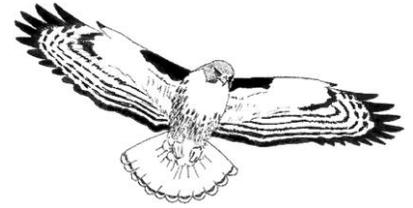




Wingspan Matters



The Peregrine Falcon

The word peregrine means “wandering” and the Peregrine Falcon has one of the longest migrations in North America. Some of the species spend their winters nesting in South America and can fly up to 25,000 km (15,500 mi) in one year to arrive at their summer habitat in Canada. Often called the “sports cars” of the bird world, Peregrine Falcons can reach speeds of over 200 mph, making them the fastest animals on the planet (that’s 130 mph faster than a cheetah!). They achieve this incredible speed during their hunting stoops where they drop towards the ground to ambush their prey.

Isis is our resident Peregrine Falcon at Hawks Aloft. She came to us as an adult in 2004 with a wing fracture. Eventually, it was determined by a veterinarian that her wing needed to be amputated at the wrist. She cannot fly, and therefore could not survive in the wild, so Hawks Aloft staff and volunteers care for her and use her as an ambassador for her species.

Background Information

In the bird world, wingspan means everything. It determines where you can live, how fast you can fly, and what you can hunt. In this lesson, students will use their measurement & math skills to learn how their own wingspan compares to several common raptor species.

WINGSPAN LAB

Learning Objective:

To apply mathematical techniques to the natural world & understand that a bird’s wingspan determines where it can live.

Grade Levels:

4 – 8

Time Required:

30 – 45 min

Subject(s):

Science, Math

Materials:

- Measuring tape
- Ruler
- Calculator

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WINGSPAN LAB TEACHER GUIDE

In this activity, students will measure their classmate's "wingspan" and then compare them to the wingspans of different birds of prey.

Materials:

Measuring tape
Ruler
Calculator

Procedure:

1. In pairs, have the students measure and record each other's "wingspan" by measuring the length of both arms from fingertip to fingertip when held outstretched.
2. Next, the students should measure and record each other's height from top of the head to bottom of the foot (not including shoe bottoms).
3. Make a table on the board and have the students fill in their "wingspans" and heights. See if they can see any trends.
4. Using a calculator (or not if you want to practice division), have the students divide their own wingspan by their own height. This is their own wingspan to height **ratio**.
5. Then, using the information from the whole class, have the students add all of the wingspans together and all of the heights together. Then they will divide the total wingspans to the total heights. This will give them the **average ratio** of wingspan to height in the classroom and should be very close to 1. Ask them to compare this to their individual ratio. If their individual ratio is less than the class ratio, then they have a shorter "wingspan" compared to height than average and vice versa.
6. Now ask each student to measure the wingspan and body length of each of the raptor silhouettes in the Student Handout and then divide the wingspan by length for each.
7. After the students have completed all their measurements, ask them how the raptor wingspan to height ratios compared to their own. Why do raptors have such large wingspans relative to their bodies?
8. Ask the students if they think the raptors with larger or shorter wingspans would be able to fly faster? (Hint: Which wings would be heaviest?)

Extensions:

- Have the students make full-sized silhouettes of the raptors. You could even make them scale up the measurements themselves to practice algebra concepts. The actual measurements are as follows (all dimensions are a median average):

Turkey vulture

Length: 67 cm (26 in)

Wingspan: 171 cm (67 in)

Weight: 1.8 kg (4 lb)

Red-tailed Hawk

Length: 49 cm (19 in)

Wingspan: 125 cm (67 in)

Weight: 1082 g (2.4 lb)

Bald Eagle

Length: 46 cm (18 in)

Wingspan: 203 cm (80 in)

Weight: 4.3 kg (9.5 lb)

Peregrine Falcon (female)

Length: 46 cm (18 in)

Wingspan: 116 cm (46 in)

Weight: 952 g (2.1 lb)

- **In the Albuquerque area? Have Hawks Aloft, Inc bring a Peregrine Falcon (the fastest animal on the planet) or other raptor to your classroom to demonstrate these principles in real life!**

My Name _____

Date _____

My Partner's Name _____

**WINGSPAN LAB
 STUDENT HANDOUT**

1. With a partner, fill out the following table:

	My Partner	Me
“Wingspan”		
Height		
“Wingspan” to Height Ratio		

2. The sum of all the “wingspans” in the class is _____.

The sum of all the heights in the class is _____.

The **ratio** of all the “wingspans” to heights is _____.

3. How does your “wingspan” to height ratio compare to the class ratio?

TURKEY
VULTURE



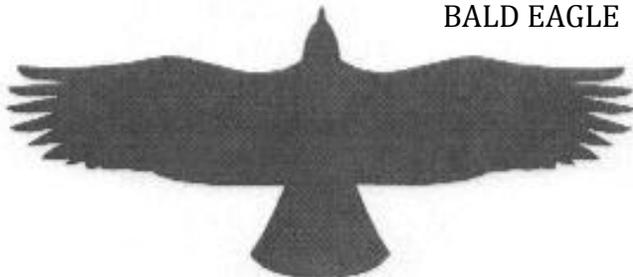
PEREGRINE
FALCON



RED-TAILED
HAWK



BALD EAGLE



4. Using the pictures above, measure the wingspan and length (from head to tail) of each raptor species. Fill in your measurements in the table below:

Species	Wingspan	Height	Wingspan-Height Ratio

Which raptor species do think can fly the fastest? Why?