

DINOSAUR

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Dinosaurs

The word dinosaur was given by SIR RICHARD OWEN and it means '**terrible lizards**'. From the middle of Triassic to the end of cretaceous the dinosaurs dominated the earth. At the end of the cretaceous period the dinosaurs became extinct.

The dinosaurs include two orders, namely **Saurischia** (Reptile-like dinosaurs) and **Ornithischia** (Bird-like dinosaurs)

Mesozoic Reptiles

Thecodonts

Dinosaurs
(Terrible lizards)

pterosaurs
(Flying reptiles)

Marine
reptiles

Therapsids
(Mammal-like reptiles)

Representative Types

The Mesozoic reptiles include the following types:

Dinosaurs:

1. Ornithomimus
2. **Tyrannosaurus**
3. Ornitholestes
4. Coelophysus
5. Allosaurus
6. **Brontosaurus**
7. Diplodocus
8. Camptosaurus
9. Trachodonts
10. **Iguanodon**
11. **Stegosaurus**
12. Ankylosaurus
13. Monoclonius
14. **Triceratops**

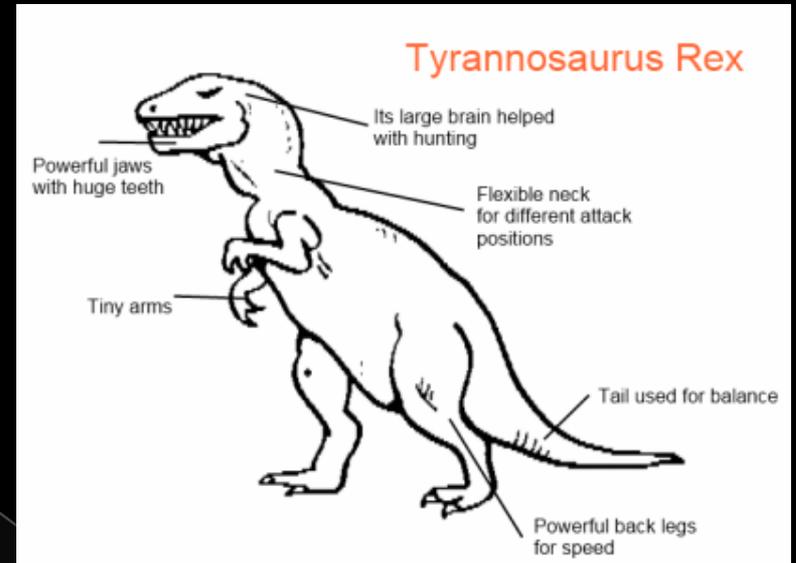
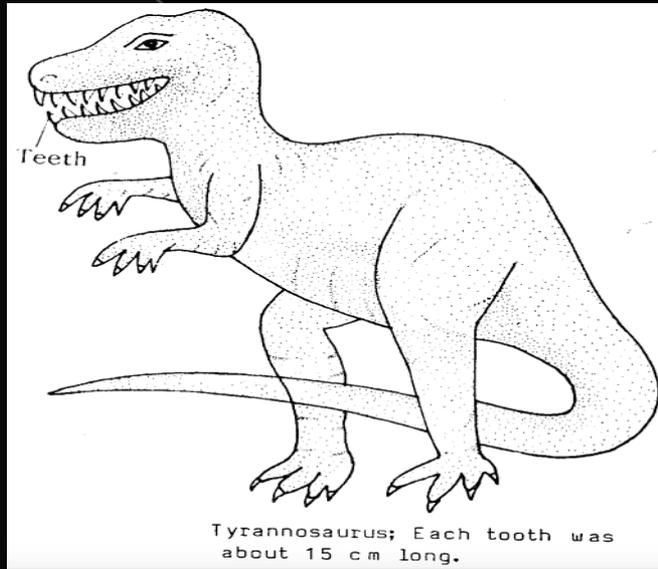
Pterosaurs: 15. Rhamphorhynchus 16. **Pteranodon**

Marine reptiles: 17. **Ichthyosaurus** (fish reptiles) 18. Pliosaurus (Swan dragons)

Mammal-like reptiles : 19. Varanosaurus 20. Edaphosaurus 21. **Dimetrodon**
22. Cynognathus 23. Tritylodon 24. Diarthrognathus

Dinosaurs

Tyrannosaurus (Tyrant dinosaur)



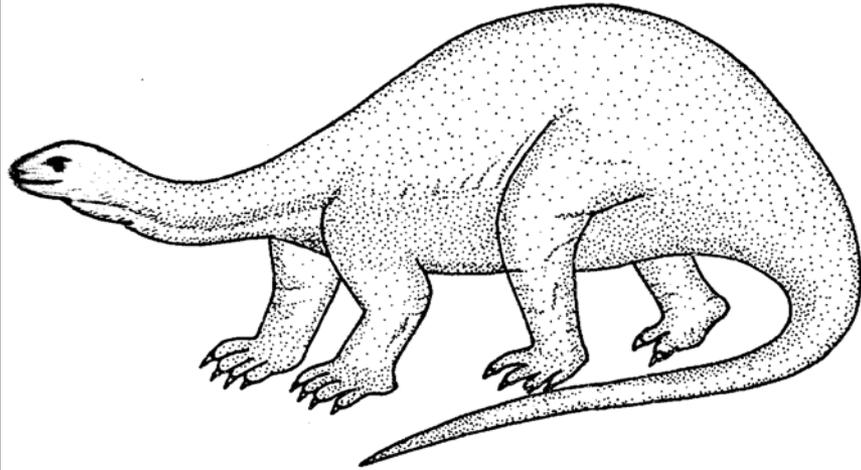
Dinosaurs

1. **Tyrannosaurus** (Tyrant dinosaur)

