Soda Straw Rocket Activity

Goal: Students will study how basic rocket processes are applied to space flight.

Objective: Students will demonstrate the ability to conduct an experiment and analyze and interpret the results.

National Science Education Standards:
Standard A: Abilities necessary to do Scientific Inquiry
Standard B: Motions and forces
Standard E: Abilities of technological design

National Mathematics Education Standards:
Measurement
Patterns and Functions

National Technology Education Standards:
NT.K-12.3 Technology Productivity Tools

Materials:

- Soda Straw Rocket Templates
- Soda Straw Rocket Data Log Handout
- Soda Straw Rocket Data Analysis Handout
- Sharpened pencil
- Tape
- Straw
- Meter stick and/or tape measure

Procedures:
Soda Straw Rockets is an extremely versatile activity that can be easily adapted to accommodate a broad range of students in varying age groups. The procedure presented here is but one of many possible ways the activity can be utilized – feel free to experiment and modify!

Students should follow the instructions provided on the soda straw rocket template in order to construct their rocket. Students can be organized into groups of 4-6 so that each of the students within the group can build a rocket with a different length nose cone. Students should select a control for this experiment. This control should be something similar to what you are testing, but something that will be unaffected by the things you are changing. For this experiment, construct one control rocket that has almost no nose cone at all. Just tape the end of the paper tube closed. Students will launch each rocket one at a time and record the distance it traveled (in centimeters) on the Data Log Handout. Students may wish to write in any observations they want to remember as they perform their experiments. Students should do five trials of the experiment and record the results on their Data Log. Students will then graph their data on the Data Analysis handout in order to draw a conclusion as to which nose cone length produced the best rocket.

Extensions:

1. Students can determine the mean, median and mode each rocket distance.
2. Students can experiment and design a new template for a rocket that they feel will fly better than the rocket design provided.
3. Students can complete this experiment focusing on launch angles rather than nose cone lengths.

NOTE: Rocket launching should take place in an open enough area where students are able to stand out of the way of rockets being launched.

Soda-Straw Rocket Template

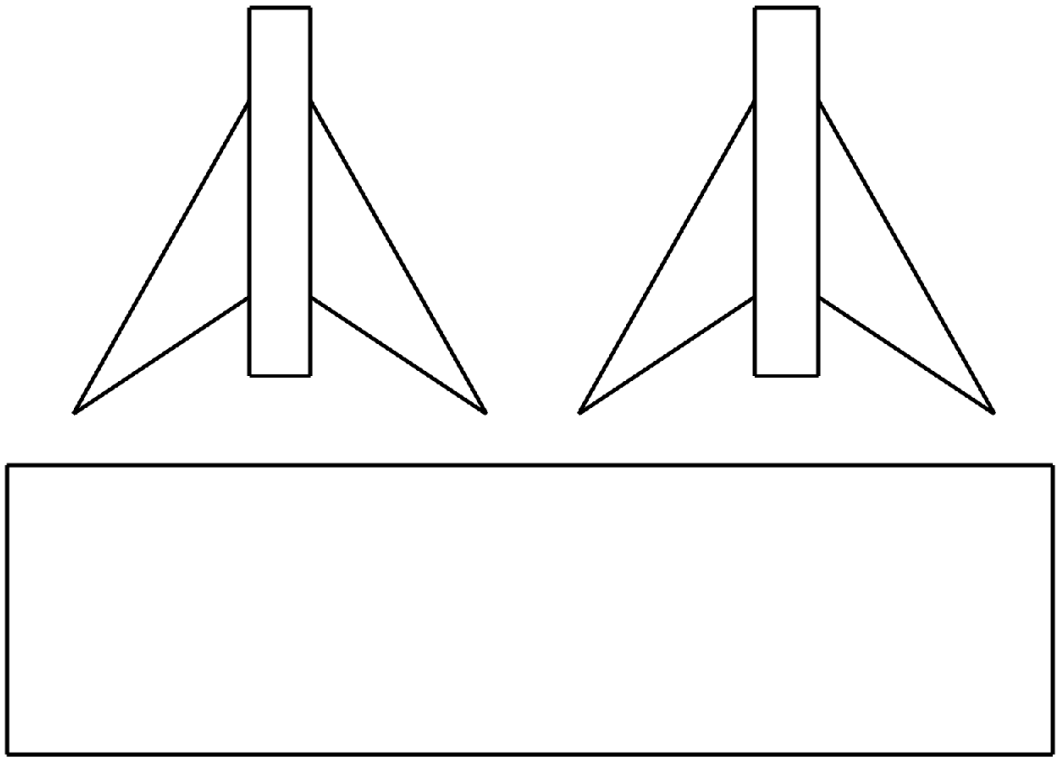
1. Carefully cut out the rectangle. This will be the body tube of the rocket. Wrap the rectangle around a pencil length-wise and tape the rectangle so that it forms a tube.

2. Carefully cut out the two fin units. Align the rectangle that extends between the two fins with the end of your body tube and tape it to the body tube. Nothing should stick out past the body tube! Do the same thing for the other fin unit, but tape it on the other side of the pencil, so you have a "fin sandwich".

3. Bend the one fin on each fin unit 90 degrees so that each fin is at a right angle to its neighbor. When you look along the back of the rocket, the fins should form a "+" mark.

4. Using the sharpened end of your pencil, twist the top of the body tube into a nose cone. Measure your nose cone from its base to its tip and record the length on your Data Log and on the rocket itself.

5. Remove the pencil and replace it with a soda straw. Blow into the straw to launch your rocket! Record the distance it travels on your Data Log.



Courtesy…John Callas (JPL)

Soda-Straw Rocket Data Log

Distance Traveled (in cm)

Length of Nose Cone	Trial #1	Trial #2	Trial #3	Trial #4	Trial #5	Notes
Control						

Soda-Straw Rocket Data Analysis