An Earth Science Experience

By: Nancy Volk

Visiting the MOST

To make your visit to the Milton J. Rubenstein Museum of Science & Technology as in depth and meaningful as possible:

A) Explore and complete some of the on-line pre-visit activities with your students.

B) Design a pre-visit, during and post-visit plan that includes activities and demonstrations that you select.

C) Discuss your plan with a MOST educational staff member prior to your visit. Request the backpack program for a "hands on" set of activities for the Earth Science Discovery Cave.

D) Plan your large group to be divided in a ratio of 8 to 10 students per chaperone.

E) Cue the chaperones about their roles. They should be engaged with the students and assisting them with their hunt for answers and monitoring the materials provided.

F) Relax and have fun!

The entrance to the MOST Earth Science Discovery Cave.

Inside This Packet

An Earth Science Experience

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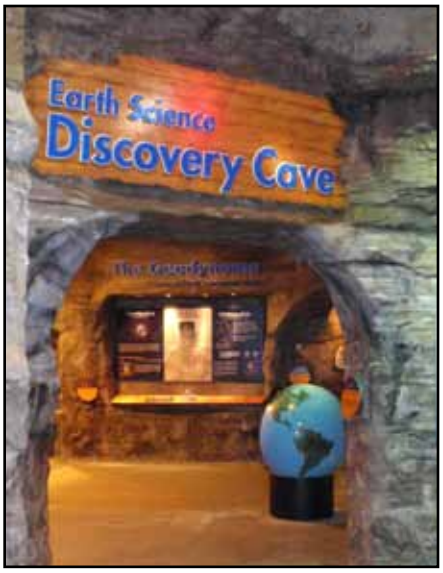

Geology: Science of the Earth

Your Earth Science adventure begins up the ramp from the entrance to the cave, located on the lower level of the MOST. This is the starting point for the information that you will need to answer the following questions.

What is the difference between these terms: relative age dating and absolute age dating?

_____

_____

_____

With your partner or team, look at the "Rocks of Central New York" board. Before reading the sign, discuss which layer occurred first? Which layer occurred last? Which is the oldest? Which is the youngest? How did you determine your answer?

_____

_____

_____

3) What kind of fault do you see in the rock above?

_____

3b) Touch the fault area. Follow the layers. How does it feel?

_____

4) What kind of fold do you see in the rock strata surrounding the waterfalls?

_____

_____

4b) Touch the monocline area—how does it feel?

_____

_____

4c) How are the terms anticline, syncline and monocline alike?
And how are they different?

_____

_____

_____

5) Which fault moves horizontally?

_____

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6) Which fault moves vertically?

_____

_____

_____

_____

7) Identify any fossils that you know in the layers.

_____

_____

_____

_____

8) Complete one to three sketches of fossils in the space provided below.
When you return to school try to identify the type of fossil.

9) Using the clay, make an impresson of one of the fossils on the wall. How is this like or unlike a fossil?

_____

_____

_____

_____

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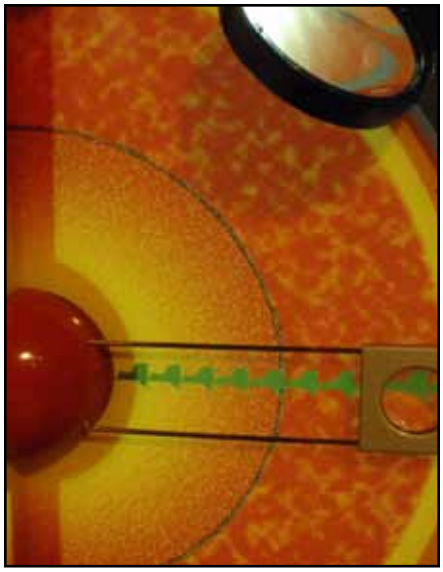
Did You Know? Team Exercise



How Hot is Hot?

1) The center of Earth is the same or more than the temperature of the surface of the Sun. The Sun's surface is about _____degrees Celsius.

The Role of Hot Spots

2) List two or three areas in the world that are hot spots.

_____ _____

_____

3) As you move from the surface of the earth towards the center of the earth, what happens to density?

_____

_____

Composition of Earth

4) Put the following four examples in order from most to least dense.
Iron, Peridotite, Basalt, and Granite

Most Dense _____

_____

_____

Least Dense _____

5) How many New York states would fit across a cross section of Earth?

_____

Geology's Unifying Theory

6) Sketch the following areas.

Transform **Spreading Area** **Subduction Zone**

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Our Dynamic Planet

Explore Our Dynamic Planet

Explore the topic assigned by yout team leader or teacher. Using the touch screen, move to your topic of study.

