Educator’s Guide
Programs for Grades Pre-K to 12

MUSEUM OF NATURAL HISTORY
UNIVERSITY OF MICHIGAN

2016-2017
Museum To You: Outreach Workshops

Bring the Museum to your school! These hands-on, inquiry-based classroom workshops provide in-depth explorations of scientific concepts using Museum objects. Classes are divided into small groups which rotate among three different hands-on stations, each facilitated by Museum staff. Classroom workshops are 60 minutes in length and have a maximum capacity of 30 students.

Cost: $225 for the first class, $125 for each additional class. Mileage fees may apply.

To register for a workshop, please call (734) 764-0480.

Museum to You Workshops

**Fabulous Fossils** • *Grades 2-4*: Using real fossils from the Museum’s collection, students will discover what makes a fossil, create their own stratigraphy column, and explore what rock formations reveal about ancient environments.

**Changing Landforms** • *Grades 2-6*: Learn how geologic forces such as glaciation, erosion, sedimentation, and weathering create and change Earth’s landforms. Students will engineer structures that influence erosion and model how glaciers move and deposit sediment.

**Rock Detectives** • *Grades 2-6*: Students will model the rock cycle, observe and test real rocks and minerals to discover their composition, and investigate how rocks and minerals are used in everyday objects.

**Changing Earth: Inside the Earth** • *Grades 4-6*: Learn how geologic forces such as volcanoes and earthquakes create and change Earth’s landscapes. Students will create a model of Earth’s layers, explore plate tectonics, and engineer earthquake-proof structures.

**The Geometry of the Universe** • *Grades 9-12*: How does gravity shape space? What is the overall shape of the Universe and how is this linked to its future? This activity-based program explores the connection between math and cosmology. This program includes 2 sessions.

Other topics may be available, please call for details.

Want these Workshops at the Museum? These workshops may also be available at the Museum. Please call (734) 764-0480 for details!

**River Residency**

*Grades K-8*: Bring a River into your school with the Museum’s 12-foot stream simulation table! *Stream Table Workshops* are fun, hands-on and inquiry-based, and up to 4 classes of 30 children may participate each day. For further information, see pages 2 and 5 of this brochure, or visit ummnh.org.

**River Residency Fees**: 1 day: $1100; 2 days: $1500; 3 days: $2000; 4 days: $2500

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**Museum Program Types**

**Learn It! Do It! Days**

On Learn it! Do it! Days, Museum educators welcome your students at hands-on stations throughout the Museum. Students explore these stations in small chaperone-led groups, participate in hands-on activities, experiments, and presentations, and even take home some of the products they create!

Have a large group and need a different date? Book your own Learn it! Do it! Day. Not all topics are available for private dates; call for details and availability.

**Guided Tours**

Guided tours provide an opportunity to learn more about our exhibits. We offer small group sizes and enthusiastic, extensively trained University student docents who help make natural history come alive for your students while they engage with our exhibits and hands-on items. We promote inquiry and participation in these guided tours, and encourage questions.

**Discovery Programs**

Discovery programs offer a combination of guided discovery in our galleries and hands-on activities in our classroom. Our extensively trained University student docents engage the students with inquiry and investigations.

**Planetarium Programs**

Live, interactive fulldome programs take students on journeys through the night sky, the solar system, sky motions, the Universe, and more. Customized programming is also available. Alternatively, fulldome movies can allow students to explore additional topics in an immersive environment. See page 9 for these titles.

**Self-Guided Visits, all ages**

Age-appropriate Discovery Guides help focus student observation and are available on the Museum website at ummnh.org.
Pre-K to Kindergarten

**Dancing with the Dinosaurs • 1 hour**
Explore the dinosaur exhibits using song, stories, and movement! This program includes both hands-on exploration in our classroom and guided discovery in the exhibits.

**Prehistoric Explorers • 30 minutes**
A short exploration of our prehistoric life gallery designed especially for young children.

**Musical Sky • 30 minutes**
Our popular preschool show examines the night sky and objects in it. We listen to space songs and see pictures of the Moon, planets and rockets.

**Mix & Match • 45 minutes**
This program is what YOU make it. You tell us which four or five topics you would like us to cover.

