

## Connections to School —

Children gain hands-on experience with important ideas contained in K-8 National Science Standards. In Balloon-Powered Cars they explore friction, force, optimization and pressure as they build cars and propel them with inflated balloons.

All NPASS2 after school projects are relaxed, informal and fun. They stress five common process skills that are mentioned in state and national science standards: observing, investigating, questioning, explaining and problem-solving. We call these the *Master Scientist Skills*.

**NPASS<sub>2</sub>**  
National Partnerships for After School Science

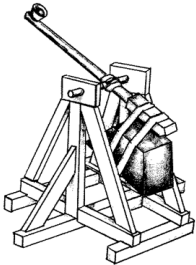
**MASTER INVESTIGATOR**

- Creative, Playful Explorer
- Fair Tester
- Quality Controller



Explore creatively and playfully. Do quick tests and comparisons.  
Change one thing and keep everything else the same. Always watch the results carefully.

## Have you seen this other *Design It!* project?



### Trebuchets

Students engineer a working model of a trebuchet, an ancient throwing machine.

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NPASS2 is a project of  
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Waltham, MA 02453

NPASS2 on the Web  
<http://npass2.edc.org>

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# MAKING SCIENCE FUN

**Balloon-Powered Cars:** an after school science and engineering project from the *Design It!* Curriculum Series



▶ Students design a model car and make it go straight and far with an inflated balloon.

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## FOR PARENTS\*

### Summary

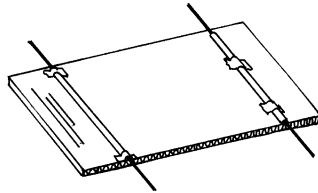
With a few simple materials children design model cars that roll freely down a ramp. They make the cars go by attaching inflated balloons.

### *Design It!* Balloon-Powered Cars Activities

- Making and Testing a Model Car
- Making a Car Go with an Inflated Balloon
- Designing a Way to Support the Neck of the Balloon
- Testing Other Kinds of Balloons
- Making Balloons More Powerful
- Designing a Special Body for Your Car

### Suggested Materials

Cardboard (6"x12")  
2 Dowels (3/16"x9")  
2 Drinking straws  
4 Plastic cups  
2-inch Length of plastic tubing (1/2 inch outside diameter)  
Tape  
9-inch Round balloons  
Cardboard or plywood ramp (about 24"x36")



### Questioning

Ask these types of questions as your child designs the challenges at home:

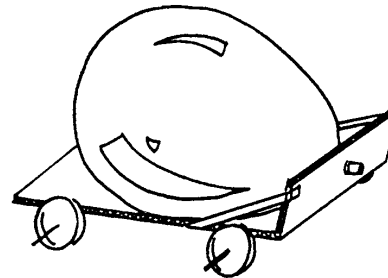
- How do you make the car go as far as possible when you roll it down the ramp?
- How can you make the car travel straight?
- How can you fix wobbly wheels?
- What happens when you use a larger balloon? How does it affect the speed? distance?

\* For more information about this project go to:  
<http://npass2.edc.org/resources/curriculum-guides/balloon-powered-cars>

## FOR KIDS

Try making a Balloon-Powered Car at home with the materials listed opposite.

Ask an adult to help cut the cardboard and plastic cups. Make your nozzle from plastic tubing or attach the balloon directly to a hole in the cardboard. If you have a balloon pump use it to pump up the balloon quickly. Challenge yourself to make your car go as far as possible on balloon power. Can you make it go 10 feet? 20 feet? 40 feet?



**Try this next**— push one balloon inside another using the eraser end of a pencil. Then attach these to the nozzle or cardboard. What happens to the car's speed? What happens to the distance that it goes?