

FOSSIL PARK ADVENTURE

Designing Signs for the Park

Brought to you by:

The Staff and 4th Grade Students of Lincoln Elementary School

www.bessermuseum.org



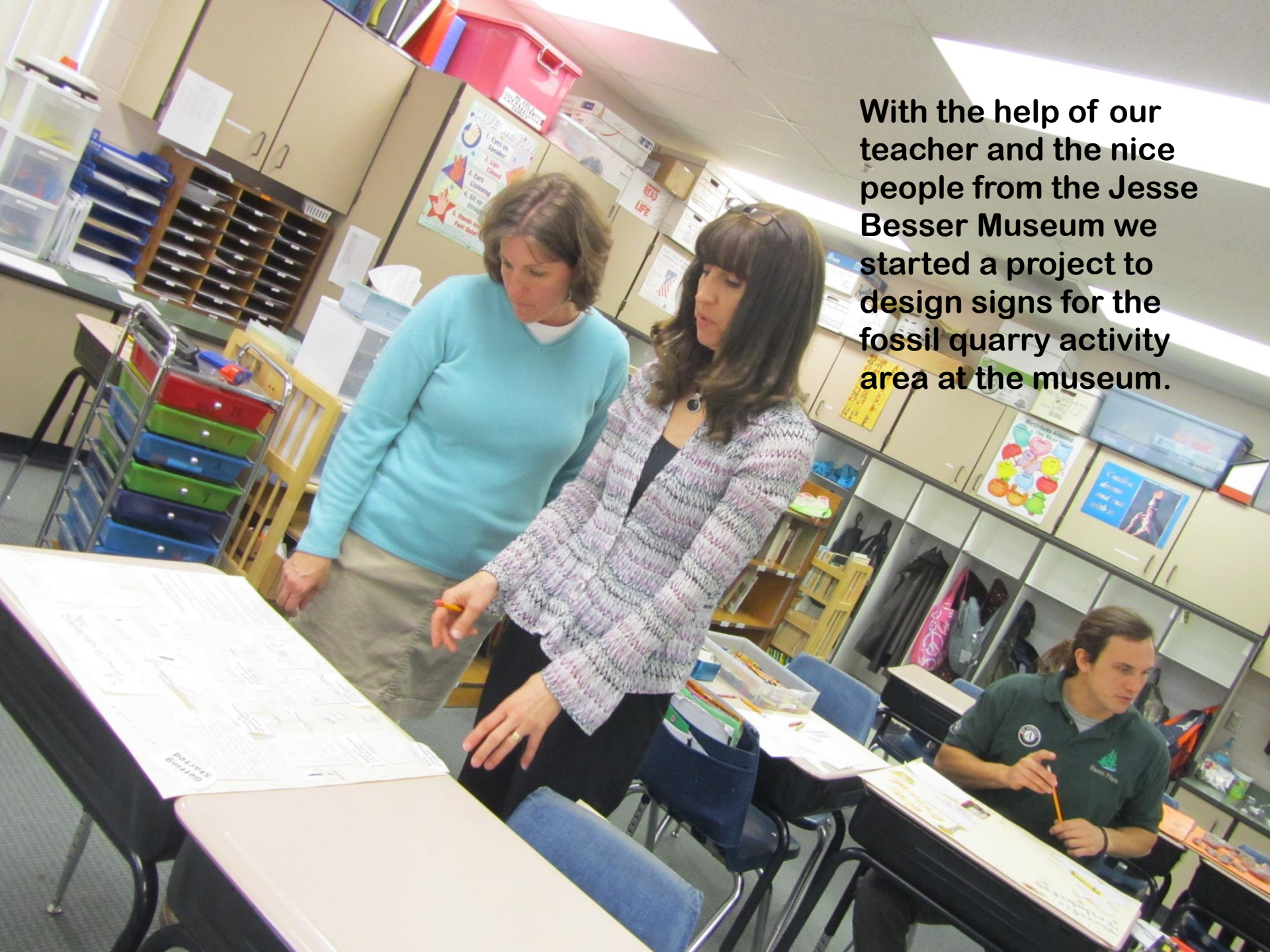
The Staff and Volunteers of the Jesse Besser Museum



Organization and funding from the Great Lakes Stewardship Initiative



With the help of our teacher and the nice people from the Jesse Besser Museum we started a project to design signs for the fossil quarry activity area at the museum.



