



# Cars on Mars

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# Cars on Mars

## OVERVIEW

Hello, space cadets! Have you ever wondered how astronauts get around in space? With all the different terrain, various altitudes, and unknown circumstances it can be challenging. Rovers are a kind of carlike spacecraft that NASA, the National Aeronautics and Space Administration, uses to explore surfaces of other worlds. So far, rovers have gone to Mars and the Moon. Maybe one day they will go even further! Some are driven by astronauts and others can be operated by scientists by remote control. Scientists use rovers to travel and study various terrains, carry vital supplies and explore new areas.

If you wish to know the current weather conditions on Mars before we embark on our journey, check out <https://mars.nasa.gov>

Your mission, if you choose to accept it, will require you to build a rover that will travel across the surface of your room (and Mars). You will follow the engineering design process to design and build a rover out of cardboard or other materials, figure out how to use rubber bands to spin the wheels and improve their design based on testing results.

Use this link and others of your choice for inspiration!

<https://www.youtube.com/watch?v=7zpojhd4hpl>

**Do some research on NASA Mars rovers and let us know which design inspired you on FlipGrid or Microsoft Forms!**

Ask yourself these questions:

What do you have to do to make the rover move?

How is energy transferred from the rubberband to the rover?

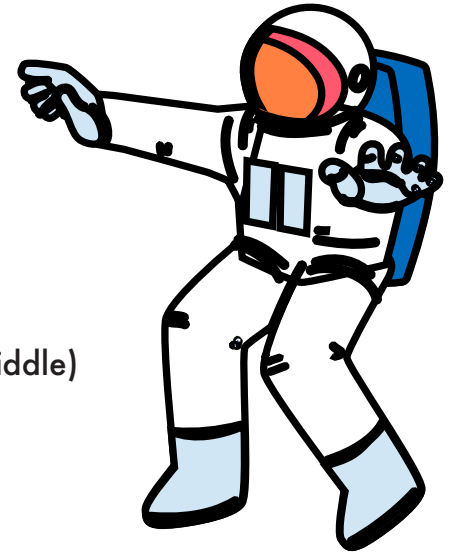
How do you think square wheels affect how the rover moves across the floor?



# EXPERIMENT

## SUGGESTED MATERIALS

- Corrugated cardboard (for body and/or wheels)
- 1 sharpened round pencil
- 2 rubber bands
- Ruler
- Tape
- 2 round candies (the hard, white, mint ones with a hole in the middle)
- Plastic drinking straw or skewers
- Scissors
- Plastic bottle or pop can



## STEPS

Use your imagination! The supplies above are not required- use your creativity and design YOUR Mars rover!

1. First, you must decide what your rover will look like. Take a moment to sketch out what you want your rover to look like and list the materials that you plan to use to construct it.
2. Now you have to make the body. To create the body of your rover, cut out a rectangle. Use your creative side and make the rectangle as big or as small as you want! Fold the cardboard into thirds, folding along, not across, the corrugation (the tubes inside a piece of cardboard).
2. Next, make the front wheels. On the object(s) you plan to use for wheels, poke a hole through the very center of the object. You will place a pencil through these holes in the next step.
3. On the body, poke one hole close to the end of each side for the axle. Make sure the holes are directly across from each other and are big enough for the pencil to spin freely.
4. Now attach the front wheels. Slide the pencil through the body's axle holes. Push a wheel onto each end. Secure with tape.
5. Next, make the rear wheels. Tape the straw under the back end of the rover. Slip a candy onto each end. Bend and tape the axle to stop the candies from coming off.
6. Finally, attach the rubber band. Loop one end around the pencil. Cut small slits into the back end of the body. Slide the free end of the rubber bands into the slits.
7. Now it is time to test your rover! Measure its travel distance with a ruler or measuring tape. Engineers make changes and improve on their original design by testing them in the design process. Try redesigning the wheel set-up or the rubber band system, or you can even redesign the body to be more aerodynamic!



# EXPERIMENT

For more information on how your rover drives on the surface of planets you can go to youtube and type in Mars in a minute: How do Rovers Drive on the Moon? Or click on the link below!

[https://www.youtube.com/watch?list=PL9TFrgFq7557nWqmfuVngU22OhTpUE9g-g&v=e6vzjNkDB5k&feature=emb\\_title](https://www.youtube.com/watch?list=PL9TFrgFq7557nWqmfuVngU22OhTpUE9g-g&v=e6vzjNkDB5k&feature=emb_title)

## Resources:

<https://www.jpl.nasa.gov/edu/teach/activity/roving-on-the-moon/>

<https://tinyurl.com/y8t4opfn>

## Additional Resources:

[nasas-curiosity-mars-rover-snaps-its-highest-resolution-panorama-yet/](https://www.nasa.gov/curiosity-mars-rover-snaps-its-highest-resolution-panorama-yet/)

<https://tinyurl.com/y822kt7s>

<https://mars.nasa.gov/news/8621/>

[https://mars.nasa.gov/#red\\_planet/4](https://mars.nasa.gov/#red_planet/4)

