

Discovering Dinosaurs

DINOSAUR BIOLOGY BASICS

Grades

K-4

Objective

These activities will ground students in the basics of dinosaur biology, physical features, size, and behavior.

Activities

- What is a Dinosaur?
- How Big Were the Dinosaurs?
- What Teeth Tell Us
- Grouping Dinosaurs



AMERICAN MUSEUM
OF NATURAL HISTORY

Source: <https://www.amnh.org/learn-teach/curriculum-collections>. Retrieved 02.04.22

What is a Dinosaur?

Activity for Grades K-4

Introduction

Dinosaurs are prehistoric reptiles that have lived on Earth from about 228 million years ago to the present. Modern birds are one kind of dinosaur because they share a common ancestor with non-avian dinosaurs. Non-avian dinosaurs (all dinosaurs besides birds), which are now extinct, varied greatly in shape and size. Some weighed as much as 80 tons and were more than 120 feet long. Others were the size of a chicken and weighed as little as 8 pounds.

All non-avian dinosaurs lived on land. Some may have gone into the swamps and lakes for food, but they did not live entirely in water. Meat-eaters walked on two legs and hunted alone or in groups. Plant-eaters walked on either two or four legs and grazed on plants.

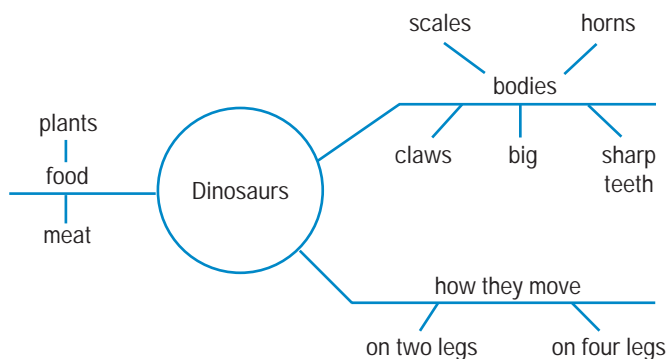
The feature that distinguishes dinosaurs from other reptiles is a hole in the hip socket. This feature allowed dinosaurs to walk upright. *Pterosaurs*, or flying reptiles, and *plesiosaurs*, ocean-dwelling reptiles, did not have this feature and were not dinosaurs.

Objective

This activity will help students understand the difference between dinosaurs and other animals.

Materials

- Picture of a dinosaur and a picture of a lizard or alligator (from a nature magazine or calendar)
- **Dinosaur or Not?** duplicated for each student
- Crayons
- Dinosaur books (You can find recommended books at www.amnh.org/resources/exhibitions/dinosaurs/)



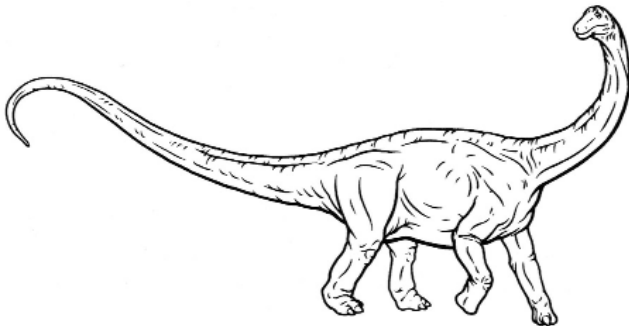
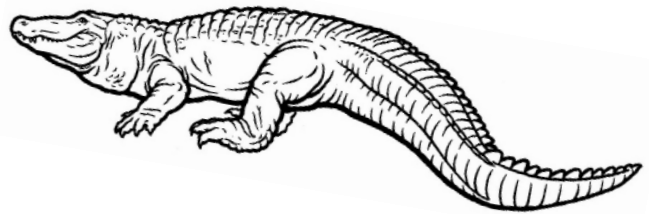
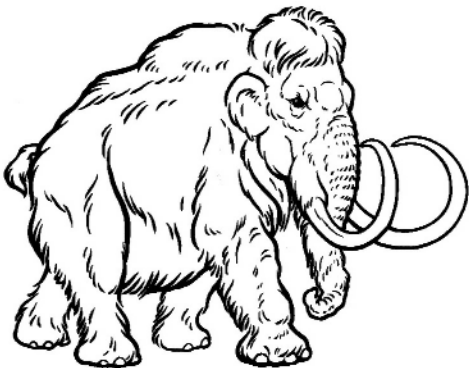
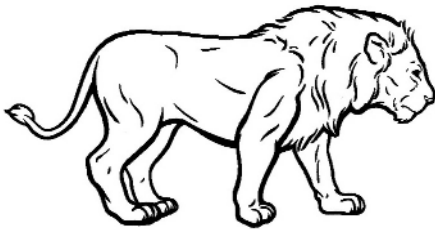
Procedure