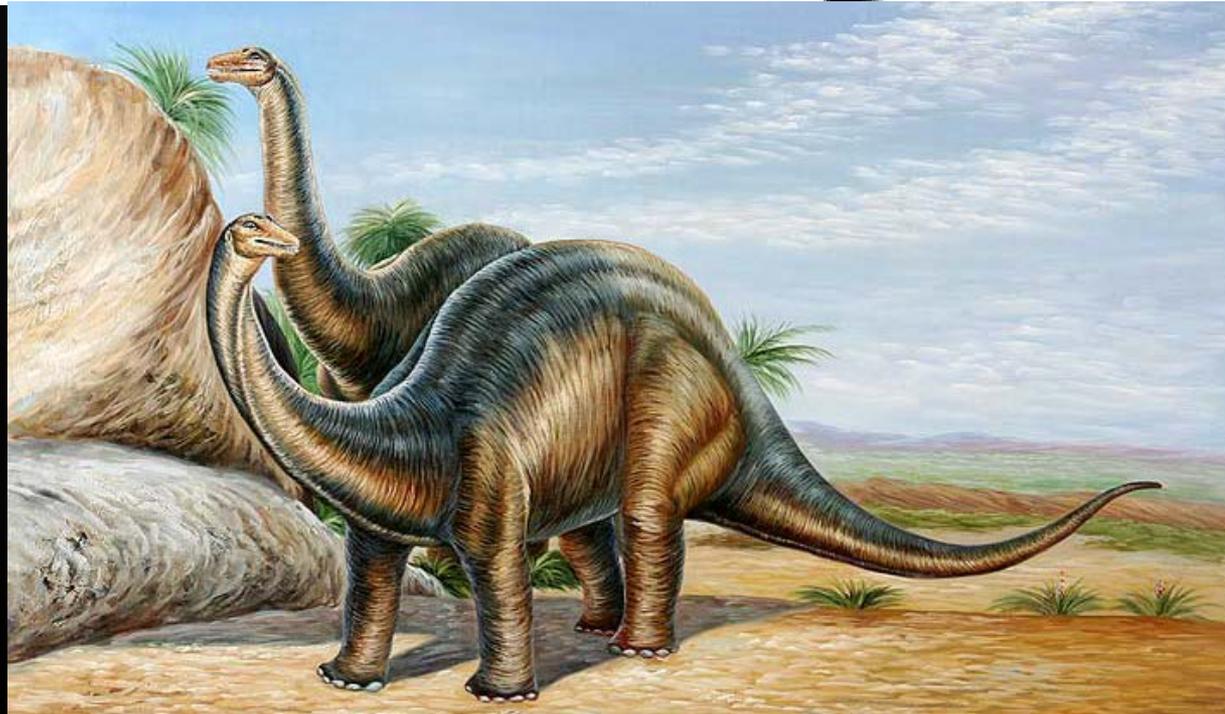
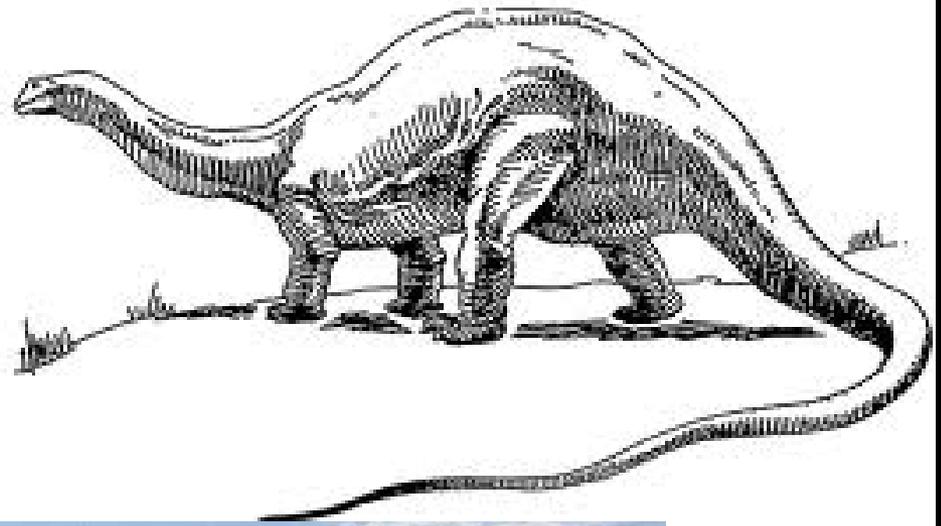
Tyrannosaurus was a Saurischian dinosaur about 6.09 metre tall and 15.24 meter long. It was the **largest bipedal terrestrial dinosaur** of the cretaceous period. The hind limbs were very strong but fore limbs and **hands greatly reduced**. The jaws were long with **large dagger-like teeth**. It was a carnivore well adapted for hunting and killing other large reptiles including other dinosaur.

