Notes to Accompany Bat Slide Show

By Bat Conservation Ireland

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Last updated February 2016

Slide 1: Introduction

Slide 2: Lizards, Birds and Frogs are not Mammals.

This slide highlights some other animal groups. Lizards are reptiles, Frogs are amphibians and Birds are birds! These animals all have a backbone and have four limbs, like humans and bats, for instance. But in contrast they lay eggs rather than give birth and of the three types of animal shown, just birds are warm blooded. In addition, their skin is covered with scales, feathers or is hairless.

Slide 3: Bats are Mammals.

Ask the children which of these animals are mammals. We deliberately include humans in this slide because children often do not think of themselves as belonging to the animal kingdom. Use this slide to discuss the features common to all mammals:

- Warm blooded
- Give birth to live babies
- Feed their babies milk
- Most mammals have fur or hair with the exception of some aquatic mammals like whales and dolphins.

Slide 4: Bats are not rodents (rats/mice)

Bats belong in the Order Chiroptera which means HAND WING. Taxonomists (scientists who study how species are related) believe based on the fossil record, DNA evidence and the structure of bodies (anatomy) that bats are more directly related to humans and apes than to rodents.

Slide 5: Fossil Bats

Bat fossil remains have been found in rocks dating from 50-55 million years ago. The skeleton of these ancient bats is much like bats of present day. The image on the right is a Townsend's Long-eared bat. This image shows the bat's wings outstretched. Trace along the bones of the wing on the right. First the shoulder of the bat, then the upper arm, elbow, forearm, then the thumb forms a small claw at the top of the wing. Each of the four remaining fingers is stretched out and there is skin between them – the index finger and middle finger together form the leading edge of the wing. In addition, a large part of a bat's wing is the skin that stretches between its little finger (fifth finger) and its body. And finally, bats also have membrane between their tail and legs.

Slide 6: Bats are the only mammals that can really fly

In this image you can see a flying squirrel. Despite the name, flying squirrels cannot undertake true flapping flight. They can glide from one branch to another but they cannot take off and work to gain height.

Slide 7: Bats are nocturnal and they like to hang upside down

Nocturnal means active during night time. Discuss how children feel during night time – sleepy and inactive. Bats are the opposite – sleeping during the day. They may prefer to fly at night because they get overheated when flying in sunshine and during the night they do not have to compete with

birds that eat insects. Hanging upside down is as easy for bats as sitting down is for us as tendons in their feet lock into place. Their body is specially adapted so the blood does not rush to their head.

Slide 8: Bats use sound to find their way around at night and to find insects to eat.

Bats make high pitched squeaks each time they flap their wings. They then listen for any echoes to bounce off prey or obstacles in their way. Ask the children if they have ever heard an echo. The way bats use sound is called echolocation. The time it takes for an echo to come back tells the bat how far away the object is. Bats can also tell shapes, sizes, texture and other things like whether the object is moving and if so, in what direction. Bats have a whole extra sense to use in darkness. However, most of the sounds bats use are too high pitched for us to hear with our ears. Sounds that are too high pitched for us to hear are called ultrasound. You may want to discuss pitch or frequency with the children. Comparing low and high notes of a musical instrument such as a piano can be a good way to explain pitch or frequency.

Slide 9: Bat Detectives

People who study bats listen to the sounds they make at night using a special instrument called a bat detector. It works a little bit like a radio because it picks up the high pitched sound waves bats make but that we cannot hear with our ears and changes them into sounds we can hear. In this way we can eavesdrop on bat echolocation. Bat workers can distinguish between species based on the sounds they hear on the bat detector.

Slide 10: A place where a bat lives is called a roost

Bats do not build nests. They just hang up in a safe place. Roosts can be in crevices in stonework, for example under bridges like the one shown. They can also roost in attics or roof spaces of buildings. Sometimes they roost in cracks or holes in trees.

Slide 11: Bat Diversity

More bat species are found in the warmth of the tropics, around the equator, than anywhere else. As you go further north or south you get fewer species. Mainland Europe has about 45 species but just one species of bat in Europe can be found north of the arctic circle, the Northern bat.

Slide 12: In Ireland we have 9 species of bat

All Irish bats are insectivorous. Most of our species can be found all across the island, although some are more common in the south than in the extreme north (where it is a little colder).

Slide 13 Life Cycle

Slide 14: In summer mothers live together in a nursery roost

These are also sometimes called maternity roosts. Female bats gather together in a roost that is warm (e.g. like an attic) and close to good habitat that will provide them with plenty of insect food (e.g. woodland, river, lake, hedges). They usually gather from May onwards. In June or early July they give birth to a single baby. A bat baby is called a pup. The baby weighs about one third the weight of its mother. The mother feeds its baby with her own milk. A bat mother can recognise her baby by its smell and the sound it makes, even if there are hundreds of other babies in the same roost. In this slide the golden brown bat at the top is probably a young bat, in the first summer the fur colour of the babies is often slightly different to the adults, even though they grow to adult size within just a few weeks.

