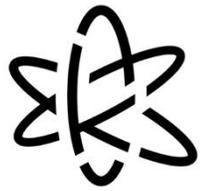




Fifth Grade Science

5th Grade Science: Summer Activity 1



Directions: This handout can also accompany a KCSatHome Teacher Video. If you have access to the video, watch the video before doing this activity. You can find the videos at <https://www.knoxschools.org/Page/21816>

Roller Coaster Science!



How does the height of a roller coaster affect the coaster car's speed when it moves around the track?

Please write or illustrate your thoughts in the box below.

Warm up activity:

For this activity you will need a toy car with wheels that spin.

Step 1: Place the car in front of you so you are looking at it from the side.



Step 2: Use your right hand to push the car to the right. (Predict what you think will happen first. Then write or draw what you observed in the box).

Step 3: Use your left hand to push the car to the left. (Predict what you think will happen first. Then write or draw what you observed in the box).

Step 4: Put both hands on each side of the car and push with the same amount of force. (Predict what you think will happen first. Then write or draw what you observed in the box).

Think about it!

When the car is sitting in front of you the forces on the car are evenly balanced because zero force is being applied to either side. However, when you push the car with either hand, you create an unbalanced force because one side of the car is being pushed and the other side is not. This allows the car to travel in the direction it was pushed. When you pushed on the car with both hands using the same amount of force, this created a balanced force because the car was receiving the same amount of force on each side.

Let's think about a roller coaster. Is the force on the roller coaster car balanced or unbalanced as it sits still in the station?

Is the force on the roller coaster balanced or unbalanced as it goes up the hill?

Is the force on the roller coaster balanced or unbalanced as it goes down the hill?

Let's experiment!

You will need: toy car with spinning wheels, a long piece of cardboard or similar material for a ramp, three objects of varying heights, (for example: stacks of books, a foot stool, a box, or similar objects to lay the ramp on), and a ruler or tape measure to record height and distance.

Before you begin, make a prediction as to which ramp will cause the car to travel the farthest distance and explain why in the box below.

Step 1: Lean the piece of cardboard along the top of the smallest object to make a ramp. Tape down the edge of the cardboard to the floor.

Step 2: Place the toy car at the top of the ramp. Release the car.

Step 3: Measure and record the height of your ramp and the distance the car traveled across the floor in the table on the following page.

Step 4: Move your ramp over to your second highest object and repeat steps 1 through 3.

Step 5: Move your ramp over to your highest object and repeat steps 1 through 3.

Roller Coaster Science!

	Height	Distance the car traveled
Ramp 1 (smallest height)		
Ramp 2 (medium height)		
Ramp 3 (tallest height)		

Was your prediction correct?

What could this tell you about the height of a hill on a roller coaster?

Think back to our essential question. Can you explain how the height of a roller coaster affects the coaster car's speed when it moves around the track?