



STEM Ahoy! Rollercoaster Run Engineering Design Challenge

Challenge

Design and create a roller coaster track that can carry a marble through a special feature and end safely inside a cup!

Directions

In this challenge you are designing your own roller coaster track including a special feature (loop, tunnel, multiple hills, etc.) and ending the track with your ball landing in a cup!

1. Research and brainstorm the designs of rollercoasters: the geometric design of supports, tracks, gravity, and momentum).
2. Sketch your prototype/design of your roller coaster track. Think about what materials you will use to create your design.
3. Think about how you will incorporate your special feature and the materials needed. Watch some videos on how roller coasters are built!
4. Use your household materials you chose to build your first roller coaster track prototype. You need to start with making the supporting columns for the track (the track itself cannot touch the table or floor).
5. The track needs to start higher, as a hill- practice using the marble or ping pong ball to test your construction ALOT!
6. Continue to build your supports as you add more to your track. Keep testing!
7. Add your special feature when ready. Continue to test that your marble or ping pong ball can make it through your design.
8. As you build, modify your design as needed. You may discover you are using too much tape, or the supporting columns are not secure. Redesign!
9. Reflect on your construction and design. How could you improve your track? What materials would you add or change?

VDOE Engineering Design Process



Materials Needed

No Legos!

- *Suggested Items:
- *Empty toilet paper rolls
- *Empty paper towel rolls
- *Cups
- *Paper plates
- *Ping pong ball OR marble
- *Cardboard
- *Construction paper
- *Scissors
- *Tape
- *Glue
- *Other household items!