



Project Exploration creates transformative learning opportunities for youth underrepresented in the sciences –particularly students of color and girls – by equipping them with the skills, practices, and mindset needed for a lifelong pursuit of learning. STEM@Home makes activities around science, technology, engineering, and math accessible and fun to do at home. This STEMbook activity, resources, and more are available at www.projectexploration.org/stemathome.

In this activity, you will:

construct a rollercoaster!



Supplies Required:

10 straws
10 popsicle sticks
4 toilet paper rolls
Tape

Glue
Scissors
2 marbles

Video

Take a virtual ride on this rollercoaster: <https://tinyurl.com/y85v7qyg>

Overview

A long line of people appears at the fairground ready to ride a roller coaster named Rocket. As people get closer to the front of the line, many change their minds about getting on the roller coaster. Some of them are excited and some are scared; others appear calm and collected. The roller coaster twists, turns, and loops. It's your turn in line, are you going to ride the rollercoaster?!

Roller coasters use basic principles of science to operate. This basic science is known as physics, which is the study of how things move. Most roller coaster rides begin with a lift hill, where a chain connects with the train and carries the riders to the tallest point. As you reach the top of the hill, the chain pushes the train over the hill. Gravity takes over and pulls the train down the hill. Using its weight and wheels, the train picks up enough kinetic energy (speed) to complete your journey. Different types of brakes are used to stop the train at the end of a ride. These brakes use friction to slow down and stop a roller coaster, by converting the train's kinetic energy into heat energy."



Instructions

1. **Problem:** What do we want to solve? How will you make your roller coaster an exciting ride? Build a roller coaster that moves as marble at different speeds, over, under, and in different directions.
2. **Solutions:** What are some ways to solve the problem? Can you make it go fast, move through a tunnel, go under a bridge or change direction?
3. **Model:** Build your design!
Gather your materials and build your roller coaster by attaching the start to an elevated base.
4. **Test:** Does your model work?
Roll the marble down the roller coaster.
5. **Reflect & Redesign:** Was your model successful? Does it need to be redesigned? Does it make it from start to finish? If there is a trouble spot, what can you do to fix the problem? Do you need to add anything to make the ride more exciting?

Additional Resources

1. How do roller coasters work? <https://tinyurl.com/y399cveq>
2. Learn more about roller coasters: <https://tinyurl.com/yxub2blt>

Share It Out

Share on social media: Take a video of your roller coaster in action! Share it on social media and explain how it works. Use the hashtags:

#Rollercoaster
#ProjectExploration
#StemAtHome

For more activities like this one, go to www.projectexploration.org/stemhome. If you're interested in learning more about Project Exploration and our free events, programs, and activities, please find us on social media and be sure to follow!



Call or text us for help: 312-772-6634

www.projectexploration.org