1. Write *What Is a Dinosaur?* on the chalkboard. Tell students that today you will explore this question. Have students work in small groups. Distribute dinosaur books to each group. Give groups 10 minutes to look through the books and find three interesting facts about dinosaurs.
2. Have groups report their facts to the rest of the class. Using students' responses, create a semantic map like the one shown.
3. Display the pictures of the lizard and the dinosaur. Ask students how the two reptiles are different. Point out that the lizard has legs that sprawl out to the side, while the dinosaur's legs are directly underneath its body. Explain that dinosaurs had a hole in their hip socket that allowed them to stand upright. Other reptiles, like lizards, do not have such a hole and therefore are not dinosaurs. Call on volunteers to imitate a sprawling stance and a dinosaur stance. Have them try walking forward using each stance.
4. Distribute **Dinosaurs or Not?** to each student. Instruct students to look carefully at each animal and to color those that are dinosaurs. When students are done, review their answers with them. (Answers: The lion, woolly mammoth, and alligator are *not* dinosaurs.)
5. As an extension to this activity, have students play a riddle game. Have students work with a partner. Distribute index cards. Have partners choose a dinosaur or another animal. Have them write three clues that tell about the organism's features on one side of the card. The answer to the riddle should be written on the back. Call on partners to read their clues aloud. Have the class guess what animal or dinosaur is being described.

Dinosaur or Not?

Name _____ Date _____

Look at the animals. Color the animals that are dinosaurs.



How Big Were the Dinosaurs?

Activity for Grades K-4

Introduction

In the Roosevelt Memorial Hall at the American Museum of Natural History, a *Barosaurus* rears up to a height of 50 feet as it protects its offspring from an *Allosaurus* attack. Some dinosaurs, such as the *Barosaurus*, were quite large and may have weighed as much as 35 tons. But other dinosaurs, such as *Compsognathus*, were about the size of a chicken and weighed only eight pounds.

