Lesson Title	Earth's History
Length of Lesson	1 class period (50 min)
Created By	Charles Vaughan
Subject	General Science
Grade Level	8
State Standards	3e
DOK Level	DOK 2 (Categorize, Compare)
DOK Application	Identify and summarize major events.
National Standards	5-8: C: Life Science 5-8: D: Earth and Space Science
Graduate Research Element	It is believed that some species became extinct from asteroid or comet collisions on Earth. My research, which entails the study of comets, may aid in confirming or denying this theory.

Student Learning Goal:

MS 8th Grade:

3e (Life Science): Explain energy flow in a specified ecosystem:

- Producers, consumers, and decomposers in an ecosystem

National Standards for Grades 5-8:

C: Life Science: Diversity and Adaptations of Organisms:

- Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival. Fossils indicate that many organisms that lived long ago are extinct. Extinction of species is common; most of the species that have lived on the Earth no longer exist.

D: Earth and Space Science: Earth's History:

- Fossils provide important evidence of how life and environmental conditions have changed.

Materials Needed (supplies, hand-outs, resources):

PowerPoint file (file name: INSPIRE_Vaughan_09_15_12_Powerpoint.ppt), video clips of dinosaurs or other ancient life, faux fossils (or real ones if you're lucky enough to have them), construction paper and scissors (enough for every student).

Lesson Performance Task/Assessment:

Students will be given basic information on the four major eras of the Earth: Precambrian, Paleozoic, Mesozoic, and Cenozoic. They will learn the approximate time

spans of these eras, as well as what geological processes and life were present. Students will also be asked to identify producers, consumers, and decomposers from each major era.

Lesson Relevance to Performance Task and Students:
Learning about the major eras has two benefits for science. First, geological motion (plate tectonics) can be further explained by discussing the super continents and their separation. Second, by using fossil evidence, students can see what creatures are now extinct and how adaptations may have occurred.

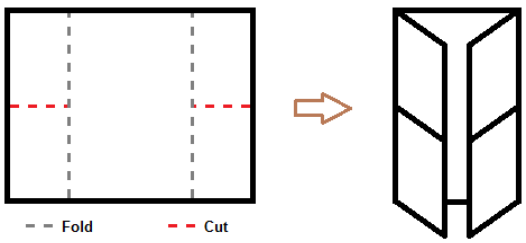
Anticipatory Set/Capture Interest:
We've dug up plenty of fossilized bones. How long ago did those creatures live? How did they die? What was life probably like for them during their era?

Guided Practice:
Much of this lesson is guided through instruction, with some video clips shown and fossil imprints passed around the classroom. Students will need to be shown how to fold the construction paper for taking notes.

Also, discuss how some creatures may become extinct. It is believed that the dinosaurs were eliminated due to asteroid/comet collision with Earth. This is an important element to my own research, since I study molecular composition of comets.

Independent Practice:
Construction paper note-taking aid:

- Have the students fold their construction paper in a window-shutter style (see image below). The students should cut the "shutters", giving four outside flaps.
- Students will then label each of the outside squares with the four major eras: Precambrian, Paleozoic, Mesozoic, and Cenozoic.
- During the presentation, students should write inside the flaps information about each era. This includes the time period, geology on Earth, and some producers/consumers.



Fossil identification:

- Pass a number of fossils around to every student. Students should attempt to identify the era of origin for the fossilized creature, as well as whether it was a producer or a consumer.

Remediation and/or Enrichment:
Remediation – IEP

Students can be encouraged to draw a fictitious creature from any single era. Have them identify whether this creature is a producer or a consumer.

Check(s) for Understanding:
Students should be able to identify producers and consumers after this lesson. They should also be able to estimate what ancient creatures came from which major eras in Earth's history.

Closure:
If a particular producer goes extinct, what would happen to its corresponding consumer? What do you think could happen next in Earth's history of life forms? Why do we believe that the Earth had multiple "super continents" throughout its history?

Possible Alternate Subject Integrations:
History, Biology

Teacher Notes:
Do not rely solely upon the PowerPoint. Integrate questions, videos, and props as needed.

Some of the materials used for this lesson were contributed by a partner university.