



# Flying Paper Birds

Grade Level: 5-8

Subject Areas: math, science.

Duration:

Preparation - 20 minutes

Activity - 50 minutes

Setting:

Classroom or Outdoors

Group Size:

unlimited

Materials:

- paper
- straws
- tape

Skills Used:

interpreting, analyzing, measuring, investigating.

Vocabulary:

aerodynamic

Project BEAK Links:

- [Adaptations - Wings & Flight](#)

## OBJECTIVES

- Student will learn the basics of aerodynamics by building paper “airplanes” which look like birds.
- Students will investigate which paper airplane flew the farthest and why. Students will investigate ways to increase the distance a paper airplane flies.

## Nebraska State Science Standards

- 8.2.1

## Nebraska State Math Standards

6.2.4, 6.2.5

## BACKGROUND

Gliding, soaring, or flapping. Whatever their means of flying, birds rely on the principles of aerodynamics to propel them through the air.

## ACTIVITY

Begin this activity with an investigation of the principles of aerodynamics and how they relate to birds flight – soaring, gliding, and flapping.

Explain to students that you will be having a paper bird (paper airplane) competition. There will be three categories in the competition:

- longest flight - distance
- longest flight - time
- most loops or flips during flight.

Give each student a piece of paper and ask them to construct one of the bird paper airplanes (see templates). If students wish, they may invent their own design or search the internet and books for other designs.

Encourage students to compare their paper airplane to that of a bird. What bird does their paper airplane resemble? What type of bird does their paper airplane fly like – is it a soaring bird like vultures and hawks, is it

a swooping bird that makes loops like many swallows?

Once students are finished constructing their paper airplanes, hold the competition. Have each student come to a designated line to launch their “bird.” (You may want to make the competition more fun by establishing rules such as “you will be disqualified for stepping over the launching line” or “using unapproved designs and materials will cause disqualification.”)

Students may enter one or all of the categories – longest distance, longest time, and most loops.

Have students volunteer to measure the distance using a tape measure (you may want to borrow a long distance tape measure from the track coach). Other students can keep time for the longest timed flight competition using a stop watch. Other students can serve as official loop counters in the most loops or flips competition.

Following the competition, have students compete the Paper Bird Airplane Assessment.

## EXTENSIONS

- Hold a school-wide paper airplane competition.
- Encourage students to alter their design to make the “bird” fly better.

## ASSESSMENT

- Assess students based on their creativity when designing or decorating their paper bird “airplane.”
- Assess students based on participation in the competition.

## ADDITIONAL RESOURCES: WEBSITES

- Earthlife: Birds in Flight  
[www.earthlife.net/birds/flight.html](http://www.earthlife.net/birds/flight.html)
- Eastern Kentucky University: Birds in Flight  
[people.eku.edu/ritchisong/554notes2.html](http://people.eku.edu/ritchisong/554notes2.html)
- Eastern Kentucky University: Birds in Flight - 2  
[people.eku.edu/ritchisong/554notes3.html](http://people.eku.edu/ritchisong/554notes3.html)
- Bird Site Website  
[www.ornithopter.org/birdflight](http://www.ornithopter.org/birdflight)

## ADDITIONAL RESOURCES: BOOKS

- Birds in Flight: The Art and Science of How Birds Fly  
by Carrol L. Henderson and Steve Adams  
Publisher: Voyageur Press; 1<sup>st</sup> edition (2008)  
ISBN-10: 0760333920  
ISBN-13: 978-0760333921
- Nature’s Flyers: Birds, Insects, and the Biomechanics of Flight by David E. Alexander  
Publisher: The Johns Hopkins University Press (2004)  
ISBN-10: 0801880599  
ISBN-13: 978-0801880599
- On Feathered Wings: Birds in Flight  
by Richard Ettliger, Rob Palmer, Miguel Lasar, KK Hui  
Publisher: Abrams (2008)  
ISBN-10: 0810995255  
ISBN-13: 978-0810995253
- Paper Birds That Fly by Norman Schmidt

Publisher: Sterling (1997)  
ISBN-10: 1895569117  
ISBN-13: 978-1895569117

- The World Record Paper Airplane Book  
by Ken Blackburn and Jeff Lammers  
Publisher: Workman Publishing Company (1994)  
ISBN-10: 1563056313  
ISBN-13: 978-1563056314

## PERMISSIONS & CREDITS

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# Paper Bird Airplane Assessment

1. Describe the design of your paper airplane.
2. What bird does your airplane most resemble? What type of bird does it fly like – glider, soarer, looper – and why?
3. How long (distance) did your paper airplane fly?
4. How long (time) did your paper airplane fly?
5. Did your paper airplane do any flips? If so, how many?
6. What changes would you make to your airplane to help it fly better?