Dinosaurs

Brontosaurus



Brontosaurus



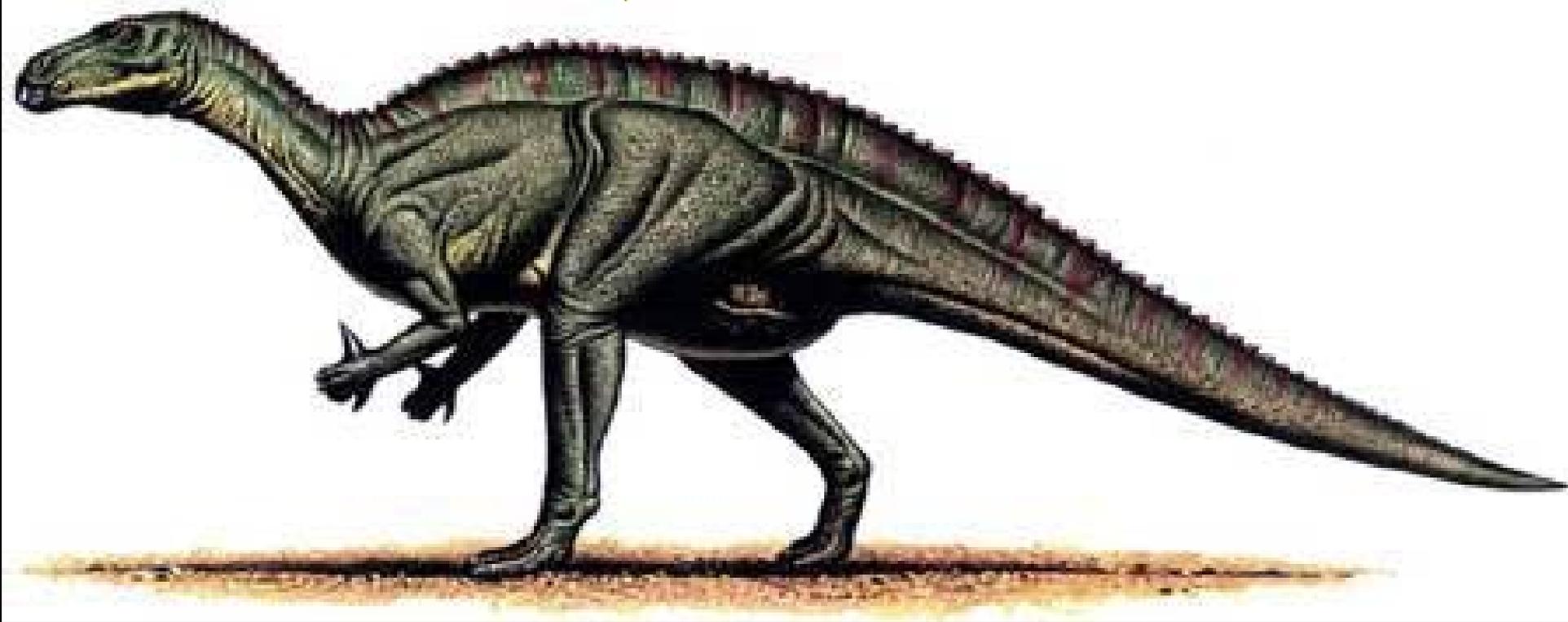
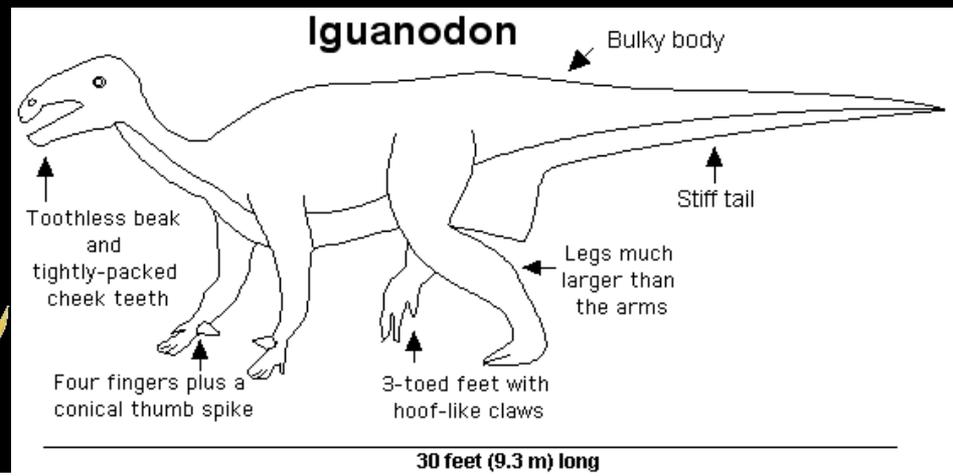
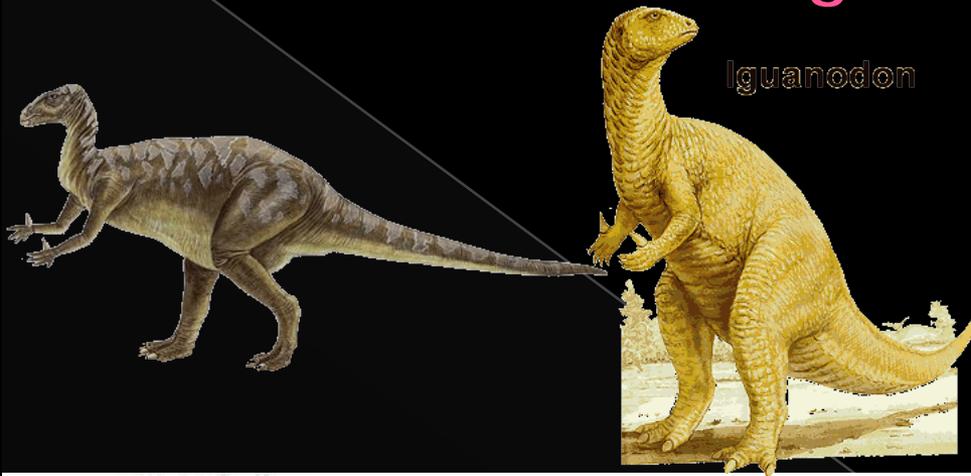
Dinosaurs

2. Brontosaurus

Brontosaurus was a giant sauropod Saurischian of the Jurassic times. It was about 22.86 m long and weighed about 30-60 tons. It was a quadrupedal dinosaur with strong fore and hind limb. But the fore limbs were slightly shorter. The feet were very broad with large **foot pads**. Both the neck and the **tail were very long** and the vertebrae had strong spines that allowed large surfaces for muscle attachment. There was a **single large claw** on the inner toe of each **front foot** and claws of the inner three digits of the hind foot. The skull was comparatively small. The nostrils were raised to the top of the skull, as an adaptation for breathing with only the top of the head protruding above the water. Brontosaurus was a herbivorous animal with leaf shaped teeth feeding on soft vegetation. It was living near swamps which offered food and shelter to these giant dinosaurs.