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Kindergarten to 1

**Prehistoric Life • 1 hour**
Learn about fossilization, paleontology, evolution and geologic time. Explore the world of dinosaurs and other prehistoric animals by observing their many adaptations. Learn what these adaptations tell us about the lifestyles of prehistoric animals.

Key Concepts: evolution, adaptations, classification, fossils

**Water, Weather and a River Community • 1 hour**
Where does water come from and where does it go? Students will explore what happens to water when it rains, model flood dangers in a river community, and discuss the effects of human-environment interactions in that community.

**Wild Weather Extravaganza • 2 hours**
Grades 1-4; November 2, 2016, February 3, 2017, and March 15, 2017
Build a working weather station, explore extreme weather, and travel through the water cycle. This program includes a brief visit to our planetarium to learn about space weather.

Key Concepts: changes in weather, severe weather, weather instruments

**Michigan Wildlife • 2 hours**
December 2, 2016 and March 17, 2017
See live animals! Join the Museum and our special guest, Leslie Science and Nature Center, to learn about animal classification, habitats, and predator-prey relationships.

Key Concepts: classification, structures and functions, habitats, food chains

**Butterfly Festival • 2 hours**
May 11 and 12, 2017
Watch live monarchs and see how they travel through each stage of their lifecycle. Look closely at butterfly and moth wings. Metamorphose when you make wings of your own!

Key Concepts: life requirements, classification, life cycles, structures and functions

**The Sky Tonight • 45 minutes**
This live show explores the current night sky and covers constellations, planets, mythology, and includes virtual trips to far away places.

**Wonderful Rocket • 45 minutes**
A classic solar system trip with a rocket named “Rachel.” Learn a little about each planet, and then explore the night sky.

**Mix & Match • 45 minutes**
This program is what YOU make it. You tell us which four or five topics you would like us to cover.

**Patterns In The Sky • 45 minutes**
Grades 1-2
Explore the patterns and motions of the Sun, Moon and stars. Learn about day and night, the seasonal pattern of sunrise and set, the Moon, and the current night sky.

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Prehistoric Life:

Paleontologists now believe that many predatory dinosaurs were partially feathered, including Deinonychus, shown here.

Q: How long is *Basilosaurus isis*, the Museum’s newest complete skeleton?
A: Over 45 feet long!


Grades 2 to 5

Prehistoric Life • 1 hour
Learn about fossilization, paleontology, evolution and geologic time. Explore the world of dinosaurs and other prehistoric animals by observing their many adaptations. Learn what these adaptations tell us about the lifestyles of prehistoric animals.
Key Concepts: evolution, adaptations, classification, fossils

Rocks and Fossils • 1 hour
Investigate the rock cycle and use stereoscopes to take a closer look at rock specimens. Investigate fossils and the ways in which they form.
Key Concepts: rock cycle, types of rocks, minerals, fossils

Michigan Ecology • 1 hour
Investigate and classify the adaptations and habitats found in Michigan’s diverse ecosystems by using skulls, soil samples, and tools such as stereoscopes.
Key Concepts: nonliving and living, adaptations, Michigan ecosystems, scientific method

Water, Weather and a River Community • 1 hour
Where does water come from and where does it go? Students will explore what happens to water when it rains, model flood dangers in a river community, and discuss the effects of human-environment interactions in that community.

How Water Shapes the Land • 1 hour
Students discover how flowing water causes erosion and sedimentation, shaping and creating various landforms. They will explore how human activities influence erosion and test various methods of erosion control.

Protecting Our Watersheds • 1 hour
What is a watershed and why is it important? Students explore how specific human activities affect water quality both in a stream and as groundwater.

Wild Weather Extravaganza • 2 hours
Build a working weather station, explore extreme weather, and travel through the water cycle. This program includes a brief visit to our planetarium to learn about space weather.
Key Concepts: changes in weather, severe weather, weather instruments

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See live animals! Join the Museum and our special guest, Leslie Science and Nature Center, to learn about animal classification, habitats, and predator-prey relationships.
Key Concepts: classification, structures and functions, habitats, food chains, adaptations, Michigan ecosystems, scientific method

Butterfly Festival • 2 hours
Grades K-3; May 11 and 12, 2017
Watch live monarchs and see how they travel through each stage of their lifecycle. Look closely at butterfly and moth wings. Metamorphose when you make wings of your own!
Key Concepts: life requirements, classification, life cycles, structures and functions