We got together in groups and designed the different signs for the quarry



We all Worked really Hard







TEACHERS ONLY
TEACHERS WILL
DETECTION



STAPLES
98
22

TEACHERS ONLY
TEACHERS WILL
DETECTION

We had to brainstorm ideas and use the most of our creativity



In the end we came up with some great designs.

These were interpreted and processed by
the Museum Graphics Department.

In the end, we created something
together that whole community of
Alpena can enjoy and learn from.

Here is how it
worked out!

Trilobite Fossil

Terrific Trilobites



Trilobites were around for most of the Paleozoic. They had three parallel, thin ridges or bands that ran down their backs. They had three pairs of legs. They had two pairs of antennae. They had two pairs of eyes. They had two pairs of ears. They had two pairs of nostrils. They had two pairs of mouthparts. They had two pairs of genitalia. They had two pairs of reproductive organs. They had two pairs of excretory organs. They had two pairs of excretory organs.

The part of the trilobite that we find most often is the pygidium. The pygidium is the part of the trilobite that we find most often. The pygidium is the part of the trilobite that we find most often. The pygidium is the part of the trilobite that we find most often.

1875 1880



COOL Crinoids



Crinoids are interesting because they look like flowers & plants but are really animals. They are sometimes called sea lilies. To identify a crinoid, look for a stalk that has the same shape as a candle. There should be a lot of rings on it.

Erin M.
Lincoln Elementary
4th Grade 2012



Crinoids are interesting because they look like flowers & plants but are really animals. They are sometimes called sea lilies. To identify a crinoid, look for a stalk that has the same shape as a candle. There should be a lot of rings on it.

Trilobites were around for most of the Paleozoic. They had three parallel, thin ridges or bands that ran down their backs. They had three pairs of legs. They had two pairs of antennae. They had two pairs of eyes. They had two pairs of ears. They had two pairs of nostrils. They had two pairs of mouthparts. They had two pairs of genitalia. They had two pairs of reproductive organs. They had two pairs of excretory organs. They had two pairs of excretory organs.

Jan M.
Lincoln Elementary
4th Grade 2012

Makenna L.
Lincoln Elementary
4th Grade 2012

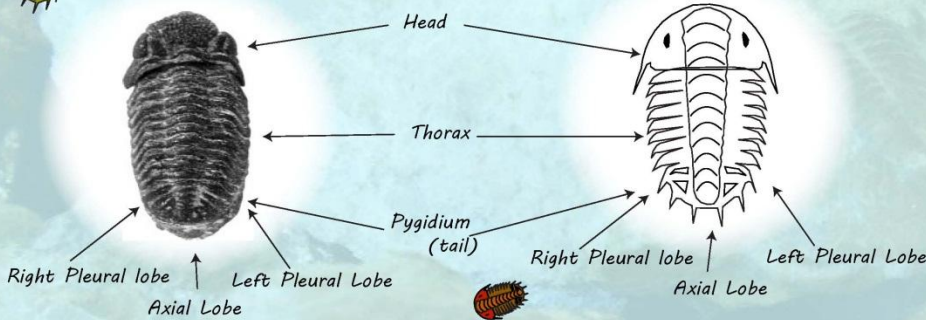
(Trilobites were everywhere)



TERRIFIC TRILOBITES

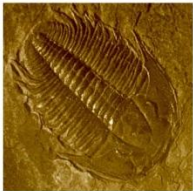


We think trilobites are cool because they look like roly-poly bugs. Their armor is camouflaged and protects them from predators. A trilobite is a rare fossil to find.



Trilobites were animals that lived in the sea. They are now extinct. Their name is derived from tri and lobos (Greek) meaning three lobes. You can see the three sections in the photo, with the central part running down from the head, and the other two on either side.

ACTUAL FOSSILS



The part of the trilobite that becomes fossilized is the exoskeleton. The trilobite would molt its exoskeleton several times during its life. So many fossils are of the molt rather than the dead animal. The molt would often break up the exoskeleton, so you can get only part of the trilobite.



