



Fantastic Feathers

Introduction

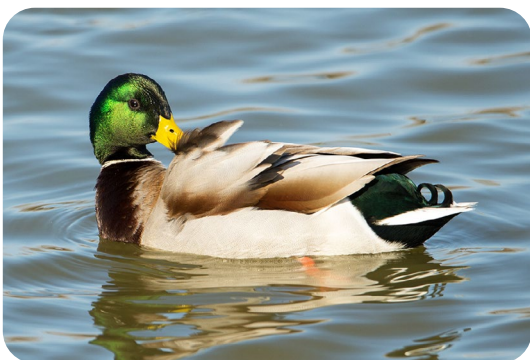
Feathers make flight possible, give birds their color and markings and, in some cases, allow them to stand out when trying to attract a mate or blend in with surroundings when hiding from a predator. Feathers also provide the bird with a “raincoat” and a warm winter “jacket.” Kids can examine real feathers and explore how feathers function and offer protection to birds.

Supplies

- Large feathers from the craft store*
- Water
- Vegetable oil
- Containers for water, oil, and soap
- Paper towels for drying the feathers
- Eye dropper
- Mineral oil or baby oil in a small spray bottle
- Liquid detergent

* NOTE: The **MIGRATORY BIRD TREATY ACT** prohibits people from collecting feathers of migratory bird species. Learn more here: fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php

Get kids thinking ...



Birds spend a lot of time preening their feathers. A feather can only be replaced by growing a new one, so birds work to keep their feathers in the best condition.

ASK: What do feathers do for birds? How? What happens to the bird if something happens to its feathers?

What Actually Makes Water Roll Off a Duck’s Back?
youtu.be/Q-8GXk9r0ik





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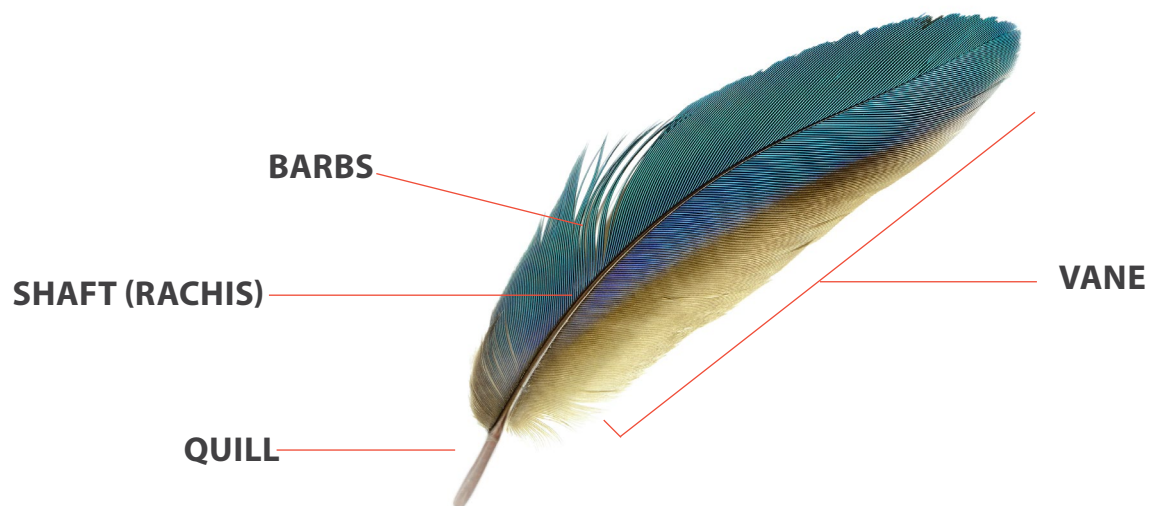
Let's get started!

STEP 1: Download the Feather Biology Slide Collection:

academy.allaboutbirds.org/feather-biology-slide-collection

Show different types of feathers and ask kids how they think they are of use to birds before handing everyone a feather. Use the Parts of the Feather diagram or share the Feather Biology Slide Collection to have kids examine their feathers and identify the parts. Kids may want to draw their feathers and label their drawings.

