15 Indiana Bats and Me

Measurement Activity

Materials: Copies of Worksheet ● Stopwatches or clock with second hand ● Weight scale for humans ● Gram scale ● Tape measures and Yardsticks (metric and standard) ● Variety of coins ● Optional: calculators

Students can learn a great deal about Indiana bats and themselves by comparing various aspects of their anatomy, physiology and behavior. In this activity, children take their own measurements and compare them to those of Indiana bats.

Background Information & Answer Key

Mammals

Even though Indiana bats fly and people walk on the ground, bats and people are similar in many ways. That's because both people and bats are mammals. With few exceptions, all mammals give birth to live young, nurse babies with milk, and have hair. Other mammals include dogs, cats, chipmunks, raccoons, elephants, monkeys, and whales.

Wingspan

Indiana bat wingspans vary from about 24-28 centimeters, or about 9-11 inches. Have students stretch out their arms and measure the distance between fingertips.

Number of Fingers

A bat's wing is actually a modified hand. (Refer to the attached diagram and explain how the wing bones are actually greatly elongated fingers. Also point out the thumb. The thumb has a small claw which aids the bat in crawling around on rough surfaces.

Weight

Have students get on a scale and take their own weight. The Indiana bat weighs only about one quarter of an ounce, or between 6 and 9 grams. Have students experiment with coins and the gram scale to find the weight of an Indiana bat in coins. This helps students better visualize how very tiny the Indiana bat is.

Height

Have students work in pairs to measure their height in inches.

Resting Heart Rate
Using a clock with a second hand or a stopwatch, demonstrate to students how to find their pulse (by putting your fingers against the carotid artery in the neck). Sitting down, students should take a resting pulse by counting the number of heart beats in a 15-second period and multiplying this by four to determine the total for one minute.

Active Heart Rate
Before taking this rate, have students simulate flight by doing one minute of jumping jacks. Immediately following this, they take their pulse again using the method described above. The bat's heart rate is high because flight is hard work. Its heart must pump rapidly to provide lots of oxygen, which is carried to flight muscles by blood. During hibernation, the opposite extreme, a bat's heart rate slows to only 20 heartbeats per minute.

Wing Beats
To determine wing beats per second, have the students flap their arms like wings and count the number they can do in five seconds. The teacher then divides that number by five to find the rate per second. To support a body in the air and overcome the force of gravity, a flying animal must beat its wings very quickly to maintain altitude.

Food Consumption
The teacher may need to help students determine this number (1/32 of a student's weight). Indiana bats eat about half their body weight in insects each night. Have students figure out how much they would have to eat in one day if they ate half their body weight. How many "quarter-pounders" would they have to eat??

Lifespan
The average lifespan for a human is 74 years. Indiana bats live an average of 5-10 years, although some individuals can live up to 14 years. For their size, bats are among the longest-lived animals. For comparison, most mice have a lifespan of only about two years.

Name _____

How an Indiana Bat Compares to Me

	Student	Indiana Bat
Kind of Animal	_____	Mammal
Wingspan/Armspan	_____	9-11 in/24-28 centimeters
Number of Fingers	_____	four fingers, one thumb
Weight	_____	approx 1/4 ounce 0.2-0.3 ounce/6-9 grams
Height	_____	about 2 inches
Heart Beats/Minute Resting	_____	less than 100*
Heart Beats/Minute Active	_____	as many as 900*
Wing Beats/Second	_____	about 12**
Food Consumption	_____	1/2 body weight per night
Lifespan	_____	5-10 yrs average, 14 possible

* Statistics for small bats in general
** Statistics for Little Brown Bat