Slide 15: Babies are born in June or July, blind and with no fur.

This is the only time in a bat's life when it is blind, its eyes open after just a day or two. Their fur grows in a couple of weeks.

Slide 16: In late summer, bats leave the nursery roost. They hibernate in winter.

Hibernation is sometimes described as sleep. However, it is much more than this. A hibernating animal looks and feels dead because its body temperature drops to the same as the surrounding air. Its heart only beats a couple of times a minute and it takes very few breaths. Its blood only pumps around the vital organs. Bats hibernate to save energy at a time of year when there are very few insects around. Condensation often forms on hibernating bats because they usually hibernate in damp environments like caves. This also means that they do not dry out (dehydrate) during hibernation. Bats choose cool places to hibernate where the temperature does not change too much from one day to the next. They sometimes use tree holes, caves or crevices in stonework. In Ireland we do not know a lot about where our bats hibernate in winter as just one species in the west of Ireland uses caves a lot.

Slide 17: Some Irish bat species

Slide 18: The pipistrelles are Ireland's smallest mammals

Pipistrelles only weigh about 4-5g, about the same weight as a teaspoon of sugar or a 5c piece. With their wings stretched out they look big. These bats are the most common species in Ireland and you might see them flying around gardens or parks in cities, or around hedgerows and roads in the countryside on a summer's evening at twilight. Just one of these little bats can catch up to 3000 insects in one night!

Slide 19: The brown long-eared bat: its ears are nearly the same length as its body!

This bat likes to fly slowly and pick up tiny insects crawling on leaves. In fact, its hearing is so good that it can hear the sound of an insect crawling on a leaf!

Side 20: Ireland's largest bat, Leisler's bat, has very small ears.

Leisler's bat flies very high and fast so this bat is designed to be more 'aerodynamic', like an airplane. Big ears would just get in the way and flop around! This bat is very rare in other parts of Europe but it is fairly common in Ireland.

Slide 21: Daubenton's bat flies over rivers, scooping up insects with its tail.

This bat loves to fly just over the surface of big slow moving rivers and canals. Sometimes it catches insects using its tail or sometimes it uses its big feet to catch them. Like a lot of our bats, Daubenton's hate bright lights and will stop flying over rivers that are lit up at night by street lights.

Slide 22: The lesser horseshoe bat is only found in the west of Ireland

In counties Cork, Kerry, Limerick, Clare, Galway & Mayo. It has a different shaped nose to the other Irish bats: it has folds of skin around its nostrils (in a horseshoe shape) called a noseleaf. This bat makes its echolocation sounds through its nose. It is rare in some parts of Europe and has even become extinct from some countries (e.g. the Netherlands).

Slide 23: Myths and Truths about Bats

Slide 24: There is no such thing as a blind bat

The only time a bat is blind is for the first day or two after it is born. Bats can see much better than us in dim light. Some bats can see in colour.

Slide 25: Bats do not get caught in people's hair.

Bat echolocation is so finely tuned that they can easily avoid getting caught in our hair. We have never met anyone who had a bat caught in their hair – although we have never met anyone with hair as crazy as this!

Slide 26: Bats have just one baby in a year

They do not have large or multiple litters of pups. A lot of young bats die during their first winter because it is difficult for them to eat enough insects in their first autumn and then have enough body fat built up to last the long Irish winter. This photo shows a baby fruit bat from Australia that has been orphaned and is being cared for by humans. Irish baby bats are much, much smaller than this.

Slide 27: Bats do not build nests

They like to hang upside down and do not bring bedding material, gnaw on wood or insulation or pipes.

Slide 28: Vampire bats live in South America

There are no vampire bats in Ireland or Europe. Irish bats just eat insects. There are three species of vampire bat. They rarely bite humans. Two species of vampire bat usually drink blood of birds, the other prefers to feed on cattle and other animals. They are not like vampires in stories that drink enough blood to kill a person – vampire bats typically drink 20g (about the same as four teaspoons of blood) when feeding. A lot of science research has been done on vampire bats because they have some unusual chemicals in their saliva to stop blood from clotting.

Slide 29: All around the world bats do lots of good things for people

They eat lots of insects that bite us or damage our food crops. The first picture shows a mosquito which is a typical food for many insectivorous bats. In Ireland bats eat midges, green fly and various moths that can damage trees and shrubs.

Bats pollinate some fruits that humans eat. The central photo shows an Australian flying fox licking pollen from a large flower. By moving from flower to flower with pollen on their muzzles, pollen and nectar feeding bats spread pollen and ensure that plants can make seeds, similar to bees. Among the food plants that are pollinated by bats are mangoes (see mango smoothie photo) and cashew nuts. Other bat pollinated plants include bananas, guavas, chocolate and balsa wood.

Fruit bats spread seeds (by pooping them out!) so that new forests can grow. In tropical areas fruit bats are extremely important for seed dispersal.

In some countries where very large numbers of bats roost in caves, people collect up their guano (more poo!) and use it as fertiliser.