COOL CRINOIDS

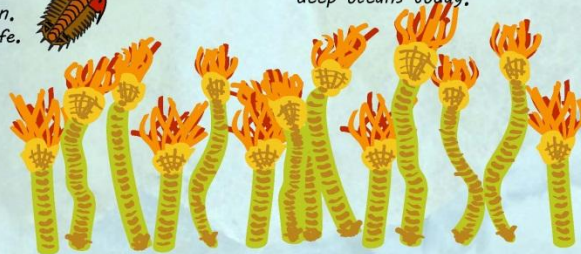
Crinoids are interesting because they look like flowers and plants, but are really animals. They are sometimes called sea lilies. To identify Crinoids, look for fossils that look like little bolts or screws. Their stems look like broken bolts.



ACTUAL FOSSILS



Crinoids have a flower-like calyx or head and usually lived in colonies on the sea floor. Several species were free swimming. The stem is formed of many disk shaped sections stacked like Oreo cookies. These disks are the most commonly found fossilized part of crinoids. Crinoids are still alive in deep oceans today.



This sign is sponsored by a grant from Great Lakes Stewardship Initiative
Designed with help from:
Ian M.
Makenna L.
Taylor M.
Lincoln Elementary 4th Grade 2012



IF ALL TIME WERE TO BE CONDENSED INTO 240-MINUTES, THE PALEOZOIC ERA WOULD LAST 3 MINUTES AND THE DEVONIAN AGE WOULD BE LESS THAN 1/2 MINUTE IN LENGTH!

EARTH TIME LINE IN MILLIONS OF YEARS



PALEOZOIC ERA TIME LINE IN MILLIONS OF YEARS



LIFE FOUND IN THE DEVONIAN AGE



460 million years ago the area was mostly different than the area you see around you today. This area was located near the equator under a warm sea that was teeming with many forms of life including Bryozoans, Corals, Brachiopods, Cephalopods, Crinoids and Trilobites. As the Earth began to dry continents, volcanoes, glaciers and continental drift moved and shaped today's landforms in their present locations we find that some of the ancient living creatures resemble those found in our oceans and seas today.

As the ancient organisms in the Paleozoic Era lived and died over millions of years, their remains settled to the bottom where they were covered by the bodies of other life forms and sediments in different layers. Combined with calcium and compressed, these layers became the limestone and shale bedrock that is prominent throughout N.J., Michigan. This combination of rock makes up the main ingredients for cement production, which is one of the major industries of the Atlantic and Pacific rim area.

Some of these plants and animals were buried but enough and those enough that the scavengers and Digger, were kept away from the remains. This prevented their bodies from being eaten or decomposing. Fossilization occurs as the minerals, which are dissolved in all water, becomes concentrated in the areas the buried organisms occupied and replace shell, bone, wood and other dead material with crystals to form a replacement of dense rock like structure in the shape of a plant or animal. Some are also forms or molds of shells and because of this we are able to see what some of the living organisms were 460 million years ago looked like.



Handwritten notes on lined paper, partially obscured and difficult to read.

Sam T. Lincoln Elementary 4th Grade 2012

Handwritten notes on lined paper, partially obscured and difficult to read.

Aaron K. Lincoln Elementary 4th Grade 2012



Dominic M. Lincoln Elementary 4th Grade 2012

Aaron K. Lincoln Elementary 4th Grade 2012

Handwritten notes on lined paper, partially obscured and difficult to read.

DID YOU KNOW...

HOW LONG AGO?

WHAT KIND OF LIFE?

WHAT DID IT LOOK LIKE?

WHAT TYPE OF HABITAT?

HOW DEEP WAS THE WATER?

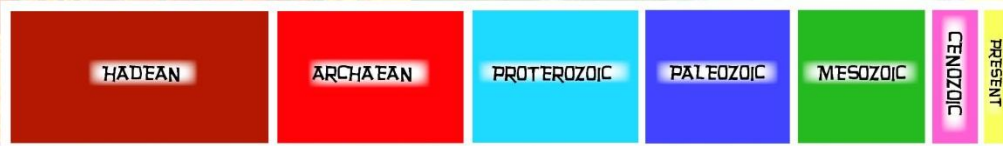
HOW DID THEY BECOME FOSSILS?

WHAT TYPE OF FOSSILS?

WAS IT COLD?

STUDY CHART TO FIND THE ANSWERS!

EARTH TIME LINE IN MILLIONS OF YEARS



4500

3800

2500

570

245

660

IF ALL TIME WERE TO BE CONDENSED INTO 100 MINUTES, THE PALEOZOIC ERA WOULD LAST 6 MINUTES AND THE DEVONIAN AGE WOULD BE LESS THAN 1 1/2 MINUTES IN LENGTH!