Objective

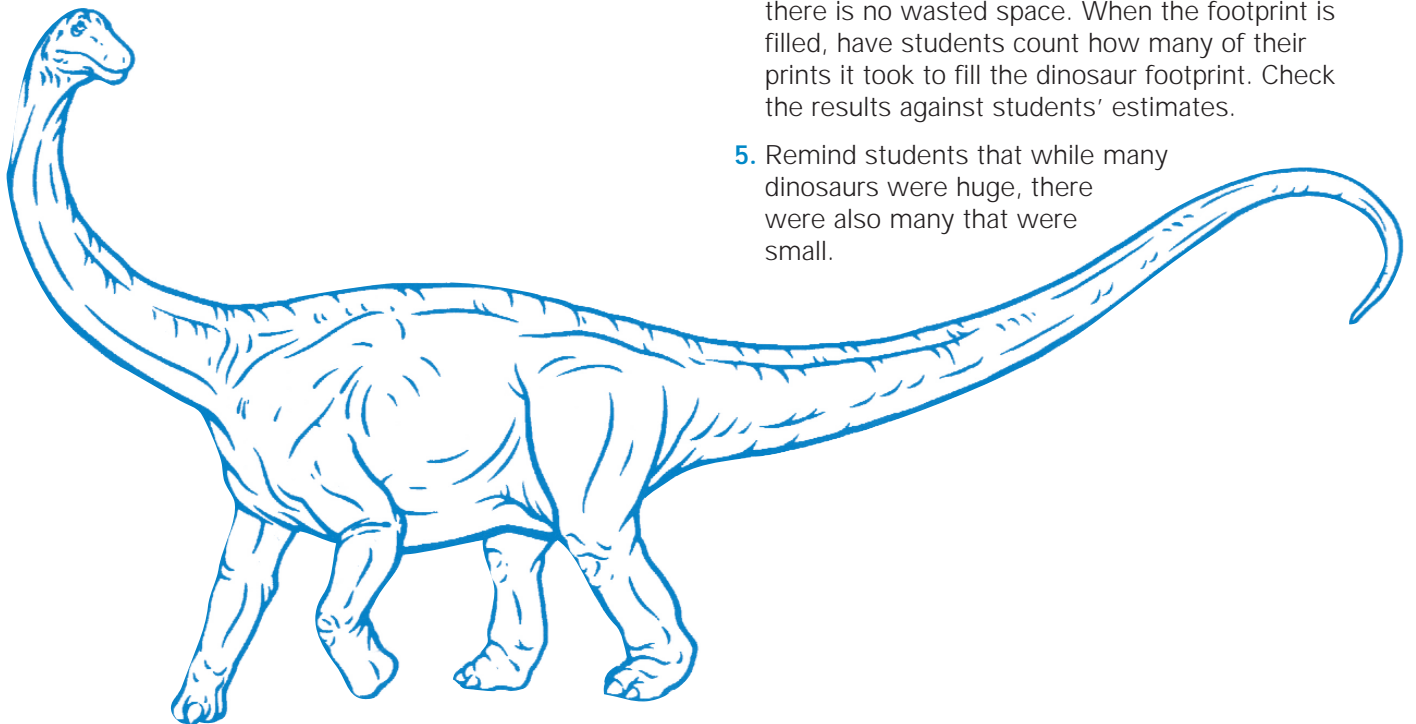
In this activity, students will begin to explore the size of the large dinosaurs by comparing their feet to the foot of a large *Apatosaurus*.

