



San Francisco
Public Library

STEM CHALLENGE

PAPER AIRPLANES

WHAT MAKES THIS STEM?

This activity is an exploration of the principles of flight. After building the paper airplane using the instructions, design your own and compare the differences in how they fly. You will observe differences in **lift**, the force that is created by the wings of the airplane, which pushes down air down so the airplane rises up; in **thrust**, the force that propels the airplane forward; and in **drag** the air resistance that acts opposite of thrust.

MATERIALS

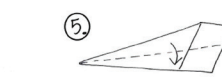
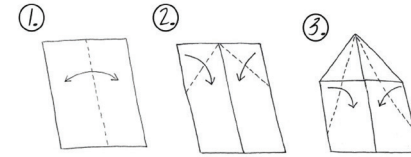
- 2 sheets of paper
- OPTIONAL: Markers, crayons, or colored pencils*

* These materials are not provided in the kit. If you would like to make your kit in the library, ask a librarian to use their craft materials.

HOW TO DO IT

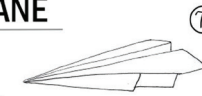
(Optional step) Before you begin, you can decorate your airplane, if desired. But this could affect the flight of your airplane.

1. Fold your 8 ½ x 11 inch piece of paper in half lengthwise to mark the middle of the paper with a fold and then open back up.
2. Hold one of the upper corners of the paper and fold into the middle creating a triangle fold and leave it folded against the middle. Repeat on the other side.
3. Take the outer corner created by the last fold and fold it completely into the middle paper fold and crease. Repeat on the other side.
4. Fold the middle fold back on itself exposing the folds you just completed and crease into place.



HOW TO FOLD A PAPER AIRPLANE

you will need a piece of copy or construction paper.



5. Take one side and fold it in half by taking the angle edge to the middle crease edge and then crease the fold just enough to allow it to create a 90 degree angle for the paper airplane wing.
6. Repeat on the other side to make the other paper airplane wing.
7. Your airplane is ready to fly.

CHALLENGES

Design your own paper airplane with the other piece of paper. Fly both and compare:

- Measure how far each paper airplane flies.
- Time how long each airplane stays in the air.



For easy video instructions and other challenges, visit on.sfpl.org/stem-challenge.

Love this experiment?
Share and tag us on social!

- @sfpl.org
- @sfpubliclibrary
- @sfpl.org



All programs at the Library are free. Supported by Friends of the San Francisco Public Library.