PALEOZOIC ERA TIME LINE IN MILLIONS OF YEARS



570

505

438

408

360

286

LIFE FOUND IN THE DEVONIAN AGE



Try to find these animals on the other signs or in the rocks!

400 million years ago this area was vastly different than the one you see around you today. This spot was located near the equator under a warm shallow ocean teeming with many forms of life including Bryozoans, Corals, Brachiopods, Cephalopods, Crinoids and Trilobites. As the Earth's forces (plate tectonics, volcanoes, glaciers and continental drift) moved and shaped today's landforms to their present locations, we find that some of the ancient living creatures resembled those found in our oceans and seas today.

As the ancient organisms in the Paleozoic Era lived and died over millions of years, their remains settled to the bottom of the ocean and were covered by layers and layers of different sediments. Combined with calcite and compacted, these layers became the limestone and shale bedrock that is prominent throughout N.E. Michigan. This combination of rock makes up the main ingredients for cement production, which is one of the major industries of the Alpena and Presque Isle areas.

Some of these plants and animals were buried fast enough and deep enough that the scavengers and oxygen were kept away from the remains. This prevented their bodies from being eaten or decomposing. Fossilization occurs as minerals, which were dissolved in water, became concentrated in the areas the buried organisms occupied and replaced shell, bone, wood and other dead material with crystals to form a crystalline or dense rock like structure in the shape of a plant or animal. Some fossils are also forms or molds of the organisms and because of this we are able to see today what some of the living organisms from 400 million years ago looked like.



This sign is sponsored by a grant from Great Lakes Stewardship Initiative
Designed with help from:
Sam T.
Annie K.
Aaron A.
Dmitrios M.
Lincoln Elementary
4th Grade 2012



Getting Started

Things You Need for Fossil Hunting

We're Ready to Dig



You might also want: hammer and

Fossils

Kerrin W.
Lincoln Elementary
4th Grade 2012

What you need for digging
Digging for fossils
Digging for fossils
Digging for fossils

Joseph N.
Lincoln Elementary
4th Grade 2012

safety glasses

Madison W.
Lincoln Elementary
4th Grade 2012

Fun to tell you
can dig for
fossils in
your yard
You need some
water for
drinking it.
The sand
water you need
water to
dig the
FOSSILS ROCKS

Alyson B.
Lincoln Elementary
4th Grade 2012

Brad B.
Lincoln Elementary
4th Grade 2012



GETTING STARTED...

Things You Need For Fossil Hunting

You need shoes that are protective for your feet, like tennis shoes.



Long sleeves would be helpful. If it is hot, wear a tank top and bring a sweatshirt.



Pants would protect your legs from sharp edges.



You need sun block so you don't get burned.



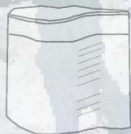
Do not wear any dangly jewelry.



You can use a magnifying glass to see fossils and what they look like.



You can use a bag to collect all your fossils so you can take them home!



Take some gloves so your hands won't get dirty.



You will need goggles to protect your eyes and brushes for cleaning fossils.



You could use something to dig with, like a metal pick.



When you go fossil hunting you need a hammer to get the mud off the fossils.



One reason you need water to go fossil hunting is to drink it. The second reason you need water is to clean the fossils.



DEVONIAN FOSSIL HUNTING IN NORTHEAST MICHIGAN

DEVONIAN FOSSIL HUNTING IN NORTHEAST MICHIGAN

Here is a list of easy to find fossil spots to help you get started: Happy Hunting!

1. LAFARGE FOSSIL PARK, BESSER MUSEUM FOR NORTHEAST MICHIGAN

491 Johnson Street, Alpena, MI.
The Lafarge Fossil Park is open sunrise to sunset.

2. SYTEK PARK AND BURKHOLDER ROAD

is located by the Bagley Street Bridge in Alpena, MI and by the Alpena County Road Commission building at 1400 Bagley Street. Parking is available at Sytek Park. Burkholder Road is directly across from Sytek Park. Be careful when crossing Bagley Street. You will find many fossils in the ditch on Burkholder Road.

3. BAY VIEW PARK

by the City Band Shell is located on State Street in Alpena, MI. You will find several large limestone boulders loaded with fossils lining the beach.

4. ROCKPORT STATE PARK

is located off US 23 North on Rockport Road (turn at Opechees' Party Store 9621 US 23 N). You will drive about 3 miles down Rockport Road until you come to the parking area by Rockport Harbor. Just a short walk inland from the parking lot you will find the abandoned quarry.

