Name_____

Date _____ **Pd**____

Unit VIII: Worksheet 3

The National Academy of Science, in order to gather information on deforestation, wishes to place a 500. kg infrared-sensing satellite in a polar orbit around the earth. The radius of the earth is approximately 6.38×10^3 km, and the acceleration of gravity at the orbital altitude of 160 km is very nearly the same as it is at the surface of the earth.

1. Construct a force diagram for the satellite described in the statement above.

2. What is the agent of the centripetal force for the satellite?

3. How much work is done on the satellite during one complete orbit of the earth? Explain your answer.

4. Determine how long it would take for the satellite to make one complete revolution around the earth.

The earth's orbit around the sun is very nearly circular, with an average radius of 1.5×10^8 km. Assume the mass of the earth is 6×10^{24} kg.

5. What is the average speed of the earth in its orbit around the sun?

6. What is the magnitude of the earth's average acceleration in its orbit around the sun? Show your work.

7. With what force does the sun attract the earth?