Name _____ Date _____ Period ___

Answer the following questions about energy on a separate sheet of paper.

1. If a rocket is launched with a velocity of 8.00×10^3 m/s, how high does it rise?

2. You are running around a track at 5 km/hr and then you increase your speed to 10 km/hr. By what factor did you increase your kinetic energy?

3. A 1500. kg car traveling at 30.0 m/s has the same kinetic energy as a 4500. kg truck. What is the speed of the truck?

4. A 2000. Kg car is pulled 345 m up a hill that makes an angle of 15° with the horizontal. What is the potential energy of the car at the top of the hill? If the car rolls down the hill, what will its speed be if we neglect friction?

5. An arrow of mass 0.10 kg was fired horizontally from a height of 1.5 m by an archer who exerted a force of 350 N on the bowstring and pulled the string back 0.70 m. How far from the archer did the arrow land?

6. A 75.0 kg person, starting from rest, slides down a slide 4.00 m long inclined at an angle of 35° with the ground. The person reaches the bottom at a speed of 6.00 m/s. What percent of the potential energy was converted to heat?

7. A 4.00 kg ball starts from rest and rolls down a hill 3.50 m high and up an adjoining hill 2.50 m high. What will its speed be when it reaches the top of the second hill?

8. Two sticky oranges, each with a mass of 0.500 kg are moving toward each other. One orange moves at 5.00 m/s and the other at 2.00 m/s.
    a. Assuming that the oranges stick together after the collision, compute the final velocity of the sticky mass.
    b. Calculate the kinetic energy before and after the collision and find out how much kinetic energy was "lost".

9. A heavy trunk is to be loaded onto a truck by pushing it up a plank inclined at 30.0o with the ground. A force of 500. N is necessary to keep the 1.00×10^3 N trunk moving up the plane to a height of 1.50 m above the ground.
    a. How much work is done in pushing the crate up the plank?
    b. What is the increase in potential energy?
    c. What is the efficiency of the system?