Dinosaurs

Iguanodon



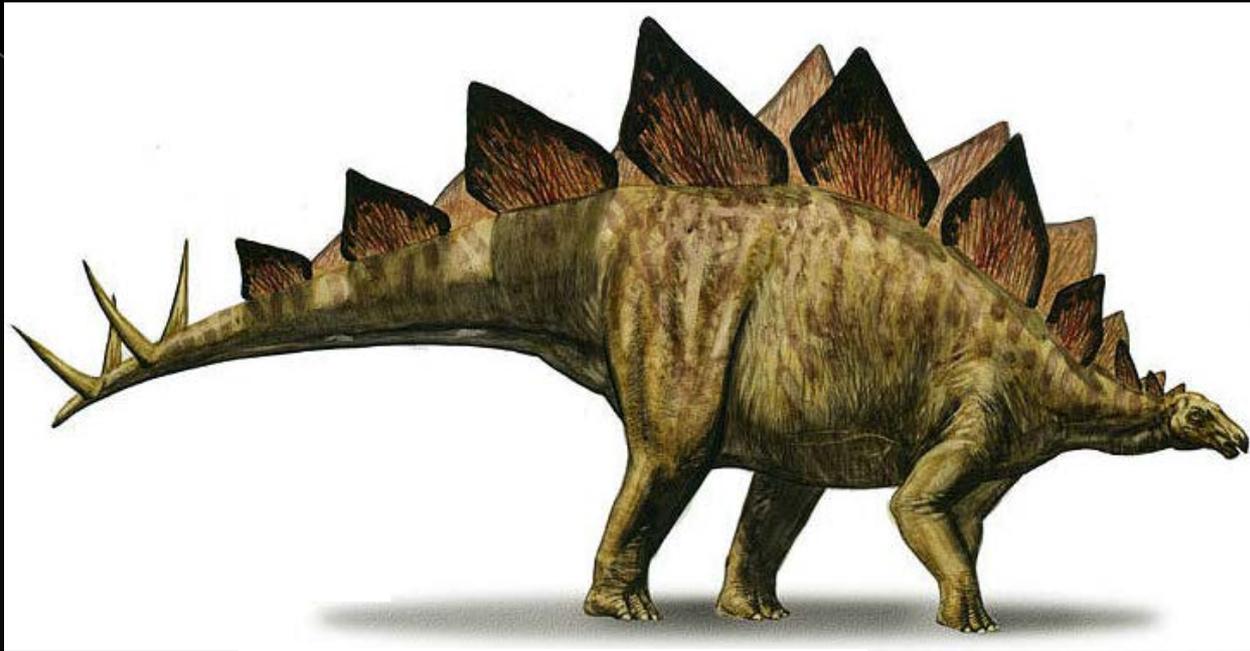
Dinosaurs

3. Iguanodon

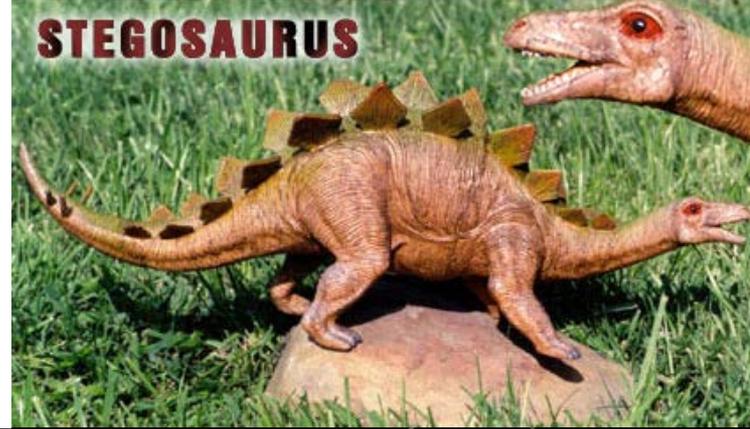
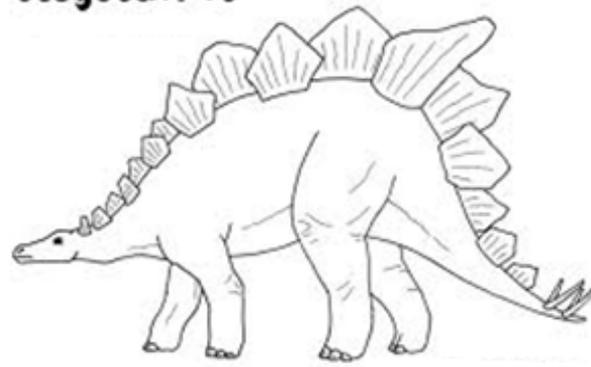
Iguanodon was an ornithischian dinosaur about 9 meter long, found in lower cretaceous sediments of Europe. In this dinosaur, the thumb was enlarged into a **sharp spike** that might have been used as weapon of defense.

