DINOSAURS	DESCRIPTIONS

SAUROPODS (HERBIVORES)

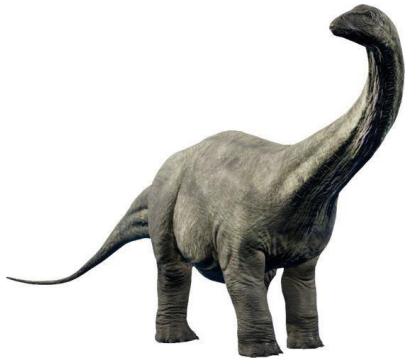
1. Sauropods had very long necks, long tails, small heads (relative to the rest of their body), and four thick pillar-like legs.
2. They are notable for the enormous sizes attained by some species, and the group includes the largest animals to have ever lived on land.
3. Sauropods were herbivorous, usually quite long-necked, quadrupeds, often with spatulate teeth (broad at the tip, narrow at the neck).
4. Hind legs were thick, straight, and powerful, ending in club-like feet with five toes, though only the inner three (or in some cases four) bore claws.
5. Forelimbs were rather slenderer and typically ended in pillar-like hands built for supporting weight; often only the thumb bore a claw.
6. Some sauropods had armor. There were genera with small clubs on their tails and some had small bony osteoderms covering portions of their bodies.

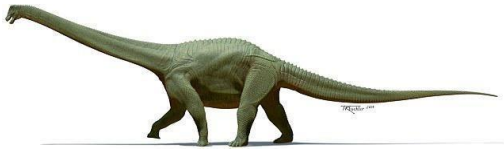
H1: Alamosaurus

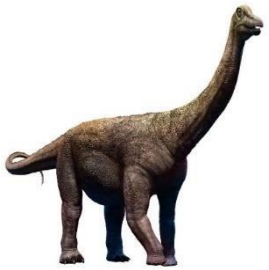
1. Alamosaurus

- Meaning of the name: Ojo Alamo lizard
- Periods: Late Cretaceous (70-66 MYA)
- Location found: USA

- A gigantic quadrupedal herbivore with along neck and tail and relatively long limbs. It is among the last survivor of non-avian dinosaurs.
- Its body was at least partly covered in bony armour.
- Its size is comparable to Argentinosaurus and Puertasaurus, which would make it the largest dinosaur known from North America.

H2: Brachiosaurus 	***2. Brachiosaurus*** - Meaning of the name: Arm lizard - Periods: Late Jurassic (154-153 MYA) - Location found: North America - Brachiosaurus had longer forelimbs compared to the hind limbs. It had an upward sloping backbone to support the long and nearly vertical neck, hence exposing its chest. - Its head stood over 9m above the ground to feed on young leaves of tall trees like modern day giraffes. - As a warm-blooded animal, the daily energy demands of Brachiosaurus would probably have to eat more than 182 kg of leaves per day.
H3: Apatosaurus 	***3. Apatosaurus*** - Meaning of the name: Deceptive lizard - Periods: Late Jurassic (152-151 MYA) - Location found: USA - The cervical vertebrae are less elongated and more heavily constructed than those of Diplodocus. - The leg bones are much stockier despite being longer, implying it was a more robust animal than other diplodocid dinosaurs. - It had a single claw on each forelimb and three on each hindlimb

H4: Dimantinasaurus 	***4. Diamantinasaurus*** - Meaning of the name: Diamantina lizard - Periods: Late Cretaceous (94 MYA) - Location found: Australia - The only Titanosauria to share a ventral keel set within a sharply defined depression under the dorsal vertebrae. - This genus is relatively small compared to other Titanosauria. - Diamantinasaurus is probably the largest known sauropod dinosaur from Australian continent.
H5: Savannasaurus 	***5. Savannasaurus*** - Meaning of the name: Savanna Lizard - Periods: Late Cretaceous (93.9-92.9 MYA) - Location found: Australia - A medium-sized Titanosauria. No ventral keel on dorsal vertebrae. - An unusually wide-bodied Titanosauria with the narrowest section of fused ischium-pubis bone measuring more than 1m wide. - The genus name of Savannasaurus, from a Taino word "zabana", refers to savanna environment in which it was found.

H6: Omeisaurus 	***6. Omeisaurus*** - Meaning of the name: Omei Lizard - Periods: Middle Jurassic (174-145 MYA) - Location found: China - Omeisaurus tianfuensis had the longest neck of the genus with 9.1m long neck. - It was named after the sacred mountain Omeishan, which is where the first fossil example of Omeisaurus was found. - Not only did their necks have several more vertebrae than the sauropods of North America and Africa, the vertebrae themselves were larger and longer.
H7: Titanosaurus 	***7. Titanosaurus*** - Meaning of the name: Titanic lizard, named after the mythological Titans. - Periods: Late Cretaceous (70 MYA) - Location found: India, Argentina - Often depicted as a burly sauropod but with a thicker, broader neck and shorter tail. - Had dragon-like lumpy spikes on its back. - Its teeth look like a garden rake.
H8: Amargasaurus cazaui	***8. Amargasaurus*** - Meaning of the name: La Amarga lizard - Periods: Early Cretaceous (129.4 -122.46 MYA) - Location found: Argentina

	- A relatively small sauropod. The most striking features were the extremely long upward projecting neural spines on the neck and anterior dorsal vertebrae, up to 0.6m long. - Some paleontologists have postulated that this dinosaur may have actually had a sail that grew out of its back for regulation of body temperature or may be even used for mating rituals. - Paleontologists believed that these dinosaurs may have traveled in herds and have their eggs in clutches and may have even taken care of them like modern birds do

CERATOPSIAN (HERBIVORES)

1. Characterized by a bony frill on the back of the skull and a unique upper beak bone, called rostral
2. Plant eating dinosaurs
3. 3 lineages
   - Psittacosauridae
     -Mostly bipedal, they had a beak, a small frill and no horns. (E.g: Psittacosaurus)
   - Protoceratopsidae
     -Mostly quadrupedal and slightly larger. This dinosaur had a somewhat larger frill but no horns. (E.g: Protoceratops)
   - Ceratopsidae
     -Had a very large frills and horns on the nose and above the eyes.
     -Made up of two lineages: Chasmosaurinae (large eye horns and small nose horns) [Triceratops] & Centrosaurinae (small eye horns and large nose horns)

H9: Pachyrhinosaurus

9. Pachyrhinosaurus

- Meaning of the name: Thick-nosed lizard
- Periods: Late Cretaceous (73.5 - 72.5 MYA)
- Location found: North America

- Instead of horns, their skulls bore massive, flattened bosses; a large boss over the nose and a smaller one over the eyes.
- The largest weighed about four tons. They were herbivorous and possessed strong cheek teeth to help them chew tough, fibrous plants.
- With relatively small and primitive hearing apparatus, it is likely that Pachyrhinosaurus would not have had very good hearing.

H10: Achelosaurus 	***10. Achelousaurus*** - Meaning of the name: Achelous lizard, named after God Achelous in Greek mythology. - Periods: Late Cretaceous (74.2 MYA) - Location found: USA - It had a large skull with hooked beak, bony neck-frill at the rear of the skull, which supported a pair of long spikes that are curved towards the outside. - Achelousaurus approached the robustness of one of the largest and most heavily built horned dinosaurs known – Triceratops. - The frill spikes of Achelousaurus are more outwards oriented than the spikes of Einiosaurus, which are medially curved; the spikes of Achelousaurus are nevertheless less directed to the outside than the comparable spikes of Pachyrhinosaurus.
H11: Styracosaurus 	***11. Styracosaurus*** - Meaning of the name: Spiked lizard - Periods: Late Cretaceous (75.5 – 75 MYA) - Location found: North America - Had four to six long parietal spikes extending from its neck frill. - A smaller jugal horn on its cheeks and a single horn protuding from its nose. - Some individuals had small hook-like projections and knobs at the posterior margin of the frill, similar to but smaller than those in Centrosaurus. Others had less prominent tabs. Some, like the type individual, had a third pair of long frill spikes.

H12: Triceratops 	***12. Triceratops*** - Meaning of the name: Three-horned face - Periods: Late Cretaceous (68-66 MYA) - Location found: North America - Bearing a large bony frill and three horns on the skull. The front of the head was equipped with a large beak in front of the teeth. - One of the species that went extinct during the Cretaceous-Palaeogene Mass Extinction. - There has been much speculation over the functions of Triceratops' head adornments. The two main theories have revolved around use in combat and in courtship display, with the latter now thought to be the most likely primary function
H13: Protoceratops 	***13. Protoceratops*** - Meaning of the name: First horned face - Periods: Late Cretaceous (75-72 MYA) - Location found: Mongolia - Member of protoceratopsid dinosaur, much smaller in size and lacked well-developed horns and retained some basal traits not seen in later genera. - A quadrupedal dinosaur that was partially characterized by its distinctive neck frill at the back of its skull. - Protoceratops appears to have had muscular jaws capable of a powerful bite. These jaws were packed with dozens of teeth, well suited for chewing tough vegetation.

