MISSOURI FOSSILS

SC/4EC/3A/04/a
Essential Skill 32

The student will compare and contrast common fossils found in Missouri (i.e. trilobites, ferns, crinoids, gastropods, bivalves, fish, mastodons) to organisms present on Earth today.

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Gasconade k-5

OBJECTIVES

1. Define fossil.
2. Identify how fossils are made.
3. Identify the following Missouri fossils:
    a. trilobites
    b. crinoids
    c. gastropods
    d. bivlaves
    e. mastodons
    f. ferns
    g. fish.

4. Students will compare Missouri fossils from the past with organisms present today.
5. Students will match fossils, to picture I.D. to similiar organisms present today.

SMART IDEAS WEB

WEB QUEST THROUGH THE VARIOUS FOSSILS

What is a fossil???

The word fossil comes from the Latin word fossilis, which means "dug up." Most fossils are excavated from sedimentary rock </subjects/dinosaurs/glossary/Sedimentaryrock.shtml>layers . Sedimentary rock is rock that has formed from sediment, like sand, mud, small pieces of rocks. Over long periods of time, these small pieces of debris are compressed (squeezed) as they are buried under more and more layers of sediment that piles up on top of it. Eventually, they are compressed into sedimentary rock. The lay that are farther down in the Earth are older than the top layers.

The fossil of a bone doesn't have any bone in it! A fossilized object has the same shape as the original object, but is chemically mc like a rock.

How are fossils made?

For about 3000 million years, life was present only in the oceans. The oldest fossils are therefore of marine creatures. When marine animals or plants died, their remains accumulated on the sea floor where they were buried by mud, sand or silt. Over very long periods, these sediments became sedimentary rock, and the animal or plant remains became encased in the rock.

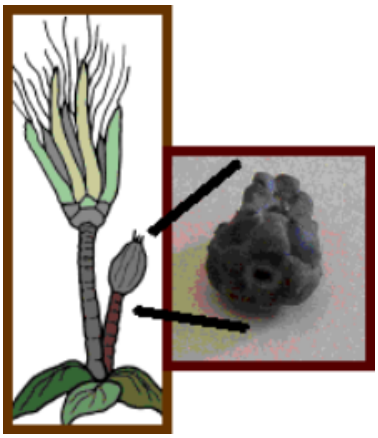
By 430 million years ago, animals and plants had colonised the land. When land animals or plants died, the soft parts usually decomposed or were eaten by scavengers. However, if the hard parts (bones, shells, wood) are quickly covered by water, sand, or even volcanic ash, they might be preserved. Teeth are the hardest parts of an animal and are most likely to be preserved.

CRINOID FOSSILS

Missouri's State Fossil

The **crinoid** became the state's official fossil on June 16, 1989, after a group of Lee's Summit school students worked through the legislative process to promote it as a state symbol. The crinoid (Delocrinus missouriensis) is a mineralization of an animal which, because of its plant-like appearance, was called the "sea lily." Related to the starfish and sand dollar, the crinoid lived in the ocean that once covered Missouri. There are about 600 species alive in the ocean today. (RSMo 10.090)

Similiar creatures today are sea urchins and sand dollars.



CRINOID FOSSILS

Echinoderms as a group also include sea urchins and starfish. They have pentagonal (five-fold) symmetry and an external skeleton composed of many small calcium carbonate plates. These plates interlock in sea urchins and sand dollars, increasing the likelihood that a complete creature will fossilize. In crinoids, the small ossicles usually disarticulate when the animal dies, and complete fossils are rare, whereas the ossicles themselves are abundant and widely collected.

Pennsylvanian limestones chock full of crinoid ossicles are commonly exposed in Missouri, especially the Callaway and Burlington Formations which outcrop near Springfield and Kansas City. Because of this, a group of students at Pleasant Lea Jr. High in Lee's Summit proposed the crinoid as the state fossil, and the legislature passed Act 10.090 on June 16, 1989, officially honoring *Delocrinus missouriensis.*

TRILOBITES

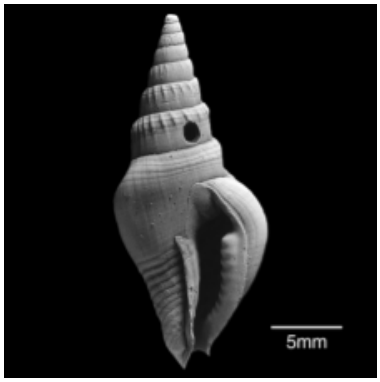
http://www.trilobites.info/trilobite.htm

Trilobites were among the most **prominent** of the **Paleozoic marine arthropods**, and they have only been found in oceanic fossil beds. No freshwater forms have ever been found. They occupied many **different ocean environments**, from **shallow flats and reefs**, to **deeper ocean bottoms**, and even the **water column**, as floating **plankton** or **free-swimming forms**. While a few were **wide-ranging** pelagic species, most were **regional**, and their **global paleogeography <trilopaleogeo.htm>** is a fascinating study of how living forms track their changing environments over geological time. Trilobites from **different habitats** often had **specialized forms** that were presumably **adaptations** to their environment.

It is thought that the **majority** of trilobites were **bottom-dwellers**, **crawling** on the **sea floor**, or within complex **reefs**, acting as roving **predators** on smaller **invertebrates** or as slow **scavengers** on **organic debris**

Similiar species today are horseshoe crabs and spiders due to their hard exsoskeletons.