Materials

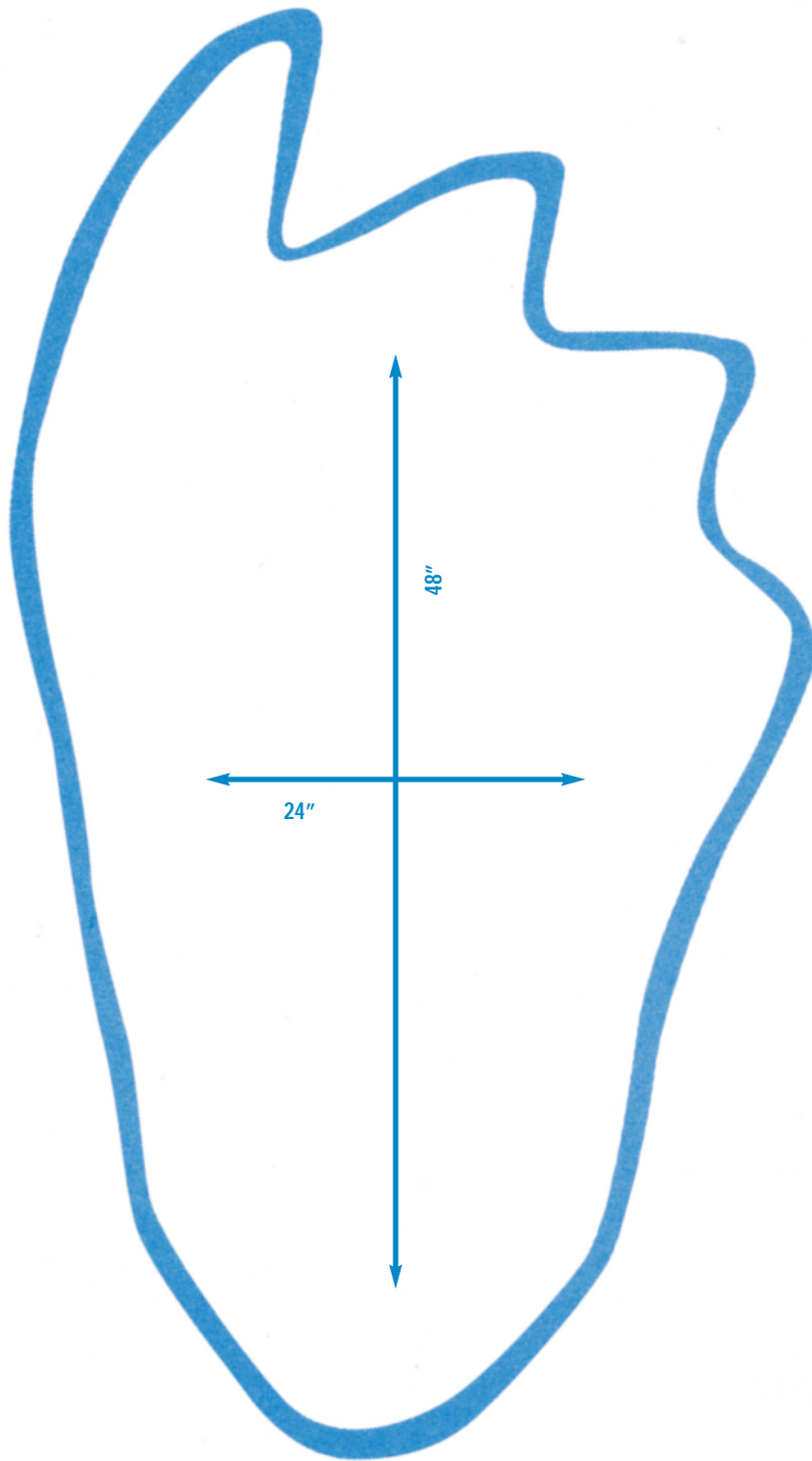
- Construction paper
- Safety scissors
- Crayons
- Glue
- An *Apatosaurus* footprint was approximately 24" by 48". Use chart paper and the footprint outline on the next page to create a footprint of this large dinosaur.

Procedure

1. Ask students to name some of the dinosaurs they know and to describe how big they were. Suggest that they compare the dinosaur's size to known objects, such as a school bus, house, building, etc.
2. Display the footprint and explain that it is the approximate size of a footprint of *Apatosaurus*, a dinosaur that was about 90 feet long and weighed about 35 tons. Tell students they are going to compare their footprints with that of the large dinosaur.
3. Have students work with a partner. Distribute construction paper, crayons, and scissors to the class. Have each student trace their own footprint on the construction paper and cut it out. Allow students time to compare their individual footprints with the dinosaur footprint.
4. Ask students to estimate how many of their footprints would fit in one footprint of an *Apatosaurus*. Write the various estimates on the board. Tape the *Apatosaurus* footprint to the chalkboard. Call on students, one at a time, to glue their footprint on the *Apatosaurus* footprint. Make sure students glue the footprints right next to each other so that there is no wasted space. When the footprint is filled, have students count how many of their prints it took to fill the dinosaur footprint. Check the results against students' estimates.
5. Remind students that while many dinosaurs were huge, there were also many that were small.



How Big Were the Dinosaurs?