H14: Psittacosaurus 	***14. Psittacosaurus*** - Meaning of the name: Parrot lizard - Periods: Early Cretaceous (126 -101 MYA) - Location found: East and Southeast Asia - The species were obligate bipeds at adulthood, with a high skull and a robust parrot-like beak. Study indicates that there are internal structure of the bristles on its skin. - One of the most diverse dinosaur genera with 12 species known, spread over Monggolia through China to Southeast Asia. - Comparisons between the scleral rings of Psittacosaurus and modern birds and reptiles suggest that it may have been cathemeral, active throughout the day and night at short intervals
H15: Bagaceratops 	***15. Bagaceratops*** - Meaning of the name: Small horned face. - Periods: Late Cretaceous (72-71 MYA) - Location found: Mongolia - Although emerging late in the reign of the dinosaurs, Bagaceratops had a fairly primitive anatomy and kept the small body size that characterized early ceratopsians. - It had a smaller frill and only ten grinding teeth per jaw, more triangular skull than its close relatives. - Bagaceratops, like all ceratopsians, was a herbivore. During the Cretaceous, flowering plants were "geographically limited on the landscape", and so it is likely that this dinosaur fed on the predominant plants of the era: ferns, cycads and conifers. It would have used its sharp ceratopsian beak to bite off the leaves or needles.

H16: Archaeoceratops  	***16. Archaeoceratops*** - Meaning of the name: Ancient horned face. - Periods: Early Cretaceous (125 MYA) - Location found: China - It appears to have been bipeds and quite small with comparatively large head with parrot-like beak. - it had no horns, possessing only small bony frill projecting from the back of its head - Archaeoceratops, like all ceratopsians, was a herbivore fed on ferns, cycads and conifers using its sharp beak to bite off the leaves or needles and chop them up to be swallowed.
H17: Microceratus 	***17. Microceratus*** - Meaning of the name: Small horned - Periods: Late Cretaceous (90 MYA) - Location found: North America and Asia - It walked on two legs, had short front arms, a characteristic ceratopsian frill and parrot-like beak. - Smallest ceratopsian dinosaurs, used to be named as Microceratops, a genus of a typical ichneumonid wasps from Madagascar. It was later renamed as Microceratus. - It is likely that this dinosaur fed on the predominant plants of the era: ferns, cycads and conifers. It would have used its sharp ceratopsian beak to bite off the leaves or needles.

STEGOSAURIAN (HERBIVORES)

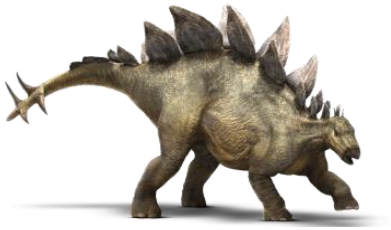
1. Comprised all the armored and quadrupedal taxa
2. Medium size to large quadrupedal herbivores with propotionally
   - Small heads
   - Short and massive forelimbs
   - Long columnar hindlimbs with a long femur
   - Short metacarpals and metatarsals with hooflike unguals
   - Consisting of vertical plates and caudodorsally inclined spines in various proportion
3. Development of tail spikes or "thagomizers" as defensive weapons
4. Later species, Stegosaurus, Huayangosaurus became larger, and developed long hindlimbs that no longer allowed them to run. Increase the importance of active defence by the thagomizer.
5. Osteoderms (not part of the skeleton proper but skin ossifications)
6. Apart from protection, suggested functions of the osteoderms include display, species recognition and thermoregulation.

H18: Tuojiangosaurus

18. Tuojiangosaurus

- Meaning of the name: Tuojiang lizard or Tuo River lizard.
- Periods: Early Cretaceous (155-150 MYA)
- Location found: China

- Tuojiangosaurus had two rows of pointed plates along the spine, which became taller over the hip region.
- It also had two outward-pointing spikes on each side of the end of the tail, angled at approximately 45 degrees to the vertical.
- Because it lacked the tall spines for muscle attachment found on the vertebrae of Stegosaurus, it was probably unable to rear up on its hind legs like that animal. This suggests that it would have eaten low-lying, ground vegetation.

H19: Stegosaurus 	***19. Stegosaurus*** - Meaning of the name: Roof lizard - Periods: Late Jurassic (155-150 MYA) - Location found: North America, Europe - Stegosaurus is heavily built quadrupeds stegosaurid dinosaurs with two rows of shingle-like armors embedded in the skin along the back bones. Its tail was tipped with spikes. - Despite the animal's overall size, the braincase of Stegosaurus was small, being no larger than that of a dog. - Some form of armor appears to have been necessary, as Stegosaurus species coexisted with large predatory theropod dinosaurs.
H20: Kentrosaurus 	***20. Kentrosaurus*** - Meaning of the name: Sharp point lizard - Periods: Late Jurassic (152 MYA) - Location found: Tanzania - Could swing its tail spikes with skull-cracking speed - Because the tail had at least forty caudal vertebrae, it was highly mobile. It could possibly swing at an arc of 180 degrees, covering the entire half circle behind it - it is hypothesised that the animal adopted a sprawling posture when defending itself. Its neck was flexible enough to allow it to keep sight of predators, as it could reach the sides of its body with its snout and look over the back.

H21: Huoyangosaurus 	***21. Huayangosaurus*** - Meaning of the name: Huayang lizard or Sichuan lizard - Periods: Early Cretaceous (165 MYA) - Location found: China - Smallest and earliest stegosaurids. - Huayangosaurus bore the distinctive double row of plates that characterize all the stegosaurians. These plates rose vertically along its arched back. In Huayangosaurus, the plates were more spike-like than in Stegosaurus. - Like Stegosaurus, however, it bore two pairs of long spikes extending horizontally near the end of its tail.

HADROSAURIDAE (HERBIVORES)

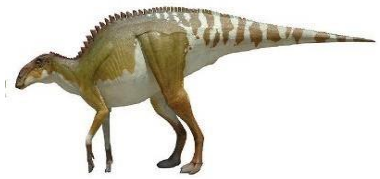
1. This group is known as the duck-billed dinosaurs for the flat duckbill appearance of the bones in their snouts.
2. Hadrosaurids had a predentary bone and pubic bone which was positioned backwards in the pelvis.
3. Divided into two principle subfamilies: the lambeosaurines, which had hollow cranial crests or tubes; and the saurolophines, identified as hadrosaurines, which lacked hollow cranial crests.
4. Hadrosaurids were facultative bipeds, with the young of some species walking mostly on two legs and the adults walking mostly on four.
5. Their jaws were evolved for grinding plants, with multiple rows of teeth replacing each other as the teeth wore down.

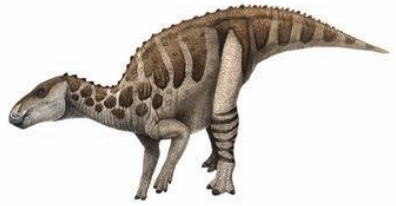
H22: Lambeosaurus

22. Lambeosaurus

- Meaning of the name: Lambe's lizard, named by Parks after Lawrence Lambe who first described the species.
- Periods: Late Cretaceous (75 MYA)
- Location found: Canada

- Lambeosaurus is notable for its hatchet-shaped hollow bony crest on top of its skull, its hadrosaurid limbs and snouts.
- Compared to Corythosaurus, the crest of Lambeosaurus was shifted forward, and the hollow nasal passages within were at the front of the crest and stacked vertically.
- In build, Lambeosaurus was like other hadrosaurids, and could move on both two legs and all fours, as shown by footprints of related animals. It had a long tail stiffened by ossified tendons that prevented it from drooping.

H23: Brachylophosaurus 	***23. Brachylophosaurus*** - Meaning of the name: Short-crested lizard - Periods: Late Cretaceous (78 MYA) - Location found: North America - This animal is notable for its bony crest, which forms a flat, paddle-like plate over the top of the skull, and a duck-bill snout. - Some individuals had crests that covered nearly the entire skull roof, while others had shorter, narrower crests.Some researchers have suggested it was used for pushing contests, but it may not have been strong enough for this. - Other notable features are the unusually long forelimbs and the beak of the upper jaw being wider than other contemporary hadrosaurs.
H24: Maiasaura 	***24. Maiasaura*** - Meaning of the name: Good mother lizard - Periods: Late Cretaceous (76.7 MYA) - Location found: USA - It had a small, spiky crest in front of its eyes. The crest may have been used in headbutting contests between males during mating season. - It walked both on two (bipeds) or four (quadrupeds) legs and appeared to have no defense against predators, except perhaps for its heavy, muscular tail and its herding behavior. - Maiasaura is a large herbivorous hadrosaurid (duck-billed) dinosaur live together in extremely large herd of up to 10,000 individuals.

