

BUILD-A-BIRD

WHAT IS BUILD-A-BIRD?

Build-a-bird is a fun crafts activity to help people learn all about different types of birds. The aim is to teach you how different birds are adapted to different environments. An adaptation is when part of the body becomes specialised for a certain function that means the animal has a better chance of survival in a particular environment. You have the chance to build your own bird with a combination of adaptations that you choose!

HOW DOES BUILD-A-BIRD WORK?

In the HOW TO document you will find a worksheet and some different bird templates to cut out and stick onto the worksheet. You can cut out the head, body, wings and legs of each of these templates, then combine them in any way you wish!

BIRD ADAPTATIONS

We have prepared some information sheets below about eight different types of birds. Most or all of these should be familiar to you. You can learn about the adaptations that different types of birds have and what environments they live in. The environment they live in determines what kinds of adaptations they have. Use these information sheets to decide what your own build-a-bird will look like. Be creative!



ENVIRONMENTS

Once you've built your bird, think about the adaptations it has and how they relate to its lifestyle and where it lives. What food might it eat? How does it move around? Can it fly, swim or run?



BUILD-A-BIRD: GROUND BIRDS

BILL

Many ground birds have a gently curved bill (beak) they may use to peck at the ground, eating a diet of plants, seeds and insects.

ENVIRONMENT

Ground birds may spend most of their time on the ground, but not all species do. Some roost in trees at night, and forage in open areas such as meadows during the day, like this pheasant in the British countryside.

Phasianus colchicus
Common Pheasant

CAMOUFLAGE

Spotted plumage may help some ground birds stay hidden in grassy or wooded areas.

BROAD WINGS

Short, broad wings are adapted for quick bursts of flight out of the undergrowth to escape predators such as foxes and cats.

ELABORATE TAIL

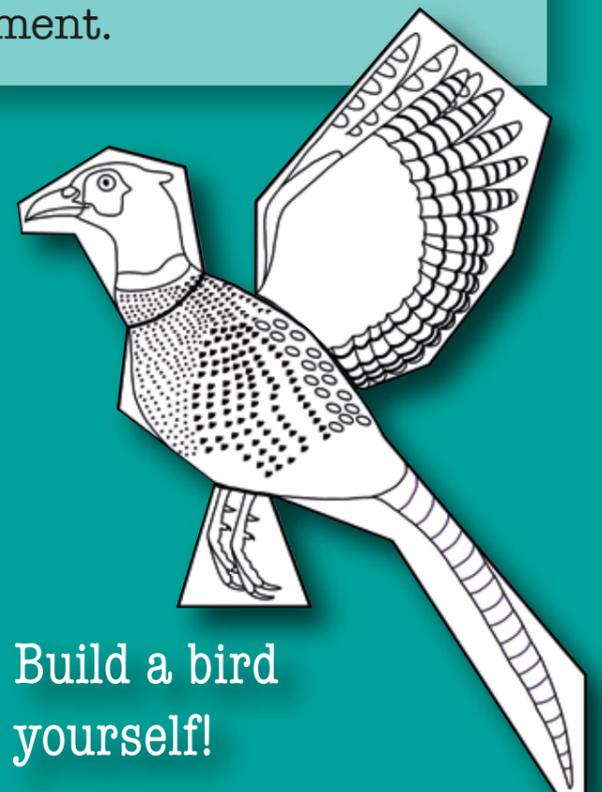
Pheasants have long tail feathers to attract mates. This is not an adaptation to the environment.



Meleagris gallopavo
Wild Turkey

STURDY LEGS

Strong, medium-length legs and toes may be good for walking through grass and undergrowth, and for scratching food off the ground.



Build a bird
yourself!



BUILD-A-BIRD:

MARINE BIRDS



Xema sabini
Sabine's Gull



ENVIRONMENT

Marine birds belong to several different families of birds. Flighted marine birds like gulls and albatrosses look similar because they share similar environments and habits. They may spend long periods of time gliding over open water or the ocean, and some species are skilled at diving and swimming underwater.

WINGS

Marine birds may have adaptations for flying for long periods of time over open ocean. Their arm bones are relatively long, and their slender, pointed wings may help them soar with little flapping effort. This helps to conserve energy while searching for food.

BILL

The size and shape of a marine bird's bill (beak) may vary depending on its diet. Some may have large bills for catching fish and swallowing them whole. Some smaller seabirds like Sabine's Gull may have relatively small bills adapted for catching invertebrates such as crabs. Some seabirds, such as albatrosses, may have a hooked tip for tearing up fish.

