Scaling out the Solar System Activity (Groups of 8)

PART A:

Let us assume that we can build a replica of the solar system in which the Earth has a diameter of 1 mm and the Earth-Sun distance is 1 m. In this replica, find the following:

Name	Mass	Number of Moons	Diameter	Distance from Sun in A.U.
Sun	333,266		109	0
Mercury	0.056	0	.38	.39
Venus	.82	0	.95	.72
Earth	1	1	1	1
Mars	0.108	2	.53	1.52
Jupiter	318	16	11.2	5.2
Saturn	95.1	23	9.41	9.5
Uranus	14.5	15	3.98	19.2
Neptune	17.2	8	3.81	30.1

Table I Numerical Data for the Planets

1) The Sun's diameter (in cm); Build it with yellow paper and scissors.
2) The 8 planets in the solar system (in mm); Build them with Mercury as golden rod; Venus as white; Earth as blue; Mars as red; Jupiter as Orange; Saturn as Purple; Uranus as Green; and Neptune as light blue.

Part B:

Let's scale out the solar system; assuming the diameter sizes are exaggerated by 15X. This would mean that the Earth-Sun distance would be only 1 meter. (Note: According to the scale in Part b, this should have been 15 m). An A.U. of 15m isn't convenient for classroom size. In this exaggerated replica, find the following:

1) The distances between the Sun and the planets (in m); Walk them out in the hallway with each person holding a planet.
2) The distance to the nearest star other than the Sun (in Km).

Part C: (Use the formula v = d/t …..where t = d/v when solved and there is 86,400 sec = 1 day.)

1) Assuming your car can travel 60 mph, (or 0.02683 km/s), how many days would it take to drive around the Earth? [Use r = 6,378 km and C = 2πr].
   a. to the Moon? (d = 384,000 km)
   b. to the Sun? (d = 150,000,000 km = 1 A.U.)
2) Assuming that a 747 airplane can travel 10X faster than your car, how many years would it take you to fly to the Sun? (Remember there is 365 days = 1year.)
   a. to Mars?
   b. to Jupiter?
   c. to Neptune?
   d. to the nearest star other than the Sun? (d = 271, 932 A.U.)