

# Kinetic Energy And Potential Energy Worksheet Answer Key PDF

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## Part 1: Building a Foundation

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**What is the formula for calculating kinetic energy?**

undefined. A)  $KE = \frac{1}{2}mv^2$  ✓

undefined. A)  $KE = mgh$

undefined. A)  $KE = \frac{1}{2}kx^2$

undefined. A)  $KE = mgx$

The correct formula for calculating kinetic energy is  $KE = \frac{1}{2}mv^2$ .

**Which of the following are examples of potential energy? (Select all that apply)**

undefined. A) **A book on a shelf** ✓

undefined. A) A moving car

undefined. A) **A compressed spring** ✓

undefined. A) A flowing river

Examples of potential energy include a book on a shelf, a compressed spring, and other stored energy forms.

**Explain in your own words what potential energy is and provide an example.**

**Potential energy is the energy stored in an object due to its position or state. An example is a rock at the top of a hill.**

**List two factors that affect kinetic energy and two factors that affect potential energy.**

1. Factors affecting kinetic energy:

**Mass, Velocity**

2. Factors affecting potential energy:

## Height, Mass

Kinetic energy is affected by mass and velocity, while potential energy is affected by height and mass.

## Part 2: Understanding and Interpretation

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**Which factor has a greater impact on kinetic energy when doubled?**

undefined. A) Mass

**undefined. A) Velocity ✓**

undefined. A) Both have the same impact

undefined. A) Neither affects kinetic energy

Doubling the velocity has a greater impact on kinetic energy than doubling the mass.

**Which statements about energy conservation are true? (Select all that apply)**

undefined. A) Energy can be created or destroyed.

**undefined. A) Total energy in a closed system remains constant. ✓**

**undefined. A) Energy can be transformed from one form to another. ✓**

undefined. A) Potential energy can never be converted to kinetic energy.

The true statements are that total energy in a closed system remains constant and energy can be transformed from one form to another.

**Describe how the concept of gravitational potential energy is applied when a roller coaster climbs to the top of a hill.**

**As the roller coaster climbs, it gains gravitational potential energy, which is converted to kinetic energy as it descends.**

## Part 3: Application and Analysis

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**If a car's speed doubles, what happens to its kinetic energy?**

undefined. A) It remains the same.

undefined. A) It doubles.

undefined. A) It triples.

**undefined. A) It quadruples. ✓**

If a car's speed doubles, its kinetic energy quadruples.

**Which scenarios demonstrate the conversion of potential energy to kinetic energy? (Select all that apply)**

**undefined. A) A pendulum swinging from its highest point ✓**

**undefined. A) A stretched rubber band being released ✓**

undefined. A) A person sitting still on a chair

**undefined. A) A ball rolling down a hill ✓**

The scenarios that demonstrate this conversion include a pendulum swinging from its highest point, a stretched rubber band being released, and a ball rolling down a hill.

**Calculate the gravitational potential energy of a 5 kg object located 10 meters above the ground. Assume  $g = 9.8 \text{ m/s}^2$ .**

**The gravitational potential energy is calculated as  $PE = 5 \text{ kg} * 9.8 \text{ m/s}^2 * 10 \text{ m} = 490 \text{ Joules}$ .**

**What happens to the total mechanical energy of a system if only conservative forces are acting on it?**

undefined. A) It increases.

undefined. A) It decreases.

**undefined. A) It remains constant. ✓**

undefined. A) It fluctuates.

The total mechanical energy of a system remains constant if only conservative forces are acting on it.

**Analyze the following situations and identify which involve only conservative forces. (Select all that apply)**

**undefined. A) A satellite orbitin Earth ✓**

undefined. A) A car braking to a stop

**undefined. A) A child sliding down a frictionless slide ✓**

**undefined. A) A book falling off a table ✓**

The situations that involve only conservative forces include a satellite orbiting Earth, a child sliding down a frictionless slide, and a book falling off a table.

## Part 4: Evaluation and Creation

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**Which of the following best describes the energy transformation in a hydroelectric dam?**

undefined. A) Electrical to mechanical

undefined. A) Mechanical to electrical

**undefined. A) Potential to kinetic to electrical ✓**

undefined. A) Kinetic to potential to electrical

The best description of energy transformation in a hydroelectric dam is potential to kinetic to electrical.

**Evaluate the following statements and select those that correctly describe energy transformations in nature. (Select all that apply)**

**undefined. A) Photosynthesis converts light energy into chemical energy. ✓**

**undefined. A) A wind turbine converts kinetic energy into electrical energy. ✓**

undefined. A) A battery stores kinetic energy.

undefined. A) Geothermal energy is a form of potential energy.

The correct statements are that photosynthesis converts light energy into chemical energy and a wind turbine converts kinetic energy into electrical energy.

**Design a simple experiment to demonstrate the conversion of potential energy to kinetic energy. Describe the setup, procedure, and expected outcomes.**

**An example experiment could involve dropping a ball from a height to show potential energy converting to kinetic energy as it falls.**