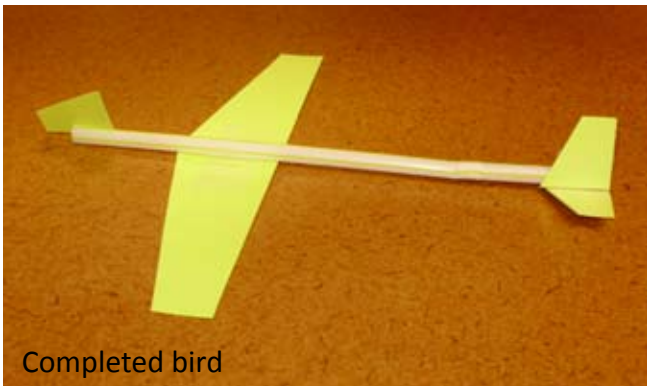
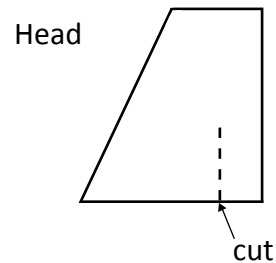
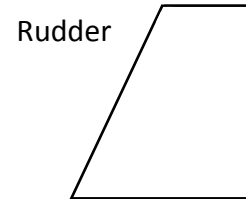
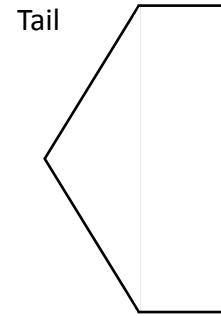
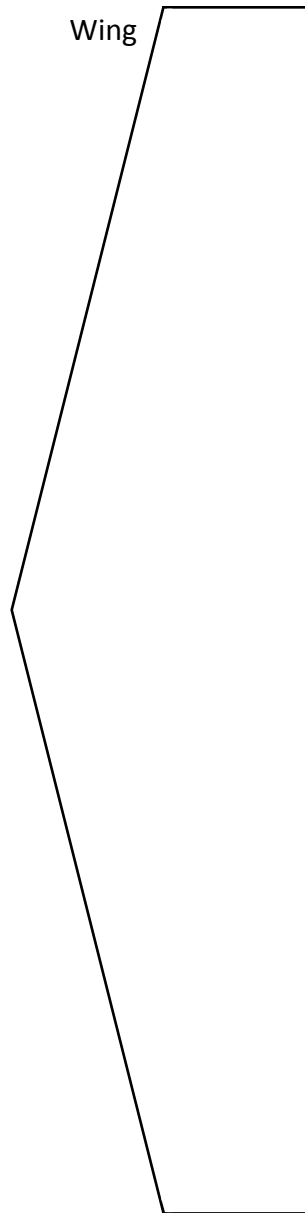
# Bird Paper Airplane Templates: Straw Flyer

## Materials:

1 straw  
1 piece of paper  
tape

## Instructions:

- Cut one wing, one tail, and one rudder from paper. Decorate to look like a bird.
- Tape wings to front  $\frac{1}{3}$  of straw. Tape tail to rear of straw. Tape rudder vertically over tail.
- Cut slit in head piece, slide



