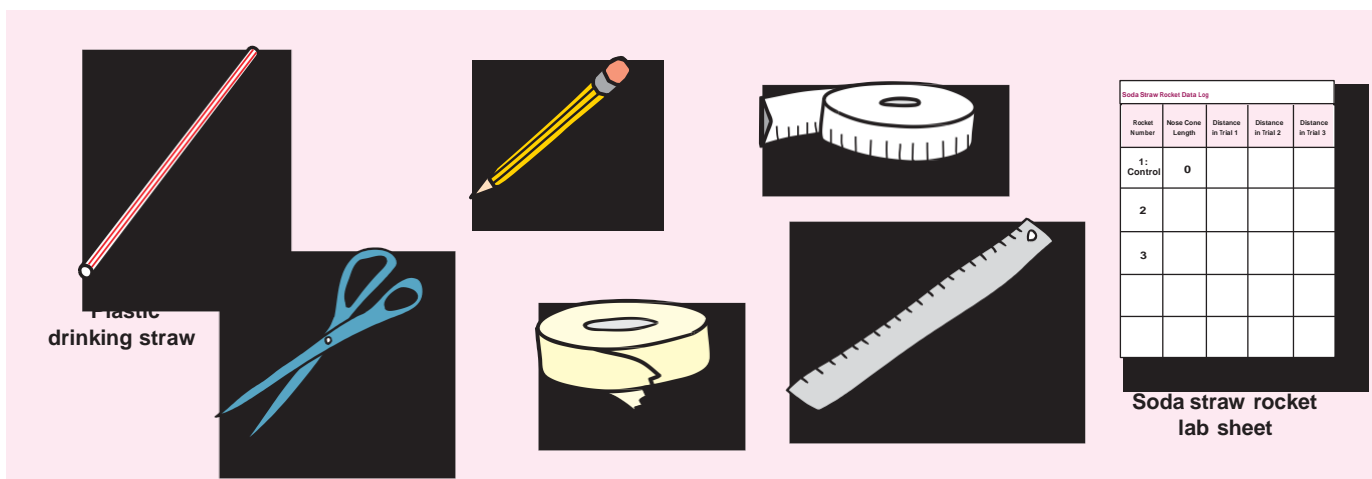




# Build A Soda Straw Rocket

## Find What You Need...

- Plastic drinking straw
- Scissors
- Pencil
- Scotch tape
- Ruler
- An open space to launch rockets
- Soda Straw Rocket Lab Sheet (Fill in the form on the last page)
- Tape measure



## How could you make a rocket fly farther?

Whether a rocket makes it to the moon, or barely makes it a mile, depends on a few variables. First, there has to be enough **force** getting the rocket moving. Second, there can't be too much **drag**, the *force* of air pressure against the rocket, slowing it down. The **shape** of a rocket affects the amount of *drag* it produces. Another factor affecting a rocket's flight path is the **angle** of the rocket when it takes off – do you want to shoot it straight up, straight out, or something in between?

In this activity, you will build and test soda straw rockets – just like a NASA engineer. You'll be changing the shape

of your rocket by varying the length of the *nose cone*, or the pointed part in the front. Your goal: To lessen the drag so your rocket flies farther.

## Fact:

A space shuttle can weigh about 200,000 lbs and moves at thousands of miles per hour. It takes a huge amount of force to get it going!



## Activity Instructions

---

1. Use the three rocket patterns in this activity as a guide.
2. Cut out one big rectangle, otherwise known as your “rocket body.” Curl the rectangle lengthwise around a pencil and tape it into a tube.
3. Cut out two rocket fin units. Line up the rectangle on one unit with the bottom of the rocket body. Tape it on. Line up the second fin unit and tape it to the opposite side of the tube.

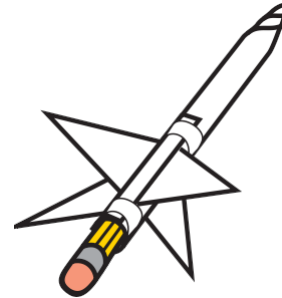


4. On one fin unit, bend the fin on the right side toward you, so it forms a right angle with the fin on the left. Do the same to the right-hand fin on the other fin unit. Now, when you look at the rocket from the bottom, the fins should form a + shape.



5. Put the straw inside the rocket and line up the front of the rocket with the end of the straw. Then, tape the end of your rocket closed. This rocket has no nose cone. This is your *control rocket* – you will test other models against this one.
6. **Important:** Find an open space where you can launch your rockets with no danger of hitting someone.
7. Let it fly! Blow into the straw to launch your rocket. How does it work? Try launching at different angles and see what makes it fly the farthest. Measure the distance flown on three flights and write the measurements on your lab sheet.

