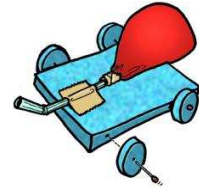


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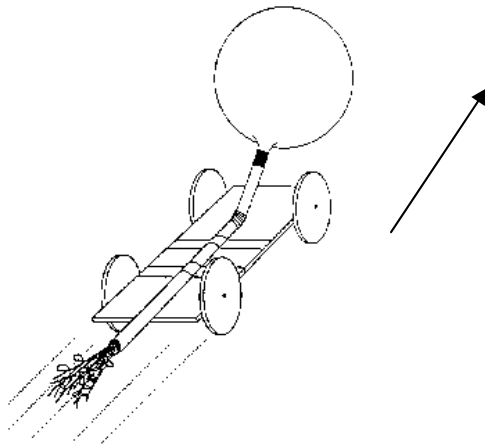
BALLOON POWERED RACE CARS



The air rushing out of a balloon pushes the balloon in the opposite direction from the airflow. This is called **propulsion**. All transportation vehicles have some type of propulsion system. Propulsion systems consist of a source of energy, a way of converting that energy into useful power, and a way of transmitting the power to move the vehicle. In this activity, you will design, build, test, and race a transportation vehicle that uses a balloon as the only energy source.

Newton's 3rd Law of Motion

For every action, there is an equal yet opposite reaction.



Objectives:

- Create a balloon powered race car for maximum speed and distance
- Incorporate Newton's Laws of Motion
- Learn how to use the formula $\text{Speed} = \text{Distance} / \text{Time}$

Materials:

- 1 balloons
- 1 toilet paper rolls
- 6 straws
- 4 popsicle sticks
- 1 piece of cardboard
- 1 piece of cardstock
- 4 paper clips
- 12" piece of string

Name: _____

Rules:

- The car must be powered by no more than 1 balloon.
- It must have at least three wheels. Wheels are defined as anything that is round and goes around.
- The car may not leave the ground.

Hints

- Control how the air comes out of your balloon with a nozzle (possible using the straws!)
- Make the axels free to rotate
- Make the vehicle light weight
- Make the vehicle balanced so it does not flip over

Brainstorm Ideas: Draw at least two detailed thumbnail sketches of your proposed solution to the problem. Identify materials used.

Idea 1	Idea 2
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Calculate Speed:

What was the speed of your balloon car? Take the distance of your car traveled and divide it by the time. Make sure to include units!

Speed = $\frac{\text{distance}}{\text{time}}$