

DINO JAWS

BEYOND THE EXHIBITION STUDENT WORKSHEETS

(students should reference Dinosaur Information Sheets)

Dino Jaws is supported by:
City of San Diego Commission for Arts and Culture
Walter J. and Betty C. Zable Foundation

Baryonyx

1. *Baryonyx* was a big dinosaur! What was the height and length of *Baryonyx*?

Height _____

Length _____

2. *Baryonyx* was one of the few known _____ dinosaurs, which means it has a primary diet of fish.
3. *Baryonyx* has a long, low snout with narrow _____ containing finely serrated teeth. The hook-like _____ also helped it hunt its prey.
4. The serrations, or saw-like edges, on the teeth of *Baryonyx* were extremely fine and small. How many of these ridges could fit into ONE millimeter? _____
5. *Baryonyx* had almost twice as many teeth as *Tyrannosaurus rex*. The crocodile-like jaws held up to _____ teeth!
6. *Baryonyx* had a strange bump on the nasal bones and scientists are not sure why. Why do YOU think this species had this bump? What would be a reason or an advantage?

Euoplocephalus

1. *Euoplocephalus* has a name with Greek origin meaning _____
which is clearly a good name when you look at this animal's head!
2. *Euoplocephalus* had a low-slung body and extensive _____.
However, it is best known for the great club-like _____.
3. *Euoplocephalus* was probably a lot like the modern hippopotamus and rhinoceros. It
is thought to have been a (n) _____, eating only plants, and with
the broad muzzle it probably was a non-selective feeder. What does it mean to be a
non-selective feeder? _____

4. *Euoplocephalus* had a complex _____, suggesting it had a
good sense of smell.
5. *Euoplocephalus* probably had more complex jaw movements than just simple
up-and-down movements. Scientists have looked at _____ wear and
_____ articulation to prove the idea of the jaws being pulled back and
pivoting inward.
6. *Euoplocephalus*' jaw seemed rather advanced for the time period in which it lived.
Speculate as to how the jaws and teeth could have been advantageous for its survival.

Tyrannosaurus

1. So many *Tyrannosaurus* skeletons have been found and examined that scientists have significant research findings on its biology, life history, diet, and even the way it _____.
2. *Tyrannosaurus* is best known for its _____ and jaws. With a 1.5 m (5 ft) long skull, and teeth up to 30 cm (12 in) long, the bite force generated was estimated at _____ p.s.i., the strongest of any terrestrial animal that has *ever* lived!
3. *Tyrannosaurus*, like other theropods, replaced its _____ quite rapidly making sure they were sharp and showing no signs of wear.
4. There have been multiple and complex debates surrounding the life history of *Tyrannosaurus* and how it ate. Most paleontologists today agree *Tyrannosaurus* was both a _____ and a _____, like other carnivores today.
5. *Tyrannosaurus* teeth could crush bone and therefore extract the marrow within.

However, its teeth were not well-adapted to _____ bone like hyenas, and therefore probably did not consume much bone in its diet.
6. Pretend you are a paleontologist. Now knowing what we know about *Tyrannosaurus*' teeth, jaws, and movements, explain why YOU FEEL *Tyrannosaurus* was a predator, scavenger, or both.

Brachiosaurus

1. *Brachiosaurus* had a proportionally long neck, small skull, and large overall body size. However, the forelimbs were longer than the hind limbs making the overall body inclined

and trapezoidal in shape, similar to what a modern _____ looks like today.

2. *Brachiosaurus* is best known for its ability to nip or crop vegetation from high trees.

This feeding strategy is known as _____, which meant *Brachiosaurus* could eat leaves from trees as high as 9m (30 ft) off the ground!

3. *Brachiosaurus* size and weight averaged about 40 tons, which is equivalent to

_____.

4. *Brachiosaurus* was also over _____ ft. long, making it twice the length of the California Grey Whale.

5. *Brachiosaurus* had only about _____ different species and lived from

_____ MYA to _____ MYA. This not only makes them rare, but their time here on Earth was very brief, geologically speaking.

6. *Brachiosaurus* had to eat a lot of vegetation. Individual intake is estimated at _____

lbs. to _____ lbs. of plant matter daily.

7. Many comparisons have been made about the *Brachiosaurus* and the modern giraffe. Describe what would be necessary to keep a *Brachiosaurus* in a habitat and what would have to be done to make sure it survived in today's world.

Iguanodon

1. The name *Iguanodon* is of Spanish-Taino and _____ origin meaning “Iguana Tooth.” This is because it had teeth like a (n) _____, only larger.
2. *Iguanodon* was named in 1825, and it was the second type of dinosaur formally named after *Megalosaurus*. Together with *Hylaeosaurus*, it was one of the three genera originally used to define _____!
3. *Iguanodons* were large, bulky herbivores that could shift on-the-fly from _____ to _____; that is running on two legs then able to run on four legs.
4. The skull of *Iguanodon* was structured in such a way that as the jaw closed shut, the bones holding the teeth in the upper jaw would _____ out. This would cause the inner surfaces of the upper jaw teeth to rub against the outer surface of the lower jaw’s teeth, _____ anything caught in between like _____.
5. Because the tooth rows are deeply inset from the outside of the jaw, it is believed that *Iguanodon* had some sort of _____ structure to retain food in the mouth before swallowing.
6. The genus *Iguanodon* in general has been tied to the advance of angiosperms (flowering plants) due to the dinosaurs’ inferred low browsing feeding habits. Explain how this animal helped plants thrive and compare it to other animals living today that do something similar.

