Thinking about Birds and the Bernoulli Principle

STUDENT ACTIVITY INSTRUCTIONS

Materials Needed:

- 4 sheets of paper
- A measuring device
- A timing device
- A pencil or pen
- The activity worksheet

Introduction (Read before doing the activity)

In this activity, you will build paper airplanes that correspond to the four major wing shapes based upon the need of the bird!

Activity Instructions:

1. Make all four paper airplanes from the instructions below.
2. Fly each airplane and observe how they fly.
    a. Consider these questions:
        i. How far does it go?
        ii. How fast does it go?
        iii. Does it go straight?
        iv. What else do you notice?
3. Record the information about each paper airplane on the activity worksheet.
4. Once you have recorded all the data, create a graph showing the results of your experiment.
5. Then answer the questions at the end of the activity worksheet.

Paper Airplane Folding Instructions

*You can find the folding instructions (written and picture) for active soaring wings, passive soaring wings, high-speed wings, and elliptical wings on the following pages.

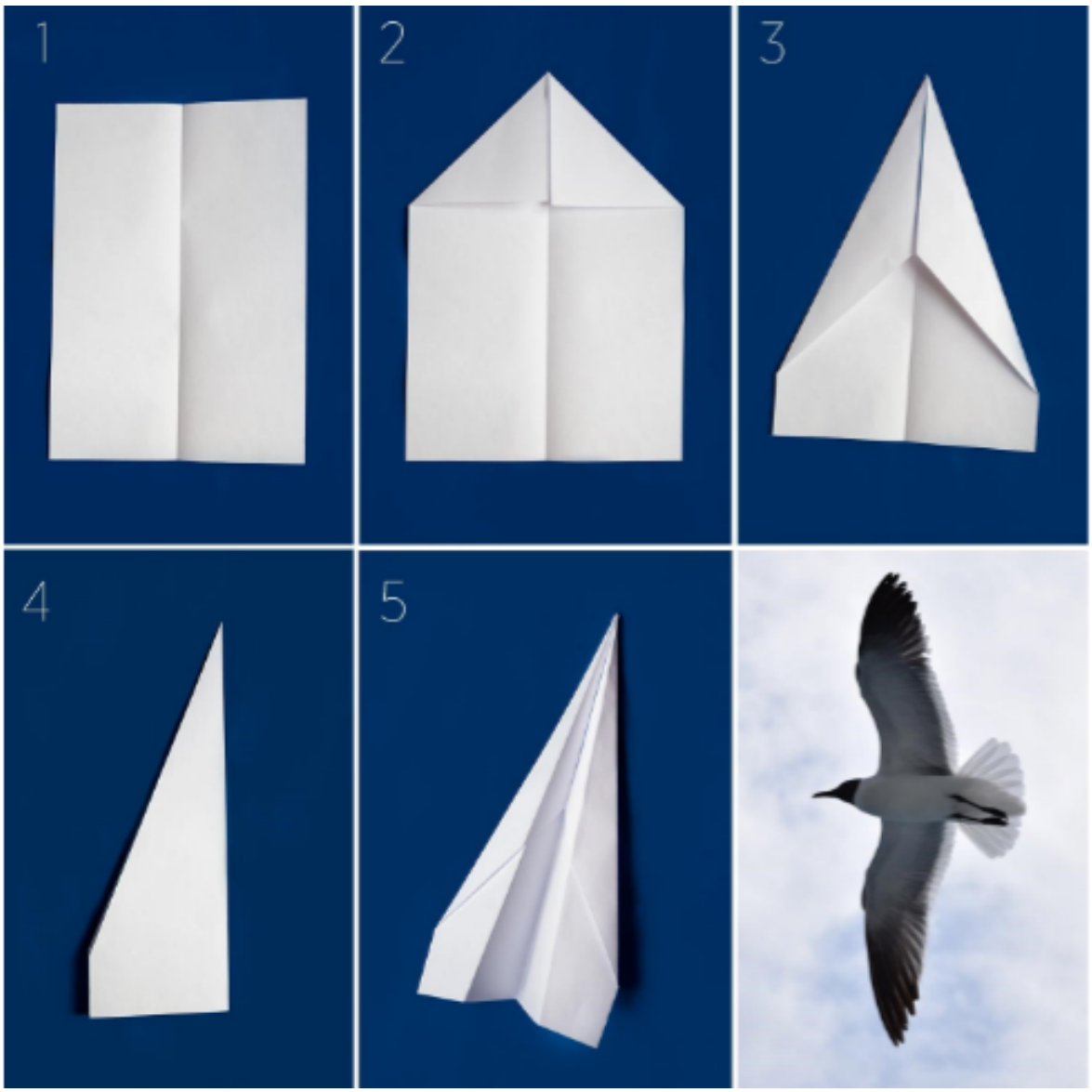
Instructions From: https://www.audubon.org/news/these-paper-airplanes-fly-birds

Laughing Gull—Active Soaring Wings

Difficulty: Easy

Birds you may know with Active Soaring Wings are the Laughing Gull and Wandering Albatross—a bird with a wingspan up to 12 feet, which can eat and sleep while flying, and flies 10,000 miles without stopping.