Dinosaurs

Stegosaurus



Stegosaurus



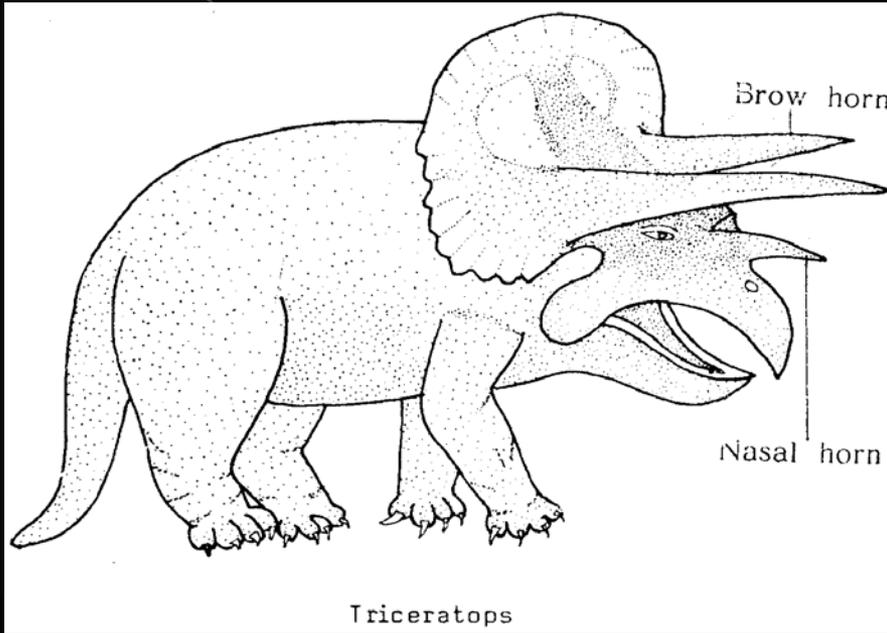
Dinosaurs

4. Stegosaurus

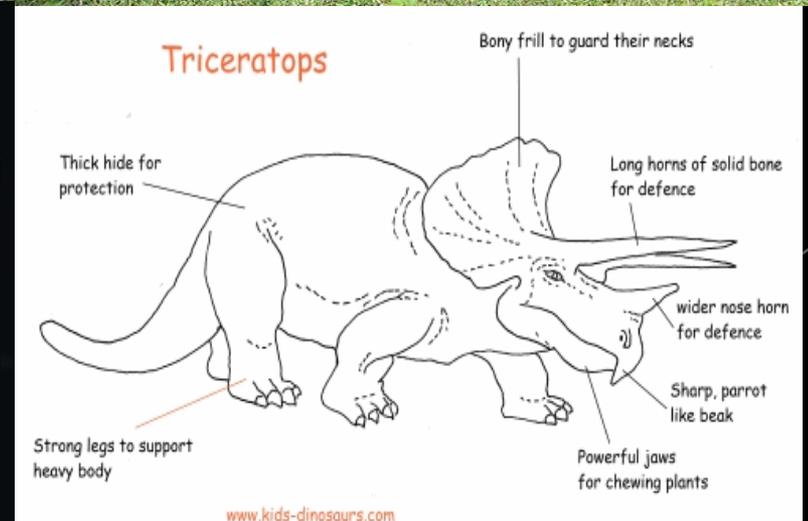
Stegosaurus was an ornithischian dinosaur commonly called **plated dinosaur**. It was about 6 meter in length with strong legs and short broad feet. The most striking feature of this dinosaur was the presence of a double row of alternately arranged bony **triangular plates** down the middle of back. The edges of these plates were thin and were probably covered by a horny layer. The real function of these dorsal plates is not known. On the tail of stegosaurus there were four **long bony spikes** which were used as weapon of defense.

Dinosaurs

Triceratops



Triceratops

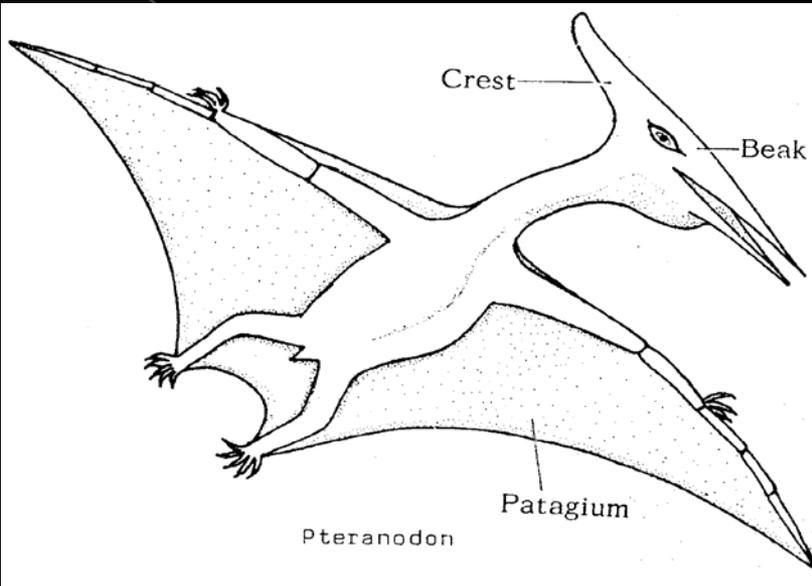


Dinosaurs

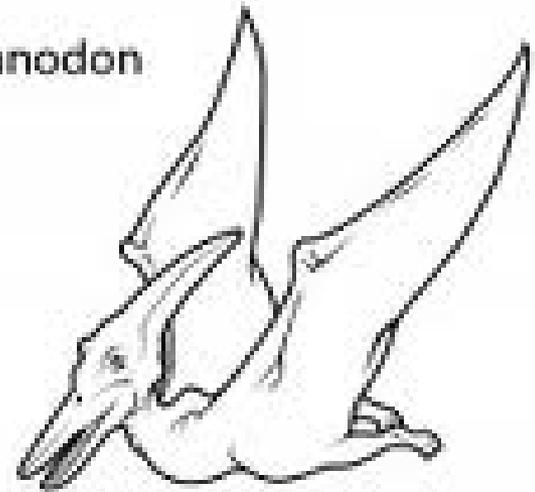
5. **Triceratops** Triceratops was an ornithischian, ceratopsian, dinosaur. It was commonly called the **horn dinosaur**. In triceratops there were **three horns**, namely one nasal horn on the front of the skull and two large brow horns one above each eye. It was a large upland dwelling herbivore that used the horns as weapons of defense. Another character seen in triceratops was the large perforated **frill** at the back of the skull. The frill was formed of the backward growth of the parietal and squamosal bones. Primarily the frill afforded attachment for strong neck muscles to control the movement of the head. Secondarily, it may have had some protective function, since it projected back over the vital neck and shoulder region. During the end of the cretaceous period, the triceratops were numerous in North America.

