

Nature's Tiny Air Show

Hummingbirds are the world's smallest birds. Almost a third of their body weight is in their large chest muscles. These are the muscles that power hummingbirds' flight.

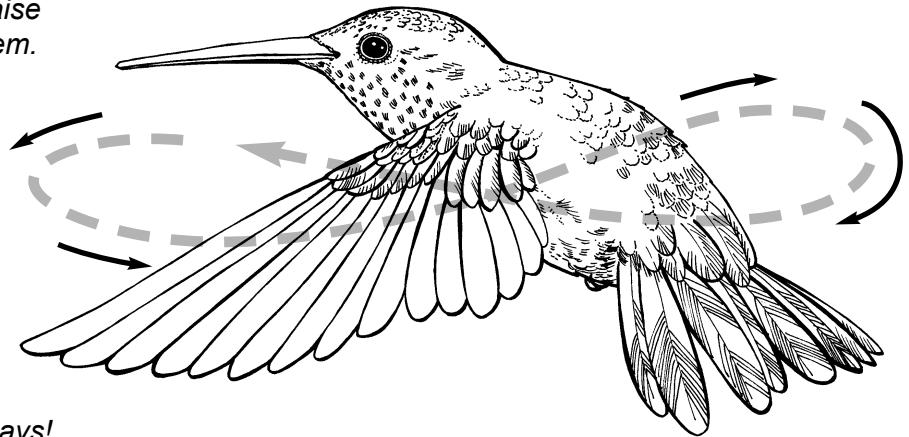
Like all birds, hummingbirds have two sets of chest muscles, one to raise their wings and one to lower them. Although most birds have small muscles for raising their wings, hummingbirds have large muscles for both raising and lowering their wings. These muscles, along with special shoulder joints and wing bones, make hummingbirds amazing fliers. They are the only birds that can fly forward, backward, up, down, and sideways! They can even fly upside down or hover like a helicopter!

Hummingbirds can fly up to 60 miles per hour, moving their wings an astounding 200 times each second! Air passing over the bird's quickly moving wingtips creates the "buzz" or "hum" that gives the hummingbird its name.

When hovering, hummingbirds only move their wings about 50 times per second. They move their wings through the air the same way that you would move your arms when treading water. The hummers move their wings in a horizontal figure-eight motion, just like the drawings of the black-chinned and broad-tailed hummingbirds.

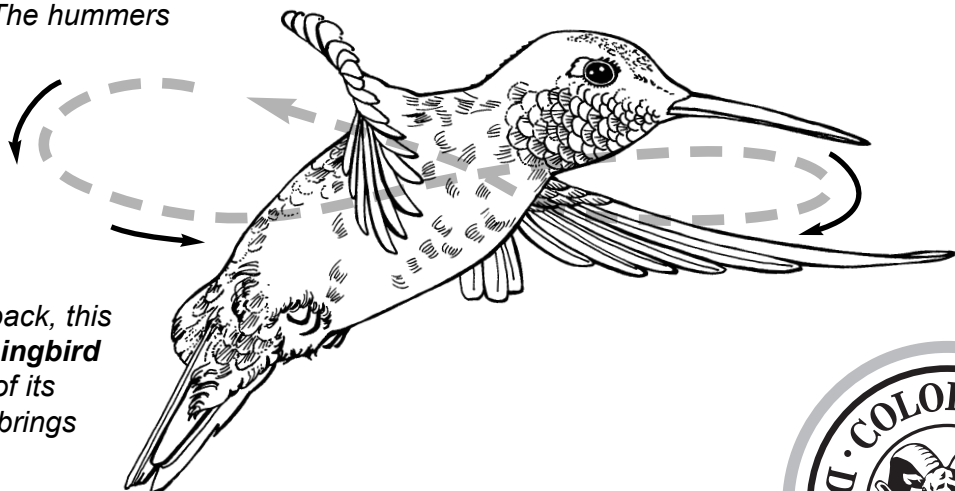
With its wings far back, this **black-chinned hummingbird** rotates the underside of its wings "palms up" and brings them forward.