Phoebastria nigripes
Black-footed Albatross



WEBBED FEET

Many marine birds have webbed feet adapted for swimming. Some marine birds may float on the surface of the water to rest or feed, paddling with their feet.

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BUILD-A-BIRD: SONGBIRDS

ENVIRONMENT



Songbirds are a diverse group of birds with over 5,000 different species, which is nearly half of all bird species! Songbirds come in many different shapes and sizes. They may show specific adaptations to many different environments, from forests and grasslands to mountainsides and deserts.

BILL

Songbird bills (beaks) are some of the most variable in shape across birds. A relatively common shape is finch-like, which is adapted for a granivorous (seed-based) diet. The deep cone shape may be used for breaking open seeds to eat the kernel inside.

Chloris chloris
European Greenfinch



SINGING

Songbirds are best known for their singing. Singing can range from the croak of a crow to the harmonious song of a blackbird. Songbirds have complex syrinxes (voice-boxes) that enable them to produce complex sounds. Songbirds learn songs from their parents and other members of their species. They often sing to attract mates and declare their territory.

PERCHING FEET

Songbirds have foot adaptations which may enable perching on thin branches in shrubs or trees. Many songbirds may look acrobatic when searching for food; next time you see a Blue Tit, pay attention to the way it clings to a branch. They can even hang upside down!



Hirundo rustica
Barn Swallow

WINGS

Some songbirds may have long flight feathers adapted for agile flying in open spaces, like swallows. Other species, like some finches, flit between trees so they may have shorter feathers forming broader wings.



Build a bird yourself!



BUILD-A-BIRD: PENGUINS



ENVIRONMENT

Penguins are charismatic flightless birds. Penguins are commonly associated with the Antarctic, but not all penguin species live there. There are also species living on coasts around Africa, South America, Australia and New Zealand. All penguins are marine birds and depend on the ocean as a source of food. Many breed in rocky coastal areas. However, Emperor Penguins breed on Antarctic sea ice and Snares Penguins from New Zealand nest in forests.



Spheniscus demersus
African Penguin

BILL

All penguins hunt for food in the sea. Larger species such as Emperor Penguins eat mainly fish and squid, so their bills (beaks) are longer and more slender than those of other species. African Penguins mainly eat small shoaling fish like anchovies. Some penguin species may specialise in eating crustaceans, and others have a more general diet so their bills may be shorter.

BONES

As penguins do not fly, they do not have the very lightweight hollow bones of flying birds. Instead, penguin bones are much heavier. This aids them in swimming, allowing them to stay underwater. It also makes penguin bones easier to fossilise, so the penguin fossil record is very rich!



FLIPPERS

Penguin wings are highly modified into flippers for swimming. As a result, they cannot fly. The wings are flat, broad and stiffened into a streamlined shape, making penguins fast and agile swimmers.

WEBBED FEET

Penguins have short legs but large, strong feet with webbed toes. Webbed feet may help penguins swim.

Build a bird
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BUILD-A-BIRD:

HUMMINGBIRDS



ENVIRONMENT

Hummingbirds live in a wide range of habitats, from tropical and temperate forests to mountainsides and even deserts. All these environments must have flowers for hummingbirds to feed from.

WINGS

Hummingbirds have relatively short arm bones but long wing feathers, especially those making up their wing tips (called 'primaries'). Their wings are specially adapted so they can beat them incredibly fast. This enables them to hover in the air to drink from many different flowers, and causes their characteristic humming sound.

BILL

Many hummingbirds have long, narrow bills (beaks). A long, slender hummingbird bill is an adaptation to drinking nectar from flowers, their main energy source. Their tongues are long and specialised, moving back and forth extremely quickly to draw nectar in. Hummingbirds may also eat small insects for additional nutrients.



Amazilia violiceps
Violet-crowned Hummingbird

TINY FEET

Hummingbirds primarily move around by flying. Their feet are adapted for perching, not walking. Hummingbird legs and feet are so short that they cannot walk properly.



Florisuga fusca
Black Jacobin



Build a bird
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BUILD-A-BIRD:

FLAMINGOS

ENVIRONMENT

Flamingos live in shallow lake, lagoon or wetland environments. Sometimes, these lakes can be highly saline (salty) or alkaline (have a high pH). Flamingos are found in these habitats around the world, from Central and South America to Africa, Asia and Europe.



