

Assignment #3**Due on Monday, September 16, 2013**

Read Section 1.3 on *Real World Measurements: Dealing with Units*, on pages 41–57 in the text.

Do the following problems

1. (*See Exercise 42 on page 61 in the text*) Assume the following information is true: The moon is 239,300 miles from the earth (center-to-center), and covers a circular orbit around the earth once every 27.32 days.
 - (a) Estimate the length of the moon's orbit around the earth.
 - (b) Assuming that the moon travels around the earth at a constant speed, how fast is it traveling in miles per hour?
2. (*See Exercise 43 on page 62 in the text*) Assume that light travels at a constant speed of 186,321 miles per second.
 - (a) Assume there is a fiber optic cable along the earth's equator. Estimate the time that it takes for light traveling in the cable to go around the equator once.
 - (b) About how many times in one second does light go around the equator?
3. The distance from the sun to the earth is about 92,960,000 miles. Estimate the time that it takes from the sun's light to travel to the earth.
4. Assume that the average density of the earth is about 5.5 grams per cubic centimeter. Given that the radius of the earth is about 3,959 miles, estimate the mass of the earth in kilograms. State the assumptions that are made in obtaining your estimate.
5. The element osmium (chemical symbol: Os) is the densest metal in the periodic table of elements. Its density is about 22.48 grams per cubic centimeter. Estimate the weight in pounds of a cube made out of osmium that is 1 inch on each edge.