TheCornellLab of Ornithology

159 Sapsucker Woods Road • Ithaca, New York 14850 • 607-254-BIRD • www.birds.cornell.edu

Birds and their Wing Shapes

Activity Information Sheet

With over 9,000 species of birds in the world and over 715 species in just the United States alone, you can find birds almost everywhere you go. Because birds are found in all types of environments, bird species come in all sizes and shapes with wings that are adapted for their survival needs. What, specifically might a bird need its wings for? Take some time to think and then list your ideas here: _____
_____

On these pages we are going to focus on flight. There are four general wing shapes that are common in birds: *Passive soaring, active soaring, elliptical wings, and high-speed wings.*

Passive soaring wings have long primary feathers that spread out, creating "slots" that allow the bird to catch vertical columns of hot air called "thermals" and rise higher in the air. Examples of birds with this wing type include eagles, most hawks, and storks.
The Bald Eagle is a classic example of a bird with passive soaring wings.


Photo by J. Young

Active soaring wings are long and narrow, allowing birds to soar, or fly without flapping their wings, for a long time. However, these birds are much more dependent on wind currents than passive soaring birds. Examples of birds with this wing type are albatrosses, gulls, and gannets.
The Laysan Albatross has very long and narrow wings that are well-adapted for the strong, constant winds over parts of the ocean. Its up-and-down flight style allows it to use small differences in wind speed to go long distances without using a lot of energy.


Photo by Yuji Nishimura


Photo by Keith Williams

Elliptical wings are good for short bursts of high speed. They allow fast take offs and tight maneuvering. While they allow high speed, the speed cannot be maintained. Examples of birds that have this wing type are crows, ravens, blackbirds, sparrows, and thrushes (such as the American Robin).
Common Ravens are acrobatic flyers. It's not uncommon to see ravens doing rolls and somersaults with their elliptical wings.

High-speed wings are long and thin, but not nearly as long as birds with active soaring wings. As the name suggests, birds with this wing type are incredibly fast, but unlike those with elliptical wings, these birds can maintain their speed for a while. Examples of birds that have this wing type are swifts, ducks, falcons, terns, and sandpipers. Notice the slender wing form of the Forster's Tern.


Photo by James Blair

And a final type of wing….

Hovering wings are small and quick. For hovering wings, in addition to the wing shape, the bird's nerves and muscles are specially adapted for incredibly fast movement.
The Ruby-throated Hummingbird might appear to float in space while sipping nectar and hovering from flower to flower thanks to its quick and mighty wings.


Photo by Guy Lichter

What paper airplane models do you think reflect the wing types we've featured here? _____
_____
_____

Wings also might be adapted for any of the following: migration, attacking prey, attracting a mate, camouflaging into the surroundings, swimming in a lake or the ocean, or simply for fluttering around for food. How might you adjust your paper airplane to fit any of the functions above? (Be creative!)

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Resources for constructing different types of paper airplanes

The links below can be stretched from 4th grade up.

1. Fun Paper Airplanes- a great site with a variety of levels of ability
   www.funpaperairplanes.com/
2. Alex's paper airplanes- many different types for more experienced students
   http://www.paperairplanes.co.uk/planes.php /
3. The World Record Paper Airplane Book by Ken Blackburn and Jeff Lammers
4. Your imagination! Some kids have designed their own beautiful airplanes that were inspired by birds.