Environmental Science Institute
THE UNIVERSITY OF TEXAS AT AUSTIN

2275 Speedway, Mail Code C9000
Austin, TX 78712
(512) 471-5847
www.esi.utexas.edu

The Secret Lives of Dinosaurs

Lesson Plan for Grades: High school
Length of Lesson: 3 hours

Authored by: Stavana Strutz for UT Environmental Science Institute
Date created: 08/16/2016

Subject area/course:
- Biology, Earth and Space Science

Materials:
- Computer
- Handout
- Art supplies: poster board or trifold board, markers, coloring pencils, construction paper

TEKS/SEs:

§112.34. Biology
(7) Science concepts. The student knows evolutionary theory is a scientific explanation for the unity and diversity of life. The student is expected to:
- (A) analyze and evaluate how evidence of common ancestry among groups is provided by the fossil record, biogeography, and homologies, including anatomical, molecular, and developmental.

(12) Science concepts. The student knows that interdependence and interactions occur within an environmental system. The student is expected to:
- (B) compare variations and adaptations of organisms in different ecosystems.

§112.36. Earth and Space Science
(8) Earth in space and time. The student knows that fossils provide evidence for geological and biological evolution. Students are expected to:
- (A) analyze and evaluate a variety of fossil types such as transitional fossils, proposed transitional fossils, fossil lineages, and significant fossil deposits with regard to their appearance, completeness, and alignment with scientific explanations in light of this fossil data.

Lesson objective(s):
- The student will describe the ecology, behavior, evolutionary relationships, and period of time a particular dinosaur lived.
- The student will be able to describe the dinosaur's coloration based upon fossil data.

Differentiation strategies to meet diverse learner needs:
- The teacher should ask students whether they prefer to read or watch videos to learn about concepts; then have students learn in their preferred learning style. However, the teacher may assign students certain methods to improve their skills. For example, if a student prefers reading, teachers may have them watch a video and take notes to improve their listening skills.
- ELL students and students with learning disabilities should have multiple forms of instruction including visual and written instruction sheets as well as a verbal instruction and demonstration.

ENGAGEMENT (35 minutes)
- Teacher will show the students the *Hot Science - Cool Talks #100* "The Secret Lives of Dinosaurs" or have them watch the lecture before class.

EXPLORATION (10 minutes)
- Each student will write two questions about the video as part of the evaluation. Teacher asks students to get into groups and share and answer their questions together.

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EXPLANATION (15 minutes)

- Teacher will have students come back together as a class and ask a series of questions based on the *Hot Science – Cool Talks* video.
  - How do we use science to explore dinosaur's lives?
  - How can we tell what dinosaurs looked like?
  - Were dinosaurs only covered in scales? If not, what else did they have?
  - What modern day organisms are dinosaurs most closely related to?
  - How do we know what colors dinosaurs were?
  - How do you think feathers originated?
  - Were dinosaur feathers used for anything other than flight? How can you tell?
  - How can we tell what behaviors dinosaurs may have exhibited?

ELABORATION (90 minutes)

- Students will act as paleontologists that discovered the fossilized remains of a dinosaur. They will choose a dinosaur and describe its ecology, its coloration and the purpose of the coloration. Students will also describe what fossils would be discovered from the dinosaur.

EVALUATION (30 minutes & throughout entire lesson)

- Students will share their media projects with the rest of the class. Other teams, will then evaluate the media projects based on the attached rubric.