Geology Rocks • 2 hours
November 4, 2016 and March 22, 2017
Learn the differences between rocks and minerals, find out what minerals hide in everyday objects, learn how earthquakes happen and touch a two billion year old rock! This program includes a brief visit to our planetarium for a look at the forces that shape our active planet.
Key Concepts: rock cycle, types of rocks, minerals, erosion, plate tectonics, fossils

Water, Water Everywhere! • 2 hours
November 11, 2016 and March 24, 2017
Explore the hydrosphere, the properties that make water special, and the water cycle. Take a close look at pond water under a microscope and test water quality. • Add a 45-minute planetarium show, Oasis in Space, $2/person (special price with Water, Water Everywhere!).
Key Concepts: water cycle, water properties, water quality

The Sky Tonight • 45 minutes
This live show explores the current night sky and covers constellations, planets, mythology, and includes virtual trips to far away places.

Mix & Match • 45 minutes
This program is what YOU make it. You tell us which four or five topics you would like us to cover.

Solar System Live • 45 minutes
Grades 3 and up
Take a live tour of the solar system including a look at its formation, the Sun, and the planets. Briefly explore the visible planets in the sky that evening.

Sun, Earth, and Moon • 45 minutes
Grades 3 and up
Our very popular live motions show examines the motions we see in the day and night sky, such as rotation, revolution, orbits, seasons, Moon phases, and solar eclipses.

Stories My Ancestors Told • 45 minutes
Grades 3 and up
The Anishinabe, or People of the Three Fires, tell many night sky stories. We will look and listen to a number of stories and then explore the night sky.

Patterns In The Sky • 45 minutes
Grades 1-2
Explore the patterns and motions of the Sun, Moon and stars. Learn about day and night, the seasonal pattern of sunrise and sunset, the Moon, and current night sky.

See “A Mammoth Mystery” on page 9

University of Michigan Museum of Natural History  (734) 764-0480  umnh.org

Q: What year was the UM Museum of Natural History founded?
A: In 1837, the state legislature authorized the University to establish a Cabinet of Natural History, which over the years grew into today’s Museum.
Grades 6 to 12

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Learn about fossilization, paleontology, evolution and geologic time. Explore the world of dinosaurs and other prehistoric animals by observing their many adaptations and what they tell us about their lifestyles.
Key Concepts: evolution, adaptations, classification, fossils

Rocks and Fossils • 1 hour
Grades 2-6
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Grades 3-8
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Grades 2-6: November 4, 2016 and March 22, 2017
Learn the differences between rocks and minerals, find out which minerals hide in everyday objects, learn how earthquakes happen and touch a two billion year old rock! This program includes a brief visit to our planetarium for a look at the forces that shape our active planet.
Key Concepts: rock cycle, types of rocks, minerals, erosion, plate tectonics, fossils

Water, Water Everywhere! • 2 hours
Grades 2-7: November 11, 2016 and March 24, 2017
Explore the hydrosphere, the properties that make water special, and the water cycle. Take a close look at pond water under a microscope and test water quality. • Add a 45-minute planetarium show, Oasis in Space, $2/person (special price with Water, Water Everywhere!).
Key Concepts: water cycle, water properties, water quality

World History through Archaeology • 2 hours
October 21, 2016 and March 10, 2017
Join researchers from the Museum of Anthropological Archaeology and the Kelsey Museum of Archaeology to learn about prehistoric and ancient cultures. Discover how we know what ancient people ate, when agriculture began, and what games people played. • Add a 45-minute planetarium show, Stars of the Pharaohs, $2/person (special price with World History through Archaeology).
Key Concepts: early civilizations, agriculture, evolution

The Sky Tonight • 45 minutes
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Sun, Earth, and Moon • 45 minutes
Our very popular live motion show examines the motions we see in the day and night sky, such as rotation, revolution, orbits, seasons, Moon phases, and solar eclipses.

“The Universe in Twelve Easy Steps” • 45 minutes
Grades 7 and up
A trip through time and space, beginning with the Big Bang, and ending with our attempts to reach out into the Universe. Significant events and aspects of the Universe are covered along the way.