Pterosaurs

Pteranodon



Pteranodon



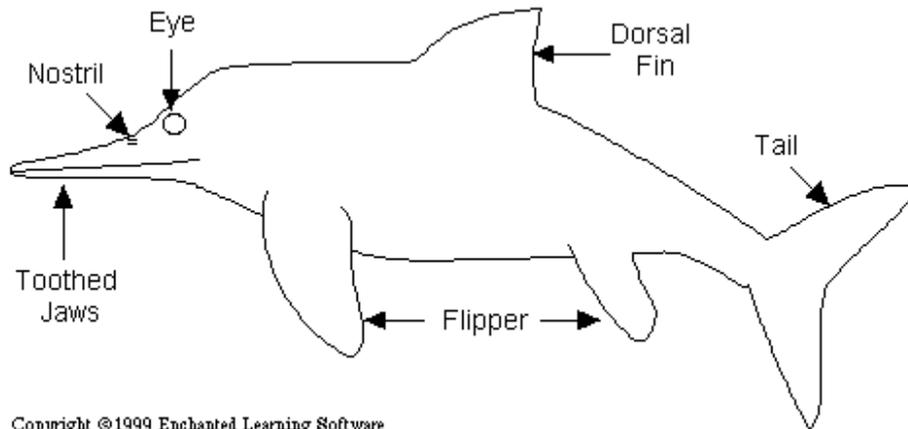
Pterosaurs

6. Pteranodon

This was a Pterosaur (**flying reptile**) of the Mesozoic era. It had a **membrane wing** with a wing spread of about **twenty feet**. The fourth finger or **little finger** was elongated and supported the wings. The body was small and the jaws formed a long **toothless beak**. In pteranodon the upper the shoulder blade (scapula) was attached to the back bone by a special bony element called the **notarium** thus giving added strength to the shoulder girdle. The pteranodon was the last of the pterosaurs.

Marine reptiles

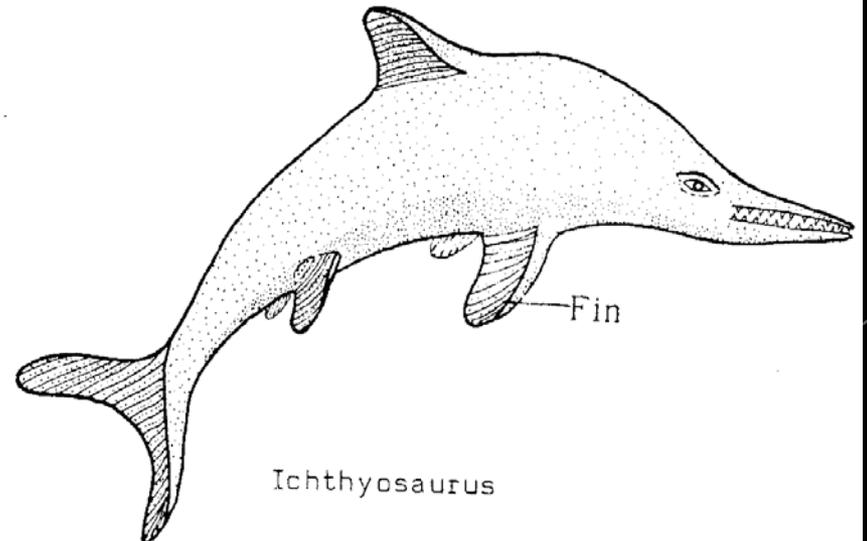
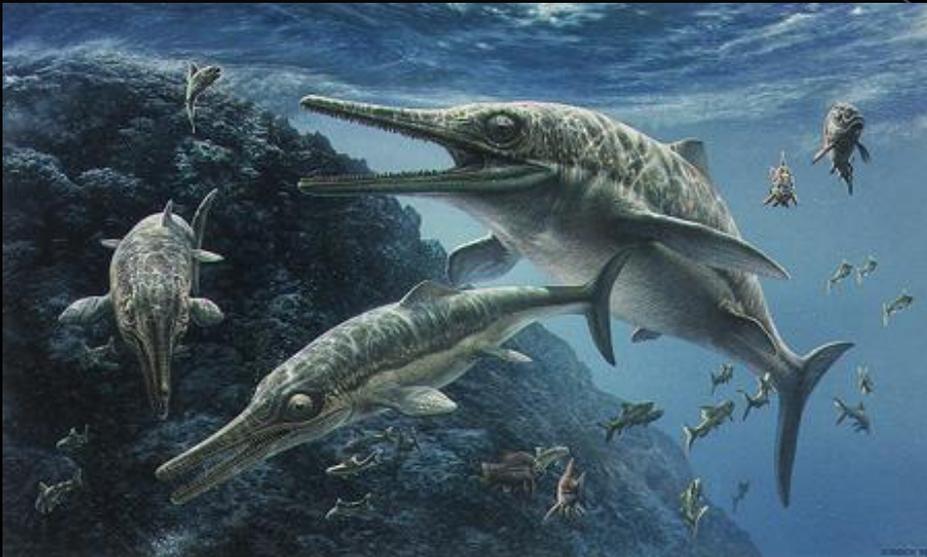
Ichthyosaurus



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Ichthyosaurus - Jur.-Cret. - 2 meters



