

Introduction

- August 23rd is National Ride the Wind day! The day to commemorate the anniversary of the first human-powered flight to win the Kremer prize. We all have seen planes glide through the sky, and some of us have even been in an airplane. But did you ever wonder what makes airplanes . . . airplanes? With the combined forces of thrust, lift, drag and gravity, it works to create **flight**.

Materials List

- Regular 8.5x11in Printing Paper
- Double Stick Tape (Regular Tape is fine as well)

Procedure

1. Fold the top right corner over to the left side, making a fold from the top of the paper to the bottom right corner.
2. Unfold the paper and repeat for the left corner.
3. Unfold the paper again and fold the top right corner over to meet the crease made from the first fold.
4. Fold the left corner over to meet the crease from the second fold.
5. Fold the top right edge over to meet the edge of the fold from step 3. Repeat for the other side.
6. Fold the top edge down and towards you to meet the point where the right and left layers cross.
7. Fold the plane in half away from you. Staring at the nose, fold the wings down at a slight angle, 1/2" in the front to about 2" in the back.
8. Add double stick tape to the inside of the body so it stays together.

Science Behind Experiment

- The airplane that you just built is amazing, goes far in distance and stays afloat for a while. But again, we meet the question of what makes the airplane a float. Air! It's all around us and air allows airplanes to glide for a distance. We call this **Aerodynamics**, the study of motion of objects through the air. To make this happen, there are 4 forces being applied on the airplane, drag & gravity and thrust and lift. Drag and gravity bring the airplane's journey to an end, drag representing the resistance it has while flying and gravity pulling it to the ground. To keep a minimum in drag and gravity, making it lighter and thinner would help a lot. The positive forces are thrust and lift, thrust being the forward movement and lift being the upward movement. The initial thrust comes from the initial launch, as an airplane would launch off the ground, the paper airplane's initial launch would be when we throw the airplane. The lift motion comes from the air below the airplane wing, pushing it up harder than the air above is pushing it down.