Chapter 12 Birds and Mammals

KEEPING IT REAL.FUN.

GUIDELINES

Paper Bird Design

7CP Life Science 2018

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 (physics of flight) and how they relate to birds 3 types of flight – soaring, gliding, and flapping (figure 2 on page 2).

Depending on success rates of data collection, there will be a flight competition.
There will be three categories in the competition:
• longest flight - distance
• longest flight - time
• most loops or flips during flight.

PROCEDURE
1. Label a bird's wing to demonstrate the physics of flight (page 2 of lab).
2. Use a piece of printer paper to construct one of the bird paper airplanes (see templates at the end of this lab). **If students wish, they may invent their own design or search the internet and books for other designs**.
3. Collect data for the flight of your paper bird design versus 2 other lab groups. Use a bar graph to present results.
4. Complete analysis questions.

Once students are finished constructing paper airplanes and gathered all data, we will hold a competition!

Competition Rules:
Work must be submitted on time.
Students will all be measured from the same starting line.
Students may enter one or all of the categories – longest distance, longest time, and most loops.

Disqualification if over the line or materials/ unapproved designs are used.

Competition supporting roles:
- Distance: volunteers measure the distance using a tape measure (Must have accurate metric measuring skills).
- Time keeper: keep time for the longest timed flight competition using a stop watch/ ipad timer.
- Loop counter: serve as official loop counters in the most loops or flips in the flight competition.

Directions: Use your textbook or online research to label the physics of flight image below.

