

# Dinosaurs and Mammals Level 2

👁️ [Gallery Search](#)

📢 [Important Facts](#)

## Diversity of Mammal Life



👁️ **Find Desmostylus, an extinct mammal from the Cenozoic era (65 million years ago - present).**

🔊 **Desmostylus** has no living relatives.

Which living mammals do scientists use to try and understand *Desmostylus*?

**Elephant, hippopotamus, bear, sea-lion**

What comparisons can you make between the anatomy of ice age mammals and today's mammals?

Ice age mammals tended to be larger and covered in the thick hair or fur.

How would these trends have aided survival during the ice age?

Thick hair helps trap body heat and large body size supports more fat for both warmth and energy storage.

Mammal life greatly diversified during the Cenozoic era. All mammals are classified as being in kingdom animalia and phylum chordata.

Class mammalia is further divided into 29 orders. Animals belonging to the same order have many features in common.

Find the extinct Cenozoic relatives belonging to the same order as the following living mammals:

Tree sloth—Giant Ground Sloth

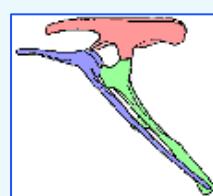
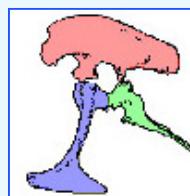
Elephant—Mastodon

Armadillo—Giant Armadillo/Glyptodont

Grizzly Bear—Short-faced Bear

Beaver—Giant Beaver

## Dinosaur Orders



👁️ **Look at the saurischian and ornithischian dinosaur pelvis forms. The blue bone is the pubis.**

Dinosaurs are divided into two orders based on the shape of their pelvis.

Find the following dinosaurs; are they ornithischian or saurischian?

*Albertosaurus*—Saurischian

*Ornithomimus*—Saurischian

*Lambeosaurus*—Ornithischian

*Plateosaurus*—Saurischian

*Camptosaurus*—Ornithischian

*Barosaurus*—Saurischian

## Diversity of Plant Life



Ginkgo



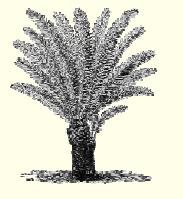
👁️ **Find the ginkgo.**

Plant life rapidly evolved and flourished during the Mesozoic era.

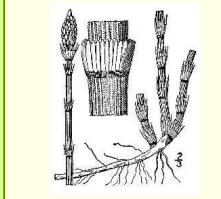
🔊 **Angiosperms (flowering plants) did not evolve until the Cretaceous period.**

Find and sketch the following Jurassic fossil plants:

Cycad



Horsetail



## Birds are Descendents of Dinosaurs



Look at the pelvis on *Bambiraptor* and compare it to the pelvis of the Great Blue Heron.

Circle the order of dinosaur from which birds evolved.

Ornithischian

Saurischian

Large dinosaurs like *T. rex* went extinct 65 mya, while birds survived. What characteristics helped birds survive? **Birds were smaller, covered in warm feathers, warm blooded.**

Compare and contrast other skeletal features of the Great Blue Heron and the *Bambiraptor*. **Many possible answers.**

Similarities

Hollow bones

Long arm and hand

Feathers

Differences

*Bambiraptor* has long tail

*Bambiraptor* has teeth

Heron has keeled sternum

🔊 At the far left is *Hesperornis*, an extinct flightless bird. All that remains of its "wing" is a vestigial bone. It was a specialized diving bird something like penguins today.

What reproductive structures do you see on plants like ferns, cycads, and conifers? **Ferns have spores; cycads and conifers both reproduce using cones which contain seeds.**

What advantages do angiosperms have over non-flowering plants? **Angiosperms produce fruits/nectar to attract pollinators that spread pollen and seeds, while other plants rely on wind, water, or gravity to disperse their pollen and seeds.**

# Birds and Hands-On Biodiversity Level 2

👁️ Gallery Search

📢 Important Facts

## Adaptations to Flight



Birds have evolved many features for a life of flight.

Search to find four features that help support flight (open drawers).  
Vertebra fused into a rigid column,  
Keeled sternum for muscles  
Light skull without teeth  
Hollow bones to reduce weight

Find the Common Loon.

Of today's animals, feathers are unique to birds and serve many functions. Look around the gallery (open drawers) and list three different functions of feathers.

Insulation, streamline the body, lift and propulsion, camouflage or mate attraction.

🔊 Unlike other flying birds the Common Loon has solid bones! So does the Ostrich. This is an example of convergent evolution.

Why did the adaptation of solid bones evolve in these species?

The Ostrich evolved from other flightless birds. Hollow bones were lost because they were not needed. Although the Common Loon can fly it has solid bones to make diving easier (make it less buoyant).

## Sexual Dimorphism in Birds

Sexual dimorphism is the differences in form between males and females of the same species.

Find the following birds in the gallery, and using the descriptions provided, circle whether our specimens are male ♂ or female ♀.

### Wild Turkey

♂ feathers are red, purple, green, bronze  
♀ feathers are brown

### Magnificent Frigate Bird

♂ scarlet red throat patch  
♀ white breast

### Canvasback Duck

♂ red head, black breast, whitish body  
♀ head and body are brown

Why might the males and females of a species have different feather colouration? Males use brightly coloured feathers to attract females. His colour is an indicator of his health and strength.

## Invasive Species

Invasive species are non-indigenous plants and animals that have harmful effects on the habitats where they have been introduced. Many invasive species in the Great Lakes arrived in ballast water discharged by ships from around the world.

Locate the following invasive species. Sketch or describe them, and explain how they might harm the local habitat into which they were unwittingly introduced.



👁️ Find the Great Lakes Marsh and the live fish tank. Inside the tank is the Round Goby. Nearby you will find other invasive species.



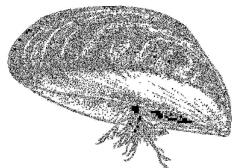
Sea Lamprey

Attacke key predator species, disrupting the food web. In our lakes it has no predators and its prey lack defenses against it.



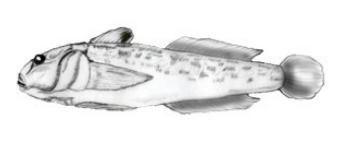
Purple Loosestrife

Grows in a thick monoculture and excludes native plants. Plants clog irrigation and drainage ditches.



Zebra Mussel

Compete with native species for food, change normal energy cycle within water column, accumulate contaminants in tissues, cover all hard surfaces.



Round Goby

Aggressive fish that outcompetes native fish and eats the eggs of larger sport fish. Eats zebra mussels and can further accumulate contaminants in their tissues.

