Paper Airplanes

Reverse engineer paper airplanes to determine how each paper airplane flies the way it does.

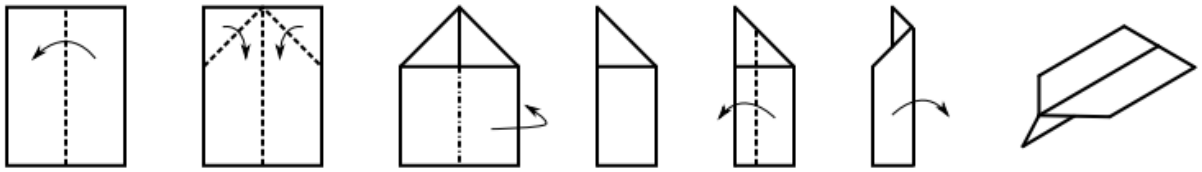
Materials Needed

A few sheets of 8 ½ x 11 paper (e.g., printer paper, notebook paper), different kinds of paper (newspaper, construction paper, cardstock, index cards, etc.), tape measure or ruler, open space area for testing, optional: scotch tape, paper clips, crayons/markers

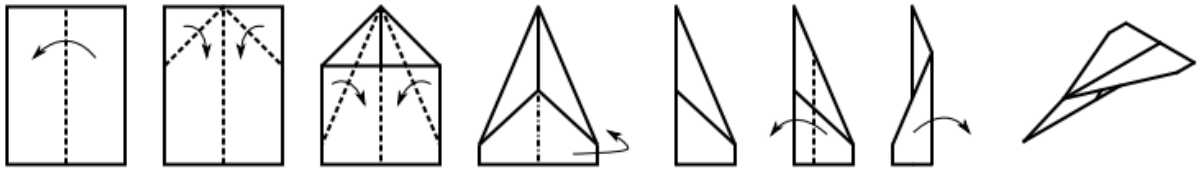
Procedure

Follow these steps to make the “beginner” paper airplane. Practice throwing in an open area. Think about the data that could be collected as the plane is flown. Measure and collect data for 3 trials (flights). Calculate averages. Optional: Use the “intermediate” paper airplane if the beginner is too easy.

Beginner



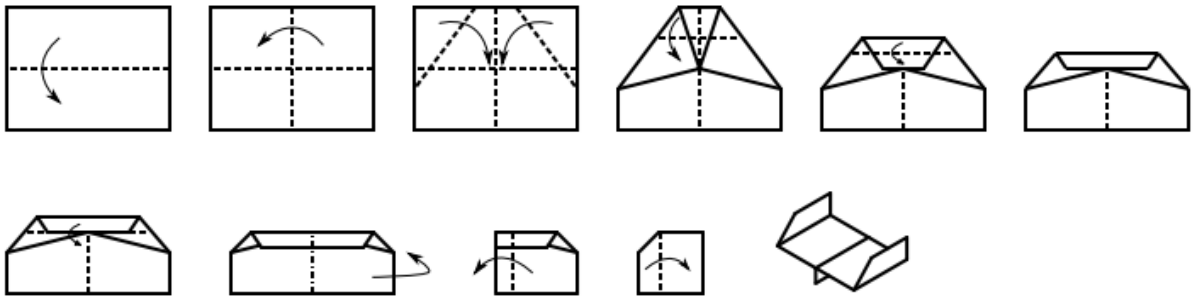
Intermediate



Next, make the “stunt” paper airplane. Practice throwing in an open area. Measure and collect data for 3 trials. Calculate averages. How does this plane fly?

.

Stunt plane



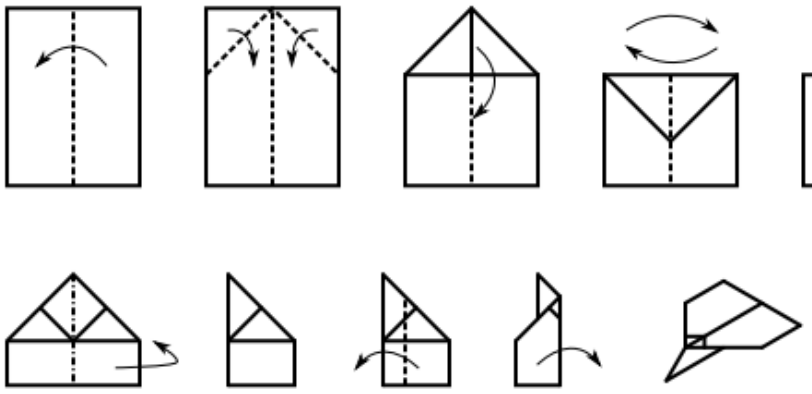
Compare your paper airplane with the stunt paper airplane. Determine the folded part(s) that make your paper airplane fly straight and not “curve/loop” as the stunt plane does. Determine the folded part(s) that make the stunt airplane not fly as straight as your airplane does.
Can the folds from the stunt plane be put into your airplane to make your plane fly straight and curve? Can the folds from your airplane be put into the stunt plane to make it fly curve and straight?

You are trying to determine how each paper airplane flies the way it does. This is known as reverse engineering.

Optional Activities

- Use different types of paper to make the same plane. Compare how two of the same planes travel when the only thing changed (the variable) is the type of paper.
- What happens if you use the same type of paper, but change the size of the pieces you are using to build smaller planes?
- Build the “advanced” plane.
- Now that you have studied these planes, design and test your own ideas.

Advanced



References

Science Buddies
https://www.sciencebuddies.org/teacher-resources/lesson-plans/paper-airplane-engineering-design
Take Off with Paper Airplanes
https://www.teachengineering.org/lessons/view/cub_airplanes_lesson06