

# MOTORIZED CAR



## YOUR CHALLENGE

Make a car that uses a battery-operated motor to go at least ten feet.

## MATERIALS (PER CAR)\*

- 1.5-volt AA battery
- AA battery holder (optional)
- Compact discs (CDs)
- Corrugated cardboard (one piece about 5 1/2 inches square)
- Electrical wire (22-gauge)
- 8 faucet washers (4, Size: 1/4 inch Large; and 4, Size: 1 to 1 1/8 inch)
- Motor with attached gear that runs on 1.5-volt AA battery
- Poster putty (1/4 package—the tackiest available)
- 2 wooden skewers (the thinnest available)
- Scissors
- Tape (masking or duct)
- Wire strippers

\* For information on where to get these materials, see page 6 or visit [pbskidsgo.org/designsquad/engineers](http://pbskidsgo.org/designsquad/engineers).

## BRAINSTORM AND DESIGN

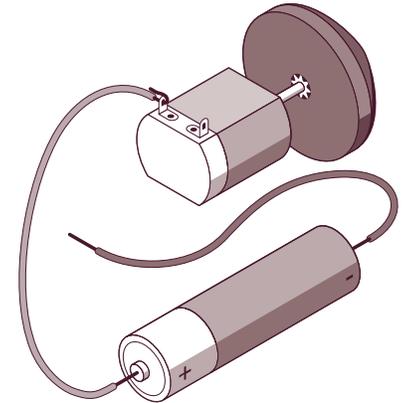
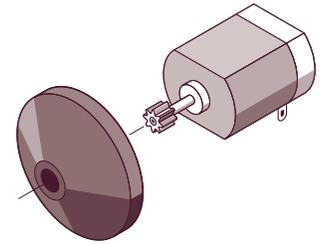
To begin, look at the materials and consider the following questions:

- The motorized wheel attaches directly to the shaft coming out of the motor. But how will I connect the unmotorized wheels to the car?
- Where do the motor and battery need to be in order to move the car?
- How will I run the wires so they don't interfere with how the car moves?
- How will I make sure the wires stay well connected to the battery and motor?

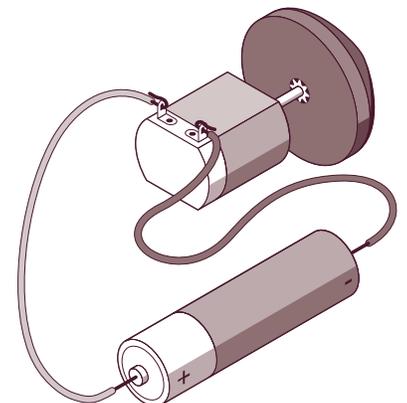
## BUILD, TEST, AND REDESIGN

To make your motor work, you'll have to make a **circuit**, a pathway for electricity. A circuit has a source of electricity (your battery), something that uses the electricity (the motor), and conductors to carry the electricity (the wires).

Review your materials and think about how you can use them to meet the challenge. Once you've finish building, try out your car in the testing area. When we made ours, we had to debug some things. For example, our motor stopped working, the wheels wobbled, and some parts dragged on the ground. If any of these things happen to you, figure out a way to fix the problem.



Open circuit



Closed circuit

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## TAKE IT TO THE NEXT LEVEL

- Make your car go faster.
- Make your car more stable for traveling over rough terrain.
- Add a switch to turn your motor on and off.
- Figure out a way to steer your car.

### INSIDE THE ENGINEERING

#### SKYCARS AWAY!

So long, Earth. Looks like soon we'll be flying cars across the sky. At least if engineer Paul Moller has anything to say about it. He's built the Skycar®, a car that can take off and land vertically, hover in the air, go 375 miles per hour, and fly up to 36,000 feet! The Skycar® uses eight computer-controlled engines to get it off the ground and keep the car level while it zips along. Paul is still working out the bugs, like keeping the Skycar® steady and reaching top altitude and speed. There's still a lot to work out, but Paul and his team are working hard to iron out all the bugs. It will take years, but when you get a Skycar® of your own, no parking on the roof, please!

Skycar is a registered trademark of Moller International Corporation



Watch *Design Squad* on PBS (check local listings). Download more challenges at [pbskidsgo.org/designsquad](http://pbskidsgo.org/designsquad).



## TAKE IT ONLINE

**Short circuit?** Build some circuits and see what happens when they short out! Download *Short Circuits* from Intel's *Design and Discovery* hands-on engineering program.

↑ [intel.com/education/designanddiscovery](http://intel.com/education/designanddiscovery)

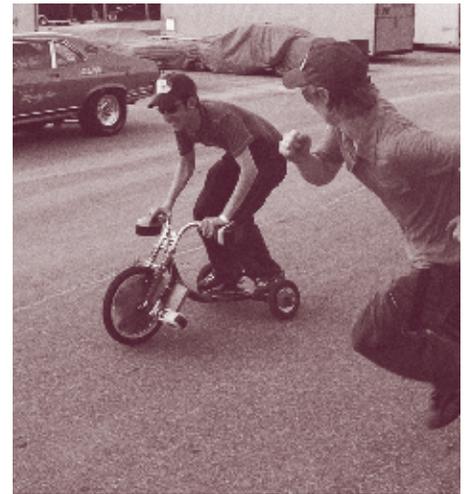


Photo: Mika Tomczak

The *Design Squad* cast converted a tricycle into a motorized racecar using battery-powered drills as their power source. The vehicle reached 20 miles per hour.



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