

Basic Air Powered Paper Rocket

Procedure Constructing the Rocket

1. Begin construction by rolling a cylinder of paper around the 1/2" PVC pipe. The paper can be rolled the long or short direction to make a tube 11 1/2" long or 8 1/2" long. Tape the seam.
2. Make nose cone. Cut a half circle and curl its corners to form the cone shape. The round edge forms the base of the cone. The straight edge folds in the middle to form the apex as the sides overlap. Tape the seam.
3. Place the nose cone over the paper body tube (keep the PVC pipe inside for support). Fit the cone to the outside dimension of the body tube. Trim off the excess paper and tape the cone securely. Make it so that no air leaks out.
4. Cut rocket fins and tape them to the lower end of the body tube. The rocket is ready for launch.
5. Time permitting, the students will launch their rockets two or more times. Before the second launch, students should do something to modify their rockets to improve their flight performance. After their flights, they should record their observations on the mission report.

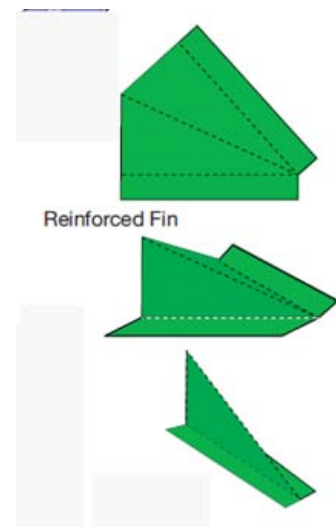
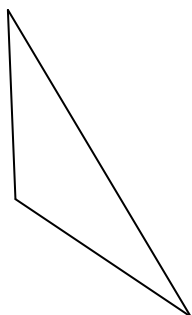
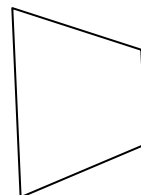
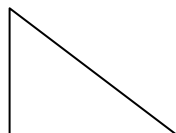
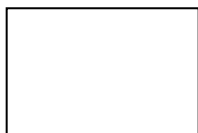
How can air rockets be modified to improve their flight performance?

- How loose or tight the tube is in relation to the launch rod affects air flow.
- The size and shapes of the fins affect air drag. Having fins mounted straight on the body of the rocket also affects drag.
- The length and shape of the nose cone, squat or slender, affects how the rocket slices through the air.

Experiment

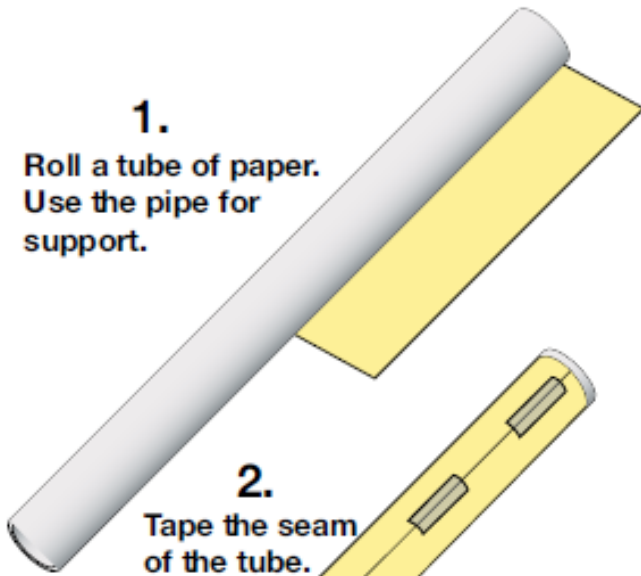
Investigate fin placement on air rockets. Have students construct a new rocket but place the fins in different locations such as near the nose cone. Have them test the rockets and discuss their performance.

