

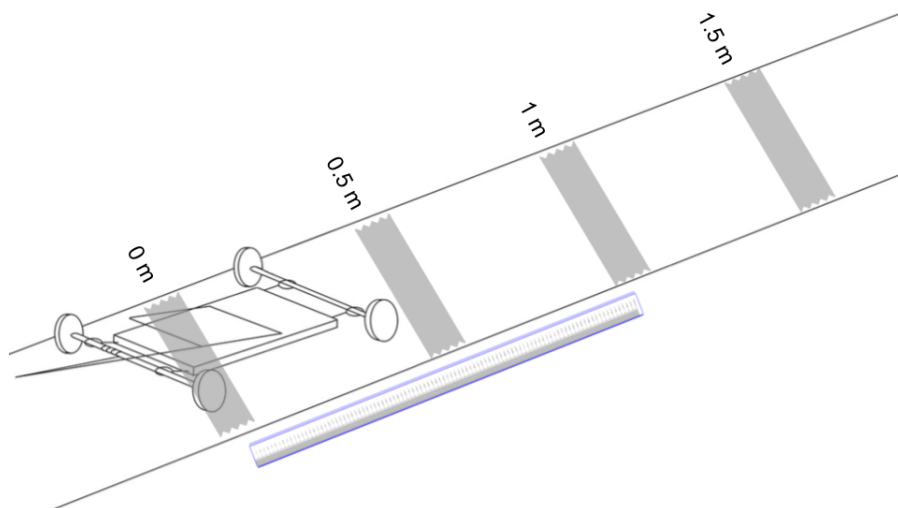
Where The Rubber Meets the Road!

Challenge Objective:

Build a rubber-band powered toy car out of household items. The goal is to make the car go the furthest. This activity is designed to be done in teams.

Rules:

- The car has to be “driven” on a flat surface, no inclined surface can be used
- The only form of propulsion has to come from the rubber bands. Wind power or any other form of power cannot be used.
- No active electronics can be present on the car in any form.
- The car can be of any shape or size. The maximum weight for the car is 2lbs.
- Students cannot touch the car while it is moving. Once the car is let go by the students on the start line, the vehicle cannot be touched until it is at rest.
- Distances have to be measured on the ground and marked down with tape before launching the car. Concretely, this means a piece of tape has to be laid at the front of the car, and then labelled pieces of tape have to be put on the ground at even distances until past where the car reaches. A measuring device has to be put next to the first two pieces of tape to show the measurements are valid. A diagram explaining this better is shown below.



Materials Allowed:

- No electronics are allowed and all materials used have to be deemed household materials by the judges.
- While this is not a restrictive list, this list of materials can be used as inspiration: cardboard, straws, skewers, CDs, sponges, bottle caps, paper clips, tape, scissors, glue, and obviously rubber bands.

Design Tips:

- Be creative!
- Remember the lighter your car, the further it will go with the same rubber band set-up!
- Try using a variety of materials before settling on your final design.
- Try and use mechanical advantage to your advantage. The best cars will distribute the force from the rubber band over a long period of time.
- Personalize it if you want to try and win the creativity challenge!

Content Required for Submissions:

- One paragraph describing how you built your car and your thought process behind it, any failed designs, what you learned from them, and how you could improve on your final design.
- A precise list of materials used
- Total distance travelled by the car. Please use metric units if possible. The distance is measured from the front of the car as the car also has to start behind the start line.
- Pictures of the car: one from the side and one from the top.
- Video of the car moving which also clearly shows the measuring lines on the ground. This video also has to clearly show the measuring tool next to the first two tape lines.

How will winners be selected:

- Judges will review all submissions. To qualify for the challenge, all 5 items described above have to be submitted to the judges.
- The judges will then verify all rules have been followed by participants.
- The overall winner of the design challenge will have the longest distance travelled by the car.
- The most creative design as judged by the judges will also win a prize!

Rubber Band Car Creativity Prize Grading Rubric

Student Names:

Category	4: Exceptional	3: Skillful	2: Adequate	1. Basic	Score
Hypothesis	The students clearly went above and beyond to think about all the various options available to them and how to maximize the distance the car travels while staying below the weight limit.	The students spent significant time on hypothesizing how to maximize the distance the car travels.	The students thought well about how to maximize the distance the car travels but are missing some key points in their thought process	The students do not seem to have thought much about how to maximize the distance the car travels	
Design Process	The students thoroughly explained their different designs and materials used and how they settled on their final design	The students explained well their various design elements and the iterative process they went through to settle on these.	The students explained in vague terms their different designs and how they chose their final design.	The students have little to no explanation of their different designs and what they learned from them	
Materials	The students went above and beyond to find creative materials to build the car out of and used them in creative ways	Creative materials were used to create the car	While standard materials were used to build the car, they were used in a creative way	The car was built with standard materials with little creative thought	
Presentation	The car looks like a car you need to buy and absolutely want to drive in. Additionally, the car would pass safety ratings	The car is appealing and looks like something you wouldn't mind to drive in from a safety perspective	The car has some decorative features or design elements that stand out	The car does not have any appealing features and is built solely for distance	
Team Work	The students collaborated in inventive ways and the work was split up evenly among all the students. It is clear there was a great team spirit among the students	The students worked together and the work was split up evenly among everyone	The students collaborated on the challenge but one student clearly did almost all the work	There was no teamwork in this group	

Total:

P.S.: Don't forget there is a separate prize for the car that travels the furthest, this rubric is solely for the creativity prize!