

DESIGN CHALLENGE

JUMPING MARBLES

INTRODUCTION

- The roller coast is believed to have begun in the 15th century Russia as an ice slide. Built in St. Petersburg, this early slide was made from a wooden frame 7- feet high that was packed with snow and watered down. Riders rode down these hills on blocks of ice that were slightly hollowed out to fit their bodies.
- This design challenge is about the thrill of velocity, acceleration, and unbalanced forces . . . We're talking about Roller Coasters! In this design challenge, your team is going to create a roller coaster that is the fastest and most exciting ride you can build!

DESIGN BRIEF

- ⦿ **Problem:** How can you design a fun and exciting roller coaster that is fast?
- ⦿ **Criteria:** Design a ramp for a marble (the roller coaster) to travel on that will allow the marble to jump the greatest distance possible to land in a cup.

⦿ Constraints:

- Your marble must complete the ramp before “jumping off.”
- You must not use human force to get your marble started on the ramp
- The distance of the jump is measured when the marble leaves the ramp (from the end of the ramp to the cup).

MATERIALS AVAILABLE

- 1 marble
- Masking tape (up to 1yd.)
- 1 Plastic Cup
- Foam pipe insulation
- Up to 2 World Geography books
- Furniture found in the classroom

SHARE YOUR SOLUTIONS

- What do you think is the best feature of your design?
Why?
- What are some things everyone's designs have in common?
- What would you do differently if you had more time?
- What were the different steps you had to do to get your project to work the way you wanted?