What Teeth Tell Us

Activity for Grades K–4

Introduction

In the Hall of Ornithischian Dinosaurs at the American Museum of Natural History, robotic dinosaur skulls demonstrate how the dental adaptations of plant-eating dinosaurs worked. They show that as teeth wore down, new teeth grew to replace them. Paleontologists can tell a lot from the size of a dinosaur's skull and from the teeth in it. If the skull has powerful jaws and long, sharp teeth, then the dinosaur was most probably a meat-eater, a carnivore. The teeth were used to rip apart meat. Wide, flat teeth with ridges indicate that the dinosaur was a plant-eater, a herbivore. The teeth were used to mash and grind tough vegetation.

Objective

This activity will introduce students to teeth and help them differentiate between the teeth of meat-eaters and plant-eaters.



Materials

- Pictures of plant-eating and meat-eating animals (from nature magazines and calendars)
- Staple removers (one per group)
- Cotton balls
- Flat rocks (two per group)
- Leaves
- **What Teeth Tell Us** duplicated for each student
- Crayons
- Small mirrors

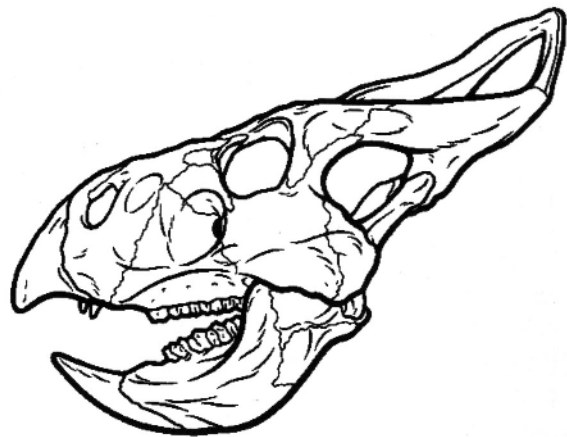
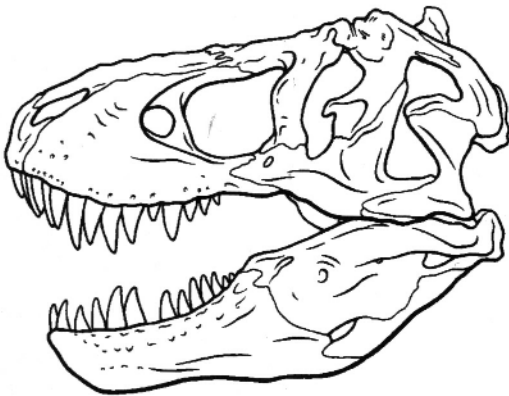
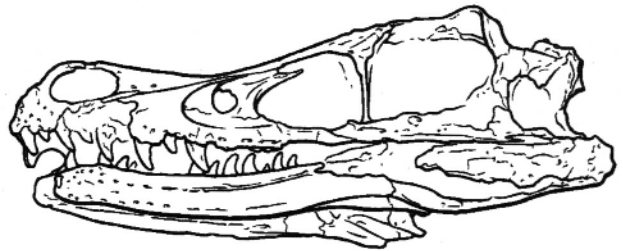
Procedure

1. Display the pictures of the animals, one at a time, to students. For each animal, ask students to describe the teeth. Ask them to name a food the animal might eat. Use questioning to elicit answers, leading students to the conclusion that long, sharp teeth are associated with meat-eaters and flat, blunt teeth are associated with plant-eaters. Tell students they are going to experiment to learn how the teeth of animals help the animals eat their food.
2. Have students work in small groups. Distribute the staple removers, cotton balls, rocks, and leaves to each group. Model what students are to do. Display the staple remover and tell students it represents the sharp teeth of a meat-eater. Show them how the staple remover works. Tell them the cotton balls represent meat. Display the rocks and tell students they represent the flat, grinding teeth of a plant-eater. Show them how the two rocks work by grinding them together. Tell them that the leaves represent plants. Have students experiment "eating" the cotton balls and leaves using the stapler remover and rocks. Have students determine which set of teeth worked best for each food. Then have students use the mirrors to examine their own teeth to identify what kind of teeth they have. Call on groups to share their findings. Students should conclude that they have both sharp, biting teeth and flat, grinding teeth. Point out to them that they are both meat-eaters and plant-eaters.
3. Distribute **What Teeth Tell Us** to students. Have them complete the exercise. (Answers: top left, herbivore; top right, carnivore; bottom left, carnivore; bottom right, herbivore.)

