

Bats of the Chihuahuan Desert

How Do Bats Fly?

In order to learn about how bats fly, it is useful to compare bats to humans. A bat's body parts and anatomy are specialized and allow them to live in their unique habitats and eat different things than humans would. Each bat species have unique structures which let them gather, catch, and eat different types of food, get water, and find shelter.

Bats can be as large as a small dog or as small as a bumblebee. They also have very large wings comparable to their bodies. These wings enable them to fly. This thin, elastic wing membrane between their fingers and legs gives them acrobatic flight capabilities. The scientific name for their wings is *chiroptera*, which translates to 'hand wing.' Such a 'hand wing' allows better movement in flight.

A bat's wing is actually very similar to our own hands. The wing bones are greatly elongated fingers. This elongation of the bones is required to support the wing membrane. The thumb, usually with a sharp claw, is not attached in the wing membrane but remains free. This helps the bat crawl around on rough surfaces.

The membrane of a bat's wing is living tissue similar to the tiny flaps of skin joining the bases of our human fingers. Because the membrane of skin joins their long fingers from the bases to the tips, a bat's fingers cannot flex independently. The muscles in the arm open up the hand/wing. The structure of the wing membrane, the arrangement of the bones supporting it, and the positioning of the muscles provide the bat with the lightness and maneuverability necessary for catching insects, hovering above flowers, or quickly avoiding obstacles.

Discussion

In this activity, we are going to determine what our wingspan would be if we had wings like a bat. (See Resource File 7 – How Do I Compare to a Bat for an image comparing a human arm and a bat wing.)

Set Up

Using sidewalk chalk, draw the silhouette of a large flying fox (wingspan approx. 4'11"). Inside of that draw the silhouette of a smaller species of flying fox (wingspan approx. 3'). Inside of that draw the silhouette of the Bumblebee bat, aka Kitt's Hog-nosed bat (wingspan approx. 4").

Note: For indoor use, tape butcher paper 5' in length to the floor and use markers to draw the silhouettes on the butcher paper.

Activity

1. Show students the silhouette display and explain that bats come in many sizes.
2. Explain that bats have large wingspans compared to their body sizes. Measure the length of each student, one at a time—using the tape measure—from the tips of their left hand fingers to the tips of their right hand fingers. Multiply that number by three. This is their wingspan.

Materials Needed:

- Sidewalk chalk
- Optional sidewalk chalk replacement for indoors:
 - Butcher paper
 - Markers
 - Masking tape
- Tape measure
- How Do I Compare to a Bat, Resource File 7
- Image of a Large Flying Fox found in Resource File 4
- Image of a Bumblebee Bat found in Resource File 4
- Image of a Little Brown Bat found in Resource File 4
- Stopwatch

3. Optional: Students can then lay on the ground (or another sheet of butcher paper) and the adult, or other students, can draw their real-sized wingspan alongside the silhouettes for a visual comparison.

Tell students: To support their body in the air and overcome the force of gravity, a flying animal must beat its wings very quickly to maintain altitude. Statistics for the little brown bat indicate that this bat flaps its wings about 12 times per second! Let's see how many time you can flap your 'wings'—arms—in 30 seconds.

Additional Activity

1. Time students for 30 seconds. Demonstrate for them how you want them to flap their arms as if they were wings.
2. Have students count each of their wing flaps during a timed 30 seconds. At the end, see how they compare to the little brown bat.