GASTROPODS



http://www2.bartleby.com/65/ga/gastropo.html

http://porites.geology.uiowa.edu/database/mollusc/mollsmnu.htm

Similiar species today belong to the class of mollusks, snails.

BIVALVE FOSSILS

http://www.kgs.ku.edu/Extension/fossils/bivalve.html

http://www.museum.vic.gov.au/prehistoric/time/bivalves.html

Bivalves are very common shallow-water molluscs, and include scallops, oysters, and clams.

Bivalves are mostly benthic (bottom dwelling) and marine, although some live in fresh water. Some bivalves are burrowers, some attach themselves to rocks or to the sea floor, while others live in cavities.

All bivalves have a shell consisting of two hinged components ('valves') which enclose the animal's soft body parts. The valves are partly open when relaxed, but are held shut by muscles when danger from predators (birds, starfish, gastropods) threatens. Some bivalves can swim short distances by clapping their two valves together.

Similiar species today are clams, oysters, scallops, and mussels.

FISH FOSSILS

http://www.paleodirect.com/fishfossils.htm

http://www.fossilmuseum.net/EdResources/FishImages.htm

See next page for descriptions.

Similiar to fish today, fossils of fish are very rare.

CLICK HERE TO SEE FISH FOSSILS FOR SALE

Fish are the most abundant of all living vertebrates and make up slightly more than half of the approximately 48,500 described species with us today! With the longest period of existence known of all vertebrates on our planet, it is no wonder that fish are so diverse. It is impossible to accurately quantify the number of species of fish that have lived since their beginning but based on known rates of evolution and emergence of new species over the entire fossil record, it is most likely in the MILLIONS!

The oceans are believed to be more than 4 billion years old. They were home to the very first known form of life on our planet 3.5 million years ago, blue-green algae. Invertebrate (without a spine) life forms thrived in these ancient seas and eventually exploded into dramatic diversity in the Devonian Period, nearly 400 million years ago but something else happened around 100 million years earlier than the Devonian that forever changed life on Earth. It was the emergence of creatures with a backbone - VERTEBRATES.

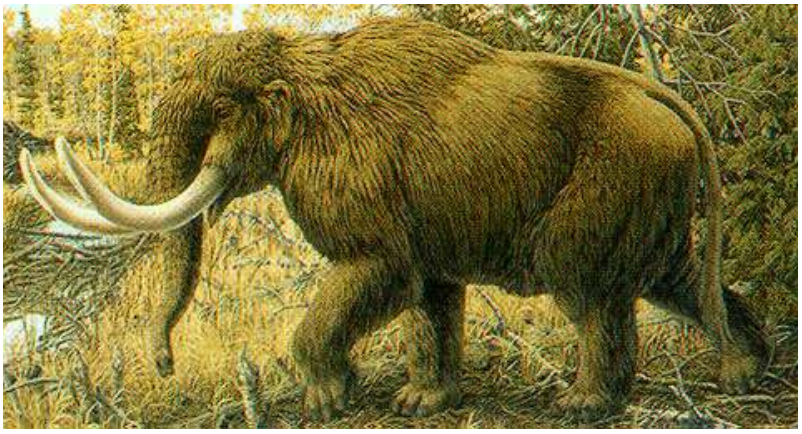
Despite their proliferation, fish are relatively rare as fossils. Aside from shark's teeth with their near indestructible durability, the fragile nature of a fish body makes it a poor candidate for fossilization.

FERN FOSSILS

http://www.7cs.com/fossils/fern.htm

http://www.eia.doe.gov/kids/classactivities/FernFossilPrimary.pdf#search=%22ferns%20fossils%22

The *fern* group of plants have fossil records extending back to the Middle Devonian periods (350 - 400 million years ago). Ferns have leaves, called fronds, which usually consist of leaflets. They live in a wide range of habitats, ranging from the tropics to cold temperate regions. *Pteridosperms* are plants similar in appearance to the fern and are popularly called seed ferns.



MASTODON FOSSILS

http://www.museum.state.il.us/exhibits/larson/mammut.html

The American mastodon (scientific name *Mammut americanum*) roamed North America from at least 3.75 million to 11,000 years ago. Mastodons, along with mammoths <mammuthus.html> and modern elephants, are members of the order Proboscidea. As adults they stood between 2.5 and 3 meters (8-10 feet) at the shoulder and weighed betweeen 3500 and 5400 kilograms (4-6 tons). Mastodons became extinct approximately 11,000 years ago. Today, paleontologists are trying to understand why <lp_extinction.html>.

Similiar species today the elephant

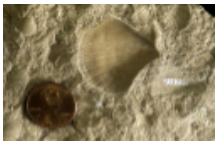
GASTROPOD

FERN

MASTODON

FISH

BIVALVES



CRINOIDS

TRILOBITES

Review video

ASSESSMENT

WHERE TO FIND FOSSILS IN MISSOURI

http://www.dnr.mo.gov/pubs/pub665.pdf

references

http://www.statefossils.com/mo/mo.html

http://www.trilobites.info/trilobite.htm

http://porites.geology.uiowa.edu/database/mollusc/mollsmnu.htm

http://www2.bartleby.com/65/ga/gastropo.html

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http://www.museum.state.il.us/exhibits/larson/mammut.html

http://www.enchantedlearning.com/subjects/dinosaurs/dinofossils/

career choices

1. Anthropologist
2. Science Teacher
3. Paleontology
4. Archaeology

Attachments

Fossilassessment.doc

Smart Idea Web.ipr