1. (1.7)(3.44)= **5.8**
	2. (3.24) / (1.774)= **1.83**
	3. (4.2) + (4.75)= **9.0**
	4. (8.994) – (4.12) = **4.87**

In the equation A\*B\*C, A has 4 sf, b has 3 sf, and C has 5 sf. How many sig figs should your answer have?

1. Be able to make estimates using order-of-magnitude.
	1. What is the height of an average male in cm?

About 200 cm (2m)

1. Be able to write numbers in scientific notation. Be able to write numbers in scientific notation out.

Be able to compare numbers (Which is larger). These are multiple choice questions.

1. You will need to know how to use the Pythagorean theorem for one problem.
	1. a2 + b2 = c2

You will be given the dimensions of a garden. You need to figure out what the length of the diagonal will be, to the proper number of sig figs.

Express the sum of 2.10 kg + 1578 g + 3.11 x 104 mg in the correct number of sig figs.

 2.10 kg + 1.578 kg + 0.0311 kg (When adding look at decimal places only)

 = 3.7091 kg (we need 2 sig figs in the decimal portion of the answer)

 = 3.71 kg

The rate at which something moves is R = a \* t. If R is measured in the units m3/s, and time *t* is measured in seconds, what are the SI units for a?

 Solve for a

 a= R/t

 Put in the units for R and t

 $\frac{m3/s }{s}$ = $\frac{m3}{s^{2}}$