Voyages to the Terrestrial Planets Homework 1 – *Geography of the solar system*

Overview: In class we started to discuss and compare the surfaces of various terrestrial bodies. Here we will continue down that path and compare and discuss some other physical properties of the terrestrial planets. The purpose of these activities (your lab on Tuesday and this homework) is to get you familiar with the field on which we will be spending the term playing. Subsequently, at the end of this assignment, you will be able to: 1) place the satellites comprising the inner solar system in their proper order, 2) list the physical properties of each of those bodies, and 3) explain the similarities and differences between each of the satellites in the inner solar system.

Due and to turn in: This homework assignment is due at the end of the class period on Monday, December 3rd. Please turn it in on the podium in the front of the classroom before leaving class for the day. You will be graded based on the completeness and accuracy of your answers.

To do: Please read through the following directions and fully answer each question in the appropriate spaces below.

Assignment:

Part 1: Locations of the inner solar system satellites (10 pts.)

1) Using the legal sized sheet of paper I have handed out to you, draw to scale the satellites comprising inner solar system that extend from the sun out to the asteroid belt. Be sure to include Ceres and our own moon; you do not need to include the sun (you can if you want), the other asteroids, or Mars' two moons. Because you are drawing this to scale, make sure that you include a scale bar on your drawing. Please also color in your drawing.

2) Below each of the satellites, list the following 12 pieces of information:
   a) satellite name
   b) diameter (in miles and kilometers)
   c) distance from the sun (in AUs)
   d) atmosphere present? If so, what is that atmosphere composed of?
   e) mass
   f) density
   g) surface pressure
   h) surface temperature
   i) highest and lowest surface elevations
   j) satellite age
   k) United States missions, if any, that have visited that body
   l) gravity at the surface of the body

Much of this information will be in your text book (look in the back of your book in the appendices), but you may also find it useful to look online for information. I list some useful websites below, but please try to avoid Wikipedia.
http://pds.jpl.nasa.gov/planets/
http://www.nasa.gov/worldbook/
http://www.solarviews.com/

Part 2: Bringing it together

Now that you spent all of that tedious time collecting all that information from above, let's put some of that information to work. Please answer the questions below with complete sentences; please limit your answer to about 5 sentences.

1) Is there any particular pattern with the planets in terms of their physical properties (i.e., diameter, mass, density, etc…) as you move out from the sun? Please explain. (1 pt.)

2) Let's look at the atmospheres. Do a majority of the satellites have an atmosphere? If so, what is the dominant gas in the atmospheres? Is the Earth different from other atmospheres? If so, how? (1 pt.)

3) Is there a significant age difference between each of the satellites? Why would this be the case? (1 pt.)

4) Using your book and/or the websites listed above, examine the internal structure of each of the satellites. Is there any significant difference between each of the satellites' insides? Please explain. (1 pt.)

5) How much longer would your sheet of paper need to be in order to include the rest of the Solar System in your diagram (keeping the same scale you used for Part 1 above)? Be sure to show your work. (1 pt.)