Once the wings are far forward, the hummer—in this case a **broad-tailed hummingbird**—turns the wings "palms-down" and moves them back again.

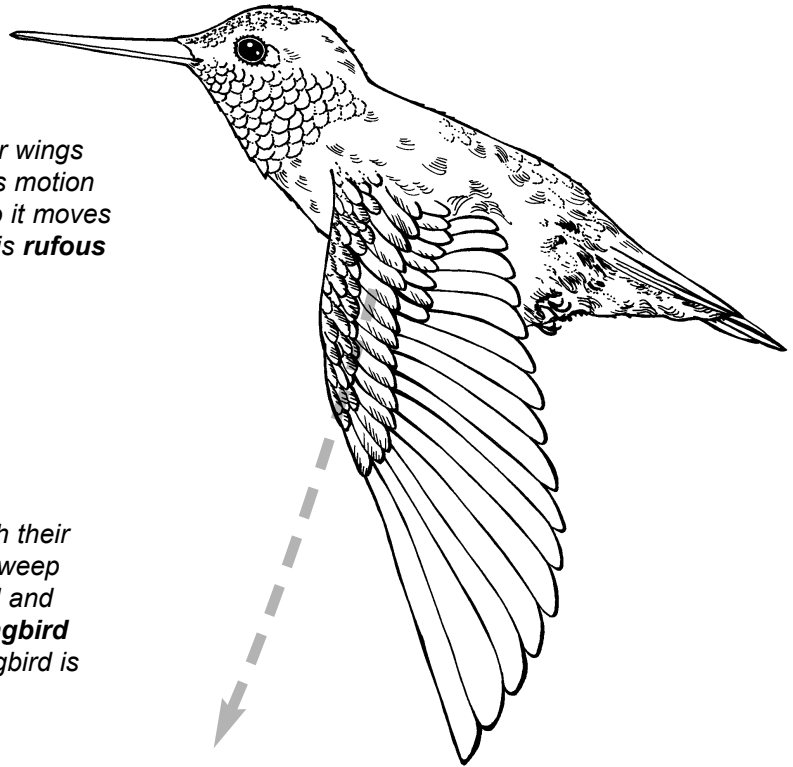


You Try It!

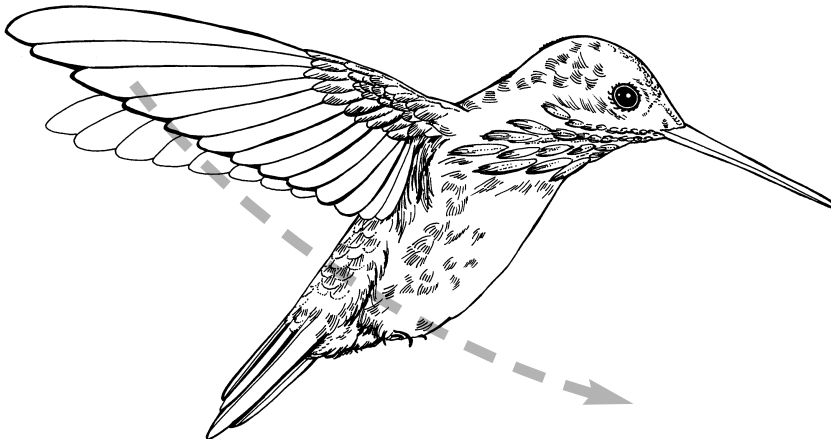
Hold your arms at shoulder height. Move them as far back as you can and then rotate your hands "palms-up." Bring your hands as far forward as you can and then turn your palms down and return to the starting position. Now do this 50 times each second!



To fly forward, hummingbirds flap their wings just like other birds, only much faster. This motion pushes air backwards and downwards, so it moves the hummingbird forward and upward. This **rufous hummingbird** is flying forward.



To fly backwards, hummingbirds reach their wings as far back as possible, and then sweep them forward. This pushes the air forward and the bird backward. This **calliope hummingbird** is flying backwards. The calliope hummingbird is the smallest bird in North America.



These stunt fliers are also very colorful birds. Find a field guide to birds. Color these four hummingbirds, which are actual size.

