

## Core Skills Analysis

### Science

- The student has learned about the principles of potential and kinetic energy in the context of roller coaster design. They now understand how energy is exchanged between the two forms during the ride.
- Through this activity, the student grasped the influence of friction on the speed and safety of the roller coaster. They can now explain how engineers mitigate friction to ensure a smooth and thrilling ride.
- By exploring the physics behind roller coasters, the student has gained insights into how gravity plays a crucial role in determining the trajectory and acceleration of the ride.
- The student has developed an understanding of how engineers optimize the design of roller coasters to balance the forces acting on the riders, relating to Newton's laws of motion.

### Tips

To further enhance the learning experience from designing a roller coaster, students can experiment with different track layouts and heights to observe how it affects the overall ride experience. Additionally, exploring the use of different materials for the track and carts can provide insights into how engineering choices impact the physics of the ride. Encouraging students to research real-life roller coaster designs and analyze their key features can also deepen their understanding of the principles involved.

### Book Recommendations

- [Roller Coaster](#) by Marla Frazee: Follow along as a group of kids create a roller coaster in this fun picture book that introduces the basics of physics and engineering concepts.
- [The Marvels of Roller Coasters](#) by Mari Schuh: Discover the science behind roller coasters through vivid illustrations and engaging explanations perfect for young readers intrigued by physics.
- [How Do Roller Coasters Work?](#) by Jack David: Explore the mechanics and physics behind roller coaster design in this informative book that breaks down complex concepts for young minds.