SOURCES AND RESOURCES

- **Dr. Julia Clarke's *Hot Science - Cool Talks #102* "The Secret Lives of Dinosaurs"**, www.esi.utexas.edu/outreach/hot-science-cool-talks/archives/
- ***About Education Dinosaurs Habitat Slide Show,*** dinosaurs.about.com/od/dinosaurbasics/ss/Where-Did-Dinosaurs-Live.htm#step1
- ***Plumage Colors of an Extinct Dinosaur***, science.sciencemag.org/content/327/5971/1369
- ***Mesozoic Dinosaur Timeline***, www.britannica.com/science/Mesozoic-Era
- ***Geologic Time Scale***,www.factmonster.com/dk/science/dinosaurs/era-of-the-dinosaurs.html
- ***Pangaea Diagram***, www.gambassa.com/public/project/1869/KimberleyDanielsandDayanneGonzalez.html

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ELABORATION ACTIVITY

Purpose: To understand the ecology, evolution, and behavior of a particular dinosaur based upon fossil evidence and scientific sources. To create a media presentation to support the student's findings.

Materials:

- Computer
- Handout
- Art supplies: poster board or trifold board, markers, coloring pencils, construction paper

Safety Information: N/A

Procedure:

1. Distribute handout and materials to students.
2. Actively walk around the room while students are working to facilitate the project.

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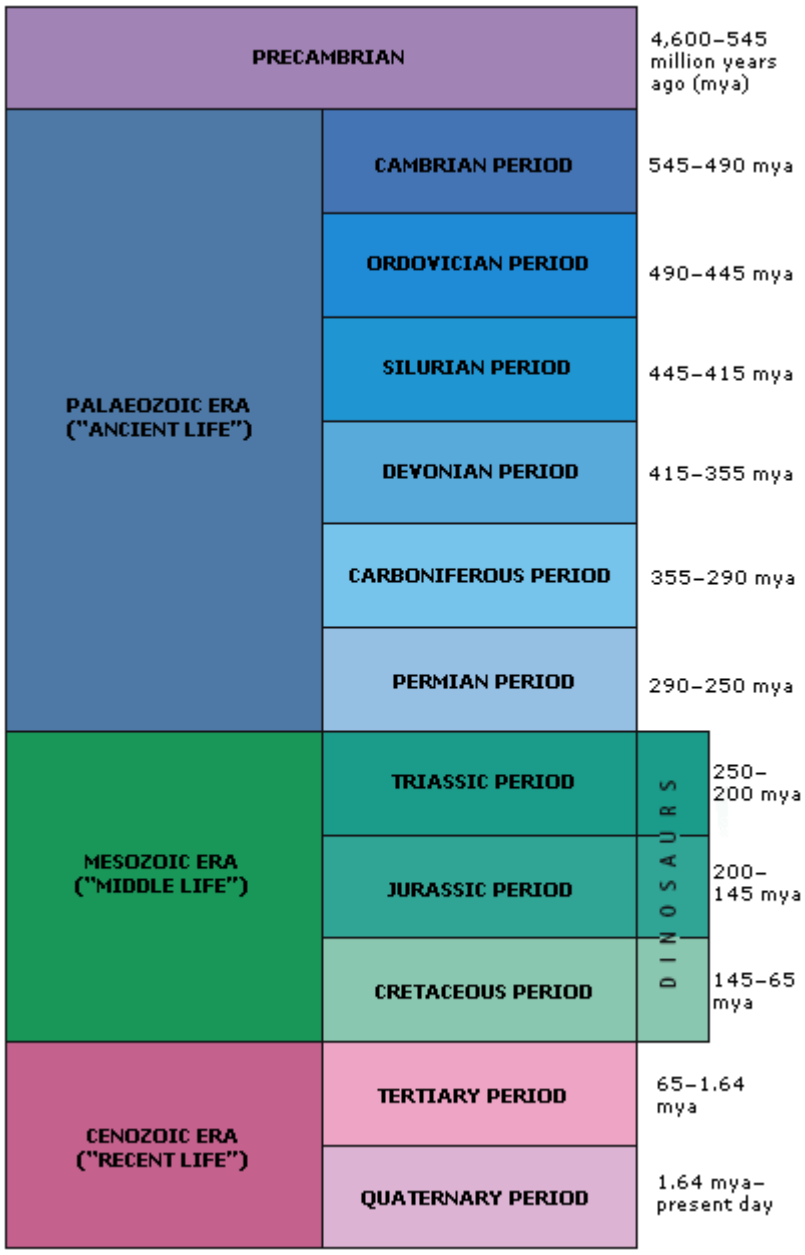
STUDENT HANDOUT:

