Coaster Energy Chase

Track how energy changes form while the total stays the same.

5.2.d "energy is conserved."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each sentence that tells energy changing form or moving to a new place, then circle the sentence that states that total energy is conserved.

Energy on the Track

1. At the top of a roller coaster hill, a train has stored energy because it is high above the ground. This gravitational potential energy came from the lift motor, which used electrical energy to pull the train upward. When the train is released, its height begins to decrease. The train has not lost energy. Energy is ready to change form as the ride moves.

2. As the train speeds down the track, gravitational potential energy changes mostly into kinetic energy, the energy of motion. The wheels and track also rub together. Friction changes some of the train's kinetic energy into thermal energy, which warms the wheels, track, and air. Riders may hear sound, so some energy is transferred through sound waves. These changes happen at the same time.

3. Near the bottom, the train may be moving fastest, so it has a large amount of kinetic energy. It cannot keep speeding up forever. As it climbs the next hill, kinetic energy changes back into gravitational potential energy. Brakes use friction to change more kinetic energy into thermal energy, and a little into sound. Even after the train stops, the total energy has been conserved, but it is spread through many places.

2 ANSWER WITH EVIDENCE

Use the passage

1. What form of energy does the train have at the top of the first hill, and what supplied that energy?

2. What does friction change some of the train's kinetic energy into as the wheels rub on the track?

3. What energy change happens as the train climbs the next hill?

4. Why has energy not disappeared after the train stops?

3 YOUR TURN

Your own words

In two panels, sketch a playground swing at its highest point and at its lowest point. Label the main energy form in each panel, then write one sentence explaining why total energy is conserved, including energy that may become thermal energy or sound.

ANSWER KEY

Coaster Energy Chase

GRADE 5 · 5.2.d

PART 1 · READ AND MARK

Underline each sentence that tells energy changing form or moving to a new place, then circle the sentence that states that total energy is conserved. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What form of energy does the train have at the top of the first hill, and what supplied that energy?	**The train has gravitational potential energy. The lift motor supplied it by using electrical energy.**
2	What does friction change some of the train's kinetic energy into as the wheels rub on the track?	**Friction changes some kinetic energy into thermal energy.**
3	What energy change happens as the train climbs the next hill?	**Kinetic energy changes back into gravitational potential energy.**
4	Why has energy not disappeared after the train stops?	**The total energy is conserved. Much of it has changed into thermal energy and sound and is spread through many places.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Panel 1: A swing at its highest point, labeled gravitational potential energy. Panel 2: A swing at its lowest point, labeled kinetic energy. As the swing moves, energy changes form, and some becomes thermal energy and sound, but the total energy is conserved.

Accept accurate labels showing gravitational potential energy at the highest point and kinetic energy at the lowest point. The sentence should state that energy changes form or transfers without being created or destroyed.