

U.07a - KE & PE review



**KINETIC AND POTENTIAL ENERGY WORKSHEET**

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

Determine whether the objects in the following problems have kinetic or potential energy. Then choose the correct formula to use:

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

$$\text{PE} = \text{weight times height} = mgh$$

$$\text{Weight} = \text{mass} \times \text{gravitational acceleration} = (\text{kg})(9.8\text{m/s}^2)$$

$$\text{Force} = \text{Newtons} = \text{N} = (\text{kg})(\text{m/s}^2)$$

$$\text{Energy} = \text{Joules} = \text{Nm}$$

$$\text{Velocity} = \text{m/s}$$

$$\text{Gravitational acceleration} = g = 9.8 \text{ m/s}^2$$

1. You throw a football with a mass of 2.1 kg. The ball leaves your hand with a speed of 30 m/s. The ball has \_\_\_\_\_ energy. Calculate it.

2. A shopping cart is sitting at the top of a hill that is 21 m high. The cart weighs 12 N. The cart 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.

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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.

7. What is the kinetic energy of a 3-kilogram ball that is rolling at 2 meters per second?

8. Two objects were lifted by a machine. One object had a mass of 2 kilograms, and was lifted at a speed of 2 m/s. The other had a mass of 4 kilograms and was lifted at a rate of 3 m/s.

a. Which object had more kinetic energy while it was being lifted?

b. Which object had more potential energy when it was lifted to a distance of 10 meters?  
Show your calculations.