Background information:

Dinosaurs lived between approximately 250 to 65 million years ago during the Mesozoic Era and during several different geological periods:



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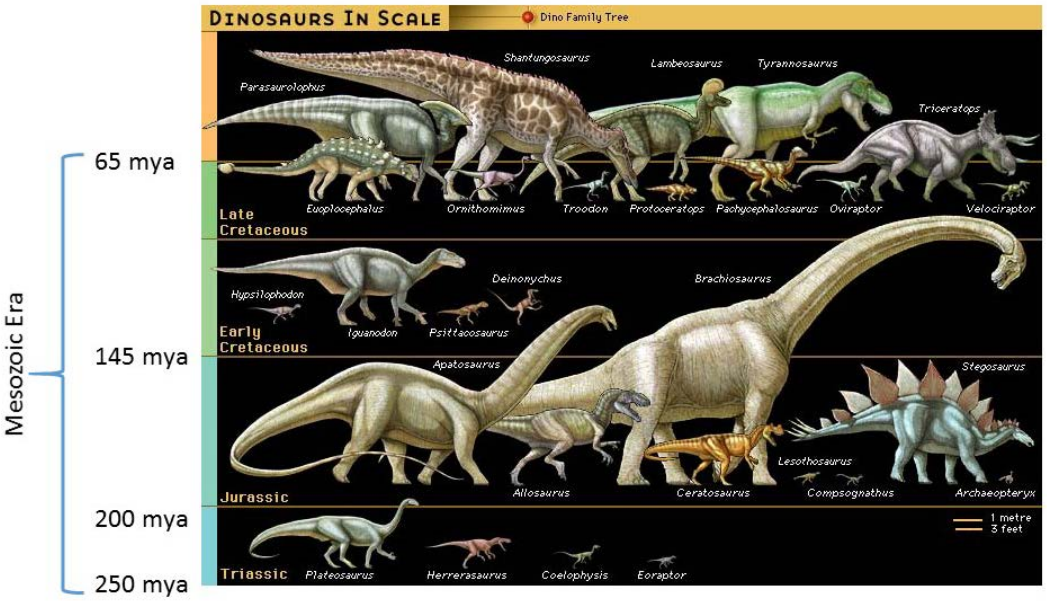
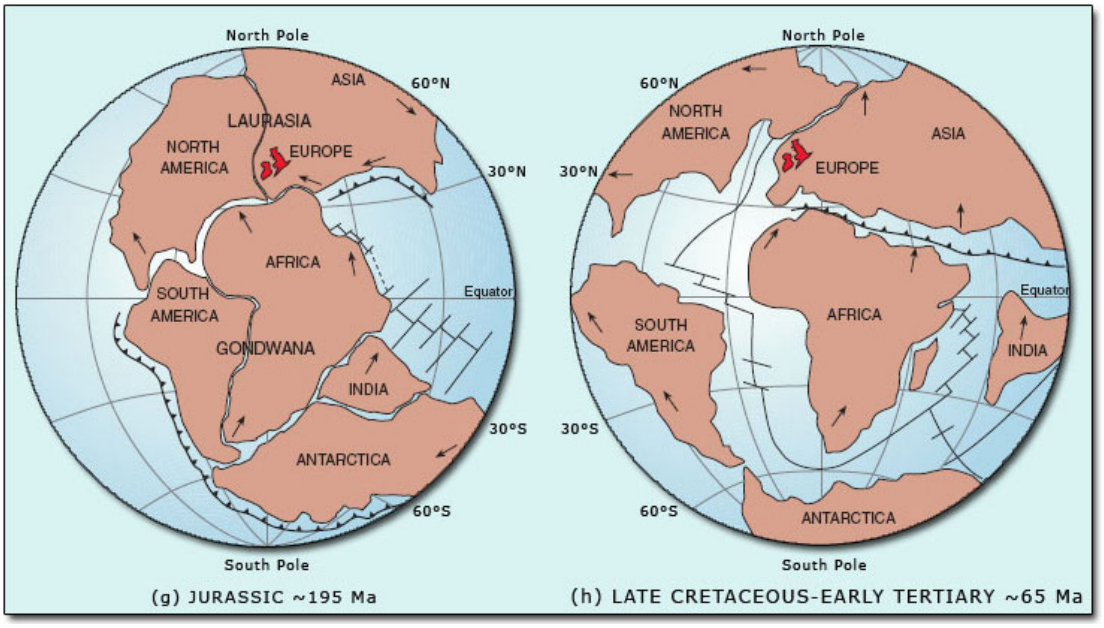