5. ROGERS CITY FOSSIL PARK

is located at the Rogers City Little League Ball Field. When entering Rogers City you will turn left off US 23 Hwy, take Business 23 North (Petersville Road) to downtown Rogers City. You will see the largest limestone quarry on your right and be able to view the quarry from "Quarry View Overlook". Turn right on Park Drive then turn left on Calcite Drive; Little League Ballfield is on the right (Lake Huron side).



WE'RE READY TO DIG!



This sign is sponsored by a grant from Great Lakes Stewardship Initiative Designed with help from:
Madison W.
Brad D.
Alyssa D.
Joseph M.
Kiersten W.
Lincoln Elementary 4th Grade 2012



CORALS Can't BE BEAT

photo of
feeding



Coral are really like animals
they have a mouth and they
eat. They also have a skeleton
made of calcium carbonate.
They live in warm water and
they are very important to
the ocean. They are the
base of the food chain and
they provide a home for many
other animals.

Michael B.
Lincoln Elementary
4th Grade 2012

Bradley T.
Lincoln Elementary
4th Grade 2012



Deatak W.
Lincoln Elementary
4th Grade 2012

CORALS CAN'T BE BEAT

Corals are rooted to the sea floor. Corals are animals that make their own homes of minerals. Some corals lived in colonies, some lived individually. Corals are different shapes and sizes. Corals eat plankton. Corals arrived on earth 500 Million years ago but are still living today!

Hexagonaria is more commonly known as the Petoskey stone. It is a colonial coral and is made up of small animals. Hexagon means "six-sided," as each corallite has six sides. Each one had small tentacles that would catch food.



Horn coral is a type of rugose coral. Rugose corals could be solitary, (made of one animal), or colonial, (made of many animals). Horn corals attached themselves to the sea floor by the narrow end of the horn as they grew in rings upward. The crater on top, called the calice, had tentacles that the coral used to filter food from the water.



Branching corals, or Acropora corals, come in many shapes and sizes depending on where they lived on the reef. The coral can grow into slender branching fingers, broad bushes of thick antlers, or flat table-like plates.



Although Bryozoans are colonial animals, they are not corals. Bryozoans are called "moss" animals. Some are sheet-like and encrust on shells or rocks. Others grow branches like small trees. Each colony consists of as many as several thousand individuals.



This sign is sponsored by a grant from Great Lakes Stewardship Initiative
Designed with help from:

Bradley T.
Migael B.
Onatah R.



Lincoln Elementary 4th Grade 2012

BRACHIOPODS

Very rare
live fossils
found in
the
Permian
era
1998

Very rare
live fossils
found in
the
Permian
era
1998

Graham A.
Lincoln Elementary
4th Grade 2012

Tiffany C.
Lincoln Elementary
4th Grade 2012



Brachiopods
are benthic bottom dwelling
marine invertebrates
having two shells
They are considered living fossils,
with 3 orders present in today's oceans.
They are rare today but during the Paleozoic Era they
dominated the sea floor.



Luke C.
Lincoln Elementary
4th Grade 2012



brachiopods

Brachiopods are benthic (bottom dwelling), marine invertebrates, bivalves (having two shells). They are considered living fossils, with 3 orders present in today's oceans. They are rare today but during the Paleozoic Era they dominated the sea floor. Though they appear to be similar to clams or oysters they are not related. They are not even mollusks. They belong to the phylum Lophophorata and are related to bryozoans.

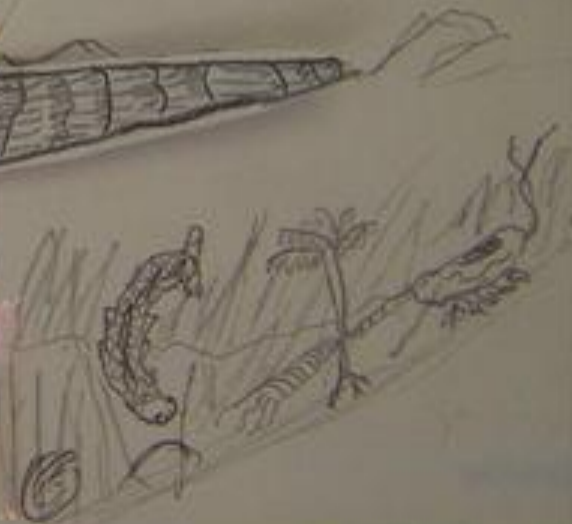


Annie K.
Lincoln Elementary
4th Grade 2012



Dmitrios M.
Lincoln Elementary
4th Grade 2012

Aaron A.
Lincoln Elementary
4th Grade 2012



CEPHALOPODS!

