



Curiosity Guide #508

Paper Airplanes

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

Nose-Heavy

Investigation #3

Description

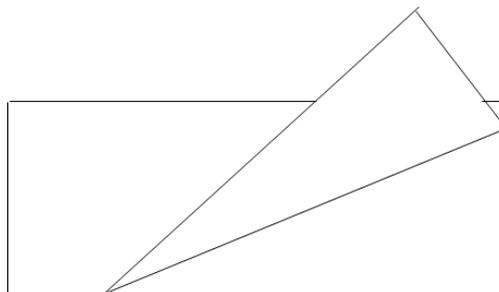
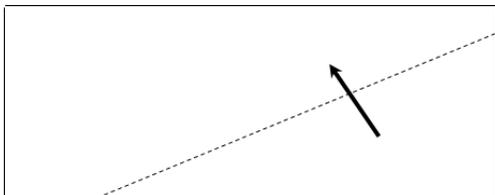
An airplane with a heavy nose? Why??

Materials

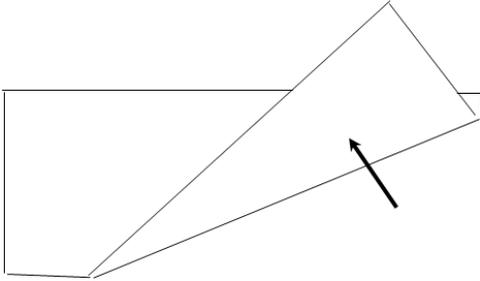
- 8 $\frac{1}{2}$ by 11-inch piece of paper
- Paper clips
- Metal washer
- Hot glue
- Assorted paper gliders

Procedure

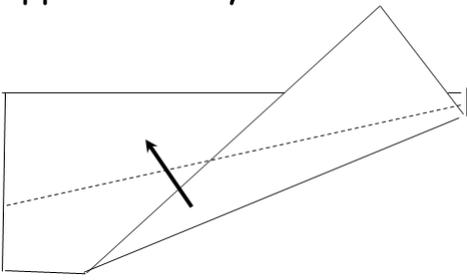
- 1) Fold the 8 $\frac{1}{2}$ by 11-inch paper in half lengthwise. The center fold should be positioned at the top through step 5.
- 2) Fold one flap back so that the crease starts at about $\frac{1}{2}$ inch and ends three inches above the center fold.



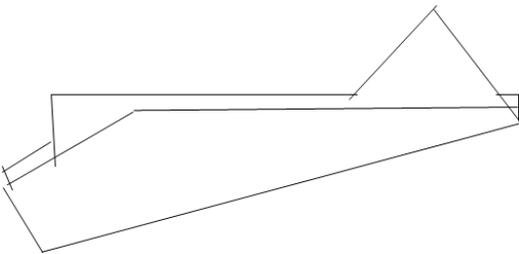
- 3) Turn the paper over, keeping the center fold at the top, and repeat on the other side.



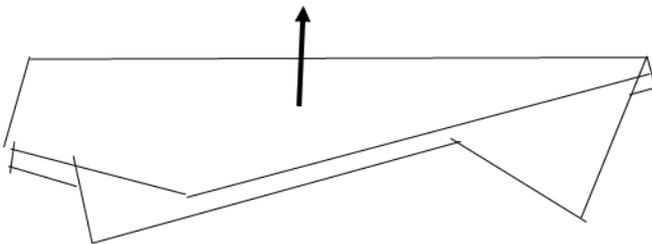
- 4) Fold the angled edge up to the center fold, starting about one-inch below the center fold. You will be folding the angled triangle approximately in half.



- 5) Turn the plane over, keeping the center fold at the top, and repeat on the other side.



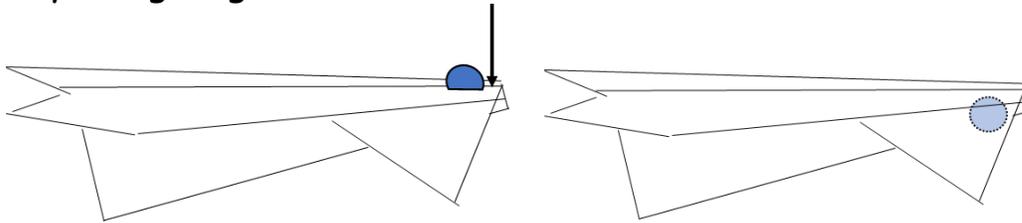
- 6) Flip the plane so the large triangle at the front end is on the bottom. Open the plane by folding each wing up horizontally.



7) Grip the plane from the triangular bottom and throw it.

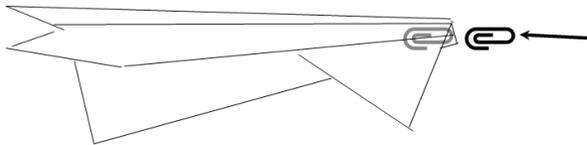
8) What did you notice?

9) Try hot gluing a metal washer in the crease on the nose of the plane.



10) Throw the plane again. Did adding the washer change the flight?

11) Make a new plane. This time add several paper clips to the crease under the nose of the plane.



12) How did adding paper clips to the nose affect the flight?

13) How do these planes compare to other paper gliders?

My Results

Explanation

One of the reasons that paper makes good planes is because paper is lightweight, and gravity won't be pulling it as hard as when a heavier material is used. However, the original plane's flight just tumbled because there was too much lift of air pushing up on the moving plane. One way to have a better balance against the upward lift is to increase the weight at the front of the plane. This action moves the center of gravity forward and makes the gravitational pull stronger. Adding a metal washer or paper clips increases the overall weight in the nose. When the nose gets pulled down by gravity, the upward air force is more balanced and improves the flight.

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