

EXTEND SPECIMEN LIST

Note the casts of *Borophagus*, *Captorhinus*, *Machairodus*, and *Teleoceras* from the *EXPLORE* exercise must also be used in this *EXTEND* exercise so both exercises cannot be performed concurrently.

Corals (Paleozoic Era to Holocene Epoch [present day]; cast of *Cania*, Devonian Period):

Corals are a diverse group of marine invertebrates (animals with no backbone) that live in colonies of genetically identical individuals connected to each other. Today some corals can be found in small colonies while other corals make large reefs in tropical habitats, such as the Great Barrier Reef in Australia. Corals are related to jellyfish. Corals first appear in rocks from the earliest Cambrian Period and survive to today. Corals capture their food, from microscopic plankton to small fish, with their tentacles. Some that live in shallow water where light reaches add to their food by using sugars made by algae that live inside their bodies. One group of extinct corals had the shapes of horns, such as *Cania*.

Trilobites (Paleozoic Era; cast of *Kettneraspis*, Ordovician Period):

Trilobites are a highly diverse group of extinct arthropod (animals with jointed legs) invertebrates that first appeared in the early Cambrian Period and went extinct in the mass extinction event at the end of the Permian Period. Trilobites lived in the ocean, swimming, or crawling on or burrowing in the ocean floor, with their numerous legs looking for food. Their food primarily consisted of soft-bodied animals or filtering mud if on the seafloor, or filtering algae if they swam. Many trilobites had complex, compound eyes composed of many lenses (up to 15,000) and some, like *Kettneraspis*, had many spines. Trilobite fossils are known that show internal anatomy such as their stomachs and intestines. Trilobites could also enroll (like armadillos) to protect themselves.

Ammonites (Devonian to Cretaceous periods; cast of *Diaboloceras*, Carboniferous Period):

Ammonites are an extinct group of marine mollusc invertebrates, called cephalopods, related to squids and octopi, and, somewhat more distantly, to living *Nautilus*. Ammonites were extremely diverse, each bearing coiled (like *Diabolocrinus*) to gently arched shells and having a body at least two tentacles. It is believed that many ammonites lived near the surface of the ocean and ate floating plankton rather than living on the bottom (like modern octopi) or in deep water (like modern squid).

***Captorhinus* (Permian Period):**

Captorhinus fossils are known from many thousands of specimens from southwest Oklahoma, as well as other states. It is a small lizard-like vertebrate (animal with a backbone) more closely related to reptiles than to amphibians. Despite what is shown in this (free-use) image, *Captorhinus* was a carnivore that probably ate small vertebrates and insects.

***Cardiocephalus* (Permian Period):**

Cardiocephalus was a small amphibian that likely burrowed in mud or soft soils to avoid drying out during dry seasons based in part on its long body and short limbs. It might have eaten other amphibian larvae (tadpoles), small fish or insects.



Ichthyosaurs (Triassic to Cretaceous periods):

Ichthyosaurs are marine reptile vertebrate whose fossils are found in rocks from the Early Triassic to the Late Cretaceous. Ichthyosaurs were related to land-dwelling reptiles that returned to the sea (like whales). Ichthyosaurs were predators primarily on cephalopods (e.g., ammonites) with large eyes, numerous conical teeth, paddle-shaped arms, a dorsal fin on their backs and a bilobed tail (both based on soft tissue impressions). Ichthyosaurs resembled dolphins in shape and habit but are only very, very distantly related (they are both vertebrates).

Tenontosaurus (Cretaceous Period):

Tenontosaurus is an ornithischian (bird-hipped) dinosaur related to *Iguanodon*. A plant-eater, *Tenontosaurus* fossils are known from the Early Cretaceous in states stretching north from Texas to Montana, and from Maryland west to Idaho. It was likely a facultative biped, meaning that it could walk on two legs but spent most of its time on four legs.

Deinonychus (Cretaceous Period):

Deinonychus is a dromaeosaur theropod dinosaur related to *Velociraptor* and to modern birds. *Deinonychus* was a small, two-legged meat-eater from the Early Cretaceous whose fossils are frequently found associated with *Tenontosaurus*. Similarities between the skeletons of *Deinonychus* and modern birds led paleontologist John Ostrom to first hypothesize a close relationship between theropod dinosaurs and birds. The illustration of *Deinonychus* bearing feathers is based on its close relationships with numerous fossils from China in which feathers are well preserved.

Machairodus (Neogene Period, mid-Miocene to Pleistocene epochs)

Machairodus is a group of knife-tooth cats; there are several species in it. *Machairodus*' canines were not nearly as long as other saber-toothed cats. Like other cats, *Machairodus* was almost exclusively a meat-eater. Because of its relatively short legs, it is inferred to have been an ambush predator.

Borophagus (Neogene Period, mid-Miocene to early Pleistocene epochs):

Borophagus is a genus of bone-crushing dogs; there are several species in it. *Borophagus* is notable for large crushing premolar teeth similar to the spotted hyena (a member of cat-lineage) that also crushes bones. *Borophagus* is assumed to have been a social animal, possibly hunting in packs, that pursued middle-sized animals (<250lbs) as opposed to very large camels and rhinoceroses.

Teleoceras (Neogene Period, Early Miocene to Pliocene Epochs):

Teleoceras was a short-legged rhinoceros that likely ate a mixed diet of grasses, branches, leaves (making it a grazer and a browser). Although *Teleoceras* looked a little like a hippo, evidence suggests that it did not inhabit ponds and lakes.

