Paper Airplanes

Goal: Learn about the physics of how airplanes fly, and make some of our own out of paper!

How do airplanes fly?

Airplanes can weigh over 50 tons, so how can something so heavy stay in the air? We can answer this question by examining the four forces that act on an airplane: **lift, weight, thrust, and drag**.

Lift and Weight

Lift is the force that pushes the airplane upwards, and it comes from the air underneath the airplane's wings. The wings of a plane are designed so that more air gets pushed underneath as the plane moves forward, and all of that air pushing against the bottom of the wings keeps the plane from falling. **Weight** is the force that tries to pull the airplane down, and it comes from the pull of gravity. The heavier the plane is, the more weight it has. You can feel this for yourself if you jump up from the floor; your weight will pull you back down.

Thrust and Drag

Thrust is the force that pushes the airplane forward, and it comes from the engines in the plane. **Drag** is the force that tries to pull the plane backwards, and it comes from the resistance in the air. You can feel this resistance on your hand by rapidly swishing it back and forth through the air.

How does it all come together?

The airplane will stay in the air as long as its **weight** force is not greater than the force of **lift**, and it will move forward as long as its **thrust** force is greater than the force of **drag**.