

Learning Target: I will be able to describe and explain how roller coasters work through the relationship between gravity, potential energy, and kinetic energy.



[How Roller Coasters Work: Gravity, Potential & Kinetic Energy Video Notes](#)

1. Why do most roller coasters start out with a big hill? \_\_\_\_\_

2. What are the two types of energy conversions on a roller coaster? \_\_\_\_\_

**Quick Check for Understanding!** Pause the video and take 2 minutes to analyze the following roller coaster diagram and think, pair, and share your answers.

What do you think would happen if a roller coaster had a hill in the middle of the track that was taller than the first hill of the roller coaster? Explain your answer. \_\_\_\_\_

\_\_\_\_\_

3. How do roller coasters demonstrate the law of conservation of energy? \_\_\_\_\_

\_\_\_\_\_

4. Gravitational potential energy is the energy an object has as a result of \_\_\_\_\_

\_\_\_\_\_

5. A 300 kg roller coaster car is at the top of a 100 ft hill. (Gravity = approximately  $10 \text{ m/s}^2$ )  
(GPE = mass x gravity x height) What is its gravitational potential energy? \_\_\_\_\_

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6. Why is gravitational potential energy highest at the top of a roller coaster hill? \_\_\_\_\_

Why is gravitational potential energy lowest at the bottom of a roller coaster hill? \_\_\_\_\_

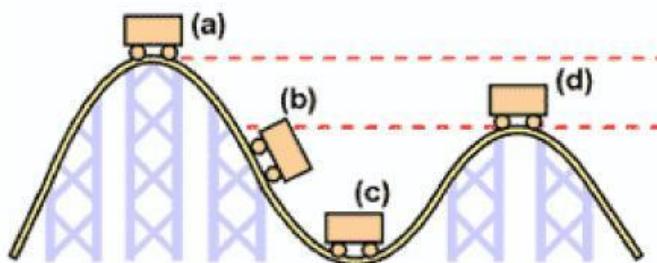
7. When is kinetic energy at its lowest on a roller coaster ride? \_\_\_\_\_

Explain why. \_\_\_\_\_

8. What is the relationship between potential and kinetic energy? \_\_\_\_\_

9. Why do cars on roller coasters move the fastest at the bottom of the hill? \_\_\_\_\_

**Quick Check for Understanding!** Take 5 minutes to analyze the diagram and answer the questions.



1. Where is the greatest amount of potential energy? \_\_\_\_\_

2. Where is the lowest amount of potential energy? \_\_\_\_\_

3. Where is the greatest amount of kinetic energy? \_\_\_\_\_

4. Where is the lowest amount of kinetic energy? \_\_\_\_\_

10. Explain how roller coasters work through the relationship between gravity, potential energy, and kinetic energy. \_\_\_\_\_