As you can see, there were many different species of dinosaurs living during different periods of time. Early dinosaurs are thought to have been small and bipedal (walked on 2 legs) and appeared during the Triassic period. At this point in time, all continents were connected into one single landmass, Pangaea. Dinosaur evolution followed habitat changes through time. Large dinosaurs appeared during the Jurassic period as did birds. During the Jurassic period, Pangaea began to break up. During the Cretaceous, Pangaea continued to break into the different continents we know today: North America, Europe, and Africa. As Pangaea broke up, more species of dinosaurs appeared and evolved to fill different niches in the new habitats that were appearing.



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You are a paleontologist, a scientist who studies the life that existed on earth before the present time. You have discovered the fossils of a particular dinosaur at a particular site across the globe. You have been contacted by the New York Times to give an interview about the fossils you discovered. Choose a specific dinosaur group from the list below and then select a species of dinosaur found in that group or make up a dinosaur based on your imagination:

1) Ceratopsians
2) Ornithopods
3) Tyrannosaurs
4) Raptors
5) Sauropods
6) Theropods
7) Pterosaurs

Then use your computer and library's resources to study the particular dinosaur you have discovered. The interview will focus mostly on the ecology and behavior of the dinosaur you have found. Prepare for the interview by creating a media presentation to share with the reporter that addresses the following questions:

1) Describe when the dinosaur lived (era, time period, mya).
2) Describe/illustrate the habitat (geography, geology, vegetation) present.
3) Describe the diet of your dinosaur.
4) Describe its relationship to other organisms (predator, prey, parasites, carnivorous, herbivorous, omnivorous, etc.)
5) Describe/illustrate the appearance of the dinosaur and what fossil evidence supports this description. (You may be creative here and make up the appearance as long as your fossil evidence supports its appearance).
6) Describe its behavior. (You may be creative here and make up the behavior as long as your fossil evidence supports its behavior).
7) Describe its phylogenetic or evolutionary relationships to other dinosaurs or birds.

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STUDENT HANDOUT:

Team: ________________________________

1- Poor	2 - Fair	3 - Good	4 - Excellent
Illustrations/Descriptions are unclear or irrelevant. Fewer than 3 questions were answered. Questions are not completely answered.	**Most parts present and correct. Illustrations & descriptions may be present, but may be unclear or irrelevant. 5 questions were answered.**	**All parts present and correct. Illustrations & descriptions are present. 6 questions were answered. Answers are correct.**	**All parts present and correct. Illustrations & descriptions are present. Answers the essential question. All questions were answered. Answers are correct and original.**

Comments: Questions:

Team: ________________________________

1- Poor	2 - Fair	3 - Good	4 - Excellent
Illustrations/Descriptions are unclear or irrelevant. Fewer than 3 questions were answered. Questions are not completely answered.	**Most parts present and correct. Illustrations & descriptions may be present, but may be unclear or irrelevant. 5 questions were answered.**	**All parts present and correct. Illustrations & descriptions are present. 6 questions were answered. Answers are correct.**	**All parts present and correct. Illustrations & descriptions are present. Answers the essential question. All questions were answered. Answers are correct and original.**

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Comments: Questions: