

Rationale

To understand the anatomy of a condor and its adaptations for flight, students will create condor paper airplanes.

Objectives

1. Students explore the concept of flight
2. Students understand the influence of size and weight to flight
3. Students identify condors as soaring, foraging birds

Aligned Standards

NGSS: Using Models and Constructing Explanations and Designing Solutions; Causation
LS4.C: Adaptation: The condor's anatomic features (eg., wings, bones, and size) promote survival in its native environment.

Time

Day 1 of two-day lesson
Teaching time: one hour (approximately)

Vocabulary

soaring
foraging
adaptation
scavenger

Materials

Scissors
Condor Plane Worksheet

Tech Integration

Soaring Condors:
<http://bcove.me/2mmv7bqq>

Seagulls flapping:
<https://youtu.be/OumJU8mk0>

Different birds in flight:
<https://youtu.be/kqX-sdvT-aM>

Condors in flight:
photo library

PROCEDURE – DAY 1

EXPLORE (15 minutes)

Watch the Soaring Condors, Seagulls Flapping, and Different Birds in Flight videos. Discuss the different ways birds fly from observations in the videos. Be sure to discuss adaptations for soaring vs. flapping.

Students fold and fly their condor paper planes. The teacher facilitates conversations with students asking questions such as:

- Which type of flight uses more energy: soaring or flapping?
- What can you infer from the condor's wing size?
- What can you infer about flight from the density of the condor's bones?

JOURNAL (20 minutes)

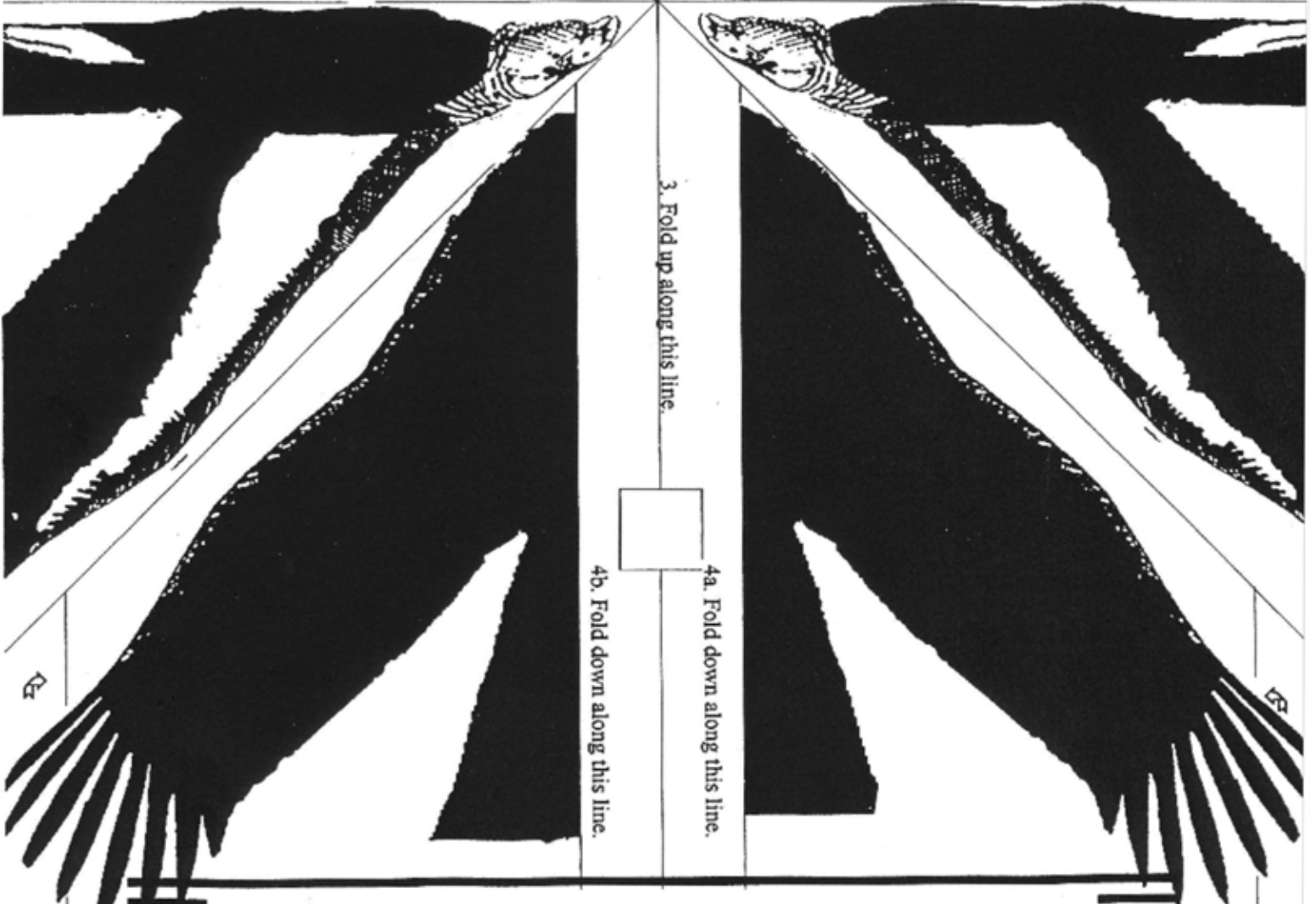
Students answer the questions above about condor flight adaptations in their journals. Discuss as a class the various flight adaptations explored in the previous lessons: wings, bones, and size.

