

Energy Potential And Kinetic Worksheets Answer Key PDF

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Part 1: Building a Foundation

What is the formula for calculating kinetic energy?

undefined. $KE = mgh$

undefined. **$KE = 1/2 mv^2$ ✓**

undefined. $KE = mg/v$

undefined. $KE = mv^2/2$

The correct formula for calculating kinetic energy is $KE = 1/2 mv^2$.

Which of the following are types of potential energy?

undefined. **Gravitational potential energy ✓**

undefined. **Elastic potential energy ✓**

undefined. Thermal energy

undefined. **Chemical potential energy ✓**

Gravitational potential energy, elastic potential energy, and chemical potential energy are types of potential energy.

Explain in your own words what is meant by the law of conservation of energy.

The law of conservation of energy states that energy cannot be created or destroyed, only transformed from one form to another.

List two factors that affect the amount of gravitational potential energy an object has.

1. Factor 1

Height

2. Factor 2

Mass

The two factors are the height of the object above a reference point and the mass of the object.

Part 2: Comprehension and Application

Which statement best describes the relationship between potential and kinetic energy in a pendulum?

undefined. Potential energy is constant while kinetic energy varies.

undefined. Kinetic energy is constant while potential energy varies.

undefined. Potential energy is converted to kinetic energy and vice versa. ✓

undefined. Both potential and kinetic energy remain constant.

Potential energy is converted to kinetic energy and vice versa as the pendulum swings.

When a roller coaster is at the top of a hill, which of the following statements are true?

undefined. It has maximum kinetic energy.

undefined. It has maximum potential energy. ✓

undefined. Its potential energy is being converted to kinetic energy as it descends. ✓

undefined. Its kinetic energy is being converted to potential energy as it ascends.

At the top of a hill, the roller coaster has maximum potential energy and is about to convert it to kinetic energy as it descends.

Describe how the height of an object affects its gravitational potential energy.

The height of an object directly affects its gravitational potential energy; the higher the object, the greater the potential energy due to the increased distance from the reference point.

If a ball is thrown upwards, at what point is its kinetic energy the greatest?

undefined. At the highest point of its trajectory

undefined. Just after it is thrown ✓

undefined. Just before it hits the ground

undefined. When it stops moving

The kinetic energy of the ball is greatest just after it is thrown, as it begins to lose energy when it reaches the highest point.

In a hydroelectric dam, which energy transformations occur?

undefined. Gravitational potential energy to kinetic energy ✓

undefined. Kinetic energy to electrical energy ✓

undefined. Chemical energy to thermal energy

undefined. Electrical energy to kinetic energy

In a hydroelectric dam, gravitational potential energy is converted to kinetic energy, which is then transformed into electrical energy.

Calculate the kinetic energy of a 2 kg object moving at a velocity of 3 m/s.

The kinetic energy can be calculated using the formula $KE = \frac{1}{2}mv^2$, which results in 9 Joules for a 2 kg object moving at 3 m/s.

Part 3: Analysis, Evaluation, and Creation

Which scenario demonstrates the conversion of kinetic energy to potential energy?

undefined. A car accelerating on a flat road

undefined. A child sliding down a slide

undefined. A ball being thrown upwards ✓

undefined. A pendulum at the lowest point of its swing

A ball being thrown upwards demonstrates the conversion of kinetic energy to potential energy as it rises.

Analyze the following scenarios and identify which involve energy transformation:

undefined. A book falling off a shelf ✓

undefined. A stretched rubber band being released ✓

undefined. A car parked on a hill

undefined. A light bulb turned on ✓

A book falling off a shelf, a stretched rubber band being released, and a light bulb turned on all involve energy transformations.

Discuss how energy conservation is demonstrated in a closed system, such as a swinging pendulum.

In a closed system like a swinging pendulum, energy conservation is demonstrated as potential energy is converted to kinetic energy and back, with no energy lost to the environment.

Which of the following best illustrates the principle of energy conservation?

undefined. A battery losing charge over time

undefined. A wind turbine generating electricity ✓

undefined. A solar panel absorbing sunlight

undefined. A perpetual motion machine

A wind turbine generating electricity best illustrates the principle of energy conservation, as it transforms wind energy into electrical energy without loss.

Evaluate the following statements and identify which correctly describe energy conservation:

undefined. Energy can be created from nothing.

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

undefined. Total energy in a closed system remains constant. ✓

undefined. Energy can be destroyed in a closed system.

Energy can be transformed from one form to another, and total energy in a closed system remains constant.

Propose a real-world scenario where both potential and kinetic energy are utilized effectively, and explain the energy transformations involved.

A roller coaster utilizes both potential energy at the top of the hills and kinetic energy as it descends, demonstrating energy transformations throughout the ride.