H25: Corythosaurus 	***25. Corythosaurus*** - Meaning of the name: Helmet lizard - Periods: Late Cretaceous (77 -75.7 MYA) - Location found: North America - Corythosaurus is known from many skulls with tall crests. The crests resemble the crests of the cassowary and a Corinthian helmet. - Its crests started developing when half the size of adults. - The crests were thought to be used for vocalization. Like a trombone, the air would travel through many chambers within the crest, and then get amplified when Corythosaurus exhaled.
H26: Bactrosaurus 	***26. Bactrosaurus*** - Meaning of the name: Club lizard - Periods: Late Cretaceous (96 MYA) - Location found: East Asia - It was named as club lizard in reference to large club-shape neural spines projecting from some of the vertebrae. - It was an early relative of Lambeosaurus, and shows a number of iguanodont-like features, including three stacked teeth for each visible tooth, small maxillary teeth, and an unusually powerful build for a hadrosaur. - Prior to the discovery of incomplete crest, Bactrosaurus was originally described as lacking a crest, hence were related to iguanodontid rather than hydrosaurid.

ORNITHOPODA (HERBIVORES)

1. Ornithopoda means “bird feet” -this refers to their characteristic three-toed feet, although many early forms retained four toes.
2. Characterized by having no armour, the development of a horny beak, an elongated pubis that eventually extended past the ilium, and a missing hole in the lower jaw.
3. The early ornithopods were only about 1m, but probably very fast. Had a stiff tail like the theropods, to help them balance as they ran on their hind legs.
4. Later ornithopods became more adapted to grazing on all fours; their spines curved and came to resemble the spines of modern ground-feeders such as the bison.
5. As they became more adapted to eating while bent over, they became facultative quadrupeds; still running on two legs, and comfortable reaching up into trees; but spending most of their time walking or grazing while on all fours.
6. Iguanodon- elaborate pasal finding in Malaysia

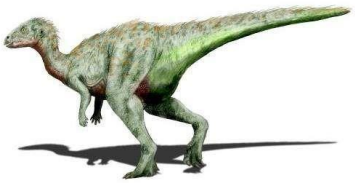
H27: Tenontosaurus

27. Tenontosaurus

- Meaning of the name: Sinew lizard
- Periods: Early Cretaceous (115 -108 MYA)
- Location found: North America

- It was informally name d as Tenantosaurus or senew lizard, refering to the extensive system od stiffening tendons in its back and tail.
- It is a bipeds iguanodontid dinosaurs with unusually long and broad tail. It was a common prey for Deinonychnus.
- Its powerful u-shaped beak and angled cutting surfaces of its teeth allow them to eat and consumes all part of plantsfrom leaves, fruits to woods.

H28: Iguanadon 	***28. Iguanodon*** - Meaning of the name: Iguana tooth - Periods: Early Cretaceous (126 -122 MYA) - Location found: Asia, Europe, North America - Iguanodon were bulky herbivores that could shift from bipeds to quadrupeds. Their large thumb spikes were used for defense against predators. - Iguanodon was the second genus of dinosaurs formally named, after Megalosaurus. It was based on these two genera and Hyalaeosaurus (the third genus) that the group Dinosauria was originally defined. - These animals had large, tall but narrow skulls, with toothless beaks probably covered with keratin, and teeth like those of iguanas, but much larger and more closely packed.
H29: Parasaurolophus 	***29. Parasaurolophus*** - Meaning of the name: Near crested lizard - Periods: Late Cretaceous (76.5 – 73 MYA) - Location found: North America, Asia - Parasaurolophus is a unique hydrosaurids with bizzare head adornment made up of large elaborate cranial crests forming a long-curved tube projecting upwards and back from the skull. - Among many functions of the crest are for species and sex recognition, acoustic resonance, and for thermal regulation. - It was quadrupeds as well as bipeds hadrosaurid dinosaurs. It probably preferred to forage for food on four legs, but ran on two.

H30: Hypsilophodon 	***30. Hypsilophodon*** - Meaning of the name: High-crested tooth - Periods: Early Cretaceous (130 – 125 MYA) - Location found: Europe - Like most small dinosaurs, Hypsilophodon is a bipeds and fast runners. A light-weight, minimized skeleton, low, aerodynamic posture, long hind limbs and stiff tail, immobilised by ossified tendons, for balance: all would have allowed it to travel remarkably fast for its size. - Hypsilophodon had a number of seemingly primitive features. For example, there were five digits on each hand and four on each foot. The fifth finger could serve to grasp food items. - Although it had a beak like most ornithischians, Hypsilophodon still had five pointed triangular teeth in the front of the upper jaw, the premaxillae.
H31: Qantassaurus 	***31. Qantassaurus*** - Meaning of the name: QANTAS lizard - Periods: Early Cretaceous (115 MYA) - Location found: Australia - Qantassaurus is only known from jaw fragments. These are foreshortened compared to related species so its face was probably short and stubby. - It probably belonged to the basal iguanodontid that could adapt to colder climate of Gondwanaland. - Qantassaurus was probably a browser, who grabbed ferns and other vegetation with its hands, and ran away from predators like a modern gazelle.

ANKYLOSAURIA (HERBIVORES)

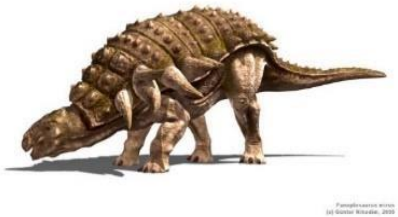
1. Ankylosaurs were bulky quadrupeds, with short, powerful limbs.
2. They have been found on every continent.
3. The first dinosaur discovered in Antarctica was the Ankylosaurian.
4. They sported a very small brain size in proportion to their body.
5. Slow moving, largely because of the shortness of the limbs combined with being incapable of running.
6. All ankylosaurians had armour over much of their bodies, mostly scutes and nodules, with large spines in some cases.
7. Ankylosaurids usually have the plates fused to the top of another band of bone.
8. Two families – Nodosauridae and Ankylosauridae

Nodosauridae

- Had longer snouts
- Did not sport the archetypal 'clubs' at the ends of their tails; but, rather, their most pronounced physical features were their spikes.
- Had very muscular shoulders and specialized knob of bone on each shoulder blade
- Act as attachment site for the muscles that held up their large parascapular spines (used for self-defence against predators)
- They had smaller, narrow beaks than the ankylosaurids

Ankylosauridae

- Had bony clubs at the end of their tails
- Domed snouts in front of the eyes
- Large squamosal plates projecting from the top and bottom of each side of the skull
- Much wider bodies and have even been discovered with bony eyelids
- The large clubs may have been used in self-defence or in sexual selection
- The clubs were made of several plates of bone that were permeated by soft tissue, allowing them to absorb thousands of pounds of force.

H32: Euplocephalus 	***32. Euoplocephalus*** - Meaning of the name: well-armed head - Periods: Late Cretaceous (83.5 – 66 MYA) - Location found: Canada - Among the ankylosaurids, Euoplocephalus was exceeded in size only by Ankylosaurus - The head and body of Euoplocephalus were covered with bony armor, except for parts of the limbs and possibly the distal tail. - The neck was protected by two bone rings. It could also actively defend itself against predators like Gorgosaurus using a heavy club at the end of its tail.
H33: Panoplosaurus 	***33. Panoplosaurus*** - Meaning of the name: Completely armoured lizard - Periods: Late Cretaceous (76-73 MYA) - Location found: North America - It consists of the complete skull with lower jaws, the cervical vertebrae - It was heavily armoured, even by the standards of other nodosaurs, probably with traverse bands of studded plates covering its back and tail, although the tail likely lacked the club found in ankylosaurids. - The armour on the head was fused into a compact helmet-like shield; these plates had a lumpy surface.

