HOW TO MAKE A
PAPER AIRPLANE

A STEP-BY-STEP GUIDE

DISCLAIMER

When used improperly, paper airplanes can cause debilitating eye injuries and severe paper cuts to both the user and bystanders. Exercise caution during both the construction and flight portions of these instructions. Personal protective equipment may be required. Be sure to clear the flight path prior to loss to reduce the likelihood of civilian casualties.

INTRODUCTION

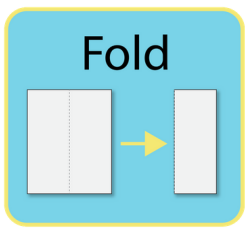
This step-by-step guide will provide the average Iowa State University student with the knowledge necessary to create a paper airplane from an ordinary piece of 8.5″ x 11″ copy paper. This guide will include details regarding the construction of the three basic portions of a paper airplane. In all phases, attention to detail is absolutely critical for a successful flight.

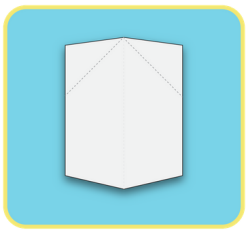
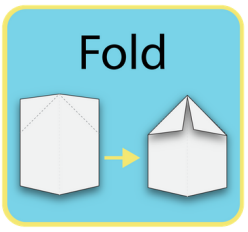
MATERIALS

- One sheet of 8.5" x 11" paper
- A flat work surface
- Scissors (optional)

THEORY

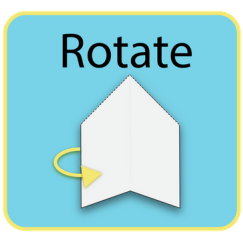
Normal airplanes balance four forces to stay aloft: lift, weight, thrust, and drag. Paper airplanes operate differently than normal airplanes because they don't utilize either lift or thrust in the same way. Paper planes are gliders, which trade altitude for speed. Because they are light, not much lift is required and is provided by the angle of the wings relative to the airplane's path through the air.

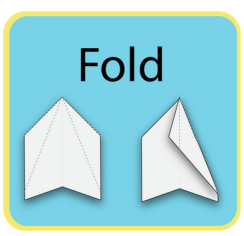



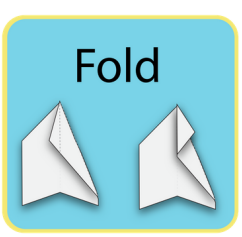



FOUNDATION

- Choose the color of your paper airplane.
- Fold the paper lengthwise, crease it, and reopen it.
- Place the paper with the outward crease facing up.
- Fold the top corners at 45 degree angles.







WINGS

- Rotate the paper so that it is pointing away from your body and the inward crease is facing up.
- Fold the long side of the paper so that the once-leading edges of the wing are one millimeter from the center crease, and crease the new line for the wing.
- Repeat this process for both sides.

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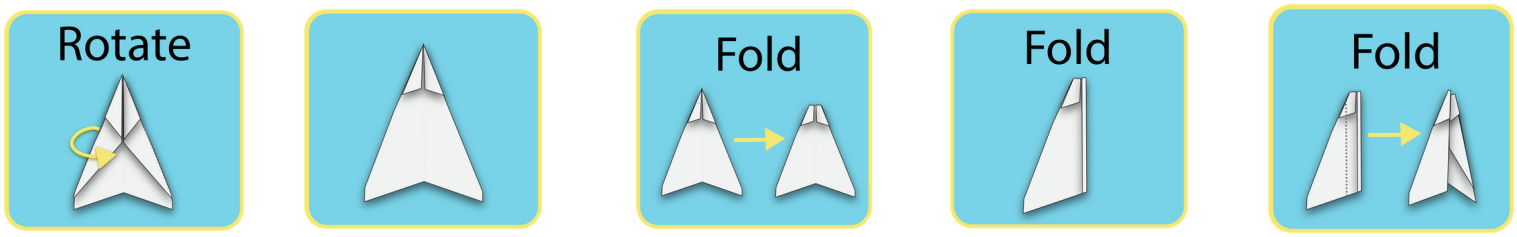
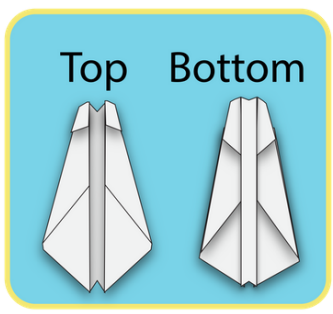
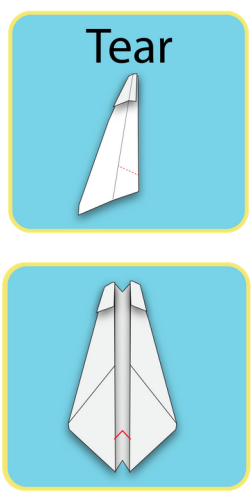


WINGS (CONTINUED)

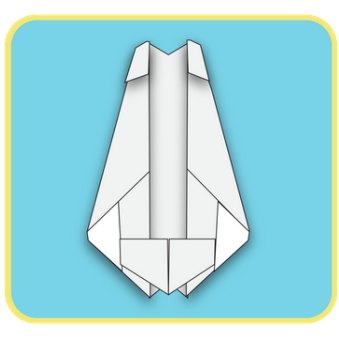
- Flip the paper over so that the center outward crease is facing up. Bend the nose of the plane in half under the front of the paper and crease.
- Flip the paper over so that the center inward crease is facing up. Fold one whole side so that the leading edge is touching the bottom of the plane. Crease this line. Repeat on the both sides of the plane.
- Gently pull them away from the center fold.



TAIL



- Gently pull the wings, exposing the center crease, pulling to make a one inch tear or cut at the bottom.
- Force this up to create a deeper, inverted fold in the plane. Crease this deeper fold so that it holds its shape while standing up.
- Refold the wings to a slight downward angle, facing down.



FINAL PRODUCT

Shown here are three different perspectives of the final product for your convenience. The final product should appear to have both upper and lower sets of wings, a prominent nose, and a tail standing upward at the back end of the airplane. Holding the paper airplane from the crease underneath will yield the best results when testing flight ability.

FURTHER READING

The following is a list of books both on the history of the paper airplane and different methods and instructions on creating paper airplanes. Enjoy!

- *The Great International Paper Airplane Book*, by Mander, Dippel and Gossage
- *Airborne All-Stars*, by Dr. Yasuaki Ninomiya
- Whitewings: Excellent Paper Airplanes, by Dr. Yasuaki Ninomiya
- Advanced Paper Aircraft, by Campbell Morris
- The Ultimate Paper Airplane, by Richard Kline
- 12 Planes for the Paper Pilot, by E.H. Mathews
- The Know How Book of Paper Aeroplanes, Know How Series
- The Gliding Flight, by John M. Collins

CONCLUSION

While there are many different ways to construct a paper airplane, this guide illustrates one interesting and effective method. The construction process begins with the foundation and then proceeds to the wings and the tail. Finally, the paper airplane is ready to take to the skies!

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