



The Blended Wing Body (BWB)

Purpose

To demonstrate the great opportunity there is for aeronautics innovation

Teacher Note

You can find this activity on a NASA bookmark that can be printed from
<http://teacherlink.ed.usu.edu/tlnasa/OtherPRINT/Bookmarks/21stAerospaceVehicle.pdf>

Materials

8.5- x 11-inch paper

Background

NASA's Aerospace Research and Technology Base program is developing technologies for a new type of aircraft that will be more economical and efficient than today's airliners. This revolutionary flying wing configuration, called the BWB, has a thick, airfoil-shaped fuselage section that combines the engines, wings, and body into a single lifting surface. The BWB can carry as many as 800 passengers over 7,000 miles at an approximate cruise speed of 560 mph. Compared to today's airliners, it would reduce fuel consumption, harmful emissions, operating cost, and noise levels. NASA is developing high-payoff technologies for a new generation of safe, environmentally compatible, and highly productive aircraft. Airplanes of the future may look very different from those of today. In the activity below, be an engineer and experiment with a possible new wing type.

Procedure

1. Fold a piece of 8.5- x 11-inch paper diagonally as shown in diagram 1.
2. Make a 1/2-inch fold along the previously folded edge. See diagram 2.
3. Make a second 1/2-inch fold. See diagram 3.
4. Curl the ends of the paper to make a ring and tuck one end into the fold of the other. See diagram 4.
5. Gently grasp the "V" between the two "crown points" with your thumb and index finger.
6. Toss the glider lightly forward. Note: The folds in the paper make the airplane's front end heavy and the back end light. Curling the ends to make a ring changes the shape of the wing and improves the wing's flight performance.

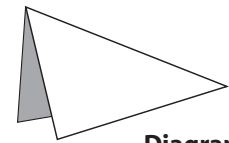


Diagram 1

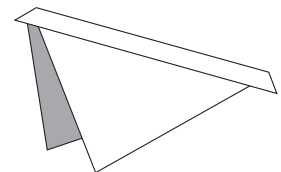


Diagram 2

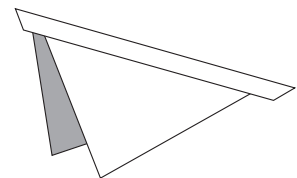


Diagram 3

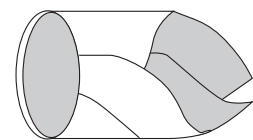


Diagram 4

Conclusion

1. How did the flight characteristics change with each wing change?

Extension

1. Conduct trial tests to find the average distance your wing glider can fly.
2. Hold competitions between gliders.
3. Make modifications to the glider and conduct trial tests to compete against other modified gliders.



R I N G W I N G

FIRST FOLD

SECOND FOLD

FIRST FOLD

SECOND FOLD

FIRST FOLD

SECOND FOLD

FIRST FOLD

FIRST FOLD

SECOND FOLD

A

B