Related Standards:

K-PS2-1 K2-ETS1
3-PS2-1 3-5-ETS1
5-PS1-1 MS-ETS1

Rockets: *Rocket Propulsion*

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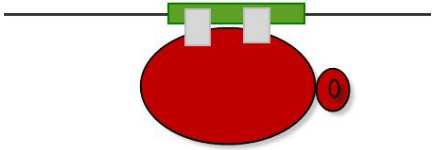
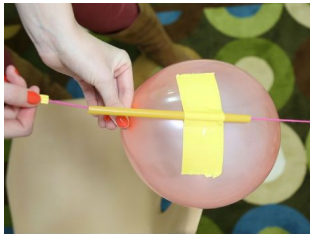
Materials:

- ❑ Balloon
- ❑ 1 Straw
- ❑ 10ft String
- ❑ Tape





Instructions:

1. With pieces of string cut to fit around the balloon, measure the circumference of the balloon with different amounts of air in it(full,1/4 full,1/2 full, & 3/4 full), and record the circumference in the table shown below.
2. Tie one end of the string to a chair, doorknob, or any other support.
3. Put the other end of the string through a straw. Then pull the string tight, and tie it to another support in the room.
4. Blow up the balloon, and pinch the end of the balloon to keep the air inside. Do not tie the balloon.
5. Tape the balloon to the straw so that the opening of the balloon is horizontal with the ground. This may require two people to help.
6. Pull balloon back to the end of the string and let go of the balloon and watch it move along the string.
7. An additional option for this activity is to have the students tape cargo (paperclips, pens, cereal boxes) and see how this affects the speed of the balloon rocket.
8. Calculate the volume of the balloon with the different circumferences using the equations presented earlier.

Try It!

Try filling the balloon with different amounts of air.
Does the balloon go further? Why or Why Not?
Do you think the direction the balloon goes affects how far it goes?

What's the science behind it?

Newton's Third Law: For every action, there is an equal and opposite reaction! A balloon provides a simple example of how a rocket engine works. The air trapped inside the balloon pushes out the open end, causing the balloon to move forward. The force of the air escaping is the "action"; the movement of the balloon forward is the "reaction" predicted by Newton's Third Law of Motion.

Related Standards:

K-PS2-1 K2-ETS1
3-PS2-1 3-5-ETS1
5-PS1-1 MS-ETS1

Rockets: *Paper Rocket*

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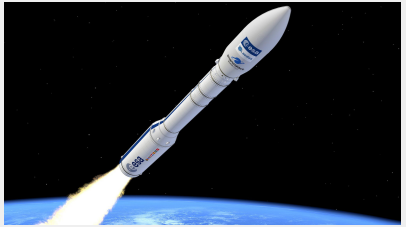
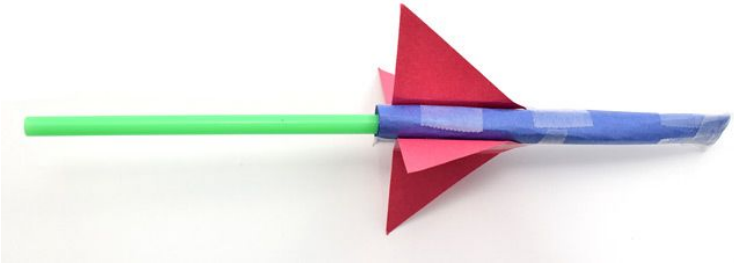
Try It!

What happens if you change the length of the rocket or the shape of the fins?



Materials:

- ❑ Materials:
- ❑ A Piece of Paper
- ❑ 1 Straw
- ❑ Scissors
- ❑ Tape



Instructions:

1. Fold paper into fourths
2. Cut along the folds to get 4 pieces of paper
3. Roll one piece of paper around one straw (not tightly enough to compress the straw)
4. Slide the straw out of the coiled paper
5. Tape the paper down to hold it in place (it should resemble a tube, this will be the body of the rocket)
6. Pinch one end of the rocket to make the nose
7. Tape the nose shut
8. Take one of the paper squares and fold it in half
9. Starting from the closed edge, cut out a triangle. Afterwards, cut out another triangle (these will make the fins)
10. Tape the triangles to the rocket's back end (there should be 4 fins on the rocket)
11. Place the rocket on the straw, then blow

What's the science behind it?

Engineering: Aerodynamics describes the way that air moves around objects. The rules of aerodynamics explains why objects such as airplanes are able to fly. Aerodynamics acts on things such as rockets blasting off from a launch pad, and even cars since the air flows around the car! During the activity, aerodynamics will even be acting on the paper rocket.