



Buffalo Society of Natural Sciences
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Buffalo Society of Natural Sciences



inspiring *curiosity*
through *exploration*



Valuing Nature's Wisdom



The programs of the Buffalo Society of Natural Sciences are supported in part by public funds from the County of Erie; City of Buffalo; New York State Office of Parks, Recreation and Historic Preservation; and our members and friends.



We believe science creates opportunities and shapes our world! Give students a hands-on, memorable STEM experience at the Buffalo Museum of Science and Tiff Nature Preserve.

Learn about NEW programs for 2017/2018 school year, including a brand new science studio and traveling exhibit!



tiff
presents:
digiPlaySpace

**For More Information
Visit Us Online At:**

Buffalo Museum of Science
www.sciencebuff.org

TIFFT NATURE PRESERVE
www.tiff.org

Follow Us:



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@TiffNaturePreserve



@BuffaloScience

@TiffNature



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- MakeCode with Minecraft
(ages 8-12, 2 hours)
 - Hour of Code
(ages 8+, 90 minutes)
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- Get Creative with 3D in Windows 10
(ages 8-12, or 13+, 2 hours)
- Code and Create with College Me
(ages 8-12 or 13+, 2 hours)
- Shoot, Edit and Share with PicsArt
(ages 13+, 4 hours or 2 2-hour sessions)
- Junior Achievement Job Shadow
(high school, 3 hours)

Contact Emily at empricol@microsoft.com
for more information!

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2017/2018 Educator's Guide

Buffalo Museum of Science | **TIFFT NATURE PRESERVE**



TIFFT NATURE PRESERVE

Tifft Nature Preserve is the environmental education site of the Buffalo Museum of Science, located at the Outer Harbor. The 264-acre Preserve provides refuge to animals and plants from the entire region with its diversity of habitats including a marsh, ponds and woodlands. The multi-use spaces of the Darling Environmental Education Center provide indoor accommodations for lunches and inclement weather.



GUIDED TOURS

Explore the outdoors with a knowledgeable facilitator on a guided tour of Tifft Nature Preserve. These tours support the NYS MST Standards and enhance science curricula for all grade levels through inquiry-based outdoor learning experiences. Indoor activity alternatives to the tour may be offered in the event of inclement weather.

STUDENTS:

\$7 per student (July – March)
\$9 per student Peak Season (April – June)

ADULTS:

\$7 per additional adult (July – March)
\$9 per additional adult Peak Season (April – June)

Duration:

PRE-K & K Tours: 1 hour
All other grade level tours: 1 – 1 1/2 hours

Minimum: 10 students

Maximum: 80 students

One adult required for every ten students; Adults in 1:10 ratio and required aides are free.

Pre-registration Required:

For more information or to reserve a date,
Call: 716.825.6397

Email: tiftreservations@sciencebuff.org



ALL GRADE LEVELS

TIFFT GUIDED TOUR – Available All Year

In addition to the standard program offerings, Tifft can customize a Guided Tour to suit your curriculum needs. Content is adjusted to suit each grade level. Specific content may be requested. Some topics may also be available as a workshop upon request.

<i>Adaptations</i>	<i>Classification</i>	<i>Invasive Species</i>	<i>Trees & Plants</i>
<i>Biodiversity</i>	<i>Conservation</i>	<i>Local History</i>	<i>Observation</i>
<i>Birds</i>	<i>Food Webs</i>	<i>Senses</i>	

ANIMAL HOMES & HABITATS

Available All Year

Learn how local animals are adapted to their preferred environments. Students will compare characteristics of the Preserve's various habitats, including grasslands, woodlands and aquatic ecosystems.

EXPLORING NATURE

Available March - November

Venture on a sensory-based journey to actively investigate the Preserve's seasonal characteristics. Students will explore plant-animal interactions and real wildlife clues through observation, smell, touch and listening skills, as well as inquiry, direct experiences and drawing conclusions.