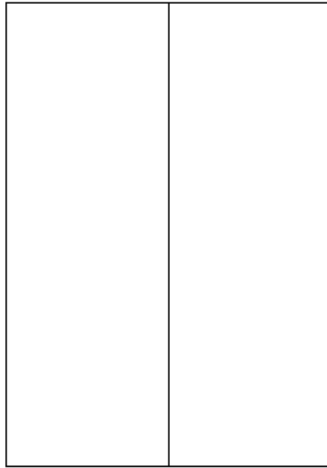
# Bird Paper Airplane Templates: Falcon

## Materials:

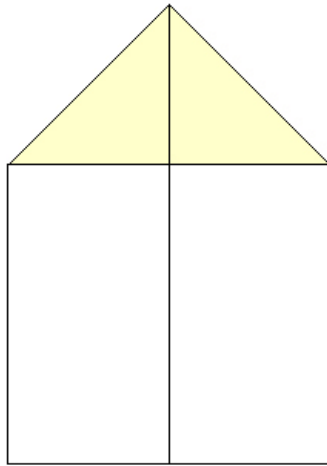
1 piece of paper

## Instructions:

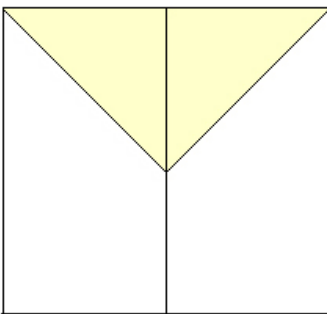
1. Fold an 8 1/2 x 11 piece of paper in half vertically, open back up.



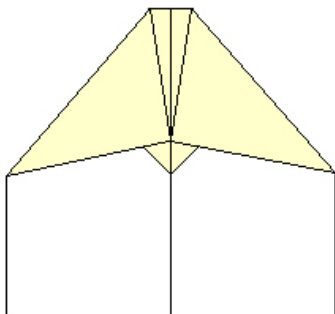
2. Fold the two top corners to the center line.



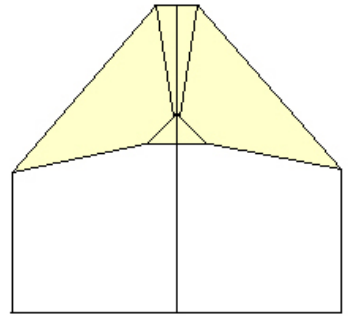
3. Fold the top triangle over (the two flaps formed in step 2 should now be under the large triangle).



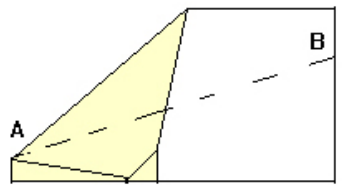
4. Fold the top two corners into the center.



5. Fold the small triangle in the center over the two flaps formed in step 4.

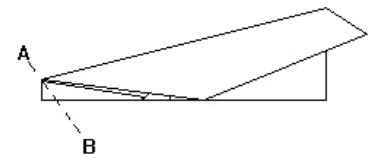


6. Fold along the center line created in step 1 so that the small triangle in step 5 is on the underside of the plane on the outside.

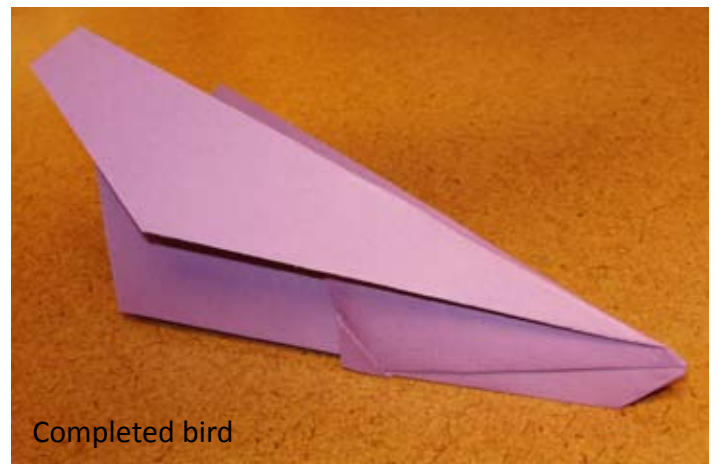


7. Fold along the AB line shown in step 6. Turn the plane over and do the same to the other side.

8. Fold along the AB line shown in step 8. Crease well. Tuck the triangular shaped piece between the two wings. This stabilizes the plane.



9. Decorate the plane to look like a falcon.



Completed bird