



# Birds

## Teacher notes

### What makes a bird a bird?

- Feathers! A feature that is exclusive to birds. They are made up of keratin. This is a substance that is similar to what your fingernails are made up of.
- Lays eggs with hard shells, though this is not a trait that is exclusive to birds. Most reptiles and a few mammals (echidna and platypus), also lay hard shelled eggs
- They are warm blooded
- Can fly (in most cases)
- Has air sacs as well as lungs
- Light weight skeleton. Bones have a hollow structure inside; this makes them lighter and able to fly easier.

### Feathers


Feathers are a distinguishing feature of birds. They help the bird to fly, regulate its body temperature keeping it warm (thermoregulate) and keep the water out for birds that dive into water. A sparrow may have as many as 300 feathers on its body. A swan may have up to 25,000.

There are five types of feathers each covering a different part of the body and used for different functions

### **Flight feathers**

- Flight feathers are found on the wings and tail of birds
- They are long and wide so they can cover a large area but not add too much weight
- They have a central strong shaft
- Flexible vanes with barbs and barbules attached
- They are covered in oil through a process called preening (collecting oil from a gland found on the rump of the bird using their beak). Preening ensures the flight feathers are waterproof

### **Contour Feathers**

- Small and colourful
  - They cover the general body area
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## **Down feathers**

- Grow under the contour feathers
- Help to keep the bird warm

## **Filoplumes**

- Fine shafts ending in small tufts of barbs
- They sense the changes in the surrounding environment, following which, the position of the contour feathers are adjusted to ensure optimum insulation and streamlining for flight

## **Bristle feathers**

- Cover the head
- Filter the air that enters the nares (nostrils or nasal passages)

## **Flight**

A bird is perfectly adapted for flight. They are stronger than humans comparatively related to body weight. Have powerful wing muscles and hollow bones, making their bodies light and ideal for flying. However not all birds fly, these birds have modified wings suited to the environment they live in. Penguins for example have modified wings suited for swimming. Kiwis have reduced wings suited to a flightless life living in forests.

Why fly? Flying enables birds to search for the best food sources and nesting sites.

## **Mechanics of flight**

Birds usually fly by upward and downward flapping movements of their outstretch wings. Air, passes over the upper surface faster than the under surface. This results in a great amount of up ward thrust (or pressure) beneath the wings which helps support the bird in the air.

## **Where do birds live?**


Birds inhabit every continent and environment on earth. There are even birds that live almost entirely at sea (although few species).

## **What do birds eat?**

Birds can be

- carnivorous (those that eat other animals)
  - insects worms thrushes and robins
  - other birds and small mammals birds of prey owls, falcon, harrier
- omnivorous (those that eat other animals and a range of plants)
- herbivorous (those that eat exclusively plants) such as



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- Grass eater ostrich and chickens
  - Nut eater finches, crows
  - Fruit
  - Nectar
  - Seeds
  - Pinecones


### **Adaptations to diet - beaks**

The beaks of birds are specialised adaptations suited to the diet the bird eats

- Meat eaters have hooked bills to rip and tear prey apart (birds of prey)
- Nut eaters have beaks with a thick base to help crack open nuts
- Insect eaters have thin tweezer like beaks to pick small insects up and hold on to them tightly
- Nectar eaters usually have long thin beaks with long tongues that allow them to reach deeply into flowers for nectar. Some nectar needers, such as parrots, have shorter tongues with a bristle on the end that acts like a sponge soaking up nectar
- Invertebrate eaters have bills that can filter insects found in water. Some have spatula type ends or long thin probes ideal for digging deep in mud or prying open shells
- Fish eaters can have pouches that can scoop up and carry fish (pelicans). Some have spear type beaks to stab fish (egrets, herons, kingfishers, terns). Some have enlarged lower mandibles and skim the waters surface collecting small fish

### **Adaptations to diet - feet**

Like the beaks of birds the feet of birds are adapted to the diet they eat

- Aquatic and semi aquatic birds who live mostly on water but nest on land (e.g. ducks), usually have webbed feet to swim with and small claws to grip on to branches and pull them out of the water
  - Arboreal (tree living birds) have gripping feet that allow them to tightly grip on to branches, the claws are usually long and sharp suited to holding on to branches
  - Raptorial feet seen in carnivorous birds have long, curved claws to hold on to prey and rip it apart
  - Aerial birds which spend most of their time in flight over land have small feet in comparison to body size because they do not need to perch in trees or on the ground to find food
  - Ground birds such as cassowaries and ostriches have feet well adapted for running having less than 4 toes
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## **Colour adaptations**

Colour is used for the following reasons

- Mating displays
- Camouflage
- Threatening displays
- Warning colours

## **Other adaptations**

The way the bird acts, wing shape and type, colour and egg characteristics are all features that are adapted to the habitat the bird lives in.

## **Why adaptations**

Birds have adaptations that are suited to the environment they live in. The adaptations allow the bird to take advantage of the resources present in the environment, such as access to food and nesting resources and mates. Without these adaptations the chances of survival would be greatly reduced.

## **Types of flight**

Different types of flight are adapted to suit the life style and habitat the bird comes from.

- Swooping flight – commonly used during hunting, highly powered dives to hit targets. Wings are folded back in a dive (e.g. Falcons).
  - Soaring birds, such as eagles use warm wind currents called thermals to help keep them high and moving in the air. The wings are usually large and broad
  - Flapping flight, most birds rely on flapping movements, which are powered by large strong breast muscles to fly. Flapping is the upward and downward flapping motion of the wings. Pigeons are a good example of this kind of flight
  - Hovering flight helps to keep birds stationary while they suck nectar from flowers e.g. Humming birds
  - Gliding birds use natural air currents to help keep them up in the air and moving. They have very long and large wings. They can glide over the sea using wind currents for hours with out flapping their wings. These birds are helpless with out wind because their wings are so large they can not sustain flapping their wings for long periods of time.
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