

Off to the Rubber Band Races

The DARPA Grand Challenge involves designing and building an autonomous vehicle that races 212 kilometers across the Nevada desert. Today, you will face your own design challenge: Build a rubber band-powered vehicle that is light, can travel far, and can carry a load as far as possible. After you design, build, and modify your vehicle, you will put it to the test against other vehicles designed by your classmates.

Procedure

- 1 Brainstorm a rubber band-powered vehicle using the provided materials. Review your available materials.
- 2 Design your vehicle. Your vehicle must follow the “Design Rules” listed on this page. Use your “Vehicle Construction” handout for guidance.
- 3 Draw a diagram showing three views of your vehicle. Show the top, side, and rear of your vehicle and label the parts, including wheels, body, axles, rubber band, rubber band support, and cargo area.
- 4 Build your vehicle. Use any of your available materials to construct your vehicle.
- 5 Test your vehicle. Test all three criteria listed on your “Performance Expectations” handout. Record the results of your testing.
- 6 Modify your vehicle. Change one variable you think will improve your vehicle.
- 7 Test your vehicle again. Compare the results from the previous testing. If you would like, modify another variable, test again, and compare the results. You may make as many additional changes to your vehicle as time allows, but you may only modify and test one variable at a time.
- 8 Update your original diagram to reflect your final design. When it is your turn, do the number of trials assigned by your teacher. The vehicle winning the challenge will be the one scoring best on the list of expectations listed on your “Performance Expectations” handout.

Design Rules

Your vehicle must be:

- built out of the materials provided
- powered by rubber bands
- constructed with at least one wheel

Questions

Write your answers on a separate sheet of paper.

- 1 Where does the energy to move the vehicle come from?
- 2 What affects the distance the vehicle travels?
- 3 Describe one type of energy transfer in this activity.
- 4 What was the most difficult part of this activity?
- 5 If you were going to make improvements to your vehicle, what would they be? Why would you make them?