What Teeth Tell Us

Name _____ Date _____

Color the dinosaurs that eat meat blue. Color the dinosaurs that eat plants green.



Grouping Dinosaurs

Activity for Grades K–4

Introduction

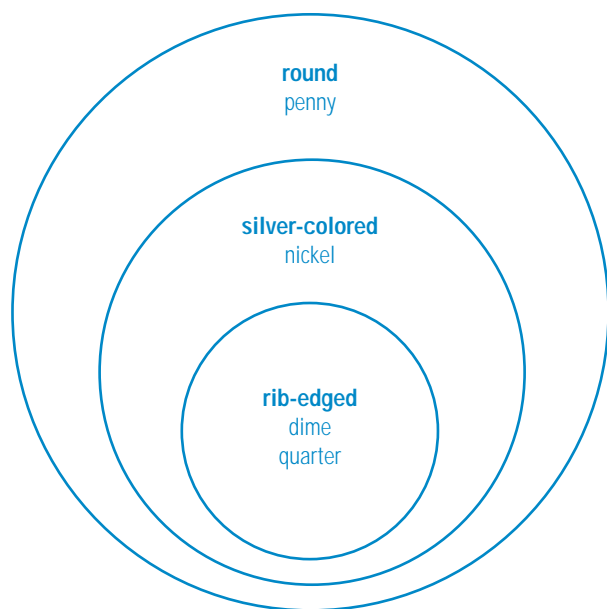
Paleontologists have identified over 700 species of dinosaurs. How do they determine which dinosaurs are related? At the American Museum of Natural History, scientists group animals using a method called cladistics. They look for unique features, such as a hole in the hip socket, that the animals share. Animals with like features are grouped together. A chart, called a cladogram, shows these relationships. Using cladistics, scientists can show how animals are linked to one another through a long and complex history of evolutionary changes.

Objective

In this activity, students will be introduced to sets and subsets as they group coins and dinosaurs.

Materials

- A set of coins (penny, nickel, dime, quarter)
- A copy of **Grouping Dinosaurs** for each group
- Construction paper
- Safety scissors
- Fun tack or masking tape
- Glue sticks



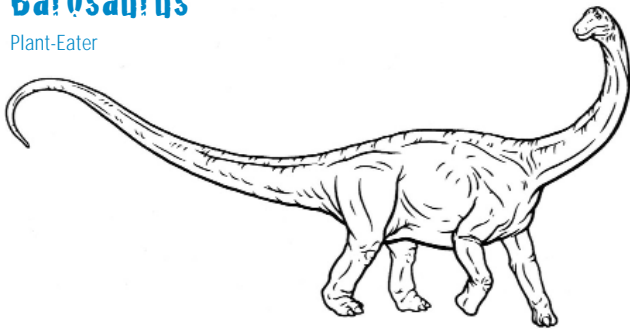
Procedure

1. Display the coins. Tell students they are going to group the coins. Have students work in groups. Distribute a set of coins, and construction paper to each group. Tell students that as you make the diagram on the board, they are to copy it on their papers.
2. Ask students to look at the coins and find one thing they all have in common. (They are all round.) Draw a large circle on the chalkboard. At the top of the circle right *round*. Place the coins inside the circle using fun tack.
3. Then have students find one thing that three of the coins share. (Three are silver-colored.) Draw a circle within the larger circle and label it *silver-colored*. Move the nickel, dime and quarter into that circle.
4. Have students find one thing that two of the remaining coins share. (Two are rib-edged.) Draw a circle within the second circle and label it *rib-edged*. Move the dime and quarter into that circle.
5. Have students identify the set (round coins) and the subsets (silver and rib-edged). Tell groups they will now work together to group dinosaurs.
6. Distribute **Grouping Dinosaurs**, construction paper, scissors, and glue sticks to each group. Have students decide how to sort the dinosaurs (meat eater / plant eaters, two- / four-legged, small / large). Have them arrange the dinosaurs into sets and subsets and glue them in place.
7. Have groups compare their sets. Discuss the different ways groups classified their dinosaurs. Display students' work. (Answers will vary.)

