

# KINETIC AND POTENTIAL ENERGY WORKSHEET

Name: \_\_\_\_\_

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

$$KE = \frac{1}{2} m v^2$$

$$PE = \text{mass} \times \text{gravitational acceleration} (9.8 \text{ m/s}^2) \times \text{height} \quad \text{OR} \quad \text{Weight} \times \text{Height}$$

Energy= joules

Weight= Newton

Mass= kilograms

Velocity= m/s

Gravitational acceleration= (9.8 m/s<sup>2</sup>)

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

$$KE = \frac{1}{2} m v^2$$
$$KE = \frac{1}{2} (2.1 \text{ kg}) (30 \text{ m/s})^2$$
$$KE = \frac{1}{2} (2.1 \text{ kg}) (900)$$

$$KE = \frac{1}{2} 1890$$
$$KE = \frac{1890}{2}$$
$$KE = 945.0 \text{ J}$$

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 Kinetic energy. Calculate it.

$$KE = \frac{1}{2} m v^2$$
$$KE = \frac{1}{2} (1120 \text{ kg}) (40 \text{ m/s})^2$$
$$KE = \frac{1}{2} (1120 \text{ kg}) (1600 \text{ m/s}^2)$$

$$KE = \frac{1,792,000}{2}$$
$$KE = 896,000 \text{ J}$$

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.