H34: Nodosaurus 	***34. Nodosaurus*** - Meaning of the name: Knobbed lizard - Periods: Late Cretaceous (99.6 - 70.6 MYA) - Location found: North America - It is thought that without a club on its tail, Nodosaurus would have been left without much in terms of active defenses. When threatened, it probably dropped to the ground so that only its armored back and sides were exposed, much like modern-day hedgehogs. - The head was narrow, with a pointed snout, powerful jaws, and small teeth. It perhaps ate soft plants, as it would have been unable to chew tough, fibrous ones - The dermal plates were arranged in bands along its body, with narrow bands over the ribs alternating with wider plates in between. These wider plates were covered in regularly arranged bony nodules, which give the animal its scientific name.
H35: Polacanthus 	***35. Polacanthus*** - Meaning of the name: Spiked armoured lizard - Periods: Early Cretaceous (130-125 MYA) - Location found: England - Polacanthus was a medium-sized ankylosaur - Polacanthus had a large "pelvic shield" or "sacral shield" - Its body was covered with armour plates and spikes

H36: Ankylosaurus 	***36. Ankylosaurus*** - Meaning of the name: Fused Lizard - Periods: Late Cretaceous (68 – 66 MYA) - Location found: North America - Ankylosaurus was the largest member of its family. - The most obvious feature of Ankylosaurus is its armor, consisting of massive knobs and plates of bone, known as osteoderms or scutes, embedded in the skin. Osteoderms are also found in the skin of crocodiles, armadillos and some lizards. - The famous tail club of Ankylosaurus was also composed of several large osteoderms, which were fused to the last few tail vertebrae.

SAUROPODOMORPHA (HERBIVORES)

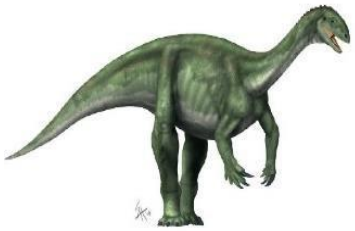
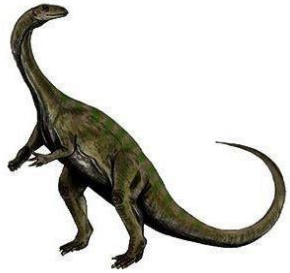
1. Clade of long-necked, herbivorous, saurischian dinosaur.
2. The dominant terrestrial herbivores throughout much of the Mesozoic Era.
3. Sauropodomorphs were adapted to browsing higher than any other contemporary herbivore, giving them access to high tree foliage.
4. Their teeth were weak and shaped like leaves or spoons. Instead of grinding teeth, they had stomach stones (gastroliths)
5. The front of the upper mouth bends down in what may be a beak.
6. Initially bipedal, as their size increased, they evolved to quadrupedal adapted only to walking slowly on land, like elephants.
7. Early sauropodomorhs were most likely omnivores as their shared common ancestor with the other saurischian lineage that was a carnivore. Therefore, their evolution to herbivory went hand in hand with their increasing size and neck length.
8. They had large nostrils, and retained a thumb with a big claw, which may have been used for defence – though their primary defensive adaptation was their extreme size.

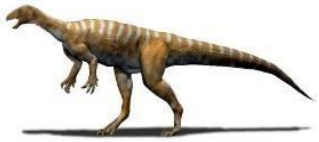
H37: Plateosaurus

37. Plateosaurus

- Meaning of the name: Broad lizard or flat lizard
- Periods: Late Triassic (214 – 204 MYA)
- Location found: France, Germany, Switzerland

- Plateosaurus was the first known large herbivores among the dinosaurs. It was among the earliest known dinosaurs.
- They had small fingers and a huge thumb that had a large claw. This claw may have been used for plucking leaves from high branches, for digging roots, or for fighting.
- Plateosaurus had a long neck, composed of around nine cervical vertebrae, a stocky body and a pear-shaped torso. It had a long tail composed of at least forty caudal vertebrae which served to counterbalance the front-heavy body and long neck.

H38: Yunnanosaurus 	***38. Yunnanosaurus*** - Meaning of the name: Yunnan lizard - Periods: Early to Middle Jurassic (201-168 MYA) - Location found: China - There were more than sixty spoon shaped teeth in the jaws of Yunnanosaurus, and were unique among prosauropods in that its teeth were self-sharpening because they "[wore] against each other as the animal fed." - Yunnanosaurus was named after the Yunnan Province in the People's Republic of China. It has typically long slender body. - scientists do not consider Yunnanosaurus to be especially close to the sauropods in phylogeny because the remaining portions of the animals body are distinctly "prosauropod" in design
H39: Massospondylus 	***39. Massospondylus*** - Meaning of the name: Longer vertebra - Periods: Early Jurassic (200-183 MYA) - Location found: Lesotho, South Africa, Zimbabwe - Massospondylus was one amongst the first dinosaurs to be named with a taxonomic history going back as far as the mid nineteenth century. It is a souropod dinosaur. - This animal, 4–6 meters (13–20 feet) long, had a long neck and tail, with a small head and slender body. On each of its forefeet, it bore a sharp thumb claw that was used in defense or feeding. - Massospondylus grew steadily throughout its lifespan, possessed air sacs similar to those of birds, and may have cared for its young.

H40: Thecodontosaurus 	***40. Thecodontosaurus*** - Meaning of the name: socket-toothed lizard - Periods: Late Triassic (203.6-201.3 MYA) - Location found: England, United Kingdom - Thecodontosaurus had a much shorter neck when compared to other prosauropodomorphs and other sauropods. - This dinosaur's front limbs were much shorter than the legs (hind limbs), and its tail was much longer than the head, neck and body put together. - The root of the teeth was not fused with the jaw bone, as in present lizards, but positioned in separate tooth sockets.

PACHYCEPHALOSAURIA (HERBIVORES)

1. They were all bipedal, have a thick skull
2. Skulls can be domed, flat, or wedge-shaped depending on the species, and are all heavily ossified
3. The domes were often surrounded by nodes and/or spikes
4. Large orbits and a large optic nerve point to pachycephalosaurs having good vision, and uncharacteristically large olfactory lobes indicates that they had a good sense of smell
5. The characteristic skull of pachycephalosaurs is a result of the fusion and thickening of the frontals and parietals, accompanied by the closing of the supratemporal fenestra (opening inside the skull).
6. The popular hypothesis among the general public that the skull was used in headbutting, but there are also several arguments about this hypothesis:
   - The spongy bone structure could not sustain the blows of combat
   - Radial pattern was simply an effect of rapid growth
   - Later analysed by biomechanical scientists the domes could withstand combat stresses.
   - 2004 scientists argued that the dome functioned for species recognition
   - 2010 scientists argued that species recognition is an unlikely evolutionary cause for the dome, because the dome forms are not notably different between specie

H41: Dracorex

41. Dracorex

- Meaning of the name: Dragon king
- Periods: Late Cretaceous (70-66 MYA)
- Location found: North America

- Dracorex hogwartsia, its only known species means “dragon king of Hogwart" name after character and place in the famous series of novels and movies "Harry Potter".
- Dracorex had a skull with spiky horns, bumps, and a long muzzle. The species also sports well-developed supratemporal fenestrae and a heavily armoured flat skull.
- Dracorex is one of the genus in the family Pachycephalosauridae. It might well be a juvenile form of the genus Pachycephalosaurus.

H42: Pachycephalosaurus 	***42. Pachycephalosaurus*** - Meaning of the name: Thick-headed lizard - Periods: Late Cretaceous (70-66 MYA) - Location found: North America - It has the thickest skull among all dinosaur. - The skull roof was once mistaken for another dinosaur's knee cap. - The thick skull domes of Pachycephalosaurus and related genera gave rise to the hypothesis that pachycephalosaurs used their skulls in intraspecific combat. This hypothesis has been disputed in recent years.
H43: Homalocephale 	***43. Homalocephale*** - Meaning of the name: Even head or flat head - Periods: Late Cretaceous (80 MYA) - Location found: Mongolia - The discovery of unusually wide hips leading some paleontologists to believe that the dinosaur gave birth to live young, unlike many dinosaurs that lay eggs. - Homalocephale is the smallest Pachycephalosauridae. It is known from a partial skull and parts of the legs and vertebrae. It has long pair of leg suggesting it can run fast. - The surface of the skull was greatly thickened, and it had been proposed that males competed in head-butting contests, similar to those of modern iguanas.

H44: Stegoceras 	***44. Stegoceras*** - Meaning of the name: Horned roof - Periods: Late Cretaceous (77.5-74 MYA) - Location found: North America - Stegoceras was the first pachycephalosaurid to be described. - Its large head housed a thick skull (around 8cm thick), a relatively large brain, and large eyes. - It walked on two legs. The legs were more than three times the length of the arms.

THEROPODS

1. The most diverse group of saurischian dinosaurs, ranging from the crow-sized; Microraptor to the huge Tyrannosaurus rex; which weighed six tons or more.
2. Theropod remains have been recovered from all continents except Antarctica
3. From the Middle Triassic through the Late Cretaceous (from 245 million to 65.5million years ago).
4. All the theropods were obligate bipeds; that is, their hind legs provided support and locomotion while the short forelimbs and mobile hands were probably adapted for grasping and tearing prey.

v. They have carnivorous dentition and large recurved claws on the fingers

vi. They also share many other characteristics, such as a distinctive joint in the lower jaw, epipophyses on the neck vertebrae, and a unique "transition point" in the tail where the vertebrae become longer and more lightly built.

vii. The jaws of theropods are noted for their complement of sharp, bladelike teeth.