1. Fold Paper in half lengthwise
2. Fold corners down to meet in the middle along the center crease.
3. Fold top edges to the center line again.
4. Fold the plane in half.
5. Fold wings diagonally to meet the bottom of the plane.

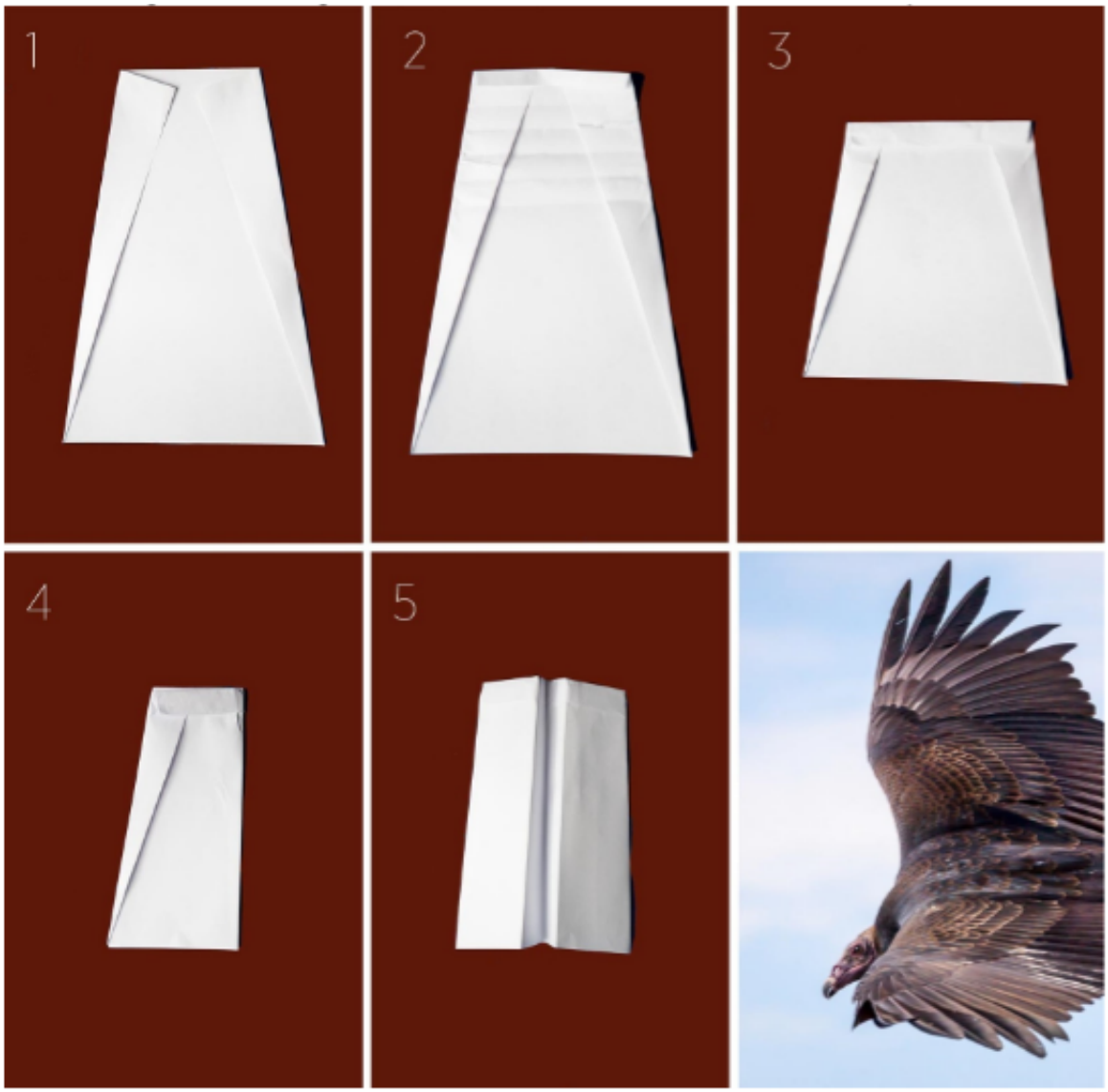


Turkey Vulture — Passive Soaring Wings

Difficulty: Medium

Some birds that have Passive Soaring Wings are the Bald Eagle and the Turkey Vulture. These birds soar for long distances looking for prey.

1. Fold the top two corners of the paper, bringing them to meet in the middle of the paper
2. Fold the top edge of the paper 1/2 inch.
3. Repeat eight times.
4. Turn the plane over and then fold the plane in half.
5. Fold edges of the wing down to meet the crease at the bottom of the plane.