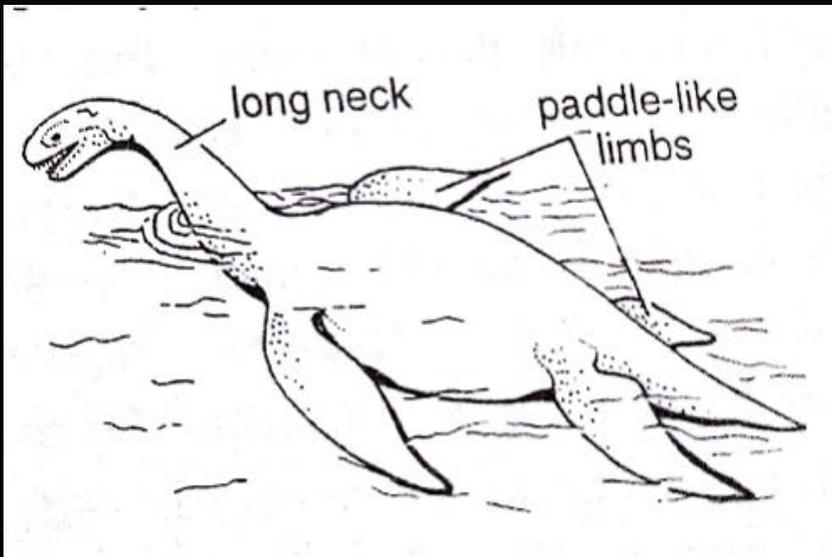
Ichthyosaurus

Marine reptiles

7. Ichthyosaurus

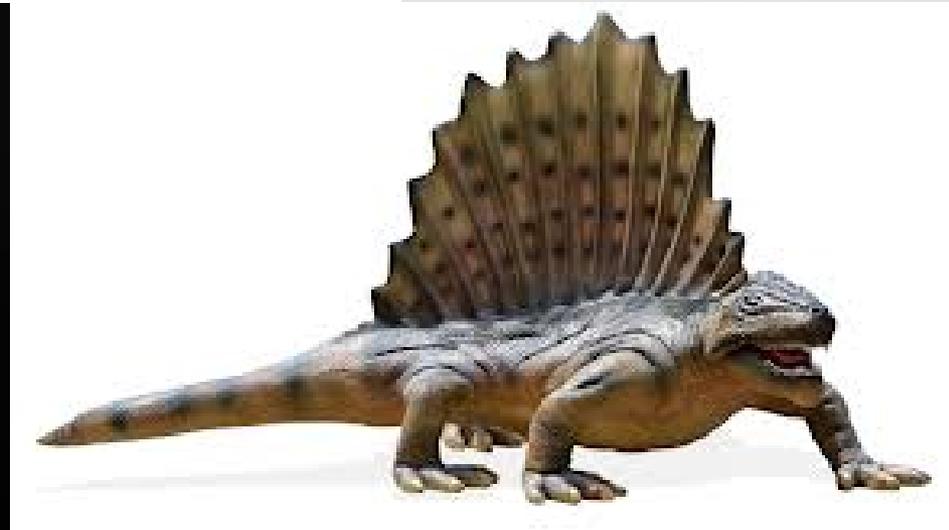
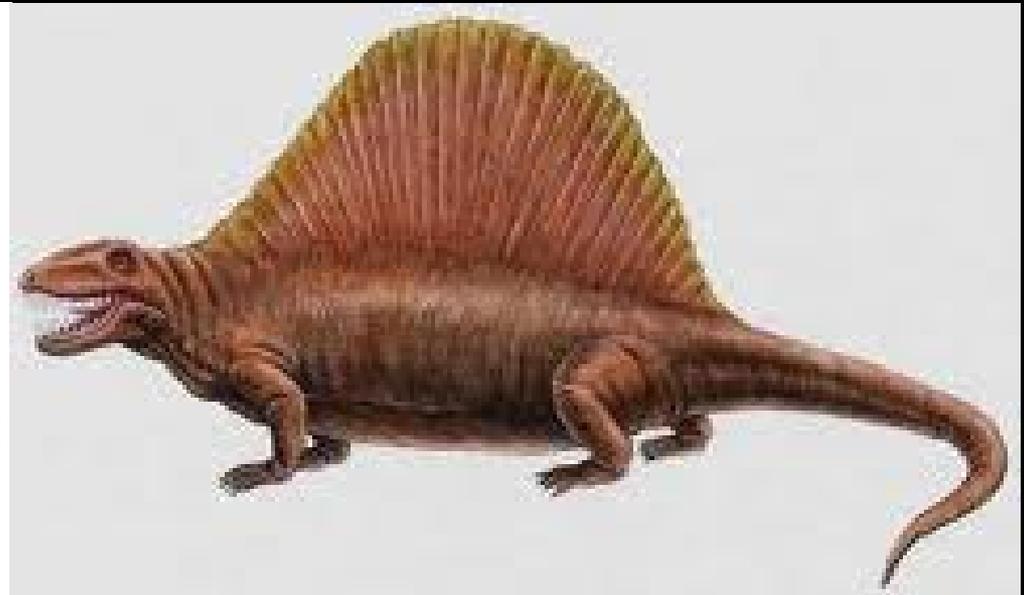
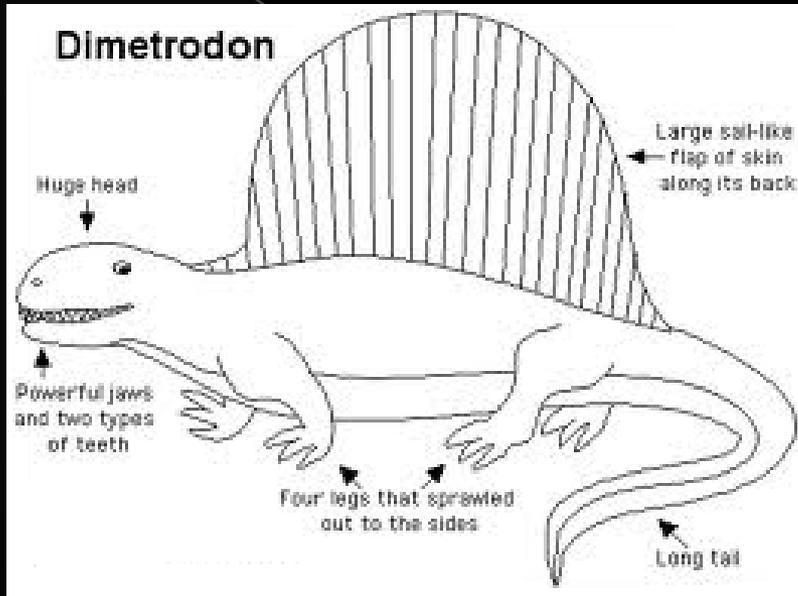
Ichthyosaurus was a marine reptile of the Triassic times. It was called the **fish reptile** since it was fish-like. It was about 10 feet in length, with a streamlined body. The four legs were modified into **paddles** for swimming. There was a fleshy dorsal fin. The bones of the fingers were increased in number (hyper dactyly) and there was an increase in the rows of phalanges (hyper phalangy). The skull was elongated. The jaws were provided with **numerous teeth**. They were Ovoviviparous i.e. they retained the eggs within the body until it was hatched.