HERBIVORES GROUP

H45: Therizinosaurus

45. Therizinosaurus

- Meaning of the name: Scythe lizard
- Periods: Late Cretaceous (70 MYA)
- Location found: Mongolia

- They had the longest known claws of any land animal reaching up to 1m in length. These claws are stiff and elongated like a scythe.
- Had proportionally small skulls bearing a keratinous beak atop long necks, with bipedal gaits and heavy, deep, broad bellies for foliage processing with the addition of sparse feathering.
- The feeding habits of Therizinosaurus are unknown since no skull material has ever been found that could indicate their diet. However, like other therizinosaurs, they were probably primarily herbivorous.

H46: Beipiaosaurus 	***46. Beipiaosaurus*** - Meaning of the name: Beipiao lizard - Periods: Early Cretaceous (125 MYA) - Location found: China - Before the discovery of Yutyrannus, they were among the largest dinosaurs known from direct evidence to be feathered. - The necks were shorter than in most therizinosaur and feet configuration differs by having a generic three-toed pes instead of four. - Beipiaosaurus had a tootless beak with cheek teeth.
H47: Sinornithomimus 	***47. Sinornithomimus*** - Meaning of the name: Chinese bird mimics - Periods: Late Cretaceous (92 MYA) - Location found: China - Relatively short neck and head for a member of ornithomimid. Body covered with feathers. - The structure of the hand is similar to that of Archeornithomimus representing thus an intermediate between the "primitive" condition of the ornithomimosaur Harpymimus and the one of the more derived ornithomimids. - Using gastrolith for digesting their food.
O2: Gallimimus	***48. Gallimimus*** - Meaning of the name: Chicken mimic: Gallus means cock or rooster - Periods: Late Cretaceous (70 MYA) - Location found: Mongolia - Gallimimus doesn't have a single tooth in its entire mouth. Most likely have feathers.

	- The bottom front part of its beak was shaped like a shovel. It had large eyes positioned on opposite sides of its head, ruling out binocular vision (depth perception). - Gallimimus was rather ostrich-like, with a small head, toothless beak, large eyes, a long neck, short arms, long legs, and a long tail. The tail was used as a counterbalance. The eyes were located on the sides of its head, meaning that it did not possess binocular vision.

CARNIVORES GROUP

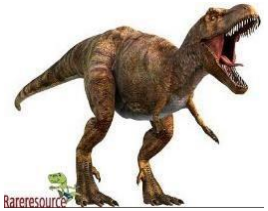
C1: Spinosaurus 	***49. Spinosaurus*** - Meaning of the name: Spinosed lizard - Periods: Early Cretaceous (112 to 93.5 MYA) - Location found: North Africa and Asia (including Malaysia) - According to recent estimates, Spinosaurus is the largest of all known carnivorous dinosaurs, even larger than Tyrannosaurus rex and Giganotosaurus. - The distinctive spines of Spinosaurus, which were long extensions of the vertebrae, grew up to 2.2 meters (7 ft) long and were likely to have had skin connecting them, forming a sail-like structure - The function of these sails is uncertain; scientists have proposed several hypotheses including heat regulation and display. In addition, such a prominent feature on its back could also make it appear even larger than it was, intimidating other animals

O1: Ornithomimus 	***50. Ornithomimus*** - Meaning of the name: Bird mimic - Periods: Late Cretaceous (76.5-66.5 MYA) - Location found: North America - Carnivores - Ornithomimus looked a lot like a modern ostrich. It has feathers. - Ornithomimus was endowed with a larger-than-usual brain. - The name Ornithomimus means bird mimic. They would have been swift runners with very long limbs, hollow bones.
C2: Giganotosaurus 	***51. Giganotosaurus*** - Meaning of the name: Giant southern lizard - Periods: Late Cretaceous (99.6 to 97 MYA) - Location found: Argentina - It is one of the largest known terrestrial carnivores, slightly larger than Tyrannosaurus, but smaller than Spinosaurus. - It had a brain only about half as big as those of tyrannosaurids - Titanosaur fossils have been recovered near the remains of Giganotosaurus, leading to speculation that these carnivores may have preyed on the giant herbivores. Fossils of related carcharodontosaurids grouped closely together may indicate pack hunting, a behavior that could possibly extend to Giganotosaurus itself.

C3: Carcharodontosaurus 	***52. Carcharodontosaurus*** - Meaning of the name: Jagged tooth lizard or shark toothed lizard - Periods: Early to Late Cretaceous (145-72 MYA) - Location found: North Africa - Carcharodontosaurus were carnivores, with enormous jaws and long, serrated teeth up to eight inches long. - Carcharodontosaurus includes some of the longest and heaviest known carnivorous dinosaurs
C4: Tyrannosaurus Rex 	***53. Tyrannosaurus*** - Meaning of the name: Tyrant lizard - Periods: Late Cretaceous (68 to 66 MYA) - Location found: North America - Tyrannosaurus was a bipedal carnivore with a massive skull balanced by a long, heavy tail. Relative to the large and powerful hindlimbs - Tyrannosaurus forelimbs were small, though unusually powerful for their size, and bore two clawed digits. - unusually good binocular vision
C5: Allosaurus	***54. Allosaurus*** - Meaning of the name: Different or another lizard - Periods: Late Jurassic (155 to 145 MYA) - Location found: North America

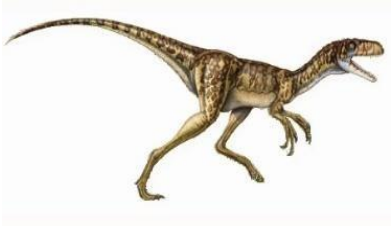
	- The skull had a pair of horns above and in front of the eyes. The horns were probably covered in a keratin sheath and may have had a variety of functions, including acting as sunshades for the eye, being used for display, and being used in combat against other members of the same species - The forelimbs of Allosaurus were short in comparison to the hindlimbs only about 35% the length of the hindlimbs in adults
C6: Gorgosaurus 	***55. Gorgosaurus*** - Meaning of the name: Fierce or dreadful Lizard - Periods: Late Cretaceous (76.6 to 75.1 MYA) - Location found: North America - Gorgosaurus was smaller than Tyrannosaurus or Tarbosaurus, closer in size to Albertosaurus and Daspletosaurus. - Gorgosaurus lived in a lush floodplain environment along the edge of an inland sea. An apex predator, it was at the top of the food chain, preying upon abundant ceratopsids and hadrosaurs. In some areas
C7: Albertosaurus 	***56. Albertosaurus*** - Meaning of the name: Lizard of Alberta - Periods: Late Cretaceous (70 MYA) - Location found: North America - tyrannosaurid forelimbs were extremely small for their body size and retained only two digits. - Although relatively large for a theropod, Albertosaurus was much smaller than its more famous relative Tyrannosaurus

C8: Carnotaurus 	***57. Carnotaurus*** - Meaning of the name: Meat eating bull - Late Cretaceous (72 to 69.9 MYA) - Location found: Argentina - - Carnotaurus was highly specialized and distinctive. It had thick horns above the eyes, a feature unseen in all other carnivorous dinosaurs, and a very deep skull sitting on a muscular neck. - The distinctive horns and the muscular neck may have been used in fighting conspecifics. According to separate studies, rivaling individuals may have combated each other with quick head blows, by slow pushes with the upper sides of their skulls, or by ramming each other head-on, using their horns as shock absorbers. - Carnotaurus was well adapted for running and was possibly one of the fastest large theropods.
C9: Majungasaurus 	***58. Majungasaurus*** - Meaning of the name: Lizard of Mahajanga - Periods: Late Cretaceous (70 to 66 MYA) - Location found: Madagascar - The skull of Majungasaurus is exceptionally well-known compared to most theropods and generally similar to that of other abelisaurids. Like other abelisaurid skulls, its length was proportionally short for its height, although not as short as in Carnotaurus. - A distinctive dome-like horn protruded from the fused frontal bones on top of the skull as well.

C10: Metriacanthosaurus 	***59. Metriacanthosaurus*** - Meaning of the name: Moderately-spined lizard - Periods: Late Jurassic (160 MYA) - Location found: England - Metriacanthosaurus was a medium-sized theropod with a femur length of 80 cm - Metriacanthosaurus thus gets its name from its vertebrae, which are taller than typical carnosaurs, like Allosaurus, but lower than other high-spined dinosaurs like Acrocanthosaurus.
C11: Abelisaurus 	***60. Abelisaurus*** - Meaning of the name: Abel's lizard - Periods: Late Cretaceous (83 to 80 MYA) - Location found: Argentina - As only the skull is known, it has proven difficult to provide a reliable size estimate of Abelisaurus. It has transpired that abelisaurids have relatively short heads - Although there are no bony crests or horns, like those found in some other abelisaurids, such as Carnotaurus, rough ridges on the snout and above the eyes might have supported some kind of crest made out of keratin, which would not have become fossilized.