Cephalopod means head-footed. Cephalopods include the first octopus and squid. Some cephalopods will have stripes. I like the part where it has sections. It looks like a tiger's stripes. Cephalopods are cool and interesting. These animals were common in the shallow seas of Michigan 400 million years ago.

These are examples of Devonian Cephalopods.



Many of the extinct cephalopods had shells that were fossilized. Some grew shells in a straight, screw like pattern; others grew into flat, disc like coils. Some were fast predators, while others were poor swimmers like the only surviving cephalopod member with a shell, the Nautilus.

Here are some actual cephalopod fossils to look at.



GASTROPODS!

Many snails are found ancient rocks of different ages. Most snails come from the sea so there are many snail fossils. Water is needed for most fossil-forming processes.

Here is what gastropods and their fossils look like.

Gastropod is a cool name for a snail; it means "stomach-footed": It is a fossil now. A fossil is a piece of rock that used to be a living creature. These fossils will have a big swirl in the middle of the rock. I love the patterns on the fossils. They are so interesting.



BRACHIOPODS!

Brachiopods are the most common fossils in Michigan. They lived 350-400 million years ago. Brachiopods lived in groups when they were alive. They attached to the sea floor with a foot called a pedicle. A brachiopod had two shells called valves. They were two different sizes. Brachiopods used to have arms to catch their food!

Here are what brachiopods look like.



Brachiopods are cool! Did you know that even though Brachiopods look like clams they're not? They're not even really related to clams or oysters but more closely to bryozoan moss animals!

These are Brachiopod fossils.



This sign is sponsored by a grant from Great Lakes Stewardship Initiative. Designed with help from:

Zoe M.
Samantha J.
Jadon D.
Graham S.
Luke C.
Tiffany C.

