

Internet Resources

Periodically, Internet Resources are updated on our web site at www.libraryvideo.com

- tapestry.usgs.gov/ages/ages.html

These pages from the United States Geological Survey web site show how geologists study rocks from various time periods.

- www.amnh.org/exhibitions/expeditions/treasure_fossil/Fossils

The American Museum of Natural History presents an online expedition, telling the story of vertebrate evolution through graphic time lines and informative passages.

- www.strangescience.net

"Strange Science" chronicles how modern scientists reached many of the conclusions we have today, while reviewing some of the mistakes made by early scientists. "How to Make a Dinosaur" is extremely interesting.

- priweb.org

Fascinating facts about fossils await young geologists on the Paleontological Research Institution web site, which includes virtual tours of fossil collections. This site also explains how scientists use fossils to provide information about the Earth and its inhabitants.

- www.enchantedlearning.com/subjects/dinosaurs/index.html

"Zoom Dinosaurs" contains a wealth of information about dinosaurs and other animals that have inhabited the Earth.

Suggested Print Resources

- Holtz, Thomas R. Jr. *Dinosaur Field Guide: Jurassic Park Institute*. Random House, New York, NY; 2001.
- Lambert, David. *Dinosaur Encyclopedia*. DK Publishing, New York, NY; 2001.
- Lessem, Don. *The Dinosaur Atlas*. Firefly Books, Ontario, Canada; 2003.
- Taylor, Paul. *Fossil*. DK Publishing, New York, NY; 2000.

TEACHER'S GUIDE

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TITLES IN THIS SERIES

- ARCTIC & ANTARCTIC
- DINOSAUR
- HUMAN MACHINE (BODYZONE)
- MONSTER
- NATURAL DISASTERS
- PLANETS
- PREHISTORIC LIFE
- RAINFOREST (JUNGLE)

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V6052



Dinosaur

Grades 4–8

The *Eyewitness DVD Series* explores the natural world with fascinating film footage and nature photography fused with striking special effects and stunning graphics. The programs offer a unique "eyewitness" view of events that shape the Earth and the living things that inhabit it.

Interactive menus allow viewers to easily select and replay any section of a program. Other features include interactive assessment quizzes and "Hotspots" — video icons that appear throughout the program and allow students to further explore specific science content or areas of interest. Each title contains a segment that reveals all the behind-the-scenes wizardry that goes into the production of the *Eyewitness* series, along with recommended web sites for further research.

Included in this guide is a brief synopsis of the program, background on the science concepts presented in the show, discussion topics, activities, vocabulary and additional resources for students to explore.



Background

Imagine a book 225 pages long, each page equal to one million years. Dinosaurs would be the main characters for the first 160 pages. Mammals would take over for the last third of the book. Humans wouldn't appear until the top of the last page, one million years ago. And it wouldn't have been until the bottom of that page that we even knew dinosaurs existed.

The evidence unearthed by paleontology — the study of fossils and ancient life forms — has given new life to the long-extinct creatures we call dinosaurs, and set them roaming across the landscapes of our imagination. The name “dinosaur” was coined by an Englishman, Sir Richard Owen, when he declared that the fossils of giant animals being discovered in England in the early 1800s should be called “dinosauria,” meaning “terrible lizards.”

Fossils revealed that dinosaurs were similar to lizards in that they had scaly skin and laid eggs, but their body plans differed. The reptile design incorporated the short, sprawling legs of the lizard and the short, bent-kneed legs of ancient crocodiles. Dinosaurs evolved because of a major breakthrough in leg design. Dinosaur legs were longer, and tucked under the body. And this breakthrough came in both four- and two-legged models. Dinosaurs could not only stand up...they could run faster than anything else around.

Billions of dinosaurs must have lived during the 160-million-year period known as the Mesozoic Era. What was it like then? At the beginning of the Mesozoic Era, called the Triassic Period, when dinosaurs first evolved, low, shrubby, fern-like plants dominated the landscape. Next came the Jurassic Period, when huge coniferous forests and groves of cycads supported the heyday of the plant-eating dinosaurs. Then came the Cretaceous Period, when the western part of North America was covered with extensive rivers, deltas, swamps and marshes. Large herds of grazing dinosaurs were hunted by a smaller number of meat-eaters. Dinosaur herds obviously once roamed the American West like the buffalo of a more recent era. Fossil nesting grounds of some dinosaurs indicate that they cared for their young much like mammals do.