Phoenicopterus roseus
Greater Flamingo



BILL

The bill (beak) of a flamingo is one of their most iconic characteristics. The lower jaw is larger than the upper jaw, which is the opposite to most other birds. This is because they feed while holding their heads upside down! Flamingos use their long, slender necks to stick their heads fully underwater. The shape of the bill is highly adapted for filter feeding. Rows of specialised plates inside the bill act as a sieve for small food items. Flamingos may have a diet of small invertebrates and algae. Many eat tiny crustaceans containing pigments that give them their pink colour.

LONG LEGS

Flamingos have long, slender legs adapted for wading through water. Their feet are webbed, which may support them on soft mud at the bottom of a lake or wetland. Webbed feet may also help them swim in deeper water.

LARGE WINGS

Large wings may help support a large, heavy body when flying. Some flamingo species migrate long distances into warmer environments for the winter.



Build a bird
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Phoeniconaias minor
Lesser Flamingo



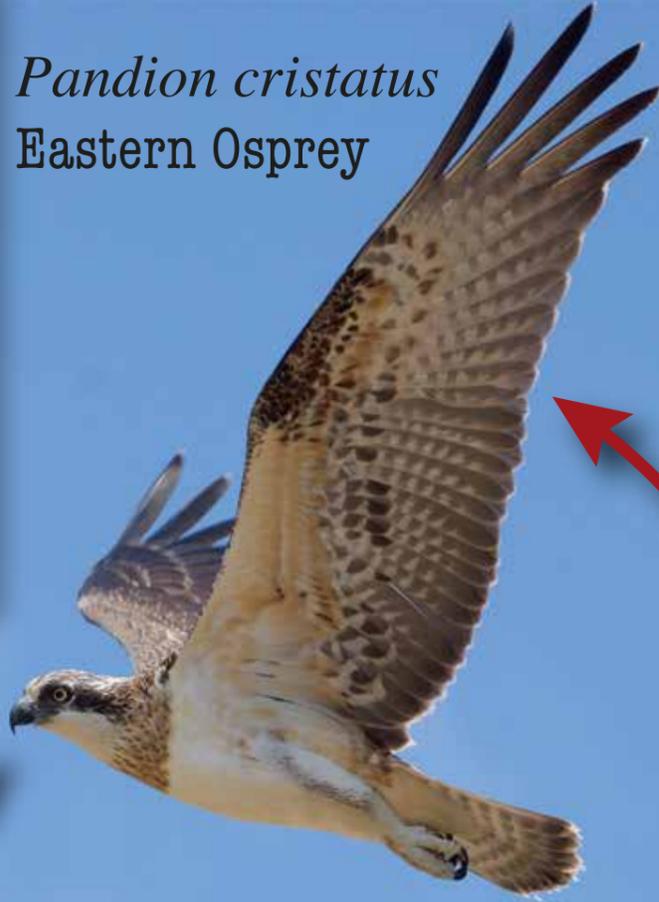
BUILD-A-BIRD: BIRDS OF PREY



ENVIRONMENT

Birds of prey may be top predators in their environment. They range in size from small to very large; some vultures and condors have wingspans of over 3 metres! Birds of prey live in many different habitats, as long as there are prey to hunt or scavenge. Most terrestrial (land) environments will support several species of birds of prey.

Pandion cristatus
Eastern Osprey



BILL

Birds of prey may have bills (beaks) that curve at the tip into a sharp point or hook. Birds of prey are carnivores, so a sharp bill may help them tear prey or carrion (dead animals) into small pieces to eat. Some birds of prey may use their sharp bill to kill prey too.

WINGS

Birds of prey may have large wingspans relative to their body size. This may help them soar in the sky as they search for prey. Vultures and condors may have very large wingspans because they may soar for long periods of time in search of carrion (dead animals) to eat.

Buteogallus meridionalis
Savanna Hawk



POWERFUL LEGS

Many species of birds of prey may use powerful legs and feet to kill their prey. They may do this by diving at a high speed out of the sky and landing on the prey with a great force. They may also have long, sharp talons (claws) on their feet which may help them to pin their prey, kill it, and carry it off.





BUILD-A-BIRD: RATITES

ENVIRONMENT

Ratites are unusual because they are completely flightless birds. They include ostriches, rheas, emus, cassowaries and kiwis. Several species, like ostriches and rheas, live in open environments like grasslands or sparse woodland. Cassowaries, however, live in forest environments. All ratites have adaptations to living on the ground, and many species are large and heavy.

