



## Curiosity Guide #508

### Paper Airplanes

Accompanies Curious Crew, Season 5, Episode 8 (#508)

#### Dragging Darts

Investigation #5

#### Description

Find out how to sharpen up the performance of your paper airplane.

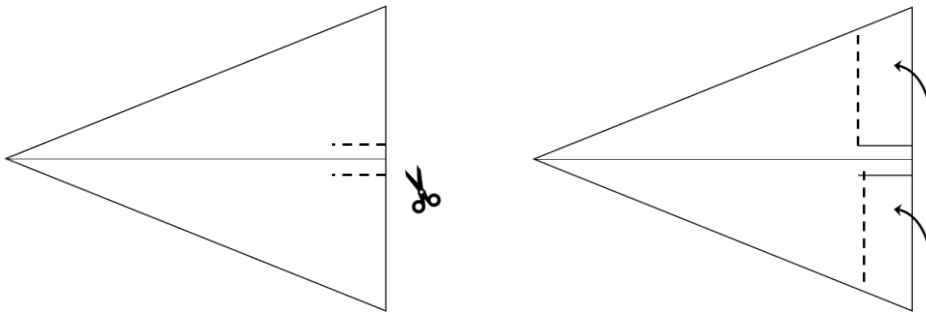
#### Materials

- 8 and  $\frac{1}{2}$  by 11 inch piece of lightweight paper
- Scissors
- Measuring tape
- Tape
- Electric plane launcher
- [https://www.grc.nasa.gov/WWW/K-12/Summer\\_Training/Elementary97/dart.html](https://www.grc.nasa.gov/WWW/K-12/Summer_Training/Elementary97/dart.html)

#### Procedure

- 1) Begin by making a typical Dart paper airplane, such as the one provided by NASA at the link provided in the Materials section.
- 2) Place a strip of masking tape on the floor to establish a launch line.
- 3) Throw your plane from the launch line at least five times, measuring the flight distance each time. You may launch the plane by hand, with an electric launcher, or with both.
- 4) Each time you launch your plane, record the results.
- 5) With your fingers, check and sharpen your creases and tip between each throw.

- 7) Use the scissors to cut a small slit 1 inch in length along the top of each wing from the center fuselage toward the nose of the plane.
- 8) Fold a one-inch crease up perpendicular to the wing.
- 9) Throw the plane again.
- 10) How does the distance compare? Why?



My Results

## Explanation

Dart-style airplanes have very sleek designs, so the planes experience less drag in the air. Dart planes work best when thrown with a lot of forward thrust. So, darts are often the plane of choice to launch with an electric launcher. Raising up the rear flaps reduced the flight distance the plane would travel, as well as shortening the plane's trajectory. The flaps on the tail of the paper plane serve the same purpose as the elevators do on the tail of an airplane. Raising the elevator creates more drag from air particles colliding with the elevator and results in the nose of the plane lifting up. This action also causes the plane to slow down, and the plane will not be able to travel as far.

**Talk the talk.** Tail flaps are elevators. Raising the elevators is called trimming up.

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