

Lesson: What is a Dinosaur?

Grade level: K-6

Lesson duration: 30 minutes

Background:

- Paleontologists now consider birds to be living “avian dinosaurs” and extinct dinosaurs to be “non-avian dinosaurs.” Birds are dinosaurs, and by definition, dinosaurs have legs directly beneath their bodies, not sprawled out to the sides. This activity will have students observe several animals that are commonly confused as dinosaurs, as well as dinosaurs and birds. Students will classify the animals as “dinosaur” or “not a dinosaur,” and then as “avian dinosaurs” or “non-avian dinosaurs”
- Dinosaurs can be large like *T.rex* or *Triceratops* or small like *Velociraptor*. As scientists have made discoveries and learned more about dinosaurs, they have realized that dinosaurs of the past and modern birds have very similar features. Birds have similar skeletal structure, similar bones that no other animals have and unique features like feathers (paleontologists have found fossils of feathered dinosaurs). More and more evidence indicates that dinosaurs of the past and modern birds are not only related, but that birds evolved from a certain kind of dinosaur during the Mesozoic era.
- Leading paleontologists now use the terminology “non-avian dinosaurs” and “avian dinosaurs.” Non-avian dinosaurs are those dinosaurs that lived during the Mesozoic Era and are now extinct. Avian dinosaurs are a type of dinosaur that have feathers, can fly and that managed to survive the extinction event at the end of the Mesozoic era that killed the non-avian dinosaurs.
- Non-avian dinosaurs can also be called non-flying dinosaurs, and avian dinosaurs can also be called flying dinosaurs. However, this can lead to confusion because many people think of animals like Pterodactyl and Pteranodon when they hear the words “flying dinosaur”. Avian dinosaurs such as early and modern birds have more similarity to non-avian dinosaurs than Pterodactyls and Pteranodons have to either avian or non-avian dinosaurs. We consider animals like Pterodactyls and Pteranodons to be “flying reptiles”.
- In addition to the terminology above, by accepting birds as dinosaurs (which are classified as reptiles), we must also now accept birds as reptiles. This seems strange to us because we have an idea in our head about what a reptile should be.
- It is important to start thinking of modern birds as dinosaurs that came into existence as avian dinosaurs alongside the non-avian dinosaurs of the past and then survived extinction to live through to the present.

Kit materials:

- (Plastic animals #2, 3, 5, 6, 11, and 14-19 will be used for the avian vs. non-avian dinosaur section of the lesson)
- Two plastic bins
- “Dinosaur” and “not a Dinosaur” signs
- “Avian Dinosaur” and “Non-Avian Dinosaur” signs
- *Boy Were We Wrong About Dinosaurs* by Kathleen V. Kundlinkski
- Image of *Archaeopteryx* fossil

Lesson objectives:

- Students will be able to identify the differences between avian and non-avian dinosaurs, dinosaurs and non-dinosaurs
- Students will understand some of the ways in which modern birds evolved over time
- Students will be able to make educated guesses about which animals are dinosaurs and which are not
- Students will observe characteristics of different animals
- Students will determine which characteristics define dinosaurs
- Students will be able to explain why each animal was categorized as a dinosaur or not

Lesson procedure:

- Read *Boy Were We Wrong About Dinosaurs* to the class. Ask students if they have some new ideas about dinosaurs from the book.
- Ask students to kneel on the floor on their hands and knees. Have them put their legs and hands far outside of their bodies like a lizard, and explain that this is *not* how dinosaur legs looked. Have them put their knees and hands back underneath them, and explain that dinosaurs had legs under their bodies, not sprawled out to the side.
- Conduct a short discussion about how scientists made the connection between birds and dinosaurs (see “Dinosaur Basics Teacher Guide”). Create a list on the board or on a sheet of paper that records some of these ideas. Let students make guesses and contribute ideas.
- Place both plastic bins on a table, and label one “dinosaurs” and the other “not a dinosaur.” As a class, place each plastic animal in one bin or the other, stating the reason why it belongs in that category.
- Re-label the bins with the “avian dinosaurs” and “non-avian dinosaurs” signs. Using just plastic animals #2, 3, 5, 6, 11, and 14-19, repeat the same exercise. This can also be played as a game, with students holding up their answers on a piece of paper.