

HOW THINGS FLY

TRY THIS AT HOME!

Create your own flight lab to see WHICH PAPER AIRPLANE DESIGNS WILL FLY THE FARTHEST.

CREATE YOUR OWN

Gliders fly without engines, just like paper airplanes! what would happen if you altered a plane's lift, weight, drag or thrust? Could it fly faster or further, or do stunts? Try experimenting with the forces of flight at home.

Here's what you will need:



COMPUTER WITH INTERNET ACCESS AND A PRINTER



PAPER CLIPS

REGULAR PRINTER PAPER (8½ X 11 INCHES)

CHOOSE YOUR AIRPLANE DESIGN HERE!

SOME ARE EASY TO MAKE;
OTHERS ARE MORE DIFFICULT.
TAKE YOUR PICK! YOU CAN EVEN
CHOOSE COLORFUL DESIGNS TO
ADD TO YOUR PLANE. PRINT OUT
YOUR CHOICE AND FOLD YOUR
AIRPLANE ACCORDING TO THE
INSTRUCTIONS. MAKE ONE,
TWO, OR ALL THREE!



TIP!

FOR AN EARTH FRIENDLY PROJECT REUSE PAPER THAT HAS ALREADY BEEN PRINTED ON.



NOTEBOOK AND PENCIL TO RECORD YOUR FLIGHT DATA



STOPWATCH AND A FRIEND TO TIME YOUR TEST FLIGHTS



DESCRIPTION: The Dart is very streamlined, with a long fuselage (body) and delta wing (a wing shaped like a triangle).

CHARACTERISTICS:

The Dart is excellent for long-distance flights and flights requiring accuracy, but it's not very good for stunts. The Dart is an extremely fast and stable paper airplane.



FLIGHT LAB

Does this stealth bomber look like any of the paper airplanes below?



The Canard (MEDIUM)

DESCRIPTION: The Canard has a long fuselage, delta wing, and canard. A canard is a small wing that is in front of an

airplane's main wing. **CHARACTERISTICS**

The Canard is excellent for long-distance flights and flights requiring accuracy. Its forward wings give extra control over how it flies. The Canard is not nearly as fast as the Dart, but it is fairly stable.

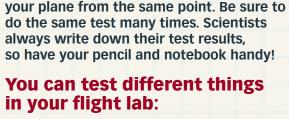
(HARD)

DESCRIPTION: The Delta has a wide delta wing, winglets (turned-up wings), and a blunt nose.

weight design and large tapered winglets make it a stable flier. If built right place, it can make long, sweeping turns.

The Delta

The Delta is a slowmoving glider. Its forward and launched from a high



Once you have your paper airplane ready, SET UP A TEST AREA. It's best if you can test your airplane outside, on a non-windy day. Mark your starting point. Always throw

- See how long your plane stays in the air. Test it at least three times. Use a stopwatch and write down your results.
- See how far your plane flies. Use a tape measure or yard stick to measure each flight.
- You can also make slight changes to your plane's design to see what happens.

Here are some suggestions for ways to change your design:

- Angle the rear wings up, just a little bit, with small folds. What happens? Why do you think so?
- Angle the rear wings down, just a little bit, with small folds. What happens? Why do you think so?
- Add a paper clip to the underside of the plane. Place it near the front of the plane. What happens? Try it again, moving it back a bit. Continue to test it out, placing the paper clip in different spots. Think about how it changes the flight of the plane each time.
- Make up your own experiments. Try folding a different kind of paper airplane. Once you come up with a design, make one small change for each flight and watch what happens.





JOURNAL

What did you figure out about flight in your flight lab?

How do these different adjustments affect the way lift, weight, drag, and thrust act on your paper airplane?