NATURE IN WINTER

Available December-February

Discover how plants and animals adapt to our region's winter conditions. Students can hone their observation skills while searching for wildlife clues. Indoor activity alternatives to the tour may be offered in the event of inclement weather. Snowshoes may be requested (\$2 per person), weather permitting.

BMS OUTREACH

(Continued...)

GRADES PRE K-2

DIGGING DINOSAURS

Students will play the role of paleontologist as they examine the fossils of dinosaurs and other ancient animals.

INSECTIGATION

Examine live insects and other creatures! Students will explore the behavior and anatomy of these animals and discover how they impact the world around us.

GRADES K-6

IT'S ELECTRIC

Students will explore electricity by building circuits, testing for conductors and insulators, and experiment with our static electricity generator.

MAD SCIENTIST

Students will experiment with slimy science, static electricity and chemical reactions in this hands-on program. An available sink is required for this program.

GRADES 3-8

CRIME INVESTIGATION

Analyze evidence and clues to help solve a crime! Students will examine the properties of matter, classify fingerprints and use the science of chromatography.



Assembly Programs

(45 minutes - 1 hour)

Get your students excited about science through these unforgettable and interactive, large-group assembly programs.

Limit: 300 people, select programs have a materials fee

Daytime: \$275 per assembly

Evening/Weekend: \$350 per assembly
\$200 per additional assembly on same topic and day

GRADES PRE K-5

BUBBLE BLAST

Explore the science of soap and suds. Students will witness exciting experiments that set the stage for bubble science.

SCIENCE MAGIC

Expect the unexpected and explore the "magic" of physics and chemistry with mind-boggling demonstrations about chemical reactions, polymers, inertia, and more!

PHYSICS IN MOTION

With thrilling large-scale demonstrations, students develop a better understanding of matter, motion, and energy.

SCIENCE BELOW ZERO

Chill out during this liquid nitrogen demonstration as basic concepts of heat and kinetic energy are explored in a cool way. This program has a materials fee.

Science Fun Festivals

(Limit: 200 people, 2 hour time limit)

Science, exploration, and discovery come to your school for a day or evening event. Choose 4 of these engaging stations!

ELECTRICITY	CRIME INVESTIGATION
COLOR	ANIMAL ADAPTIONS
ENVIRONMENT	RENEWABLE ENERGY
HEALTHY BODY	NATIVE AMERICAN CULTURE
MAD SCIENTIST	
<i>*Possible Materials Fee</i>	

Science Theme Days

Join us for our Science Theme Days where students can enjoy engaging, hands-on activities throughout the museum!

DINOSAURS AND COMPANY

November 17 - Suggested for Pre K-4

INSECTS

April 27 - Suggested for Pre K-4

HEALTHY BODIES

May 18 - Suggested for Grades 3-8

BUBBLE FUN

June 8 - Suggested for Pre K-4

Buffalo Museum of Science Highlights:

digiPlaySpace

Art and technology collide with this interactive exhibit developed by the Toronto International Film Festival. Paint with light, fly through a 3D holographic world, explore green screen technology and much more! Don't miss the Museum's latest traveling exhibit, running from November 18 – April 22.

BUFFALO IN SPACE

Here in Buffalo, outer space is close to home. In the Museum's newest science studio, Buffalo in Space, visualize the size and scope of the solar system, experiment with reflection and refraction, and discover how local aerospace companies drive space technology into the future.



TIFFT WORKSHOPS (3-12)

Continued...

EXAMINING ENERGY

Available September - June

Energize your students' understanding of energy, electricity, and resource conservation. Students will explore examples of energy transfer in nature, generate their own electricity and compare renewable resources (solar, wind, hydroelectric, and geothermal) with traditional non-renewable resources while using Tifft's Environmental Education Center as a model in sustainability.

