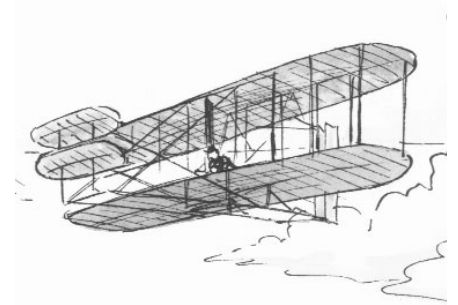


# What's Wing Warping?

Wing warping is the twisting, or warping, of plane wings to control the roll of the plane. The Wright brothers first thought of this system and used cables to control the up-and-down movement of their wing tips to roll their aircraft to the right or left. In this activity, you will build paper airplanes and adjust the wing tips up or down to simulate wing warping. Then you will test how it affects the flight of your craft.

## Procedure

- 1 Cut out the paper airplane template. Trace this pattern on a piece of tag board. Copy the fold lines from the template onto the tag board.
- 2 Cut out the rudder. Fold the airplane body (fuselage) along its center line, and place the rudder into place in the tail position.
- 3 Staple the rudder into place. Staple the fuselage three more times, once near the front and twice in the center.
- 4 Attach a paper clip to the nose. Slide it forward or backward to adjust the center of gravity. Sharply score the wing tips along the fold lines so that they can be easily repositioned.
- 5 To steer your plane, decide whether the wing tips should be up or down on the leading and trailing edges of the plane's wings.
- 6 Your first challenge is to work with your team member to make your plane fly straight. Then change the way you fold the flaps to make it curve to the right. Finally, make it dive down. Throw your plane *gently* when you conduct your trials.
- 7 Use the charts on your "Flight Data Sheet" student handout to record your team's observations of the flight path and the wing flap positions for each different wing configuration your team tries.



## Questions

Write your answers on a separate sheet of paper.

- 1 How can you make the plane turn to the right? How can you make it dive?
- 2 If you move the paper clip, how does that affect the flight path?
- 3 Of the two adjustable wing areas—leading or trailing edges—which provides greater stability to the aircraft and allows it to fly farther?
- 4 Which wing configuration flies the longest and straightest? Why?

