

Assignment #1

Due on Wednesday, September 11, 2013

Read Section 1.2 in the text, pp. 5–31.**Do** the following problems

1. (*See Exercise 21 on page 33 in the text*) The dimensions of an olympic size swimming pool are 50 meters in length, 25 meters in width, and an average depth of about 2.5 meters.
 - (a) Estimate the volume of water that the pool can hold in cubic feet.
 - (b) Given that one cubic foot of water weighs about 62.4 pounds, estimate the weight of water in the pool in pounds.
2. (*See Exercise 22 on page 33 in the text*) The radius of the Earth is roughly 3,959 miles.
 - (a) Estimate the volume of the Earth in cubic meters.
 - (b) Given that mass of the earth is about 5.972×10^{24} kilograms, estimate the average density of the Earth in Kg/m^3 . Give your answer also in grams per cubic centimeter.
3. (*See Exercise 23 on page 33 in the text*) Seen from the air, much of Nebraska is covered with circular farm plots, each of about 1 mile in diameter.
 - (a) Estimate the area of a farm plot in square feet.
 - (b) Assuming that one square foot of the plot needs 1.31 gallons of irrigation water, estimate the total amount of water needed to irrigate the entire plot.
4. (*See Exercise 26 on page 34 in the text*) The average diameter of a red blood cell is about 7 microns.
 - (a) Assuming that a red blood cell is spherical, estimate its volume in cubic centimeters.
 - (b) Assuming that 45% of blood is made up of red blood cells, estimate the number of red blood cells in a pint of blood.
5. (*See Exercises 27 and 28 on page 34 in the text*) Eighteen grams of distilled water contain approximately Avogadro's number of water molecules
 - (a) Estimate the number of water molecules in one gram of distilled water.
 - (b) How many grams would a trillion molecules of water weigh?