VISIBLE PARTS OF A FEATHER



SHAFT: base to tip of feather — supports all the other pieces of the feather

QUILL: part of the shaft that attaches the feather under the skin

VANE: grows out from the shaft on both sides and contains the barbs

BARBS: grow out of the shaft and contain barbules that hook the parts of the feather together to keep it smooth. You need a magnifying glass to see the barbules.





Types of feathers

Down feathers: more delicate feathers that are located beneath the outside feathers and provide insulation for the bird

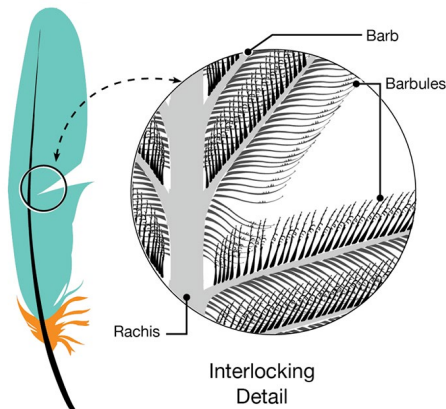


(IMAGE VIA BIRD ACADEMY/CORNELL LAB OF ORNITHOLOGY)

Contour feathers: the visible feathers that one can see on the bird; they provide the color of the bird and hook together to keep the rain out

Flight feathers: contour feathers of the wing and tail that make it possible for the bird to fly

Talk about how the feathers work and why. Encourage them to pull the barbs apart — separate the barbs so there are gaps between them. Then have them zip the barbs back together by starting at the bottom and running their fingers up the feather (like zipping up a jacket).



ASK: What's happening to the feather? How do birds manage this movement?

Birds zip up their barbs by using their beaks. In addition to hooking the barbs together again, they add a little waxy, oily coating to the feather. This waxy coating comes from a gland on their rump. Have kids test to see if their feathers still have this coating.

(IMAGE VIA BIRD ACADEMY/CORNELL LAB OF ORNITHOLOGY)





Oil Spill Experiment

STEP 1: Have kids lay their feathers on a table and use an eye-dropper to place a few drops of water on the feather. **CHECK WITH THEM:** Does the water bead up? If not, have kids spray just a bit of the baby oil on their feather, then put a few drops of water on the feather again. **ASK:** Does the water bead up now? Why? The baby oil is working in place of the bird's natural oil.

STEP 2: Next, have kids dip their feathers into a container of water, then separate the barbs and zip the feather back together. **CHECK WITH THEM:** What happens to the feather? Does it return to its original state? Why or why not?

STEP 3: Now, have kids add oil to their container of water, and then drag their feathers through the container. Remove the feathers from the container and have them repeat the process of pulling the barbs apart and zipping them back together. **CHECK WITH THEM:** What happens now? How does this affect the birds' ability to keep dry?

Kids can see that the barbs won't zip when coated in oil.

Oil and other pollutants that birds might encounter when they swim, bathe, migrate, or look for food, coat the barbs and barbules and prevent them from locking together. When barbs can't "zip" up, feathers can't keep water out or keep the bird warm and the bird could drown or have a dangerously low body temperature. Unzipped barbs also affect aerodynamics of flight feathers, leaving birds unable to fly away.

STEP 4: Cleaning the feathers. Have kids conclude by swishing their oily feathers in a container with soapy water to remove the oil, dry the feather and then repeat the separation and zipping up process.

CHECK WITH THEM: Does it work? Why or why not?

Open up a discussion about what they learned from their experimentation. Encourage kids to share their ideas and concerns.





Start with a Book: Bird Buddies Toolkit

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More oil spill activities

OIL SPILL! (U.S. FISH & WILDLIFE SERVICE)

fws.gov/rachelcarson/toolkit/Environmental_Contaminants/Oil_Spill_activity.pdf

OIL SPILL CHALLENGE

startwithabook.org/sites/default/files/Oil-Spill-Challenge.pdf



BIRD REHABILITATION SPECIALISTS CLEAN A JUVENILE BROWN PELICAN AFTER A GULF COAST OIL SPILL. (PUBLIC DOMAIN PHOTO BY TOM MACKENZIE, USFWS)

