

ROLLER COASTER RUN

- LEVEL:** Middle/High School
- DESIGN TYPE:** Prepared In Advance
- DESIGN TEAM COMPOSITION:** 2-4 students per design team

DESIGN CHALLENGE:

Slowly the car inches up the improbable incline, defying gravity, and propelled by unseen forces. As the roller coaster car gets to the crest of the hill and peers over the top at the twisted tracks and loop-the-loops that lie just ahead, you try to convince yourself that the person who designed this cruel contraption knows what they are doing. Your challenge is to design and build a free standing roller coaster that incorporates thrill elements, safety features and use of a creative theme to attract riders. A successful rollercoaster design is measured by the number of thrill elements and time.

MATERIALS:

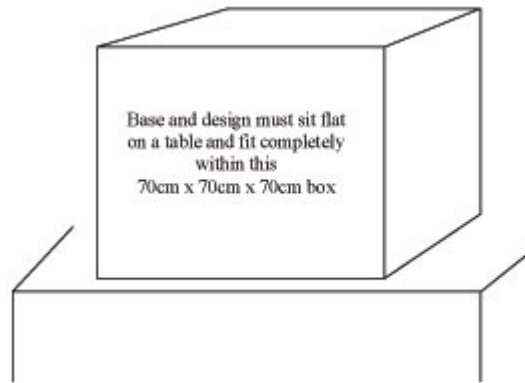
A variety of materials may be used to construct the roller coaster. However, pre-manufactured building kits (ex. Legos, Lincoln logs, etc.) will not be permitted. Below are suggested construction materials:

Light weight wood	Cardboard	Pipe insulation	Wooden dowels
Wire String	Assorted tape	Paper tubes	Straws
Paper clips	Straight pins	Styrofoam	Rubber bands
Popsicle sticks	Staples	Plastic tubing	PVC pipe

CHALLENGE RULES:

Design Specification

- Design must be mounted on a flat base, and the design and base must both fit within a box 70 cm x 70 cm x 70 cm.



- Designs, including the base, **cannot exceed 10 kg in weight.**
- Students are required to include the title of their roller coaster, team member names, school name and advisor(s) name on the roller coaster or base.
- A **minimum of two (2)** “thrill” design elements are required. Additional “thrill” design features will score five (5) to ten (10) extra points each, based on the level of difficulty.
- Students must creatively incorporate a defined theme for the roller coaster to increase its appeal for a potential “rider” and/or buyer (ex. “MESA Monster”).
- Students will use a **standard 1416 mm, glass, marble** to serve as the “vehicle” to demonstrate the roller coaster “run”. The marble must come to a complete stop, on the track, at the end of the run to demonstrate safety. Design elements that “slow” the car at the end of the run will score more points.
- Students must design a track with a ride that lasts between 10 and 25 seconds. Maximum points will be awarded to the “longest” runs. Deductions will be made if the ride is shorter or longer than required (2 points per second over or under the time limit).
- The marble must stay in contact with the track at all times. **If the design requires the marble to leave the track for any reason in order to finish the run, the team will receive a deduction of 25 points.**
- In the event of a “false” start or a run during which the marble leaves the track unintentionally, teams are allowed a second run. Teams will receive a five (5) point deduction for a second run.
- Free standing roller coaster designs, that pass specification check, will be placed on a table (6-8ft) with a flat, level surface, which will serve as the platform for testing.

- Design teams are required to have a minimum of two (2) team members present to demonstrate & discuss their roller coaster design to a panel of judges.
- Just prior to starting a “run” team members will **briefly summarize their design, pointing out thrill elements and safety features to the judges.**
- Teams may bring their own, standard 1416 mm, glass marble (must be approved by judge) or use one provided by the host site.

SCORING:

Designs are scored based on the following formula:

$$\text{Score} = \text{Design Points} - \text{Deductions}$$

Awards will be given for 1st, 2nd and 3rd place design teams.