Oceans or Atmosphere

List your topic area.

_____

Subtopics

Current Weather, Seas Surface Temperature and Water Vapor, Ocean Currents, Particles in the Stratosphere, Asian Tsunami or Plate Motion, Ocean Draining, Plate Boundaries, Plates and Quakes, Daily Quakes, Active Volcanoes

List your subtopic area.

_____

Write it Out

Write out three ideas you learned or three questions you have after listening to the audio recording about your topic.

_____

_____

_____

_____

_____

_____

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Effects of Water

Looking at this section of the exhibit answer the following questions.

1) How are caves formed?

_____

_____

_____

_____

2) What combines to from carbonic acid?

_____

_____

3) Explain the similarities and differences between stalactites and stalagmites.

_____

_____

_____

_____

_____

_____

4) Using the clay, make stalactites, stalagmites and columns.
Draw a sketch of each and label below.

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5) List the names of the falls that you can think of that are in Central New York?

_____ _____

_____ _____

_____ _____

5) How long does it take to build a mature cave?

_____

_____

Coral Reef Adventure

1) Coral reefs are the most biologically diverse marine ecosystems on Earth, only rivaled by what other major ecosystem?

_____

_____

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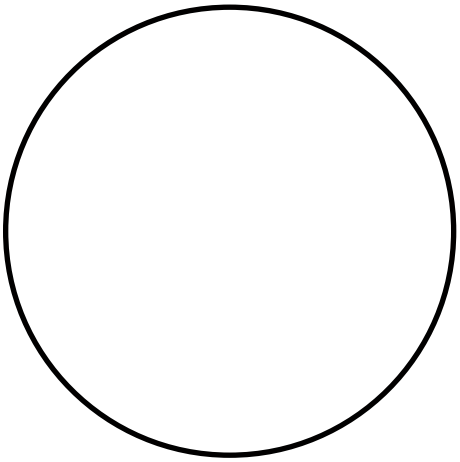
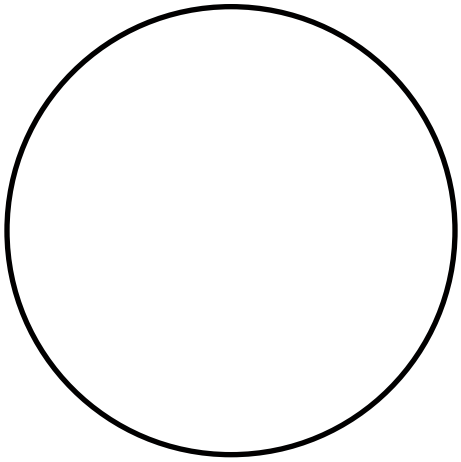
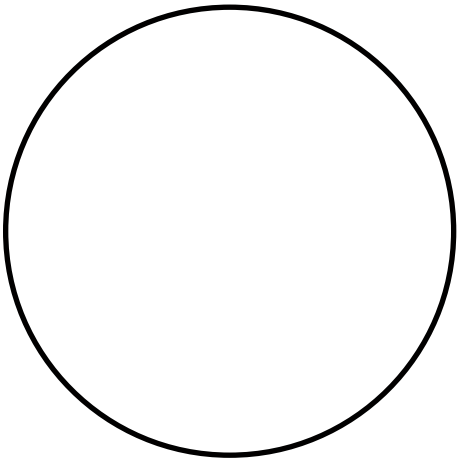
2) Name the types of corals and sketch them in the spaces provided.







3) What is living coral? An animal or a plant? Explain your answer.

_____

_____

_____

_____

_____

_____

_____

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Salt From the Earth

Salt Mines in New York State

1) In the Syracuse area, the salt is mined how far below the surface of the earth?

_____

2) It is the _____ salt mine in _____?
(deepest, shallowest) (continent)

Geological Exploration

3) How do scientists find our about what is below the surface of the earth?

_____

_____

_____

4) Over the past 100 years, how much salt has been removed from the salt bearing strata beneath the Tully Valley?

_____

5) Syracuse is named after what other city? Why?

_____

_____

_____

_____

6) How much salt does one gallon of brine produce?

_____

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Mineral and Rock Exploration

1) What is a vug?

_____

_____

_____

_____

2) What four minerals can be found in the cave exhibit?

_____ _____

_____ _____

Evidence of Life

Ancient Sea Life

3) Create another sketch of a selected fossil and identify the type of fossil when you return to your classroom.

4) Pretend you are an archaeologist. What fossil did you find?

_____

_____

_____

_____

Name: _____ Date: _____

Mineral and Rock Exploration

Lake Fossils

5) Sketch below or create a rubbing of the fossil that interests you. Write as much detail as possible about your selected fossil.

