Name:_____

Gainesville Model Solar System Project

Info: 1 Astronomical Unit (AU) is the Earth-Sun distance and equals 9.3×10^7 miles or 1.5×10^8 kilometers.
Speed of light = c = 186,300 miles per second, or 300,000 km per second.
Velocity (speed) = distance / time.

Instructions: Answer all the questions below. Type all your answers, including tables. You may handwrite the graphs or use a graphing program like Excel. The assignment is due Wednesday June 21st.

1) a) Make a table of objects, listing name and diameter, in the system that are Mars-sized or smaller. List them in order of decreasing size. Then answer the questions: b) Which objects other than planets are larger than Mercury? c) Which objects are larger than Pluto? d) If we include all of the objects in question c, how many planet-sized objects can the solar system be said to contain?

2) The so-called 10th planet "Xena" or UB313 has an average distance of 60 AU. Given that the Model Solar System has a scale of 1.83 miles for 39 AU, how long would the MSS be if we included Xena?

3) If we were to walk at a constant pace and in straight lines, our speed between the planets in the MSS would be a constant. A graph of velocity versus distance/object would be a straight horizontal line.

a) To see how we did with our interplanetary walk, calculate the speed traveled between each planet by subtracting the real distances in millions of miles (OR AU if given on the monuments!) for each pair of planets and dividing by the minutes it took to go from the first planet to the second planet. (Example, if Mars is 150 million miles and Earth 93,000,000 miles, and we took 30 seconds (0.5 minutes), we traveled at 150-93, or 57, million miles per 30 seconds, or 114 million miles per minute.) Include the Sun and asteroids in your calculations, so start with your results of Sun to Mercury, then Mercury to Venus, etc. Take the data you calculate from the above and put it in a table.

b) Graph the data such that your calculated 'velocity' is on the Y axis and the first object of your pair is on the X axis. Speculate why the graph isn't a straight horizontal line and why any particular planet isn't 'on the line'. Use the whole side of a piece of graph paper, with proper labeling of the axes, proper units shown, title, and your name.

c) Average the velocity values and put at the bottom of the table, and as a horizontal line on the graph. Compare to the speed of light (convert this to a speed using minutes for the time units). What is our relative speed compared to the speed of light? Are we imitating the starship "Enterprise"? If so, what's our warp speed (the ratio of our speed to the speed of light?

4) At home, find the real values for the average distance of each planet from the Sun (from an appendix in your textbook). Using the speed of light value, calculate how long it takes for light to go from the Sun to each planet (skip the asteroids). Place values in a table below, and in another column, include how long it took for you to go from the Sun to each planet in our walk. State your answers in minutes, or hours and minutes, but not in seconds.

5) Planets, like many other things, can be categorized by some characteristic(s). A specific example is number of moons. Some planets have lots of moons, some few. Here the Category would be Number of Moons which two groups, Few and Many, and you would list which planets are in each group.

From all the data you have gathered, categorize the planets into groups, based on whatever characteristics you wish that come from your data only. State what the groups are, and what the characteristics are that distinguish one group of planets from another group.

6) The monuments were put up a few years ago. Find out from your textbook or other sources, any information that needs to be updated. Give an exact citation for your source of information, either book, journal or newspaper, citation format or the exact Webpage address. You must provide a minimum of 5 items for credit.

7) What did YOU learn today from this trip?

Name: _____ Gainesville Model Solar System Data Recording Sheet

Data	Sun	Mercury	Venus	Earth	Mars	Asteroids	Jupiter	Saturn	Uranus	Neptune	Pluto
Distance											
AU											
Diameter											
Number of Moons											
Steps/Time to next object											
…											
…											
…											
Details of moons											
…											
…											
Other details											