Plesiosaurs: The Plesiosauria Greek: plesios, meaning "near to" and sauros, meaning "lizard" or plesiosaurs are an extinct Mesozoic marine reptiles (marine Sauropsida), belonging to the Sauropterygia. Plesiosaurus was an aquatic reptile of the Jurassic period. It used four fins and a short broad tail for mobility, and had a serpentine neck almost as long as the rest of its body, with a small head at the end. They were usually about 11 feet in length, full grown.



Mammal-like reptiles

Dimetrodon



Mammal-like reptiles

8. Dimetrodon

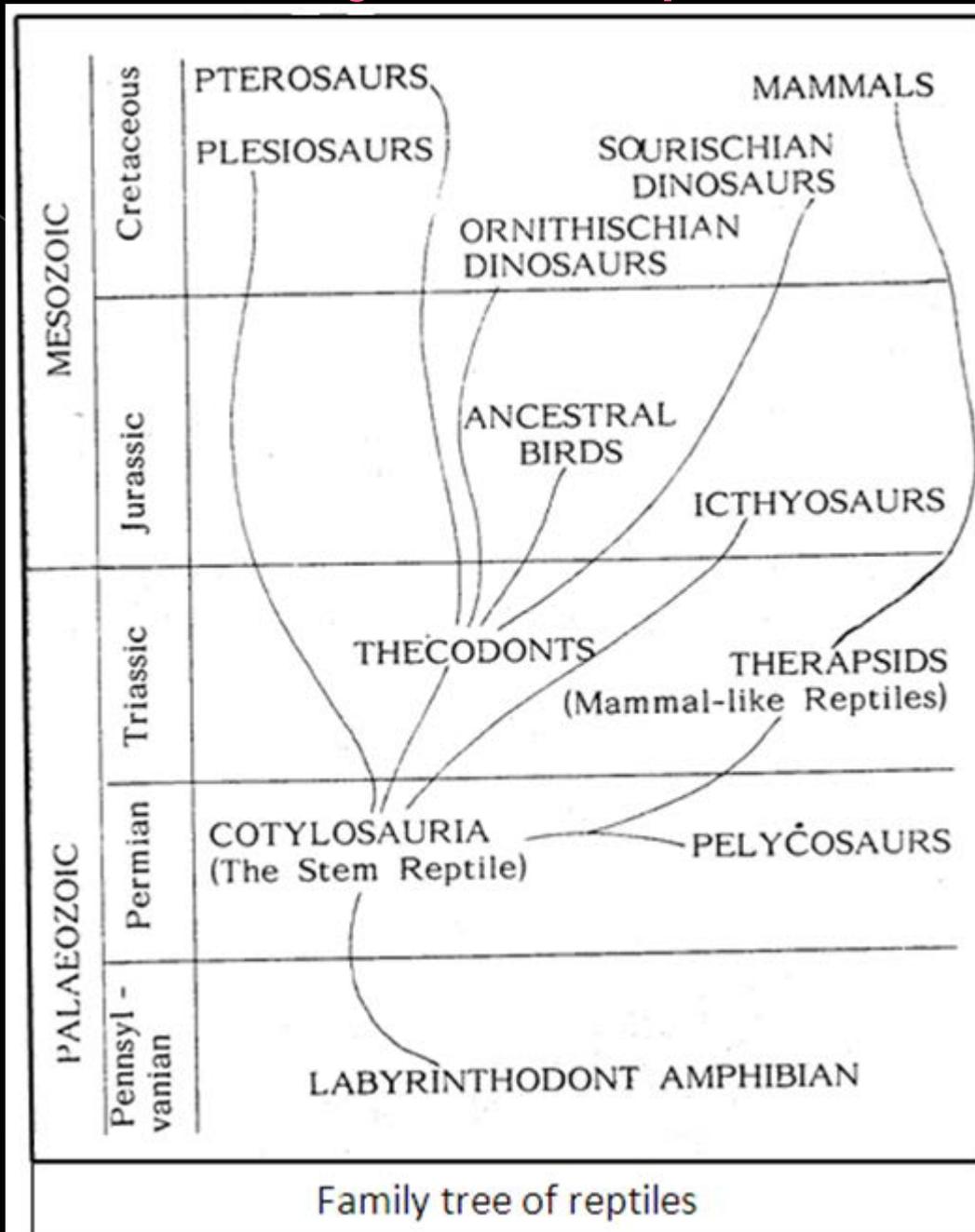
Dimetrodon was a synapsid mammal-like reptile of the Mesozoic era. In Dimetrodon the spines of the vertebrae were very much elongated. In the middle region of the body, the **spines** were very long. These spines were supported by a **web of skin** so that they appeared as longitudinal **sail** on the middle of the back. The real significance of the 'sail' in Dimetrodon is not known. Many functions have been attributed to the sail. They include:

1. The sail was protective in nature.
2. The sail was a sort of psychological warfare device that made Dimetrodon look big there by frightening the enemies.
3. The sail was an expression of sexual dimorphism in which animals with a big sail was a male and without the sail was a female.
4. The sail was a temperature regulating device and provided a great area of skin surface for warming up or cooling off of the animal.

Evolutionary tree of Dinosaurs

The dinosaurs evolved during the **Triassic period** of the **mesozoic era** from the Thecodont stem. There are two main **groups** of dinosaurs, namely the **Saurischian** (reptile-like dinosaurs) and **Ornithischian** (bird-like dinosaurs) which evolved from the thecodonts. The Saurischians include the giant herbivorous **sauropods** and the giant carnivorous **Theropods**. The Ornithischian dinosaurs include varied forms like **plated dinosaurs**, **armoured dinosaurs**, **horned dinosaurs** and the **duck-bill dinosaurs**.

Family tree of reptiles



Family tree of reptiles

Questions ????

Thank You
Dr. N. G. Kotadiya