C12: Dilophosaurus 	***61. Dilophosaurus*** - Meaning of the name: Two-crested lizard - Periods: Early Jurassic (193 MYA) - Location found: North America - It had a pair of longitudinal, plate-shaped crests on its skull, similar to a cassowary with two crests. The function of the crests is unknown; they were too weak for battle, but may have been used in visual display, such as species recognition and sexual selection. - The forelimbs to have been powerful weapons, strong and flexible, and not used for locomotion. He noted that the hands were capable of grasping and slashing,
C13: Erlikosaurus 	***62. Erlikosaurus*** - Meaning of the name: King Erlik's lizard - Periods: Late Cretaceous (96 to 89 MYA) - Location found: Asia - Erlikosaurus were therizinosaurs, a strange group of theropods that ate plants instead of meat, and that had backward facing pubises like ornithischians - Also, like ornithischians, their jaws were tipped by a broad rounded bony beak useful for cropping off plants. - Scientists now know some therizinosaurs were feathered, so it is likely that Erlikosaurus were as well. Erlikosaurus had exceptionally long slender claws on their feet

C14: Cryolophosaurus 	***63. Cryolophosaurus*** - Meaning of the name: Frozen crested lizard - Periods: Early Jurassic (194-188 MYA) - Location found: Antarctica - The first carnivorous dinosaur to be discovered in Antarctica and the first dinosaur of any kind from the continent to be officially named - It has a peculiar nasal crest that runs just over the eyes, where it rises up perpendicular to the skull and fans out. It is thin and highly furrowed, giving it a unique "pompadour" appearance and earned it the nickname "Elvisaurus."
C15: Achillobator 	***64. Achillobator*** - Meaning of the name: Achilles' warrior or Achilles' hero - Periods: Late Cretaceous (96 to 89 MYA) - Location found: Mongolia - It was probably an active bipedal predator, hunting with the large sickle-shaped claw on the second toe of each hind foot. - Achillobator is probably a dromaeosaurid, a family of dinosaurs currently thought to be very closely related to birds.

C16: Alectrosaurus 	***65. Alectrosaurus*** - Meaning of the name: Alone lizard - Periods: Late Cretaceous (96 MYA) - Location found: Mongolia - Alectrosaurus was a very fast running tyrannosauroid as indicated by the elongated hindlimbs that likely filled the niche of a pursuit predator, a trait that seems to be lost by the advanced and robust tyrannosaurids
C17: Eotyrannus 	***66. Eotyrannus*** - Meaning of the name: Dawn tyrant - Periods: Early Cretaceous (127-121 MYA) - Location found: UK - Primitive characters for Tyrannosauroidea are the elongate neck vertebrae and the long, well-developed arms forelimbs along with the undecorated dorsal surface of the skull, unlike the more advanced tyrannosaurids. - However, this animal, proportionally, has one of the longest hands in Theropoda known to date. - This theropod would be a probable predator of such herbivorous dinosaurs as Hypsilophodon and Iguanodon.

C18: Yangchuanosaurus 	***67. Yangchuanosaurus*** - Meaning of the name: Lizard of Yangchuan - Periods: Late Jurassic (160-144 MYA) - Location found: China - Yangchuanosaurus was a large, powerful meat-eater. It walked on two large, muscular legs, had short arms, a strong, short neck, a big head with powerful jaws, and large, serrated teeth. - Yangchuanosaurus was a large, powerful meat-eater. It walked on two large, muscular legs, had short arms, a strong, short neck, a big head with powerful jaws, and large, serrated teeth.
C19: Coelophysis 	***68. Coelophysis*** - Meaning of the name: Hollow form - Periods: Late Triassic (216 - 196 MYA) - Location found: South Africa, USA, Zimbabwe - Early meat-eating dinosaurs like Coelophysis relied on their speed and agility to catch a variety of animals like insects and small reptiles. The sharp teeth and grasping claws of Coelophysis would have helped them to hold and kill their food. - Coelophysis had large eyes and good eyesight. Its neck and head were long. The tail was also long, and had an unusual structure within its interlocking prezygapophysis of its vertebrae, which formed a semi-rigid lattice, apparently to stop the tail from moving up and down. This may have let the tail act as a rudder or counterweight when the animal was maneuvering at high speeds. - The name Coelophysis means "hollow form" or "hollow process", so named because of its hollow limb bones. Coelophysis was very slim and it probably would have been a fast runner.

C20: Velociraptors 	***69. Velociraptor*** - Meaning of the name: Quick plunderer or swift thief or swift siezer - Periods: Late Cretaceous (75-71 MYA) - Location found: Mongolia - The swift minnow - Have sickle shaped claws, may have feathers. - Small but have large skull
C21: Borogovia 	***70. Borogovia*** - Meaning of the name: Borogove - Periods: Late Cretaceous (84-65 MYA) - Location found: Mongolia - Only partial hindlimbs of this dinosaur have been found, so reconstructions are speculative. It was named after Lewis Carroll's borogoves from the poem Jabberwocky, published in 1871. - Borogove is a fictionary thin shabby-loking bird with its feathers sticking out all round, something like a live mop.
C22: Dromaeosaurus	***71. Dromaeosaurus*** - Meaning of the name: Running lizard - Periods: Late Cretaceous (76.5-74.8MYA) - Location found: Canada, USA - The back foot of this dinosaur had a large claw for kicking.

	- Although only a few bones are known from the hindlimb, they indicate that Dromaeosaurus was a powerfully built animal. The presence of feathers in closely related animals makes it extremely likely that it was feathered as well. - Dromaeosaurus had remarkably large eyes and excellent vision. It also probably had a good sense of smell and hearing. Its neck was curved flexible and its jaws were solidly built. The tail was flexible at the base but sheathed in a lattice of bony rods; this allowed it to be carried in a sharply upturned position.
C23: Masiakasaurus 	***72. Masiakasaurus*** - Meaning of the name: Vicious Lizard - Periods: Late Cretaceous (70 MYA) - Location found: Madagascar - The most distinctive characteristic of Masiakasaurus is the forward-projecting, or procumbent, front teeth. - they had a specialized diet, perhaps including fish and other small prey.
C24: Adasaurus 	***73. Adasaurus*** - Meaning of the name: Evil spirit Ada's lizard - Periods: Periods: Late Cretaceous (70 MYA) - Location found: Central Asia - Like Velociraptor dinosaurs, it was bipedal with a big, sickle-like claw on each foot - may have had feathers

C25: Oviraptor 	***74. Oviraptor*** - Meaning of the name: Egg thief - Periods: Late Cretaceous (75 MYA) - Location found: Mongolia - The toothless strong beak (curved upper and lower jaws) of Oviraptor would have been able to crush even hard objects. - This dinosaur may have stole and eaten other dinosaurs eggs, or fed on fishes and shellfishes.
C26: Sinornithosaurus 	***75. Sinornithosaurus*** - Meaning of the name: Chinese bird lizard - Periods: Early Cretaceous (124.6 – 122 MYA) - Location found: China - Relatively short neck and head for a member of ornithomimid. Body covered with feathers. - The structure of the hand is similar to that of Archeornithomimus representing thus an intermediate between the "primitive" condition of the ornithomimosaur Harpymimus and the one of the more derived ornithomimids. - Using gastrolith for digesting their food.

C27: Archaeopteryx 	***76. Archaeopteryx*** - Meaning of the name: Ancient feathers or ancient wings. - Periods: Late Jurassic (150.8 - 148.5 MYA) - Location found: Southern Germany - Bird-like dinosaurs that is transitional between non-avian feathered dinosaurs and modern birds. For long it was considered as the first bird or original bird. - More in common with theropod than birds with its jaws with sharp teeth, three fingers with claws, a long bony tail, hyperextensible second toes (killing claw) - As in the wings of modern birds, the flight feathers of Archaeopteryx were somewhat asymmetrical and the tail feathers were rather broad. This implies that the wings and tail were used for lift generation, but it is unclear whether Archaeopteryx was capable of flapping flight or simply a glider.