Name: _____ Date: _____

Earth's Magnetic Field

1) Do rocks have memory? Yes or no? Explain.

_____

_____

_____

Geomagnetism

2) How long have we known Earth to have a dipolar magnetic field?

_____

3) What causes Earth's magnetic field?

_____

_____

4) Using the magnetometer, what is the highest magentic field strength?

_____

4b) What is the orientation of the magnetometer at this point?

_____

5) If the intensity of Earth's dipole field were to decay to zero, what would be the polarity of the field where it built up again?

_____

_____

5b) Explain.

_____

_____

_____

6) Draw Earth's geomagnetic field and use arrows to show directions.

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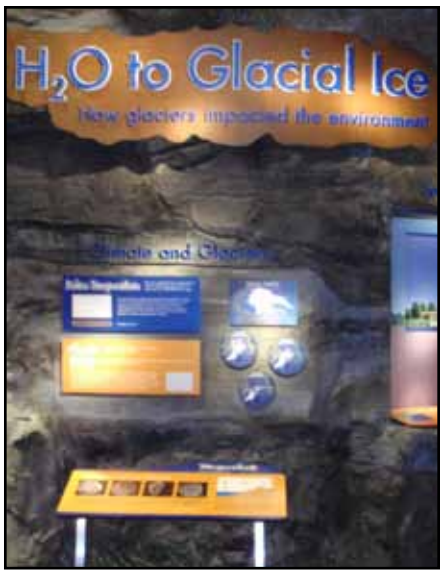
Glaciers on the Move



1) Name three glaciers.

_____ _____

_____

2) What did the Great Lakes area look like 2,000 years ago? Have the Great Lakes always looked as they do today?

_____

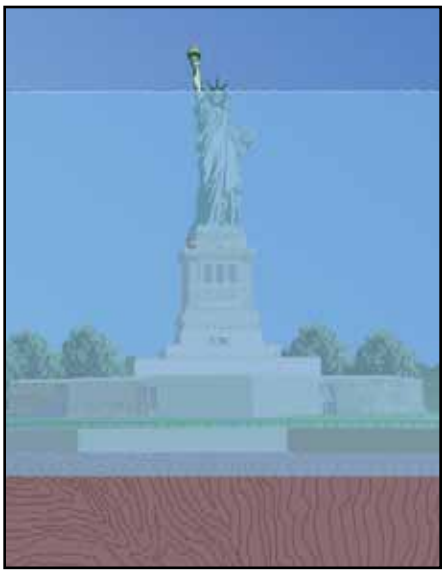
_____

_____

3) What is one of the youngest geomorphic features on the North American continent?

_____

Finger Lakes of Central New York



4a) How many Finger Lakes are there? _____

4b) They are oriented in a _____ and _____ direction.

5) What are the two deepest Finger Lakes?

_____ _____

6) How did the Finger Lakes form?

_____

_____

_____

7) How thick was the ice over New York State 21, 000 years ago?

_____

8) How many Carrier Domes thick was the ice layer?

_____

Climate and Glaciers

9) How is paleotemperature measured when looking at ice cores?

_____

_____

_____

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Earth Science Narrative

Choose one of the following ideas to write about during your visit to the MOST!

- Pretend that you are an insect in the exhibit area. Describe the tour from this vantage point.
- Write a journal entry and draw a sketch to go along with your entry about your museum experience today.
- Write a letter to a relative or a friend sharing about your museum trip today.
- Pretend to be an scientist and design a new Earth Science museum exhibit. Sketch the exhibit and explain about the topic and content.

Once you choose your topic, write for ten minutes. Share your writing with a partner. Provide ideas and feedback for your partner. Finish your writing assignment.

New York State Standards

Standard 1: Analysis, Inquiry, and Design

Math: m1.1, m2.1, m3.1, **Scientific** s1.1, s1.2, s1.4, s2.1, s3.2, s3.3, **Technology** T1.1, T1.3, T1.5

Skills: Observing, describing, classifying, sequencing

Standard 3: Mathematics

Standard 4 Life Science: Key idea 5, Key idea 6

Standard 4: Physical setting
2.1c, 2.1d, 2.1e, 2.1g, 2.1h, 2.1j, 2.2a, 2.2b, 2.2c, 2.2d, 2.2e, 2.2f, 2.2g, 2,2h 3.1a, 3.1g, 3.1h, 4.2e, 4.4 g, 5.2b

General Skills:
Recognize and analyze patterns and trends
Classify objects according to established scheme
Sequence events
Cause and effect relationships
Interpret results
Use a magnetic compass
Interpret field maps
Determine density

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Notes...