Velociraptor

1. *Velociraptor* is derived from Latin words (*velox* meaning 'swift' and *raptor* meaning 'robber') and is a genus of dromaeosaurid theropod that lived approximately

_____ ago.

2. *Velociraptor* was probably a carnivore with a long tail and an enlarged

_____ - _____ claw on each foot, which is thought to have been used to

_____ its prey.

3. *Velociraptor*'s skull was uniquely up-curved, _____ on the upper

surface and _____ on the lower. How many teeth lined each side of

the *Velociraptor* jaw? _____

4. Several traits, adaptations, and characteristics we thought about *Velociraptor* have changed over the years. Name at least two things we thought about *Velociraptor* that we know are NOT true today.

5. *Think outside the fossil box*: On the back of this sheet of paper, explain the **RPR Method** (raptor prey restraint) thought to have been used by *Velociraptor*. Compare and contrast it to a modern bird of prey.

Coelophysis

1. *Coelophysis* is known from a number of complete fossil skeletons and was a lightly built dinosaur measuring _____ in length and _____ tall at the hips.
2. *Coelophysis* conforms to the basic _____ body shape, but the chest bones display some interesting and special characteristics like having a _____ or 'wishbone', the earliest known example in a dinosaur.
3. *Coelophysis* had a long narrow head with sharp, curved, jagged teeth showing it was a _____, probably eating small, lizard-like animals that were found within some of its body cavity fossils.
4. The teeth of *Coelophysis* were typical of predatory dinosaurs, blade-like and curved with fine _____ on both leading and trailing edges.
5. Catastrophic flash floods were common in the range of *Coelophysis* and during the time period in which it lived. Why is this important for paleontologists to know and remember when looking at *Coelophysis* fossils?
6. Imagine you are a paleontologist in the field digging up fossils. Do you think *Coelophysis* was a pack hunter? What evidence do you have to support your conclusions? What are the advantages of pack hunting?

Oviraptor

1. *Oviraptor* is a genus of small Mongolian theropod dinosaur first discovered in 1924. Its genus name is Latin for ‘_____ - _____’.
2. Studies and findings show *Oviraptor* was probably sitting on eggs belonging to *Oviraptor* itself, meaning the original specimen found was probably _____ its eggs, not _____ them.
3. _____ from more primitive *Oviraptors* show an extensive covering of feathers on the body, wings, and tail fans.
4. *Oviraptor* was originally presumed to have eaten _____. The idea of a crushing jaw was first proposed because of the toothless beak found on the original skull. Together with an extension of several bones below the jaw from the palate, this would have made a (n) ‘_____’ tool.
5. *Oviraptor* is traditionally depicted with a distinctive crest, similar to the ‘horn’ found on what modern bird in Australia? _____
6. What is the existing fossil evidence showing *Oviraptor* was occasionally a carnivore?

7. Paleontologists today are still uncertain what the diet of *Oviraptor* might have been. By looking at the skull, jaws, and teeth, what do you hypothesize its diet *most likely* consisted of?

Edmontosaurus

1. *Edmontosaurus* is a genus of crestless hadrosaur (or duck-billed dinosaur.) Their fossils have been found in rocks of western _____ dating from the Late to Early Cretaceous Period _____ to _____ million years ago.
2. *Edmontosaurus* was a bulky animal measuring _____ long and weighing around _____. It had a long, laterally flattened tail and a head with an expanded, duck-like beak. This beak was toothless and both the upper and lower beaks were extended by _____ material.
3. The type and shape of *Edmontosaurus* teeth are very significant. The _____ of teeth were present only in the upper cheeks and main bone of the lower jaw. The teeth were continually _____, taking about half a year to form. They grew in columns with an observed maximum of _____ in each, and the number of columns varied based on the animal's size.
4. *Edmontosaurus* was a large terrestrial _____. It used its broad beak to cut loose food, perhaps by _____, or by closing the jaws in a clamshell-like manner over twigs and branches and then _____ off the more nutritious leaves and shoots.
5. Hypothesize as to why *Edmontosaurus* perhaps adapted both the behavior to chew food and the physical characteristics to do so. What would be the advantage of this adaptation?

Protoceratops

1. *Protoceratops* is Greek meaning, ‘ _____ ’.

It belongs to a genus of sheep-sized _____ ceratopsian dinosaur and lived in the Early Cretaceous Period approximately _____ years ago.

2. *Protoceratops* was rather small in comparison measuring approximately

_____ in length and _____ high at the shoulder. A fully grown adult would have weighed less than _____!

3. *Protoceratops* was a relatively small dinosaur but had a proportionately large skull. It was

a quadrupedal _____ with a parrot-like _____ and teeth in the _____. These teeth were distinctly different and defined the diet of the *Protoceratops*. This animal appears to have had muscular jaws capable of _____.

4. Why do paleontologists think *Protoceratops* lived in herds? _____

5. Imagine *Protoceratops* was still alive today. Describe the habitat or environment in which you would find this animal. How would it live? What would it need to survive? What would it eat? Is there another animal today requiring the same habitat? Explain.