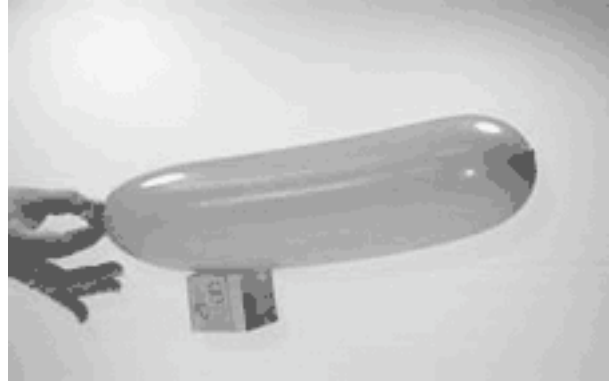


Balloon Rockets

Aerospace engineers apply Newton's Third Law ("to every action there is an equal and opposite reaction") to take us to the Moon and beyond. With this open-ended project, you become the aerospace engineer, designing and building a balloon rocket to transport your cargo.

Materials

- Tape
- Clothespeg
- Straw
- Scissors
- Scrap paper
- Cereal box (or stiff paper)
- Paper or plastic cup (optional)
- Balloon (long skinny ones work best)
- Long piece of fishing line (or smooth string)
- Bottle cap or marble (to use as cargo)



Instructions

Your Task

Design and build a rocket that will transport your cargo.

Your Guidelines

1. The propulsion for your rocket will be an inflated balloon.
2. Build your cargo container from materials such as paper, a cereal box, or a paper or plastic cup.
3. Your rocket will travel along a piece of fishing line, which is threaded through a straw on your rocket. Remember to include the straw somewhere in your design.
4. It is up to you to find the best way to attach the cargo container to the straw and the balloon.

Launching Your Rocket

1. Blow up your balloon and use the clothespeg to hold it closed.
2. Tape one end of the fishing line to a wall about chest high. Hold the other end in your hand at approximately the same height.
3. Load your cargo (bottle cap, marble, or any other small, light object) into the container.
4. Thread the fishing line through the straw attached to your balloon rocket.
5. Unclip your clothespeg and watch your rocket fly!



What's Happening

When you blow up a balloon, you force air into a small space. Air particles don't like to be squished (engineers call it "compressed"). The particles want to move to a less crowded area. When you let go of the clothespeg, the air in the balloon rushes out to the lower pressure (less crowded) room. All that air rushing out the back of the balloon pushes it forward. Remember, for every action—air rushing out the balloon opening—there is an equal and opposite reaction—the balloon rocket shooting off down the fishing line.

A Step Further

Testing is an important part of engineering. Record how far along the fishing line your rocket went, modify your design, and test it again. Did it go as far or farther than your original rocket?