Ride on the Wild Side

Straw Roller Coasters

GhostRider is one of the longest wooden track in the United States at 4,533 feet long and stands at 118 feet tall! Your task is to **design a roller coaster using ONLY straws & skewers.**

The engineers who designed GhostRider had to test the speed of their coaster to make sure it is slow enough to be safe and stay on the tracks but fast enough to make it around the entire track without getting stuck and still be fun! You will have to think about forces like gravity and friction, as well as how the roller coaster takes advantage of potential and kinetic energy. Scan our QR Code for expanded directions

Materials

- 10 straws
- 9 short skewers
- 6 long skewers
- 6 spacers

We will give you: paper, tape, scissors, and a ping pong ball will act as your cart.

First Design Question:

How do we hold up a roller coaster track?
What do you notice from the picture above?

Building Buildings:

Step 1 To begin Use small skewers to make a strong triangle base. Then use long and small skewers to make different sized pyramids to support your tracks (Need Help? see expanded directions for details).

Step 2 Begin by taping two straws together lengthwise. Repeat this step so that you have both sides of your straw track. Every 6 inches place a small spacer to ensure that your track stays 1-inch wide.

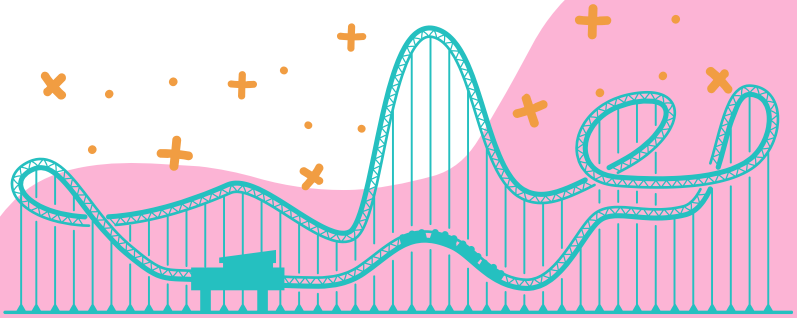
Step 3 Connect your straws to either side of the top of your tallest pyramid. Your straws should be about one inch apart. Experiment with the angle on the straws and see how it affects how fast the ball travels.

Stop and think:

Why do you think the first drop of a roller coaster is the steepest?

Step 4 Next try to extend your track. Use the medium pyramid to create a hill with your track. You may need to use additional straws to extend your track (remember to keep sides of track one inch apart using the small spacers). Bend the straws so that there is a dip and then hill over the medium pyramid.

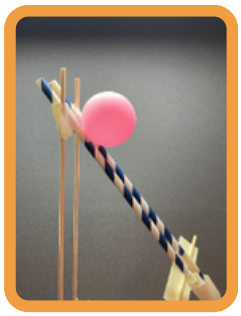
Test your roller coaster to see if your ball can travel over the top of the hill. If it cannot, consider switching to the small pyramid.



Stop and think:

What is the tallest hill your ball can safely travel over? What happens to the speed of the ball as it travels up to the top of the hill, and then back down the other side?

Helpful Hints



If you are having a hard time keeping your ping pong ball on your track, consider adding construction paper to specific sections.

Step 5 Continue to add straws to make your track longer. To support your track, you may need to make additional pyramids.

How many different elements (e.g., hills, jumps, angles) can you add to your track? What happens as you add more elements?

Stop and think:

- Can you build a track that has a larger hill after a smaller one?
- What is the longest track you can build and have your ball still make it to the end?
- When is the ball moving more slowly? Faster?
- Which of the following elements would you like to add to your roller coaster?
- How fast is your roller coaster? Check out our QR code for directions on how to calculate speed.