Energy on the Move

Track how energy changes form while total energy is conserved.

SC.6.P.11.1 "Explore the Law of Conservation of Energy by differentiating between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each phrase that tells how energy changes from one form to another, circle the words potential or kinetic energy, and number the energy changes in order.

Ramps, Hills, and Bounces

1. At a skate park, Maya stands still at the top of a ramp. Because of her height above the ground, she has gravitational potential energy, stored energy related to position. When she rolls down, her speed increases. Her gravitational potential energy changes into kinetic energy, the energy of motion. Near the bottom, she has less gravitational potential energy and more kinetic energy. If friction is small and air resistance is ignored, total energy in the rider, board, and Earth system stays the same while its forms change.

2. Later, a coaster car climbs the next hill after racing through a low point. As it moves uphill, it slows because kinetic energy changes into gravitational potential energy. At the hilltop, the car is moving more slowly but is higher. On the following drop, the change reverses: gravitational potential energy becomes kinetic energy and the car speeds up. The car does not create energy at each change. In a real coaster, friction and air resistance also transfer some energy to thermal energy and sound.

3. A dropped rubber ball offers another energy story. Before release, the ball has gravitational potential energy. As it falls, that energy changes mainly into kinetic energy. When the ball hits the floor, it briefly compresses, so some kinetic energy becomes elastic potential energy. The ball then pushes back into shape and rises as energy changes again. Each bounce reaches a lower height because some energy spreads to the floor and air as thermal energy and sound, yet energy is still conserved in the larger system.

2 ANSWER WITH EVIDENCE

Use the passage

1. What type of energy does Maya have at the top of the ramp, and what gives her that energy?

2. What energy transformation happens as Maya rolls down the ramp? Include what happens to her speed.

3. Describe the energy changes when the coaster car climbs a hill and then travels down the following drop.

4. Why does the rubber ball bounce to a lower height each time while energy is still conserved?

3 YOUR TURN

Your own words

Use the three panels to sketch a playground swing moving upward, at its highest point, and moving downward. Label the energy form or energy change in each panel, then write exactly two sentences explaining how energy changes and remains conserved, including where some energy goes in a real swing.

ANSWER KEY

Energy on the Move

GRADE 6 · SC.6.P.11.1

PART 1 · READ AND MARK

Underline each phrase that tells how energy changes from one form to another, circle the words potential or kinetic energy, and number the energy changes in order. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What type of energy does Maya have at the top of the ramp, and what gives her that energy?	**She has gravitational potential energy because she is high above the ground.**
2	What energy transformation happens as Maya rolls down the ramp? Include what happens to her speed.	**Gravitational potential energy changes into kinetic energy, and her speed increases.**
3	Describe the energy changes when the coaster car climbs a hill and then travels down the following drop.	**Going uphill, kinetic energy changes into gravitational potential energy. Going downhill, gravitational potential energy changes into kinetic energy.**
4	Why does the rubber ball bounce to a lower height each time while energy is still conserved?	**Some energy transfers to the floor and air as thermal energy and sound. Energy is conserved in the larger system.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Panel 1: A swing moves upward, kinetic energy changes into gravitational potential energy. Panel 2: The swing is highest and slowest, with mostly gravitational potential energy. Panel 3: The swing moves downward, gravitational potential energy changes into kinetic energy. As the swing rises, kinetic energy changes into gravitational potential energy, and as it falls, the change reverses. In a real swing, friction transfers some energy to thermal energy and sound, but total energy is conserved in the swing, air, and surroundings.

Accept gravitational potential energy or potential energy when the student clearly connects it to height, and accept kinetic energy when the student connects it to motion. For the swing, accept accurate labels and an explanation that accounts for thermal energy or sound while stating that total energy is conserved in a larger system.