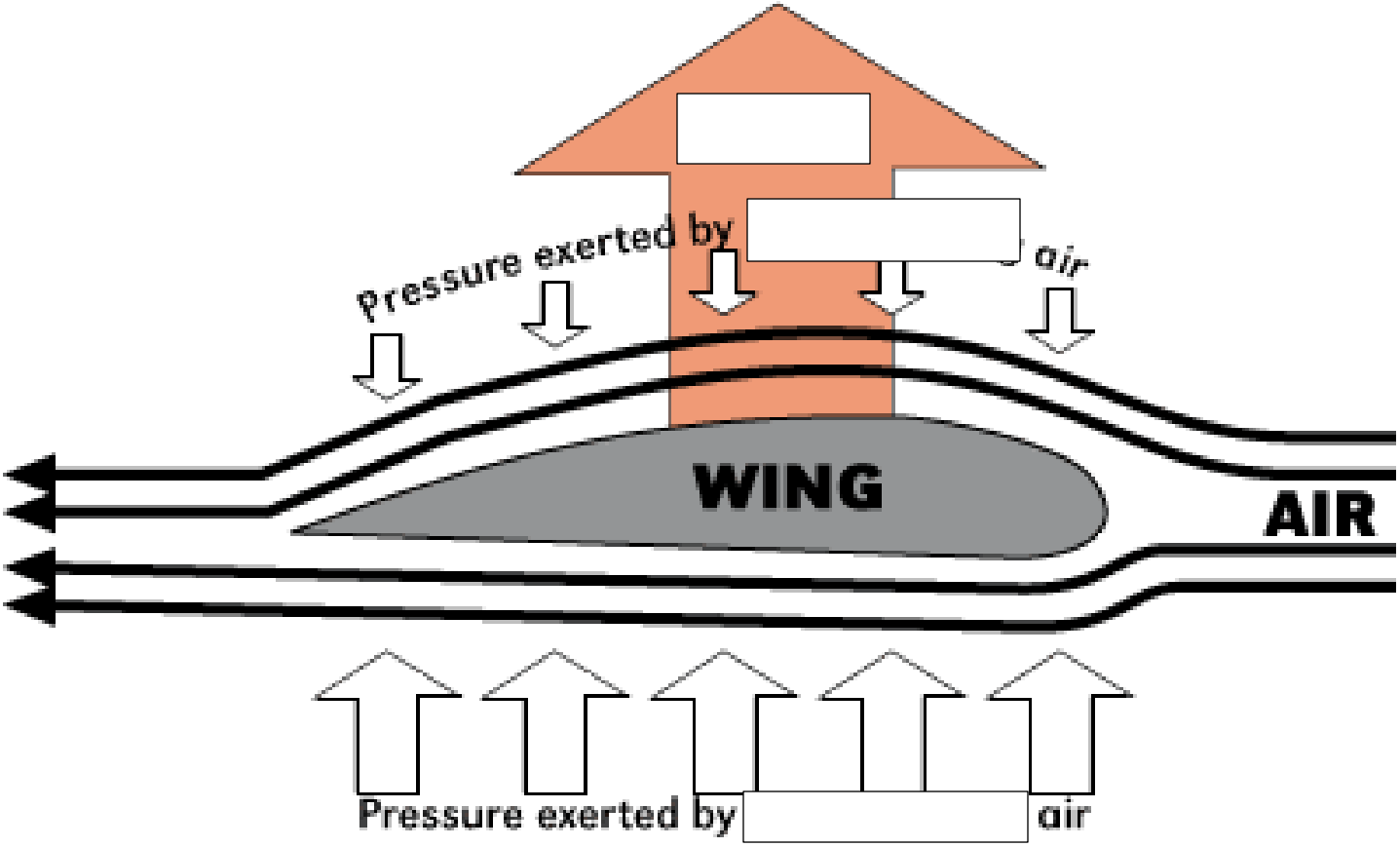
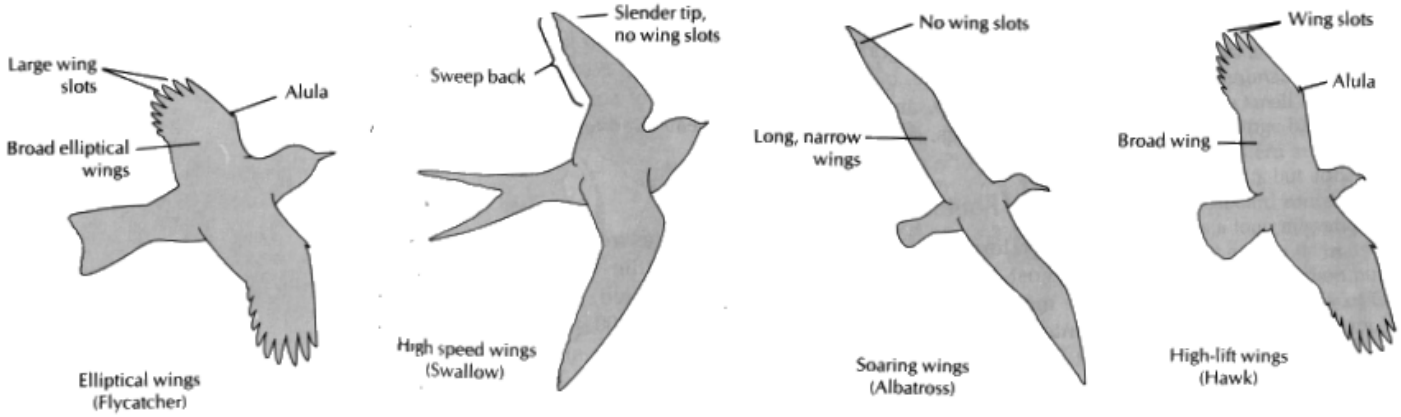
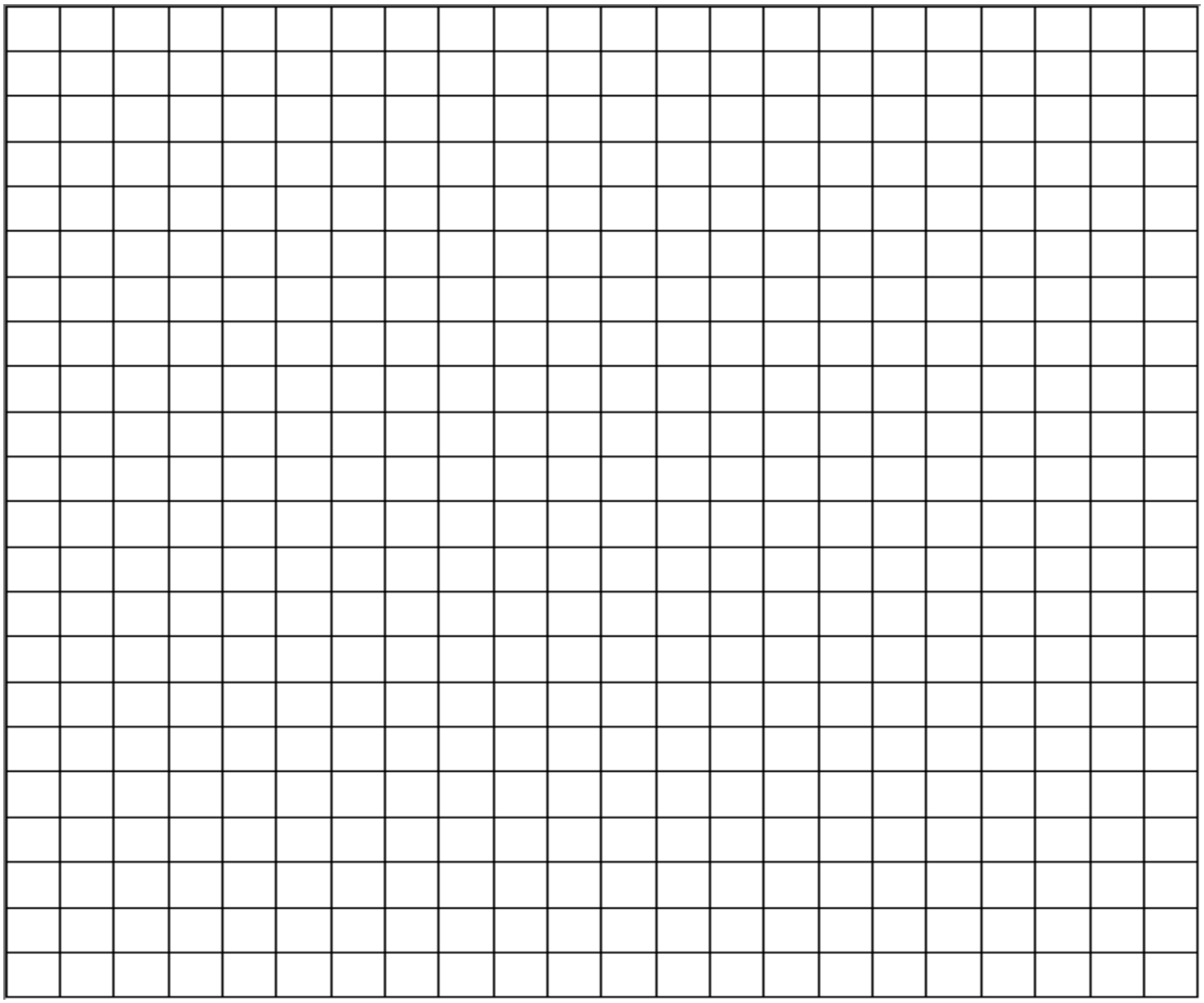