PTEROSAURIA (CARNIVORES)

1. They are not dinosaurs but flying reptiles.
2. The most successful group of reptiles where they flourished all through the age of dinosaurs, a period of more than 150 million years.
3. Earliest pterosaurs are small and have study bodies and long tails. Evolved into a broad variety of species (Some had long, slender jaws, elaborate head crests, or specialized teeth, and some were extraordinarily large.)
4. Diet: Fish
5. Consist of two main types:
   - Basal pterosauria (smaller animals with fully toothed jaws and, typically, long tails)
   - Pterodactyloids (Short tails, some had long, slender jaws, elaborate head crests, or specialized teeth, and some were extraordinarily large.)
6. Examples of pterosaurs:
   - Quetzalcoatlus (Largest known flying animal ever lived)
   - Pteranodon (as known as the Toothless Wing)
   - Dimorphodon (head was very lightly built but large and deep)
   - Tapejera (had an enormous crest on the top of its head – a crest that would have been brightly coloured and used to attract mates)

C28: Quetzalcoatlus

77. Quetzalcoatlus

- Meaning of the name: God of feathered serpent or feathered dragon (in Aztec and Mesoamerican myth)
- Periods: Late Cretaceous (68-66 MYA)
- Location found: North America

- The largest known flying animal to have ever lived. It is an ancient reptile, not a dinosaur.
- Quetzalcoatlus had a very sharp and pointed beak, very long wing span and very short tail.
- It was a member of the Azhdarchidae, a family of advanced toothless pterosaurs with unusually long, stiffened necks.

C29: Pteranodon 	***78. Pteranodon*** - Meaning of the name: Wings of the toothless - Periods: Late Cretaceous (86-84.5 MYA) - Location found: North America - Pteranodon had a wingspan of 7 metres or more, and its toothless jaws were very long and pelican-like. - They were probably warm-blooded like bats and birds today. They walked on four legs and flew like albatros. - Pteranodon is a genus of pterosaurs which included some of the largest known flying reptiles. It is not a dinosaur.
C30: Dimorphodon 	***79. Dimorphodon*** - Meaning of the name: Two-formed tooth or two-shaped tooth - Periods: Early Jurassic (195-190 MYA) - Location found: England, Mexico - Dimorphodon means "two-form tooth", derived from the Greek δι (di) meaning two", μορφη (morphe) meaning "shape" and οδων (odon) meaning "tooth", referring to the fact that it had two distinct types of teeth in its jaws – which is comparatively rare among reptiles. - Dimorphodon is a member of the family Dimorphodontidae, a type of rhamphorhynchoid pterosaurs, It is one of the earliest known Pterosauria. Pterosauria is not a dinosaur. - With its disproportionately large head and tucan-like mouth lined with barbed teeth, the Dimorphodon is actually thought to have spent most of its time on the

	ground, using its folded wings as forelegs. As one might imagine from its ungainly body plan, it may have only been capable of short flights.
C31: Tapejera 	***80. Tapejara*** - Meaning of the name: A Tupi (Tupi people of Brazil) word means old being. - Periods: Early Cretaceous (112 MYA) - Location found: Brazil - - The creature also makes effective use of razor-sharp claws to latch onto surfaces such as the trunks of tall trees, holding its position indefinitely. Warlike tribes appear to consider Tapejara the equivalent of a versatile rotor aircraft, capable of rapid positional changes and aggressive agility. - Tapejara crests consisted of a semicircular crest over the snout, and a bony prong which extended back behind the head. - Tapejara is a genus of Brazilian Pterosaurid

ICE AGE ERA

HERBIVORES

Sivatherium 	**81. *Sivatherium*** - Meaning of the name: Shiva's beast - Periods: Quaternary - Years (Epoch): 1 MYA (Early Pleistocene) to 0.008 MYA (Holocene) - Species: *Sivatherium giganteum* (Mammalia) - Distribution of species: Africa to South Asia - one of the largest giraffid known, and also one of the largest ruminants of all time - Sivatherium resembled the modern okapi, but was far larger, and more heavily built - This weight estimate is thought to be an underestimate, as it does not take into account the large horns possessed by males of the species. Sivatherium had a wide, antler-like pair of ossicones on its head, and a second pair of ossicones above its eyes. Its shoulders were very powerful to support the neck muscles required to lift the heavy skull
Macrauchenia patachonica 	**82. *Macrauchenia*** - Meaning of the name: Big neck - Periods: Neogene to Quaternary - Years (million) (Epoch): 7 (Late Miocene) to 0.01 (Late Pleistocene) - Species: Macrauchenia patachonica (Mammalia) - Distribution of species: South America

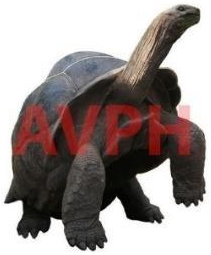
	- Macrauchenia had a somewhat camel-like body, with sturdy legs, a long neck and a relatively small head. Its feet, however, more closely resembled those of a modern rhinoceros, with one central toe and two side toes on each foot. - One striking characteristic of Macrauchenia is the openings for the nostrils on top of the head, above and between the eyes. Increasingly retracted nostrils are an evolutionary trend in later litopterns. Because mammals with trunks show the nostrils in a similar position, a popular hypothesis is that Macrauchenia had a trunk similar to a tapir or an inflated snout like that of the saiga antelope, perhaps to keep dust out of the nostrils - One insight into Macrauchenia's habits is that its ankle joints and shin bones may indicate that it was adapted to have unusually good mobility, being able to rapidly change direction when it ran at high speed
Mammoth 	**83. *Mammuthus* (Mammoth)** - Meaning of the name: Earth horn - Periods: Quaternary - Years (Epoch): 2.6 MYA (Pleistocene) to 0.004 MYA (Holocene) - Species: *Mammuthus primigenius* (Mammalia) - Distribution of species: North America, North Asia, Europe - Woolly mammoth (M. primigenius) was the last species of the genus with few survived the Last Ice Age up till 4000 years ago in Wrangel Island of Siberia. - It was covered in fur, with an outer covering of long guard hairs and a shorter undercoat to withstand the extreme climate during the Last Ice Age. - The ears and tail were short to minimise frostbite and heat loss

Diprotodon 	**84. *Diprotodon*** - Meaning of the name: Two forward teeth - Periods: Quaternary - Years (Epoch): 1.6 MYA to 0.044 MYA (Pleistocene) - Species: *Diprotodon optatum* (Mammalia) - Distribution of species: Australia - Largest known marsupial to have ever existed. Wombat-like. Carrying immature babies in natural skin pouch. - both the small and large diprotodonts coexisted throughout the Pleistocene and the size difference is similar to other sexually dimorphic living marsupials - Diprotodon superficially resembled a rhinoceros without a horn. Its feet turned inwards like a wombat's, giving it a pigeon-toed appearance. It had strong claws on the front feet and its pouch opening faced backwards.
Primigenius 	**85. *Bos primigenius*** - Meaning of the name: Aurochs or Urus or Ure - Periods: Quaternary - Years (Epoch): 2.0 MYA (Pleistocene) - Species: *Bos primigenius* (Mammalia) - Distribution of species: Eurasian, North Africa, India - an extinct species of large wild cattle that inhabited Asia, Europe, and North Africa. It is the ancestor of domestic cattle. The species survived in Europe until 1627, when the last recorded aurochs died in the Jaktorów Forest, Poland.

	- The horns of the aurochs were characteristic in size, curvature, and orientation. They were curved in three directions: upwards and outwards at the base, then swinging forwards and inwards, then inwards and upwards. Aurochs horns could reach 80 cm (31 in) in length and between 10 and 20 cm (3.9 and 7.9 in) in diameter. - During the mating season, which probably took place during the late summer or early autumn, the bulls had severe fights, and evidence from the forest of Jaktorów shows these could lead to death.
Coelodonta 	**86. *Coelodonta*** - Meaning of the name: Hollow tooth - Periods: Neogene to Quaternary - Years (Epoch): 3.7 MYA (Pliocene) to 0.01 MYA (Holocene) - Species: *Coelodonta antiquitatis* (Mammalia) - Distribution of species: Eurasia - Coelodonta= from the Greek mean "hollow tooth", in reference to the deep grooves of their molars - Extinct genus of Rhinoceros. Extinct during the Last Ice Age - Stocky limbs and thick woolly pelage made it well suited to the extreme steppe-tundra environment during the Last Ice Age
Moeritherium 	**87. *Moeritherium*** - Meaning of the name: The beast from Lake Moeris - Periods: Paleogene - Years (Epoch): 37 MYA to 35 MYA (Late Eocene) - Species: *Moeritherium lyonsi* (Mammalia) - Distribution of species: North Africa - These prehistoric mammals are related to the elephant and, more distantly, sea cows and hyraxes. Possible ancestor of later mammoths and elephants, tapirs, pigs and pigmy hippopotamus

