

$$KE = \frac{1}{2} mv^2$$

$$W = F\Delta x$$

$$\Delta KE = W$$

$$GPE = mgh$$

$$\Delta PE = W$$

Work & Kinetic Energy

For questions 1-2, refer to the following statements.

- I. A parent lifts an 8.0 kg baby from the ground to a height of 1.3 meters.
- II. She then holds the baby and carries it a horizontal distance of 5.2 meters.
- III. She then sets the baby back down on the ground again.

1. During which of the actions described above is the work done by the mother on the baby positive?
2. During which of the actions described above does the mother do no work?
3. A 950-kg car moves with a speed of 37 m/s. What is its kinetic energy?
4. An 875-kg compact car speeds up from 22.0 m/s to 44.0 m/s while passing another car.
 - a) What were its initial and final energies?
 - b) How much work was done on the car to increase its speed?
5. A rifle can shoot a 0.0042-kg bullet at a speed of 965 m/s.
 - a) Find the kinetic energy of the bullet as it leaves the rifle.
 - b) What work is done on the bullet if it starts from rest?
 - c) If the work is done over a distance of 0.75 m, what is the force on the bullet?
6. A 50.0 kg diver steps off a diving board and drops straight down into the water. The water provides an upward average ~~net~~ force of 1500 N. The diver comes to rest 5.0 m below the water.
 - a) How much work was done to stop the diver under water? 1300 N 4.0 m
 - b) How much kinetic energy did the diver possess at the water's surface?
 - c) Use this information to determine the distance between the diving board and the water.