

KINETIC AND POTENTIAL ENERGY WORKSHEET

Determine whether the objects in the following problems have kinetic or potential energy. Remember, kinetic energy is the energy of motion and potential energy is stored energy due to an object's shape or position. Then, choose the correct formula to use:

$$\text{Kinetic Energy} = \frac{1}{2} \times \text{mass} \times \text{velocity}^2$$

$$\text{Potential Energy} = \text{Weight} \times \text{Height}$$

For each problem, write the formula used, show your work, and write a correct answer with correct units.

Example:

An 80kg man is jogging at a rate of 4m/s. He has kinetic energy. Calculate it:

$$\text{Kinetic Energy} = \frac{1}{2} \times \text{mass} \times \text{velocity}^2$$

$$\text{Kinetic Energy} = \frac{1}{2} \times 80\text{kg} \times (4\text{m/s})^2$$

$$\text{Kinetic Energy} = \frac{1}{2} \times 80 \times 16$$

$$\text{Kinetic Energy} = 40 \times 16$$

$$\text{Kinetic Energy} = 640 \text{ J}$$

1. You serve a volleyball with a mass of 2.1 kg. The ball leaves your hand with a speed of 30m/s. The ball has _____ energy. Calculate it.

2. A baby carriage is sitting at the top of a hill that is 21 m high. The carriage with the baby weighs 12 N. The carriage has _____ energy. Calculate it.

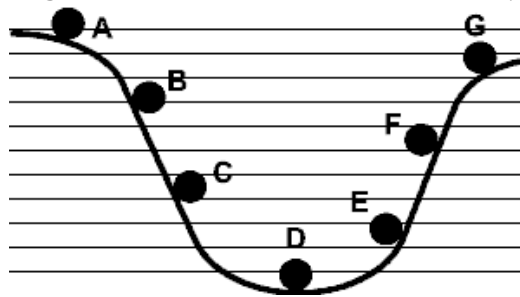
3. A car is traveling with a velocity of 40 m/s and has a mass of 1120 kg. The car has _____ energy. Calculate it.

4. A cinder block is sitting on a platform 20 m high. It weighs 79 N. The block has _____ energy. Calculate it.

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

6. A roller coaster is at the top of a 72 m hill and weighs 966 N. The coaster (at this moment) has _____ energy. Calculate it.

This graph shows a ball rolling from A to G. The ball starts at point A and rolls to point G.



7. At what letter does the ball have the greatest kinetic energy? _____
8. Which letter shows the ball when it has the maximum potential energy? _____
9. Which letter shows the ball when it has the least potential energy? _____
10. Why is point G slightly lower than point A? In other words, why couldn't the ball go back to the same height at which it started?