See “Big History” on page 9
See “A Mammoth Mystery” on page 9

Q: How many complete prehistoric skeletons does the Museum display?
A: The Museum has 18 complete prehistoric skeletons bigger than a large dog, plus many more smaller and partial skeletons!
How to Schedule

Schedule ONLINE now by clicking the link at ummnh.org or by phone at (734) 764-0480 (9-5 weekdays).

You will need:
- Multiple possible dates and times for your visit
- Number of children and adults
- Activities you would like to schedule
- School address and phone number
- We recommend one chaperone for every 10 students.

Program Fees and Time

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<th>PROGRAM</th>
<th>STUDENT/CHAPERONE RATE</th>
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<td>Discovery Programs</td>
<td>$6 for 1 hour</td>
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<tr>
<td>Guided Tours</td>
<td>$6 for 1 hour; $3 for 30 min.</td>
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<td>Learn It! Do It! Day</td>
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<td>Planetarium Shows</td>
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<td>Stream Table Workshop</td>
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<td>$2, unlimited time</td>
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All prices include museum admission. Minimum fee may apply. Teachers are admitted free.

Payment
- A non-refundable $75 deposit is due at least 2 weeks prior to visit.
- Balance is due upon arrival.
- We reserve the right to cancel services for any program for which deposit is not paid 2 weeks prior to visit.
- We accept all forms of payment.
- Refunds will not be given for amounts of $10 or less overpaid.
- Your program is confirmed when you receive confirmation paperwork.

Cancellations & weather policy
Groups that cancel or do not arrive forfeit their deposit. Exceptions will be made for inclement weather.

Scholarships
Financial assistance is available. Call (734) 764-0480 to ask about availability and how to qualify. Scholarship funds are limited, so call as early as possible.

Thanks to our sponsors for their generous support of 2015-2016 scholarships:
- Jack and Shirley Daball
- Filmer Memorial Charitable Trust
- Suzanne D. Goodrich*
- Estate of John M. Youngpeter  
  * deceased

Museum Store
Students can visit the Museum Store to purchase a memento of their Museum visit. Many items are available for under $5!

For more information
For questions or booking information please call our main office at (734) 764-0480 or email ummnh.office@umich.edu.

More Planetarium Programs

Big History: From the Big Bang to us as explorers
Grades 6-12
Humans haven’t always been here to observe the Universe. 4.5 billion years ago a planet formed where conditions became conducive to life, which became ever more complex. The planet changed and life changed with it, leading to us, aware of our place in the Universe, and becoming the observers we are today. What have we observed in our species’ time on Earth?

Fulldome Movies
Movies in the digital planetarium immerse your students in far away places and cover a range of topics from astronomy, to biology, evolution, the origins of life, the microscopic world, Earth’s oceans, and more. Most are short enough to include other content such as night sky, sky motions, planets, and Moon phases. Visit our website for details, titles, and trailers. See previous pages for live, interactive planetarium programs. More details at ummnh.org.

A Mammoth New Exhibit & Program
Explore what U-M scientists have learned from the partial remains of the mammoth found near Chelsea, MI when the exhibit opens in November of 2016. Touch a real mammoth bone, examine the skull in 3-D on an interactive touch screen and learn what information is recorded in the tusks.

A Mammoth Mystery • 1 hour
Grades 3-6
Discover the stories hidden in bones! Students become junior paleontologists as they explore mammoths’ life cycles, learn about mammoth evolutionary history, and discover evidence for why these ice age giants became extinct.

Key Concepts: life cycles, adaptations, Michigan history, evolution, fossils, human impact on the environment
Free BUS parking can be found in the lot behind the Museum.

For private vehicles, please allow extra time to find parking. Public parking structures within easy walking distance of the Museum are located on Forest Avenue, Maynard Street, and Palmer Drive, and charge hourly fees. Two metered ADA accessible spaces are located in the parking lot behind the Museum, nearest the ramp to the loading dock. For more detailed directions visit the Museum website at ummnh.org.

University of Michigan
Museum of Natural History
1109 Geddes Avenue
Ann Arbor, MI 48109-1079
ummnh.org
ph: (734) 764-0480
fx: (734) 647-2767

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Michael J. Behm, Mark J. Bernstein, Laurence B. Deitch, Shauna Ryder Diggs, Denise Ilitch; Andrea Fischer Newman, Andrew C. Richner, Katherine E. White, Mark S. Schlissel (ex officio)

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