From fossilized footprints, called trace fossils, paleontologists can calculate how fast dinosaurs moved. The study of dinosaur dental records tells us about their feeding habits. The record for the most teeth belongs to Edmontosaurus with over 1,000 teeth. The largest herbivores such as Diplodocus and Brachiosaurus had peg-shaped teeth, much like a horse, which they used like rakes to strip leaves and needles off trees. Most meat-eaters, or carnivores, had dagger-like teeth. While we know when dinosaurs became extinct, we do not know for certain why they died out. What we do know is that dinosaurs will continue to fascinate humans, and life on earth will continue to evolve.

Vocabulary

Cenozoic Era — (“Current Time”) The current era, beginning about 65 million years ago with the extinction of the dinosaurs and marked by the dominance of mammals.

Deinonychus — (from Latin, meaning “terrible claw”) Carnivorous raptors that were the dinosaur equivalent of pack-hunting wild dogs or wolves.

evolution — A theory that all types of living organisms have their origin in other pre-existing types and that the differences among them are due to small changes in individual animals over many generations.

fossil — (from Latin, meaning “to dig”) Preserved evidence of living things that previously existed on the Earth, often found deep inside rock, peat, tar, ice or golden amber.

Mesozoic Era — (“Middle Time”) One of the major divisions of geological history, following the Paleozoic Era and preceding the Cenozoic Era. It is known as the Age of the Dinosaurs and lasted for 160 million years. This era consists of three periods:

Triassic Period — The first period of the Mesozoic Era, when both dinosaurs and tiny mammals began to appear.

Jurassic Period — The second time period of the Mesozoic Era, when dinosaurs ruled the Earth.

Cretaceous Period — The third period of the Mesozoic Era, when flowering plants appeared and dinosaurs abruptly disappeared.

paleontology — (British spelling: palaeontology) The science of studying fossils.

theropods — Meat-eating dinosaurs who used their short powerful neck and huge jaws to rip great chunks of meat off a kill, like T. rex, Albertosaurus, Baryonyx, Deinonychus, Coelophysis, Compsognathus and oviraptors.

ornithopods — Bird-hipped, plant-eating dinosaurs that often lived in herds for defense against predators. Examples are Iguanodon, Maiasaura, Tenontosaurus and Edmontosaurus.

oviraptors — (meaning “egg thieves”) Bird-like dinosaurs that ate eggs.

sauroopods — Big, plant-eating dinosaurs that used their long necks to go where no herbivore had ever gone — to the tops of trees. Examples are Brachiosaurus and Diplodocus.

Tyrannosaurus rex — (from Latin meaning “tyrant lizard king”) A very large, bipedal, carnivorous dinosaur with small forelegs that lived in the Upper Cretaceous period, and was primarily found in North America. First named “Dynamosaurus Imperiosus” by fossil hunter Barnum Brown, the species was renamed in 1905.

Discussion Topics

- Why are mistakes common in the science of paleontology?
- What happens after a fossil is brought into the lab?
- Why have some creatures, like sea urchins and cockroaches, changed very little over millions of years, while other animals have become extinct or have changed dramatically?
- Were dinosaurs cold-blooded like reptiles or warm-blooded like birds?
- Describe the nesting grounds of Maiasaura. How does this information change your opinion of dinosaurs?

Focus Questions

1. How did dinosaurs get their name?
2. Describe the differences between dinosaurs and reptiles.
3. Why do scientists study fossils?
4. How can scientists determine how fast dinosaurs moved?
5. How long did the Mesozoic Era last? What were the three periods of this era? How would you describe them?
6. Describe the tenth T. rex fossil, excavated by John Horner in 1990.
7. What evidence has been found to support the current theory about the extinction of dinosaurs?

Activities

- Allow students to virtually explore the environment during the reign of dinosaurs with activities and lessons from this web site, developed as part of the NASA “Classroom of the Future”:
www.cotf.edu/ete/modules/msese/dinosaur.html
- Direct students to the Dino Directory at the Natural History Museum of London’s web site to research and report on their favorite dinosaurs:
internt.nhm.ac.uk/jdtml/dino/
- Challenge students to learn more about the dinosaur fossils found in their region and share information about the pertinent researchers and dig sites. For example, students in the Northeast could research the unearthing of *Hadrosaurus foulkii* in Haddonfield, New Jersey, while students in the West could research any number of *Tyrannosaurus* finds, like “Sue” or “Black Beauty.”