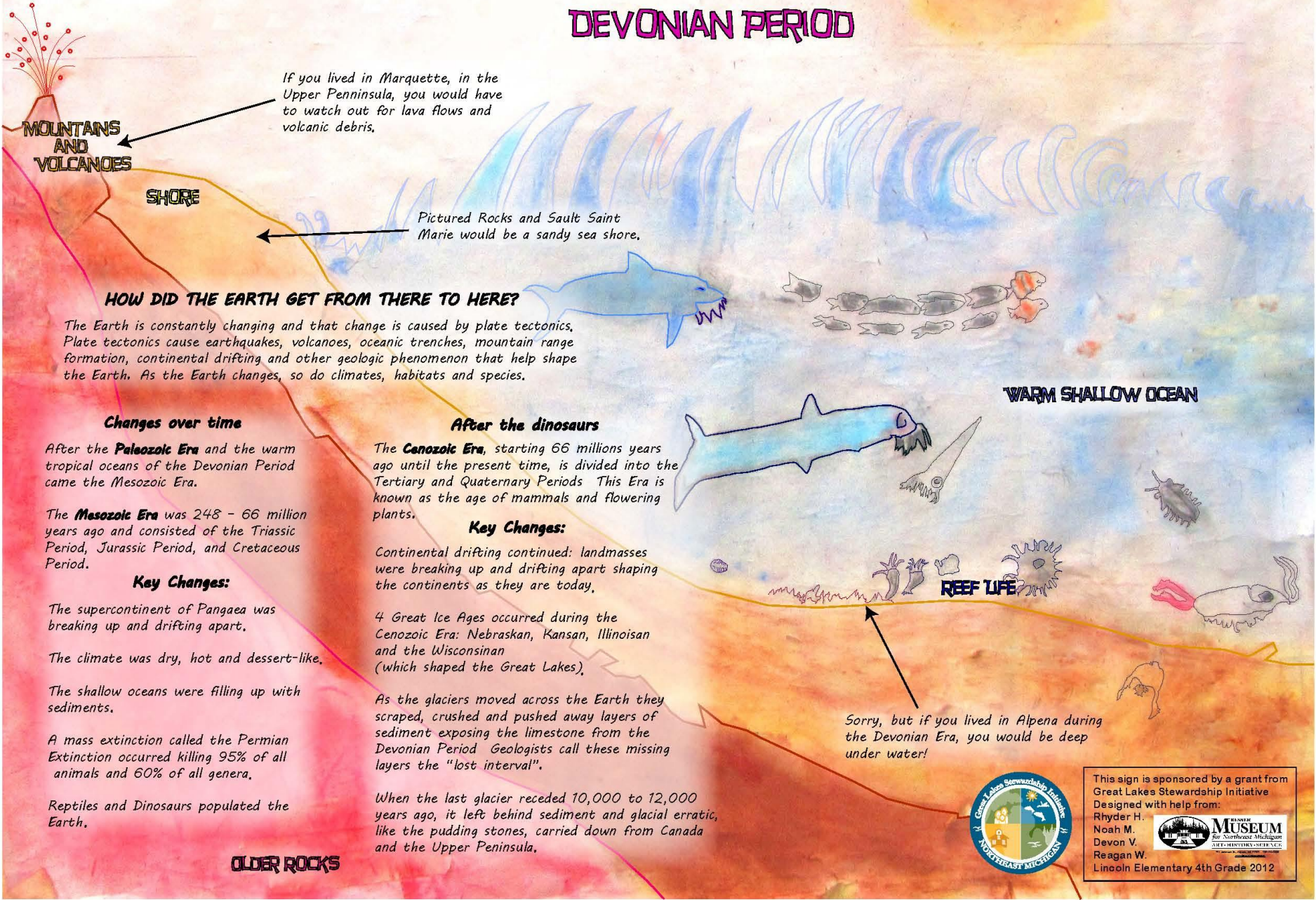
Lincoln Elementary 4th Grade 2012





NORTHERN MICHIGAN 350 MILLION YEARS AGO

DEVONIAN PERIOD



If you lived in Marquette, in the Upper Peninsula, you would have to watch out for lava flows and volcanic debris.

MOUNTAINS AND VOLCANOES

SHORE

Pictured Rocks and Sault Saint Marie would be a sandy sea shore.

HOW DID THE EARTH GET FROM THERE TO HERE?

The Earth is constantly changing and that change is caused by plate tectonics. Plate tectonics cause earthquakes, volcanoes, oceanic trenches, mountain range formation, continental drifting and other geologic phenomenon that help shape the Earth. As the Earth changes, so do climates, habitats and species.

Changes over time

After the **Paleozoic Era** and the warm tropical oceans of the Devonian Period came the **Mesozoic Era**.

The **Mesozoic Era** was 248 - 66 million years ago and consisted of the Triassic Period, Jurassic Period, and Cretaceous Period.

Key Changes:

The supercontinent of Pangaea was breaking up and drifting apart.

The climate was dry, hot and desert-like.

The shallow oceans were filling up with sediments.

A mass extinction called the Permian Extinction occurred killing 95% of all animals and 60% of all genera.

Reptiles and Dinosaurs populated the Earth.

OLDER ROCKS

After the dinosaurs

The **Cenozoic Era**, starting 66 millions years ago until the present time, is divided into the Tertiary and Quaternary Periods. This Era is known as the age of mammals and flowering plants.

Key Changes:

Continental drifting continued: landmasses were breaking up and drifting apart shaping the continents as they are today.

4 Great Ice Ages occurred during the Cenozoic Era: Nebraskan, Kansan, Illinoian and the Wisconsinan (which shaped the Great Lakes).

As the glaciers moved across the Earth they scraped, crushed and pushed away layers of sediment exposing the limestone from the Devonian Period. Geologists call these missing layers the "lost interval".

When the last glacier receded 10,000 to 12,000 years ago, it left behind sediment and glacial erratic, like the pudding stones, carried down from Canada and the Upper Peninsula.

WARM SHALLOW OCEAN

REEF LIFE

Sorry, but if you lived in Alpena during the Devonian Era, you would be deep under water!



This sign is sponsored by a grant from Great Lakes Stewardship Initiative. Designed with help from: Rhyder H. Noah M. Devon V. Reagan W. Lincoln Elementary 4th Grade 2012. **BRUNER MUSEUM** for Northwest Michigan. 1875 - 1975

Thank you to everyone that contributed.

Thank you for creating something that the community will enjoy for years to come.

Thank you for helping us to learn and grow!

Fossils are

Cool!!