

Paper Roller Coasters

Objective: Work in groups of 2 or 3 utilizing your knowledge of Newton’s 3 Laws of Motion to create a paper roller coaster that can carry a marble for the longest period of time without stopping.

Guidelines:

1. The model should be designed for a glass marble. When released from the top of the first hill, the marble will travel through the entire ride and arrive at the bottom loading platform. (For this project, the marble will be raised by hand to the top of the first hill to start the “ride”.)
2. Your team may use more than one marble.
3. Magnets, electricity, springs, and other forms of energy may not be used - this is a “gravity ride” only.
4. No one is permitted to touch the coaster once the ride begins.
5. There needs to be a clear “end” to your ride.
6. You will have only three chances. Your longest time will be the one you get graded on.

Grading:

A	B	C	D	F
100% - 30+ sec	88% - 26 sec	79% - 23 sec	67% - 19 sec	58% - 16 sec
97% - 29 sec	85% - 25 sec	76% - 22 sec	64% - 18 sec	55% - 15 sec
94% - 28 sec	82% - 24 sec	73% - 21 sec	61% - 17 sec	52% - 14 sec
91% - 27 sec		70% - 20 sec		50% - 13 sec

Bonus Points (added on to total seconds on judging day):

- Loop..... 3 seconds per revolution
- Corkscrew / Helix..... 2 seconds per revolution
- Jump (a jump moves up... not a fall)..... 2 seconds each
- Theme.....up to 3 seconds
- Marble rolls up and over a hill.....2 seconds
- Openness of track
 - Closed on all sides.....1 second (once)
 - Open on more than one side..... 2 seconds

You don’t get any extra points for “time wasters”, but you are going to want to include them!