Planet Math

Your Challenge:
Planets have different characteristics. Some are related and others are not. Using the Solar System Update program, complete all but the last column of this table for each planet. Note that in the software, a value given as 2.5 E 7 is a shorthand for the scientific notation 2.5 x 10^7.

	Distance (in AU)	Period (in Years)	Radius (in km)	Mass (in kg)	Temp (in °F)	Surface Gravity (in g s)	My Weight (NT)
Mercury							
Venus							
Earth							
Mars							
Jupiter							
Saturn							
Uranus							
Neptune							
Pluto							

Discovering More

1. Make a line graph showing how the length of a planet's year depends on its distance from the Sun. Describe the relationship. Is it linear? (If a planet is twice as far, is its year twice as long?)

Think about how old you would be on each planet. How would you calculate your age there?

On which planet have you lived the most years ?_____ The fewest?_____

2. On a second graph show how a planet's temperature is related to the planet's distance from the sun. Then describe the relationship. Explain any data that do not fit on the curve. (Use the information in the Solar System Update software.)

3. A planet s surface gravity measures the acceleration of gravity on the surface (or on the cloud tops for the giant planets). In the software, it is given for each planet as that planet's ***ratio*** to the Earth's gravitational acceleration. To calculate how much you would weigh on each planet, multiply your weight on Earth by the relative surface gravity. Scientists use kg (kilograms) as a unit of *mass* and NT (Newtons) as a unit of *weight*. On Earth your weight in NT = your mass in kg times 9.8 m/s^2 = your weight in lb times (9.8 / 2.2), since 1 kg = 2.2 lb. Calculate your weight on Earth in NT _____, then multiply by the relative surface gravity to get your weight (NT) on the other planets. Record your weight on each planet on the Activity table.

4. A planet s surface gravity is determined by two of the other variables in the table. Make graphs to determine which two variables contribute to the surface gravity.
(*Hint*: once you've found one variable that the surface gravity is nearly proportional to, try plotting another variable against the surface gravity **divided by** that first variable).

Name the two variables: _____ and _____

Explain the relationship:

5. ADVANCED: Astronomers calculate the density of planets to determine what is inside them. Density is the mass of an object divided by its volume. Assume each planet is a sphere and use the radius to determine the volume. Convert your answer into grams per cubic centimeter. Every planet with a density less than 1.0 would float in water (if you had a big enough bathtub).
Which planets contain the lightest elements?

Which planets contain the most iron and other dense materials?