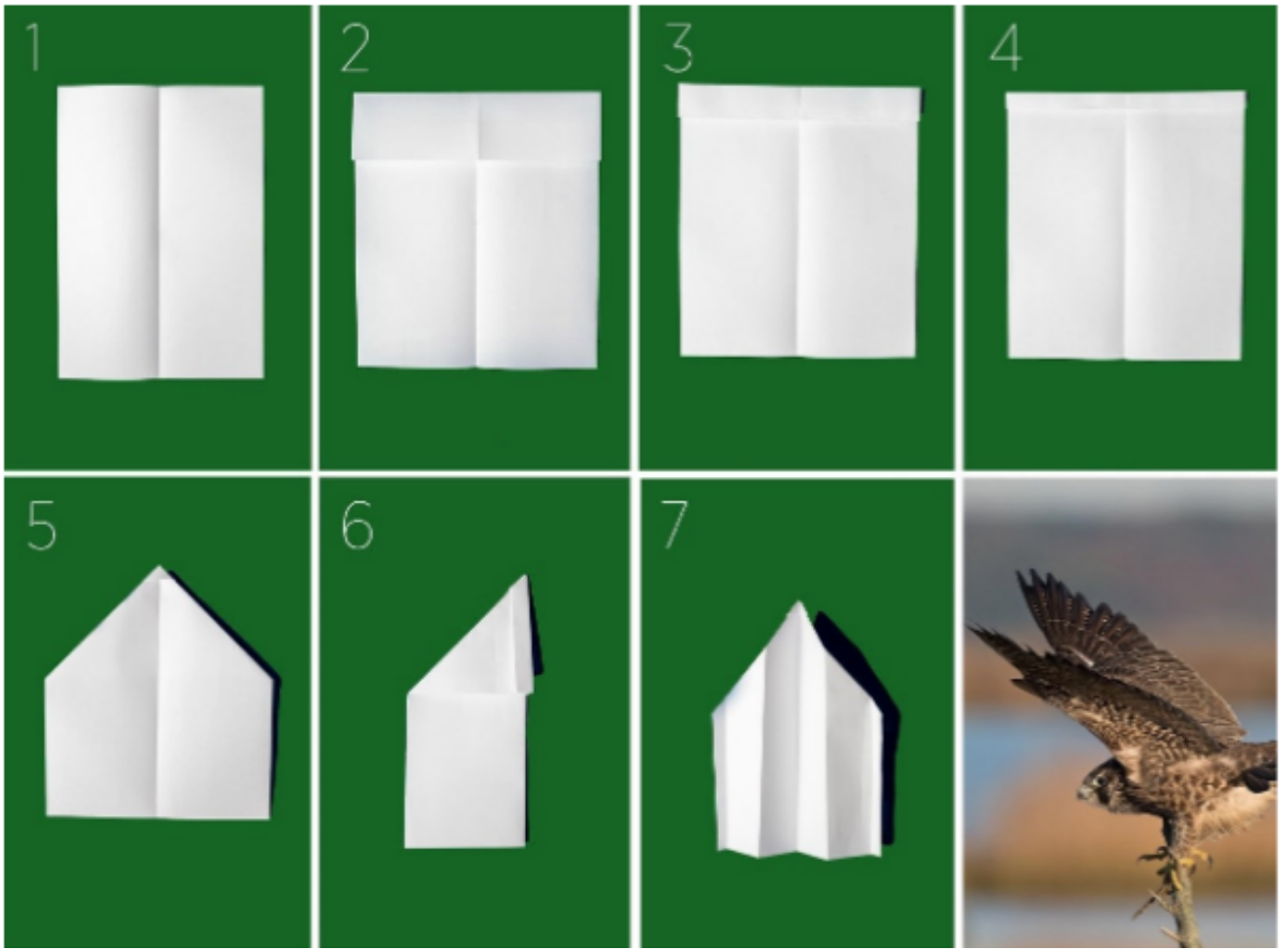


Peregrine Falcon—High-speed Wings

Difficulty: Medium

Common birds with these wings are the Forster's Term and the Peregrine Falcon (which can reach dive speeds up to 240 mph).

1. Fold the paper in half
2. Fold the top down 2"
3. Fold the top again in order to double the thick edge.
4. Fold top edge in half again
5. Fold the top corners to meet at the center line
6. Fold the plane in half towards you
7. Fold sides to meet at the base to make the wings.



American Crow—Elliptical Wings

Difficulty: Hard

Birds you may know with Elliptical Wings are the Northern Cardinal and the American Crow.

1. Fold paper in half lengthwise, then unfold.
2. Fold Corners to meet at center line.
3. Fold the peak down to create a square.
4. Fold top two corners to center line, one inch above downward-facing point, to make a triangle on top and a diamond on bottom.
5. Fold point up to secure the flaps.
6. Fold the plane in half away from you.
7. Fold the edges down to create the wide wings.