8. Now, see if you can build a better rocket. Follow steps 2 – 4 to build a second rocket. This time, push the rocket body up to the sharpened end of the pencil. Twist the end of the tube closed around the sharpened end to form the nose cone. Remove the pencil.



9. Measure the length of your nose cone. Write it on your lab sheet and on the rocket.
10. Test it! How far can you make your second rocket fly? Measure the distance and enter it on your lab sheet.
11. Keep experimenting. What do you think might help another rocket reduce drag and fly farther: A longer nose cone than the second rocket, or a shorter nose cone? Choose one and build and test another rocket.  
**Tip:** Pencils with longer sharpened-ends would help you make longer nose cones – but you could twist the nose cone without a pencil too.
12. Keep testing different nose cone lengths until you make the best rocket!

---

## Conclusions

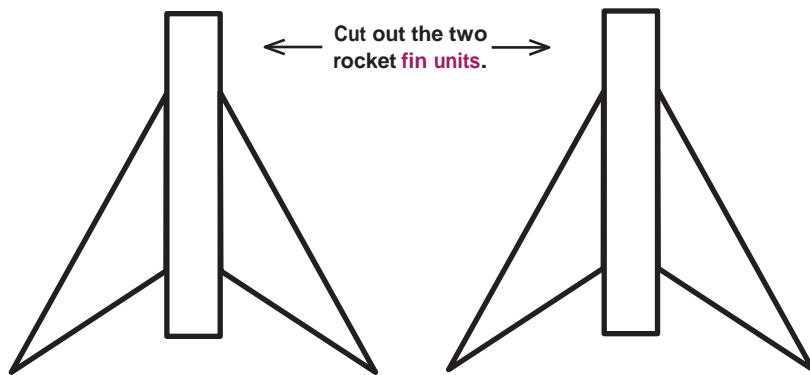
Did anything surprise you about this activity? What are at least two ways you can “prove” that air pressure exists? What might happen if you tried this activity on Mars?

## Brain Buster:

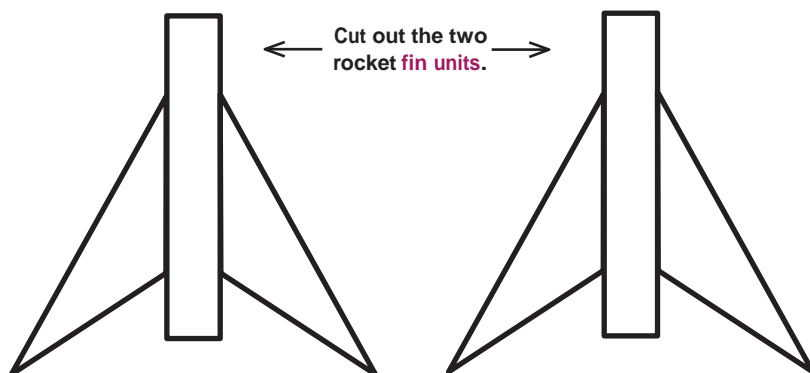
What other variables could you change on your rocket – and how might they affect its flight?

Try it and find out.

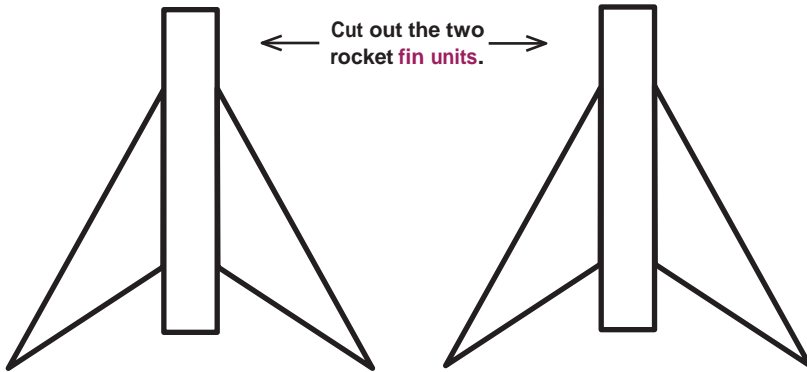
## Rocket Pattern



↑  
Cut out the **rocket body** and curl it lengthwise around a pencil and tape it into a tube.



↑  
Cut out the **rocket body** and curl it lengthwise around a pencil and tape it into a tube.



↑  
Cut out the **rocket body** and curl it lengthwise around a pencil and tape it into a tube.

### Soda Straw Rocket Data Log

Rocket Number	Nose Cone Length	Distance in Trial 1	Distance in Trial 2	Distance in Trial 3
1: Control	0			
2				
3				



Kids' Science Challenge Science Projects are presented by the award-winning radio series, Pulse of the Planet



Made possible by the National Science Foundation

©2009 Jim Metzner Productions. All rights reserved.