Some Fin Shapes



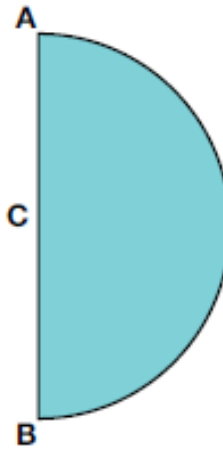
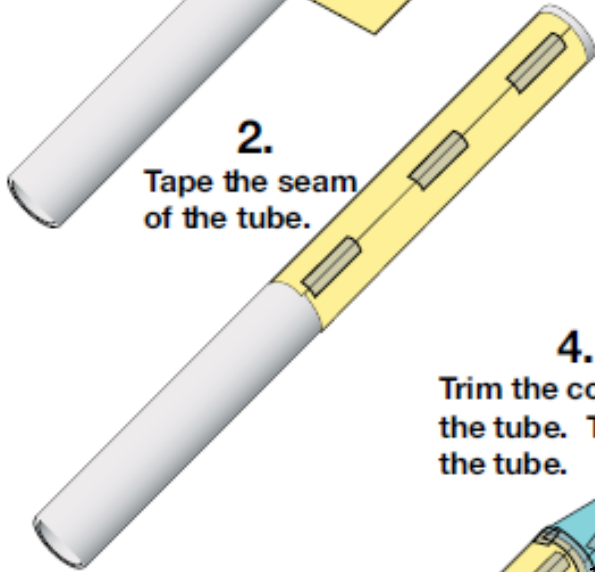
1.

Roll a tube of paper.
Use the pipe for support.



2.

Tape the seam
of the tube.



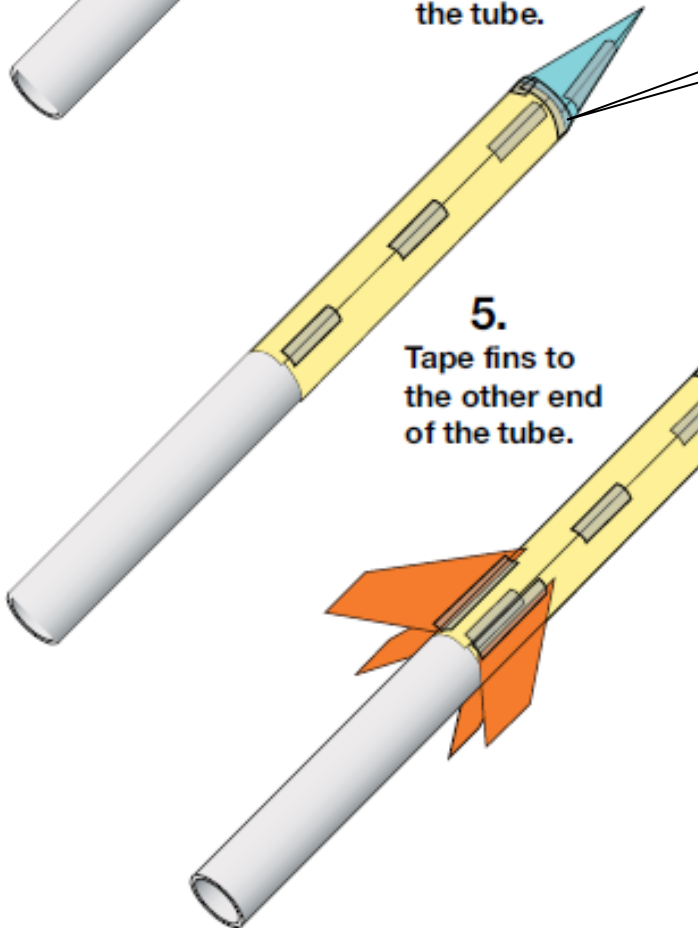
3.

Curl a nose cone from a
semicircle. Tape the seam.

4.

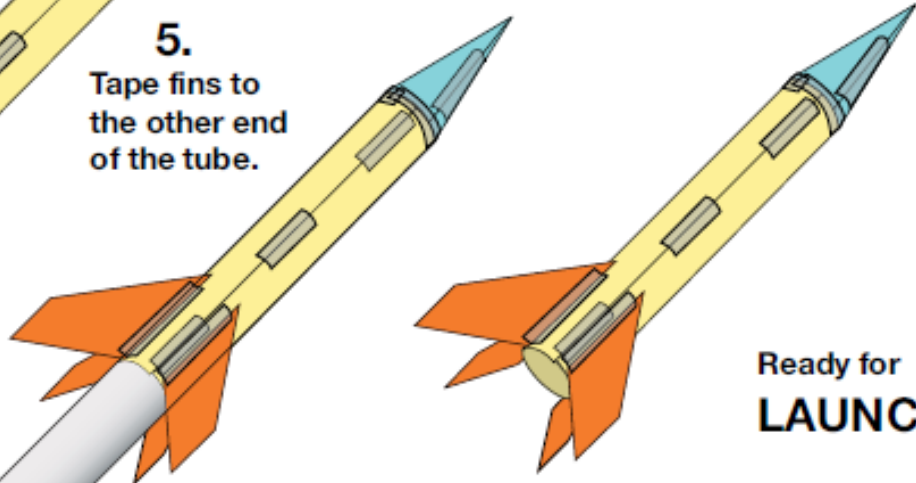
Trim the cone to fit
the tube. Tape it to
the tube.

