INTRODUCTION TO ENERGY

***Instructions**: Show your work completely in your journal when answering the following questions.*

1. Define the following terms:
    a. Mechanical Energy
    b. Kinetic Energy
    c. Potential Energy

2. Explain the concept of conservation of energy. How is this similar to conservation of momentum?

3. Car A has mass *m* and travels at 60 km/hr. Car B has half the mass of Car A, but travels at 120 km/hr.
    a. Which car has more momentum?
    b. Which car has more kinetic energy?

4. Suppose an automobile has a kinetic energy of 2000 J. If it moved with twice the speed, what will be its kinetic energy? Three times the speed?

5. Most Earth satellites follow an oval shaped (elliptical) path rather than a circular path around the Earth. The potential energy increased when the satellite moves farther from the Earth. According to conservation of energy, in what location relative to the Earth does a satellite have the greatest speed?

6. Does an automobile consume more fuel when its air conditioner is running? When the lights are turned on? When the radio is on while sitting idle at a stop light? Explain in terms of conservation of energy.

7. If a boulder is raised above the ground such that its potential energy is 200 J and then it is dropped. What is its kinetic energy just before it hits the ground?

8. What will be the kinetic energy of an arrow shot from a bow having a potential energy of 50 J?

9. What is the potential energy of a 2500 kg wrecking ball that is lifted to a height of 35 meters?

10. What is the kinetic energy of a 0.10 kg pellet fired at 180 $^{m}/_{s}$?