Figure 2. Types of bird flight.



	T1	T2	T3	T4	T5	**AVERAGE**



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? Is it a soaring bird like vultures and hawks, is it a swooping bird that makes loops like many swallows?

3. How long (distance) did your paper airplane fly?

4. How long (time) did your paper airplane fly?

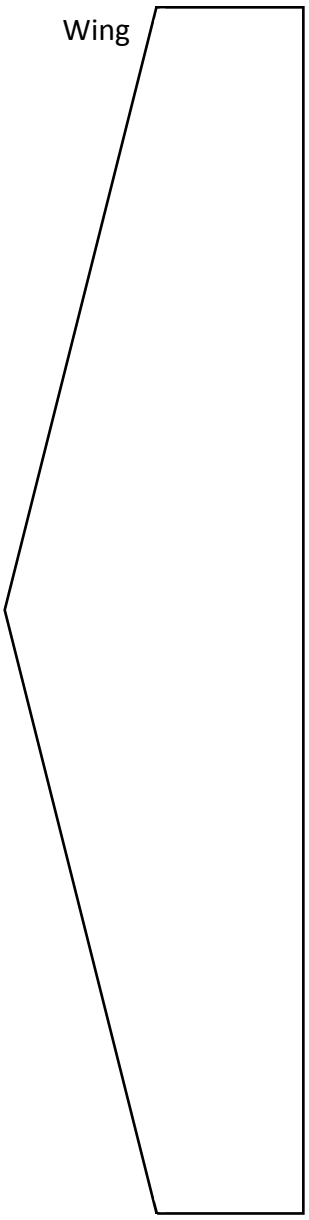
5. Did your paper airplane do any flips? If so, how many?

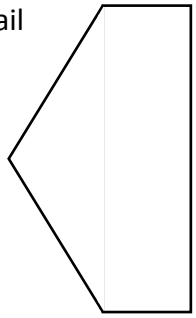
6. What changes would you make to your airplane to help it fly better?

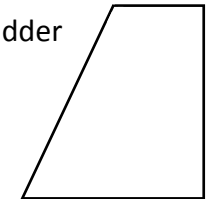
Bird Paper Airplane Templates: Straw Flyer

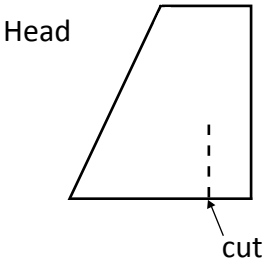
Materials:
1 straw
1 piece of paper
tape

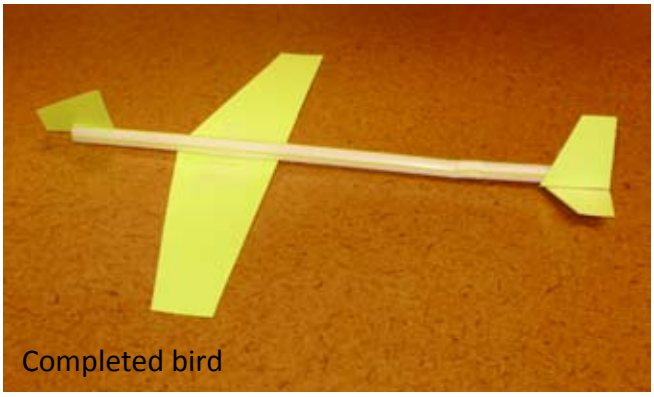
Instructions:
• Cut one wing, one tail, and one rudder from paper. Decorate to look like a bird.
• Tape wings to front $^{1}/_{3}$ of straw. Tape tail to rear of straw. Tape rudder vertically over tail.
• Cut slit in head piece, slide







