girl scouts of western washington

Discover Girl Scouts at Home

STEM

Brownie at Home

Lunch Bag Rocket

Supplies

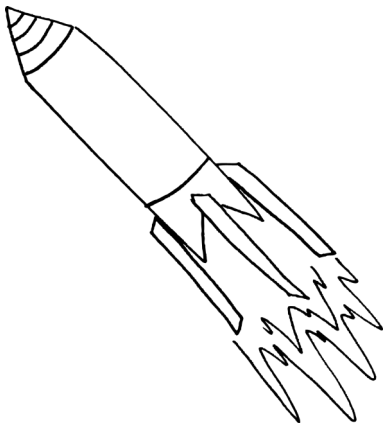
- About 10 feet of string (nylon string works best).
- A long, thin balloon.
- Tape.
- A paper lunch bag.
- A straw.
- Other creative materials (cardstock, index cards, etc.)—whatever you have on hand.
- Scissors.
- Markers, crayons, or colored pencils.

Scientific Concepts

Newton's Third Law of Motion: *For every action, there is an equal and opposite reaction.*

Newton's Third Law is a fundamental law of motion, which means it applies to *everything* that moves!

Watch this short video from a NASA astronaut on the International Space Station to learn what it means and how it works.



girl scouts of western washington

Discover Girl Scouts at Home

STEM

Brownie at Home

Lunch Bag Rocket

Instructions

1. If you want, decorate your bag. Avoid putting holes in it and gluing anything heavy on it.
2. Slide the string through the straw.
3. Tie each end of the string to something at the same height (like two chairs) and pull the string tight. This is the track for your rocket.
4. Tape the paper bag to the straw along one of the long sides so that the bottom of the bag is at one end of the straw and the opening is at the other.
5. Slide the open side of the paper bag/ straw combo to one end of the string.
6. Blow up the balloon and hold it closed so the air can't get out. This will be the rocket's "engine."
7. Put the balloon inside the bag, then let go. This launches your rocket—blast off!
8. Once you've launched it a few times, experiment with the design! Use the other creative materials (whatever you have on hand) to add things to your rocket. Think about:
    - How can you make your rocket fly faster or smoother?
    - How can you make your rocket spiral around the string when it flies?

Virtual Troop Meeting Ideas

Video, text, or voice chat. Have your Girl Scouts complete steps 1-7 on their own. Then, have them share what structures they think they could add to the rocket for step 8. Be mindful that not everyone in your troop may have access to the same creative materials.

Photo or video share, or live video. Have your Girl Scouts share their results for step 8!

Video, text, or voice chat. Have your Girl Scouts watch the video linked in Scientific Concepts. Then, discuss: How does Newton's Third Law apply to their rockets? What is the action and reaction? How is the reaction opposite to the action? How is it equal?