Make this joint as air
tight as possible



5.

Tape fins to
the other end
of the tube.



Ready for
LAUNCH!

Air Rocket Mission Report

Name: _____

Test Flight 1 Summary:

Body Tube Length: _____ cm

Nose Cone Length:_____ cm

Number of Fins:_____

Area of 1 Fin: _____ square cm

How far did the rocket travel?

Describe the flight of the rocket. (Did it fly straight, wobble, drop quickly to the ground, etc?)

Test Flight 2 Summary:

Body Tube Length: _____ cm

Nose Cone Length:_____ cm

Number of Fins:

Area of 1 Fin: _____ square cm

What did you do to improve the rocket?

Predict how far the rocket will fly. _____

Describe the flight of the rocket.

How far did the rocket travel? _____

Did your improvements work? Why or why not?

Final Rocket Design

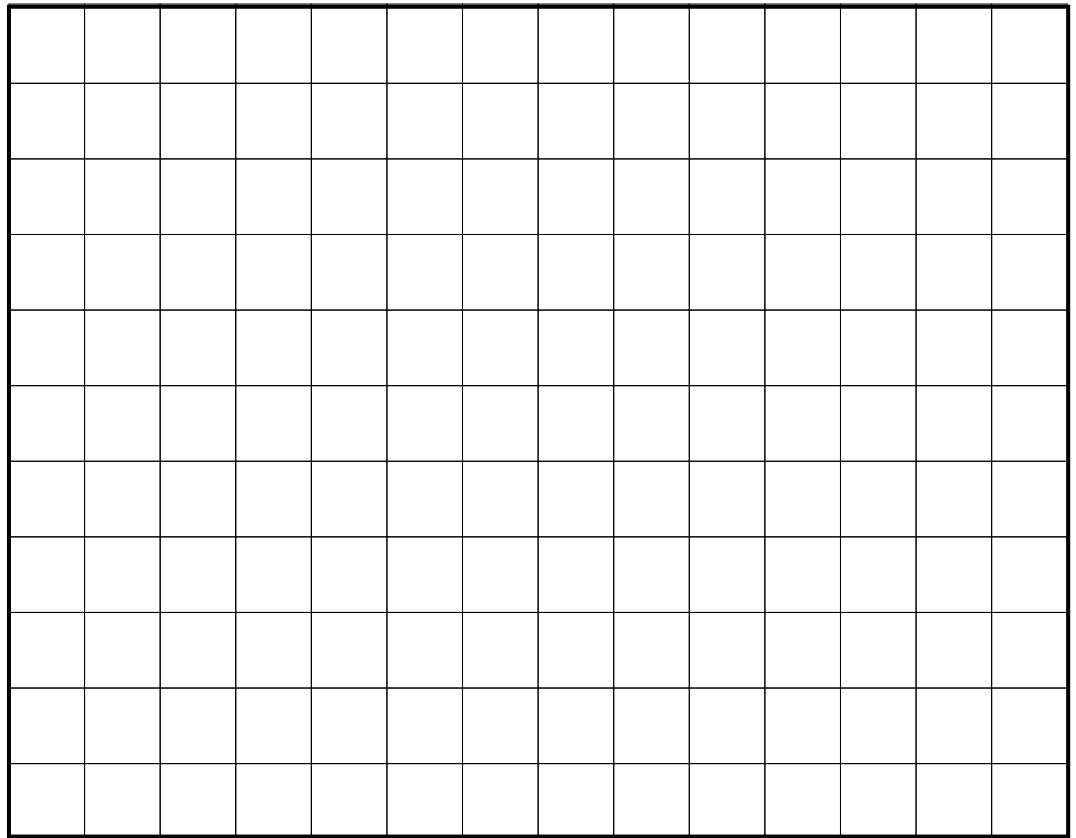
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Rocket Fin Design

Design your fin on the first graph. Estimate its area by counting the number of whole squares it covers. Look at the squares partially covered. Estimate how many whole squares they are equal to. Add the two numbers together.

Area =

_____ square cm



Redesign your fin.

Area =

_____ square cm