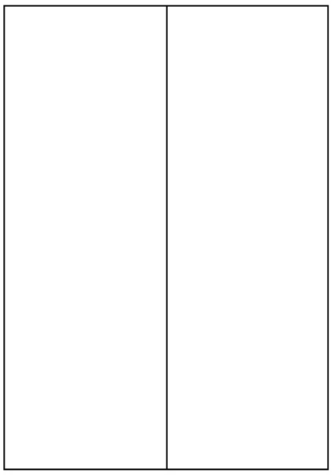



Completed bird

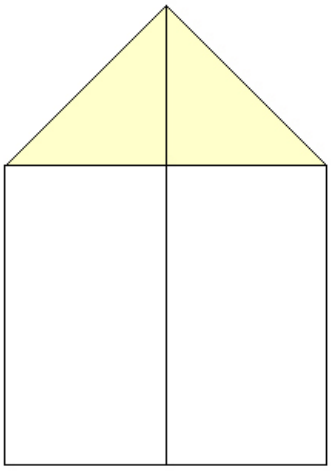
Bird Paper Airplane Templates: Falcon

Materials:
1 piece of paper

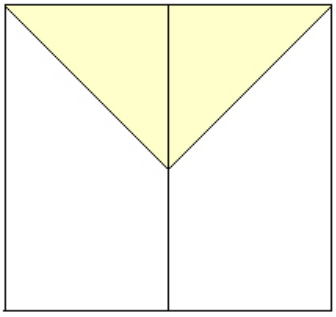
Instructions:
1. Fold and 8 $^{1}/_{2}$ x 11 piece of paper in half vertically, open back up.



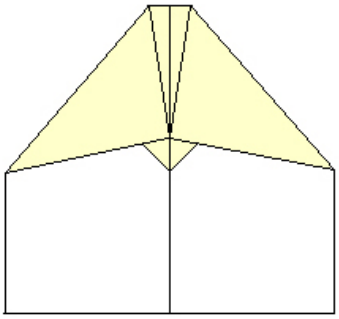
2. Fold the two top corners to the center line.



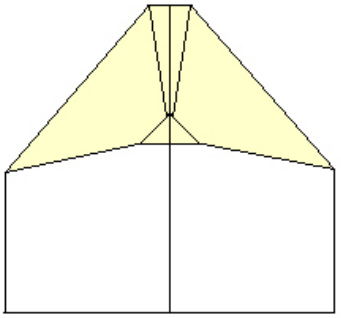
3. Fold the top triangle over (the two flaps formed in step2 should now be under the large triangle).



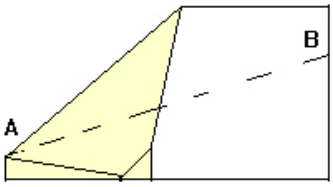
4. Fold the top two corners into the center.



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

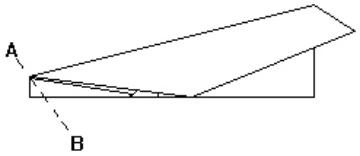


6. Fold along the center line created in step 1 so that the small triangle in step 5 is on the underside of the plane on the outside.

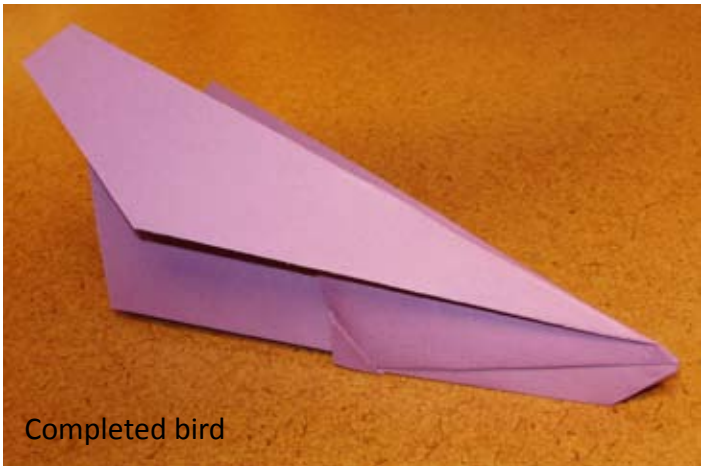


7. Fold along the AB line shown in step 6. Turn the plane over and do the same to the other side.

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



9. Decorate the plane to look like a falcon.



Completed bird