FLIGHTLESS WINGS

Ratites are characteristic for being flightless. Their wings and sternum (breastbone) are very different from those of a flying bird. The ancestors of modern-day ratites lost the ability to fly and instead became more adapted to living and moving on the ground. Ratite wings are often much smaller compared to their body size than flying birds, and their hair-like feathers are not functional for flight. Some extinct ratites, called moas, didn't have wings at all! Some living ratites may use their wings for other functions, such as staying balanced when running.



Struthio camelus
Common Ostrich

BILL

Ratites exhibit a variety of food preferences which is reflected in their bill (beak) shape. Adult ostriches are mainly herbivorous so their short, wide bill is useful for eating plants. Kiwis have long bills which are great for probing for worms underground!

Casuaris casuaris
Southern Cassowary



STRONG LEGS

The only way ratites can move around is by using their legs. Many ratites, such as ostriches, rheas and emus, have long legs adapted for fast running. Ostriches and rheas can run up to 40 mph!





BUILD-A-BIRD: MEET THE RESEARCHERS

LIZZY STEELL

 @LizzySteell

Lizzy is a first year PhD student in the Field Palaeobiology Research Group studying passerine bird evolution. Passerines are a super-diverse group of birds that includes songbirds. Lizzy investigates morphological variation in passerine skeletons, looking at how the shape of bones varies across the passerine family tree. She is particularly interested in suboscine birds, which are closely related to songbirds. Lizzy enjoys running and birding in the countryside. Lizzy designed the Build-a-bird activity and put together the information posters.



ALBERT CHEN

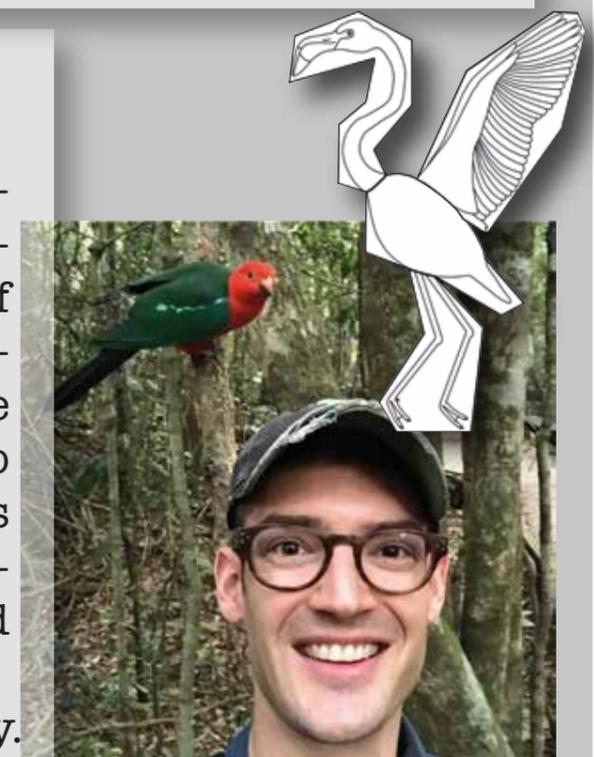
 @albertonykus

Albert is a PhD student in the Field Palaeobiology Research Group. He has a strong interest in all types of animals, but he especially likes feathered dinosaurs, including birds! Albert studies the bones of modern and extinct birds to try and figure out how different groups of birds evolved and how they are related to one another. When he is not doing research on birds, he likes to watch birds, read about birds, and draw cartoons of birds. Albert illustrated all the templates for Build-a-bird.

DR DANIEL FIELD

 @daniel_j_field

Daniel is a lecturer in evolutionary palaeobiology in the Department of Earth Sciences, University of Cambridge, where he directs the Field Palaeobiology Research Group. He is a Fellow of Christ's College, where Charles Darwin spent his undergraduate years, and holds a UK Research and Innovation Future Leaders Fellowship. Daniel uses the fossil record of birds to help answer questions about how, where, and when Earth's modern biodiversity arose. He is passionate about natural history, evolution, and science outreach, and enjoys studying and photographing Earth's living biodiversity in the field. Daniel provided all the photographs in the Build-a-bird activity.



Find out more about Lizzy, Albert and Daniel's research at www.danieljfield.com