

# Out of this World Rocketry

## Lesson 4 Paper Rockets



### Materials

- 1/2 inch PVC pipe
- scrap paper
- scissors
- scotch tape
- modeling clay

### Optional Materials

- cork
- hot glue
- glue gun
- cardboard
- index cards
- tape measurer

### Introduction

Building and flying rockets is an exciting and educational way to introduce students to aerospace education. This lesson allows students to produce cheap, safe and reusable paper rockets.

### Part I

#### **Experiment 1**

##### Materials

1. 12 inch or 18 inch sections of 1/2 inch PVC
2. scrap paper
3. scissors
4. scotch tape
5. modeling clay

##### Optional Materials

1. piece of cork (for the nose cone)
2. hot glue gun
3. hot glue
4. cardboard
5. 4 x 5 inch index cards (for sturdier fins)
6. tape measurer

Demonstrate how to roll the fuselage\* of the rocket by wrapping a sheet of paper around a section of 1/2 inch PVC pipe, taping the cylinder (paper) and removing it from the tube. The cylinder must be loose enough on the launch tube so that the rocket will not become stuck but tight enough to prevent air from escaping around the base of the rocket. Use the modeling play or play-dough to seal the nose cone end of the body tube. Allow students to construct their own paper rockets.

To 'launch' the rockets, use the PVC pipe, with half of the rocket slid over the end of the pipe, and have students blow the rocket off the end. The pipe should be at a 45 degree angle.





### **Reflect**

- Where is the mass of the rocket located, near the nose cone or the opposite end?
- How is mass going to affect the flight of the rocket?
- What factors determine how a rocket will fly? (think back to the balloon exercises)?  
i.e. fins, nozzles, length
- Where were the fins positioned on the rocket?
- How would the type of material used for fin construction affect performance of rocket?

It is fun to have students 'race' their paper rockets. Using the tape measurer, determine how far students rockets fly.

### **\*Vocabulary**

Fuselage: the central body portion of an aircraft or rocket designed to accommodate the crew, cargo and in some cases fuel.

Nose cone: a protective cone constituting the forward end of an aerospace vehicle.