Potential and Kinetic Energy Worksheet

Kinetic Energy (KE) = ½ mass times velocity squared

\[ KE = \frac{1}{2} mv^2 \]

Potential Energy (PE) = mass times the acceleration due to gravity times height

\[ PE = mgh = N*h \quad (g= 9.8 \text{ m/s}^2) \]

1 Newton (N) = 1kg*1m/s^2 or 1kgm/s^2

1. You serve a volley ball with a mass of 2.1kg. The ball leaves your hand at 30m/s. The ball has _________________ energy. Calculate it.

2. There is a bell at the top of a tower that is 45m high. The bell weighs 190N. The bell has _________________ energy. Calculate it.

3. The potential energy of an apple is 6.0 joules. The apple is 3m high. What is the mass of the apple?

4. What is the velocity of a 500kg elevator that has 4000J of energy?
5. What is the mass of an object that creates 33,750J of energy by traveling at 30m/s?

6. Missy Diwater, the former platform diver for the Ringling Brothers’ Circus had a kinetic energy of 15,000J just prior to hitting the bucket of water. If Missy’s mass is 50kg, what was her velocity?

7. A 75kg refrigerator is located on the 70th floor of a skyscraper (300m above ground). What is the potential energy of the refrigerator?

8. At what height is an object that has a mass of 50kg, if its gravitational potential energy is 9800J?

9. A 10kg mass is lifted to a height of 2m. What is its potential energy at this position?
10. Calculate the kinetic energy of a truck that has a mass of 2900 kg and is moving at 55 m/s.

11. A bullet has a mass of 0.0042 kg. The muzzle velocity of the bullet coming out of the barrel of the rifle is 993 m/s. What is the KE of the bullet as it exits the gun barrel?

12. What is the potential energy of a 3 kg ball that is on the ground?

13. A roller coaster is at the top of a 72 m hill and weighs 966 N. At the top of the hill the coaster car has _________________ energy. Calculate it.

14. What is the kinetic energy of a 3 kg ball that is rolling 2 m/s?

15. A baby carriage is rolling down a hill at 18 m/s. If the carriage has 90 J of kinetic energy, what is the mass of the carriage?