Grouping Dinosaurs

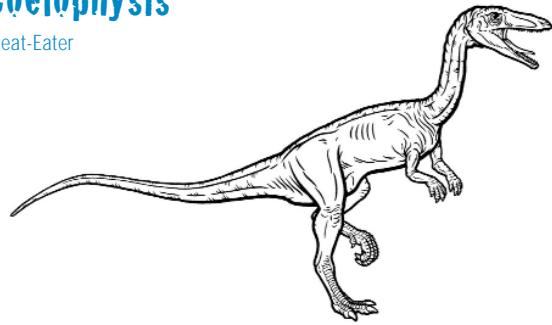
Barosaurus

Plant-Eater



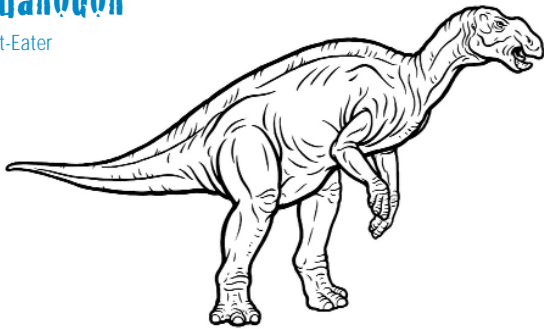
Coelophysis

Meat-Eater



Iguanodon

Plant-Eater



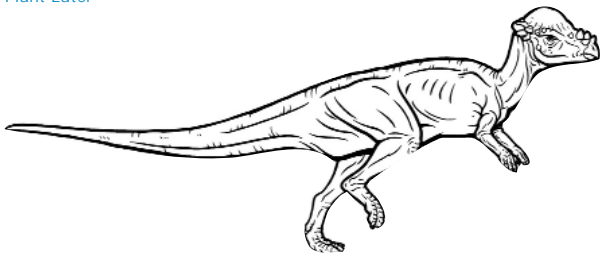
Ornithomimus

Meat-Eater



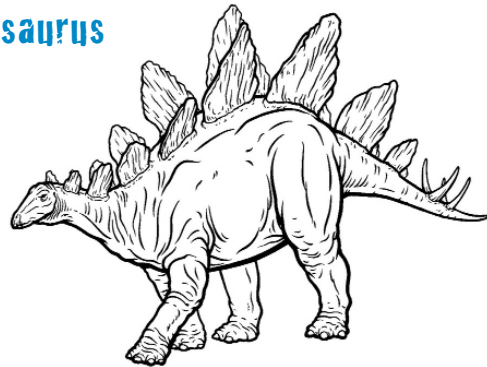
Pachycephalosaurus

Plant-Eater



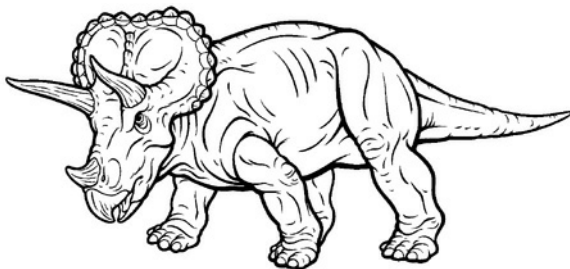
Stegosaurus

Plant-Eater



Triceratops

Plant-Eater



Tyrannosaurus rex

Meat-Eater