Many of the flyers will fail. With the knowledge gained in previous lessons, have the students engineer better flyer designs in their journals. Test new models.

2. Fold down along this line.

2. Fold down along this line.

1. Fold down along this line.



3. Fold up along this line.

4b. Fold down along this line.

4a. Fold down along this line.

CONDOR PLANE

Before you begin

Print out enough flyers for each student and set out scissors.

What to do

Not all birds fly in the same way. (Some birds are divers, too!) Some birds fly by flapping their wings for an extended amount of time, while others soar with hardly any flapping. These soaring flight adaptations continue an investigation of condor anatomy.

Explore

Show the video of seagulls flapping and different birds in flight. Have the students look for any contrast in flight style as they watch soaring condors.

Help the class to define flapping and soaring. Soaring: flight without much flapping for long distance travel.

Ask the students to stand (behind their desks or in a circle). Have them pretend to be “flapping” birds and flap their arms in the air for 30 seconds. Rest for 10 seconds. Then have the students pretend to be “soaring” birds, and have them raise their arms without flapping for 30 seconds. Then ask the students which type of flight uses more energy: soaring or flapping?

Direct the students to the condor they created from lessons A and B. Pose the question: If the condor is a big bird, with big wings, what type of flight would be best? Or, what can you infer from the condor’s wing size?

Without drawing any conclusions, direct the students to the “condor plane” and explain that they are to make a glider by following the folding directions on the page.

1. Fold along the “hamburger-style” line
2. Fold along the diagonals
3. Fold along the “hot dog-style” line
4. Fold along the body line (note there is a 4a. and 4b.)
5. Fold the wing tips in the direction of the arrow printed close by the tips

Be sure to have the students write their names on their condors!

When the students are finished folding their gliders, have them stand to one side of the classroom or venture out to the school-yard for soaring trials. Have the students stand in a long line and fly their gliders. See which student’s glider flies the farthest.

Journal

Upon returning to the classroom, have the students answer the following questions in their journals:

1. What can you infer from the condor’s wing size?
2. What can you infer about flight from the density of the condor’s bones?

End the discussion talking about the various adaptations from the three lessons A, B, and C: wings, bones, and size. Talk about how these adaptations promote survival in its native environment. What type of food source might a long-distance flight traveler have? (Optional: define foraging as a wide search for food/resources.) Thinking back to the video, what type of area/habitat was the condor flying in?

Many of the flyers will fail. Have the students engineer better designs for new flyers. Explore ideas based on knowledge from the previous lessons. Test new models.

Day 1 of two-day lesson
Teaching time: one hour
(approximately)

ELL MODIFICATION:
Translate the vocabulary
words in Spanish and give
an image for each word.



OPTIONAL EXTENSION:
Have the students engineer better
designs for new flyers. Explore
ideas based on knowledge from the
previous lessons. Test new models.