



Weapons of Mass Destruction - Part 2

What is an Owl?

Most birds of prey belong to the Order Falconiformes. Owls do not belong to this Order. They are an example of convergent evolution. That is they form the same niche (or function) as other birds of prey but are not related. Owls belong to the Order Strigiformes. The Masked Owl is the large tyto owl in Australia. Owls are all nocturnal raptors. They have large eyes, soft feathers for silent flying and whiskers around their bills. Masked Owls have an intensely defined facial disk with forward facing eyes and heavy feathering down both tarsi to their feet. Much of an owl's hunting relies on stealth and surprise. They are very quiet flyers and are dull in colour. They have binocular vision and the facial disk helps to funnel sound to their ears. They can rotate their heads about 270 degrees which gave them the name of the wise owl as this appears to people like someone thinking. There are several differences between owls and Tawny Frogmouths which are more closely related to kookaburras than to owls. Owls will eat animals and birds up to their own body size whereas frogmouths are insectivorous. Owl's eyes face fully forward and have large asymmetrical ears which allow them to focus sound, giving them exceptional hearing, so that they can hear their prey at night whilst frogmouths eyes are more to the side. Owls have large powerful feet whilst frogmouths only have small weak feet.

Activity - Discovering raptors

You will need a selection of birds of prey or photos showing their beaks and feet. Match the feet with type of food it eats. What are the features of each feet and beak that tells you whether it can catch snakes, flying birds, small mammals, insects, large mammals or fish?

Raptors vary in size, general appearance and life histories. Unlike most other birds, the female raptor is larger than the male. Choose a bird of prey and complete the following:

- What sort of food does it eat?
- How does it catch its prey?
- Where does it live?
- What size is it?

Show its beak, talon and wing design and overall coloring

Activity - Raptor families

Find out which Genus, Family and Order each raptor belongs to. Design a family tree showing who is most closely related and who is most distantly related. Choose two of these raptors and describe the different niches they inhabit.

Flight is important

Flight is an important strategy for different raptors. In general, raptors tend to fly longer, faster and higher than any other bird. Different wing and tail shapes are an important indicator of hunting strategy. Eagles have long, broad wings well suited



Masked owl. Phot by P.Tonelli

to gliding and soaring and supporting the body weight of such a large bird and their larger body size and massive feet allow them to catch and carry larger prey. Goshawks and sparrowhawks have shorter and more rounded wings than eagles. They have longer tails to allow them to turn more rapidly and fly by constant flapping. The long tail allows them to twist in midair to catch birds and make short, fast flights. Falcons have long, narrow wings allowing them to reach great speeds and catch fast moving prey, particularly birds. Peregrines are the fastest moving land animal on earth. They hunt by searching prey from a great height, soaring on thermals then launch their attack by drawing their long narrow wings close to the body and plummeting at great speeds (called stooping) and then at the last moment unfurling its wings and striking with its powerful talons.



Juvenile harrier. Photo by P.Tonelli

Different wings types

Kites have long wings but relatively weak legs and spend much of their time soaring. Although they do take live prey they mostly feed on insects and carrion. True hawks are medium sized raptors that hunt from concealed perches. They have long tails for tight steering. Harriers are large, slender hawk-like birds with long tails and thin legs that use their keen eyesight and long broad wings to glide low over marshlands seeking prey. Owls have soft feathers which muffle sound so they can catch prey at night using stealth. Falcons are medium sized birds with long pointed wings and are particularly swift flyers.

Activity - Aerodynamics

Have students work in pairs. Each has a piece of A4 paper. One folds their paper into a rectangle then a square. Simultaneously each student then drops their piece of paper from the same height. Which one falls the quickest and why? Compare the unfolded piece to an eagle's wing designed for soaring and the folded piece to a peregrine folding its wings and swooping onto prey.

Activity - Wing design

Have students all hold their arms straight out and compare them to a bird's wing. Birds have the same structure as a person's arm. They have an upper arm connected to an elbow to the lower arm and a wrist that connects to the hand or fingers. In a bird – the upper arm and lower arm make up the inner wing whilst the rest of the wing is the hand. In soaring raptors such as eagles they longer inner wings so they get a lot of lift and can soar rather than flap. Falcons have smaller inner wings (shorter arms) and longer hands so they have more pull for flapping. Test this method out by having students flap their arms when straight out or pull their arms in and flap their hands. In pairs see how long students can be a falcon or an eagle by flapping their arms once a second. Who tires quickest? Explain that some birds can fly for days at a time.

Activity - Compare different raptor wings

Which wings are for faster flying? Peregrines have a narrow pointed wing which reduces drag and a swept-back wing design so they can reach great diving speeds.

Eagles wings are designed to ride winds and thermals so are much broader allowing them to soar whilst looking for prey. Falcons have done a trade off – having shorter wings and long tails so they can turn quickly amongst trees. This means they must flap more and glide less so they often hunt from perches. Their typical flight is to flap flap then glide due to their short broad wings. Owls have long broad wings with muffling so they can fly silently.

Activity - Raptor kite making

Have teams design a kite shaped like a raptor of their choice.

Practice flying your raptor to see which ones fly the best. Which are faster, which can soar better or go further. Discuss how wing design relates to the different types of hunting strategies different raptors have.