	- a rotund semi-aquatic mammal with short, stubby legs - The shape of the skull suggests that, while Moeritherium did not have an elephant-like trunk, it may have had a broad flexible upper lip like a tapir's for grasping aquatic vegetation
Uintatherium 	**88. *Uintatherium*** - Meaning of the name: Beast of the Uinta Mountains - Periods: Paleogene - Years (Epoch): 56 MYA to 38 MYA (Early to Middle Eocene) - Species: *Uintatherium anceps* (Mammalia) - Distribution of species: USA, China - Its most unusual feature was the skull, which is both large and strongly built, but simultaneously flat and concave: this feature is rare and, apart from some brontotheres, not regularly characteristic of any other known mammal. - Uintatherium was a large browsing animal. It was similar to today's rhinoceros, both in size and in shape. - The large upper canine teeth might have served as formidable defensive weapons, and superficially resembled those of saber-toothed cats. Sexually dimorphic, the teeth were larger in males than in females. However, they also might have used them to pluck the aquatic plants from marshes that seem to have comprised their diet.
Paraceatherium	**89. *Paraceratherium*** - Meaning of the name: hornless beast - Periods: Paleogene - Years (Epoch): 34 MYA to 23 MYA (Early to Late Oligocene)

	- Species: *Paraceratherium bugtiense* (Mammalia) - Distribution of species: Eurasia - It is one of the largest terrestrial mammals that has existed and lived from the early to late Oligocene epoch. Because of its size, it would have had few predators and a slow rate of reproduction. - The bones above the nasal region are long and the nasal incision goes far into the skull. This indicates that Paraceratherium had a prehensile upper lip similar to that of the black rhinoceros and the Indian rhinoceros, or a short proboscis (trunk) as in tapirs. - The simple, low-crowned teeth indicate that Paraceratherium was a browser with a diet consisting of relatively soft leaves and shrubs.
Elasmotherium 	**90. *Elasmotherium*** - Meaning of the name: Siberian unicorn - Periods: Quaternary - Years (Epoch): 2.6 MYA to 0.039 MYA (Pleistocene) - Species: *Elasmotherium sibricum* (Mammalia) - - Distribution of species: Eurasia - Elasmotherium is thought to have had a keratinous horn, indicated by a circular dome on the forehead. There was likely a large hump of muscle on the back, which is generally thought to have supported a heavy horn. - The feet were unguligrade, the front larger than the rear, with 3 digits at the front and rear, with a vestigial fifth metacarpal. - size of a mammoth and is thought to have borne a large, thick horn on its forehead.

Megalochelys 	**91. *Megalochelys atlas*** - Meaning of the name: - - Periods: Neogene to Quaternary - Years (Epoch): Late Miocene to Early Pleistocene - Species: *Megalochelys atlas* (Reptilia) - Distribution of species: Asia, Eastern Europe - an extinct species of giant cryptodiran tortoise - It is widely suspected that the species went extinct due to the arrival of Homo erectus, due to staggered extinctions on islands co-inciding with the arrival of H. erectus in these regions
Megaceros Elk 	**92. *Megaloceros*** - Meaning of the name: Great horn - Periods: Quaternary - Years (Epoch): 1.2 MYA (Pleistocene) to 0.0077 MYA (Holocene) - Species: *Megaloceros giganteus* (Mammalia) - Distribution of species: Eurasia - An extinct species of deer and is one of the largest deer that ever lived. Best known as Irish elk or giant elk. - Have the largest antlers of any known deer, a maximum of 3.65m from tip to tip. One of the survivors from extreme climatic change of the Last Ice Age. - the Irish elk physically resembled reindeer, and the body proportions of the Irish elk are similar to those of the cursorial addax, oryx, and saiga antelope. These include the relatively short legs, the long front legs nearly as long as the hind legs, and a robust and cylindrical body.

Daeodon 	**93. Daeodon (Hell pig)** - Meaning of the name: Dreadful teeth - Periods: Paleogene to Neogene - Years (Epoch): 29 MYA (Oligocene) to 15 MYA (Miocene) - Species: *Daeodon shoshonensis* (Mammalia) - Distribution of species: North America - The type species is Daeodon shoshonensis is the last and largest of entolodonts - Because Daeodon has a mix of different tooth types it has been imagined to be an omnivore capable of foraging for plants, particularly certain parts like roots and tubers, as well as perhaps scavenging carrion, just like warthogs have been seen to do in Africa today - Although pig-like however, it is still not certain how close entelodonts are related to pigs, or even if at all.
Doedicurus 	**94. *Doedicurus*** - Meaning of the name: mortar tail - Periods: Quaternary - Years (Epoch): 2 MYA (Pleistocene) to 0.007 MYA (Holocene) - Species: *Doedicurus clavicaudatus* (Mammalia) - Distribution of species: South America - One of the largest glyptodonts ever lived, a group of mammals with heavy body armour that can rolled to protect themselves against predator. Glyptodonts include the modern armadillo species. - Doedicurus was likely a grazer, but its teeth and mouth, like those of other glyptodonts, seem unable to have chewed grass effectively, which may indicate a slow metabolism

	- It has spike tail and may have swung this in defense against predators or in fights at speeds of perhaps 11m/s or 40km/h
Bullockornis Planei 	**95. *Bullockornis* (Demon duck of doom)** - Meaning of the name: Ox bird - Periods: Neogene - Years (Epoch): 15 MYA (Middle Miocene) - Species: *Bullockornis planei* (Aves) - Distribution of species: Australia - The bird's skull is larger than that of small horses with very large beak suited for shearing. - The genus is an extinct flightless bird that was believed related to geese and ducks - nicknamed the demon-duck of doom or thunderduck

CARNIVORES

Dire Wolves

96. *Canis dirus* (Dire Wolf)

- Meaning of the name: Fearsome dog
- Periods: Quaternary
- Years (Epoch): 0.125MYA (Late Pleistocene) to 0.0095 MYA (Early Holocene)
- Species: *Canis dirus* (Mammalia)
- Distribution of species: North America, South America, Asia
-
- Its teeth were larger with greater shearing ability, and its bite force at the canine tooth was the strongest of any Canis species.
- Dire wolf is thought to have been a pack hunter. They were originated from North America and migrated to South America and part of Asia before came back again to North America before their extinctiopn shortly after the Last Ice Age.
- The extinction of the large carnivores and scavengers is thought to have been caused by the extinction of the megaherbivore prey upon which they depended.The cause of the extinction of the megafauna is debated but has been attributed to the impact of climatic change, competition with other species including overexploitation by newly arrived human hunters, or a combination of both

Giant short faced bear

97. *Actodus*

- Meaning of the name: Giant short-faced bear
- Periods: Quaternary
- Years (Epoch): 1.8 MYA (Middle Pleistocene) to 0.01MYA (Early Holocene)
- Species*: Arctodus simus* (Mammalia)
- Distribution of species: North America

	- One of the largest known terrestrial mammalian carnivores that has ever existed. One adult consumes 16kg flesh per day to survive. - It moved in a pacing motion like modern bears, making it built more for endurance than for great speed. - Extinct during the Last Ice Age.
Saber-toothed Tiger 	98. *Smilodon* (Saber-toothed Tiger) - Meaning of the name: Scalpel or two-edged knife tooth - Periods: Quaternary - Years (Epoch): 2.5 MYA (Early Pleistocene) to 0.01 MYA (Early Holocene) - Species: *Smilodon populator* (Mammalia) - Distribution of species: North America, South America - Although commonly known as the saber-toothed tiger, it was not closely related to the tiger or other modern cats. Extinct during the Last Ice Age. - Smilodon was more robustly built than any extant cat, with particularly well-developed forelimbs and exceptionally long upper canine teeth - Longest found of the long canine teeth are at about 28cm. Fed on largemammals such as camel and bison.

Megalania 	**99. *Megalania*** - Meaning of the name: Great roamer - Periods: Quaternary - Years (Epoch): 1.5 MYA to 0.04 MYA (Pleistocene) - Species: *Megalania prisca* (Reptilia) - Distribution of species: Australia - extinct giant goanna or monitor lizard - Megalania is the largest terrestrial lizard known to have existed. Judging from its size, it would have fed mostly upon medium- to large-sized animals, including any of the giant marsupials such as Diprotodon, along with other reptiles and small mammals, as well as birds and their eggs and chicks. - Being a member of Anguimorpha, Megalania may have been venomous and if so, would be the largest venomous vertebrate known
Boidae 	**100. *Titanoboa* (gargantuan Boidae)** - Meaning of the name: Titanic boa - Periods: Paleogene - Years (Epoch): 60 to 58 MYA (Middle to Late Paleocene) - Species: *Titanoboa cerrejonensis* (Reptilia) - Distribution of species: South America - Titanoboa was vaguely like modern-day constrictors, but only it was much larger. In fact, it is the largest species of snake that had ever lived on planet Earth