



Teacher's Guide

Raptors: Adaptations for Predation **NATURE Science Education Series**

Grade Levels:

5-12

Subject Areas:

Sciences
Life Sciences
Biology
Ecology

Synopsis:

Explains how raptors fly and hunt, comparing their abilities to those of high-tech fighter aircraft. The peregrine falcon, for example, surpasses even the F-22 Raptor aircraft in its speed, agility, and accuracy on target. As each detail of raptors' adaptations for flight and predation are described, they are compared to devices created on similar principles by aeronautical engineers. Raptors studied include eagles, kestrels, owls, vultures, falcons, and hawks. A final segment focuses on the tactics of raptors' hunts from hawks taking advantage of bats' nighttime flights to Harris' hawks' teamwork in capturing their prey.

Learning Objectives: Students will:

- Describe the adaptations that make raptors effective birds of prey.
- Give examples of raptors' characteristics that have inspired aeronautical engineers in the design of aircraft.
- Appreciate the integration of form and function in nature.

Vocabulary:

raptors, elite, birds of prey, nimbleness, vultures, stealth, falcons, stoop, peregrine falcons, nictitating membrane, viscous, falconers, banding, osprey, kestrel, thermal soaring, dynamic soaring, turkey vulture, shear layer, aeronautical engineers, ruff, stealth flyers, dampens, minimize, hovering, image stabilization, unmasking, ultraviolet, voles, sweet spot, stereoscopic vision, acuity, diffused, tactics, strategy, Mexican free-tailed bats, exploit, carrion, goshawk, food chain, Harris' hawks, peregrine-gyr Falcon hybrid

Pre-Viewing Discussion:

What birds are included in the category, birds of prey? What is another name for birds of prey?

What birds are members of the raptor family?

How are raptors adapted to be predators?

Why would aeronautical engineers study the flight of raptors or the physical characteristics of raptors?

Post-Viewing Discussion:

How are the peregrine falcon's eyes and eyelids adapted to the speed of its stoop?

How have researchers been able to study the range of raptors? What have they learned from their investigations?

What is the purpose of the unique flight pattern known as thermal soaring? What is the purpose of dynamic soaring? How are specific raptors adapted for thermal or dynamic soaring?

What have aeronautical engineers learned from observing raptor flight patterns and raptors' physical adaptations for spotting and hunting prey?

Further Activities:

Compare the structure of a raptor's eye to that of a human eye.

Find out how falconers train and command their birds.

Find out if any raptors are endangered, how they became endangered and what is being done to restore their populations to health.

Find several opinions of why the bald eagle was chosen as an emblem of the United States.

Related New Dimension Media Titles:

Shape of Life series

Biological Classification series