

Rubber Band Car (45 Minutes - Coach Scheduled Event)

Description: Teams will build a simple 3-wheeled vehicle that uses power provided through an elastic source to travel a specified distance within a specified area.



Participants per team: 2

Spirit of the competition:

- It is a rules violation if coaches, parents, mentors, or spectators enter the competition area or communicate with the team members at any time during the competition. Violation of this rule will place the team below all other teams.

Safety Requirements:

Safety glasses labeled ANSI Z87.1+ (impact rated)

- All competitors must wear their eye protection during any competitor's flight phase of the competition.
- If a team does not have the required eye protection, they will be given the opportunity to obtain it, time allowing, but will not receive extra time.
- If a team is unable to obtain eye protection, the team will not compete and will receive a no-show score.



Materials Provided:

- Three – ≈4 cm plastic wheels
- Two – ≈7.5 cm cooking skewers
- One – ≈20 cm paper straw
- One – ≈11 cm by ≈9 cm piece of cardboard
- 50 cm of masking tape
- 2 Rubber bands – student choice from an assortment of sizes #64, #33, and #19

The Competition:

The estimated time to finish the written test is 15 minutes and 45 minutes for the entire event.

Teams will be trying to stop at the center of a target between 5- and 10-meters distance.

Part 1 – Written Test: The team members will take a test on the principles of elasticity.

As a part of the written test the team will estimate the distance their vehicle will stop from the center of the target.

Part 2 – Construction Phase:

- The Event Supervisor will announce the distance to the target center on the day of the competition.
- Teams will use their materials to build a 3 wheeled vehicle.
- Each team will have one scored run.
- Teams may cut their materials to any size they deem appropriate.
- Teams may not request any additional materials. A request will result in a tier violation. This means that the team may still participate but will be placed below all teams that do not violate this rule.
- Teams will have 40 minutes to build and test their car in the competition area. Teams may test their car at any time during this time with permission of the Event Supervisor.
- Releasing a car down the track without permission of the Event Supervisor during both the testing and scoring phases of the competition will result in a tier violation.

- Teams must state their intent that they are ready to launch and must wait for the Event Supervisor to acknowledge their intent.
- Teams may ask for their scored run at any time during the competition.

Scoring:

Teams will receive two weighted rankings. These rankings will be added to find the final placements. The team with the lowest sum will place first

- 75% - Teams will be ranked in order with the team whose car comes the closest to the marked end point measured to the nearest millimeter ranked first.
- 25% - Teams will be ranked based on their written test score.
- Tier 1: Teams with no violations.
- Tier 2: Teams whose device loses a part or has golf fall out.

Scoring Example:

Equation: (written test ranking x 0.25) + (car ranking x 0.75) = final ranking

- Team A ranks 3rd on the written test. This scores 0.75 ranking points. The team also scores 5th on their distance. This scores 3.75 ranking points. The team's final ranking score is 4.5.
- Team B ranks 2nd on the written test. This scores 0.5 ranking points. The team also scores 7th on their distance. This scores 5.25 ranking points. The team's final ranking score is 5.75.
- Team A places first in the rankings.

Tiebreakers:

1. Teams will be ranked based on the difference between their estimated distance and their averaged actual distance.
- Further ties will be broken by finding the best team measurement closest to the finish point for one run.

Possible Resources:

Division A will not release previous tests, or the exact resources used by the Event Supervisor or test writer for any events. The listed resources are meant as a starting point. It is up to the competitor to research further.

- [Build a Rubber Band–Powered Car - Scientific American](#)

Example of the Elastic Vehicle Course