WILDERNESS SURVIVAL

Available September - June

Discuss survival needs and venture on a guided journey indoors and outdoors in search of shelter, water, food, and fire building materials. Students can implement team-building skills while constructing a lean-to, as well as learn knot-tying, the importance of fire and wayfinding techniques.

WINTER SCIENCE

Available December-February

Compare winter animal survival adaptations. Students will use weather monitoring instruments, conduct an experiment and search for evidence of animal survival on an outdoor hike. Indoor activity alternatives to the tour may be offered in the event of inclement weather. Snowshoeing may be requested (\$2 per person), weather permitting.



OUTREACH TO YOUR CLASSROOM

Bring nature into your classroom! These hands-on programs will bring items from the Tifft Nature Preserve's education collection to your students for a learning experience like no other!

Fees:

DAYTIME: \$100 per classroom / \$85 per additional program on same topic and day.

EVENING/WEEKEND: \$150 per classroom / \$100 per additional program on same topic and day.

CAPACITY

DAYTIME: Maximum 30 students per program session

An additional mileage fee will be added for roundtrip travel. Must book minimum of two (2) programs.

GRADES PRE K-1

Content is adjusted to suit each grade level. Specific content may be requested.

STORIES IN HAND

Share in a hands-on, nature-themed story-time. Stories will be brought to life for young learners with real biofacts of animal fur, bones, and wildlife clues to see, feel, and investigate. Program length is 45 minutes.

GRADES PRE K-8

Content is adjusted to suit each grade level. Specific content may be requested.

NATURE DETECTIVES

Put on a detective hat and use sight, smell, hearing and touch to investigate real clues left behind by different local animals. Students will learn lessons in habitats, adaptations and food webs.

ANIMAL ARCHITECTURE

Investigate real animal shelters such as bird and insect nests, small burrows, and plant galls from the Tifft Collections. Students can work in teams to create their own small shelter in the classroom from natural materials, investigate the importance of shelters in various habitats, and the adaptations of the animals that made them.

GRADES 3-8

Content is adjusted to suit each grade level. Specific content may be requested.

ENERGY EXPLORATIONS

Understand why energy is vital to the world and all the people who live in it. Students will investigate what energy is and how we all use energy, plus explore renewable and non-renewable resources and the impacts of energy-related choices.



BUFFALO MUSEUM OF SCIENCE

Explore the Museum with your students! Our state-of-the-art science studios foster hands-on and inquiry-based learning that aligns with your STEM curriculum. There's something for everyone! In addition to our science studios, join our team of Science Buffs throughout your visit for engaging science demonstrations and activities. All presentations are free with admission and occur throughout the Museum.



SCIENCE STUDIO OVERVIEW

First Floor

Explorations – Nurture curiosity through inquiry and play! Perfect for toddler and preschool scientists.

Second Floor

Artifacts – Explore the museum's collection of artifacts from around the world.

Biodiversity – Examine plants and animals from biomes around the world, including the rainforest, African savanna, American prairie, and the oceans.

CONSTRUCT – Let your imagination run wild! Design and create any number of things using everyday objects.

Explore You – What do you know about YOU? Discover the human body and what keeps us healthy.

Rethink Extinct – Take a journey through time, through the five major extinction events – and even into our future.

Third Floor

Bug Works – Investigate bug sounds, life cycles, habitats, and how even the smallest insects keep our planet in check.

In Motion – In this highly interactive studio, students will experiment with the basic of physics, mechanical motion, and engineering.

Our Marvelous Earth – From extreme weather to the rocks beneath your feet, this immersive studio focuses on our Earth's systems and how they interact.

Yum – Explore the science of food and healthy living in a fun and engaging way.

Fourth Floor

Buffalo In Space – Visualize the vastness of space and the solar system, while discovering technologies and current space research that will shape their future.

BMS PRICING 2017-2018

Buffalo Museum of Science Admission Fees

Groups of 10 or more that are pre-booked can take advantage of the following pricing

Group Admission:

\$8 per student

Group Admission + Guided Tour:

\$10 per student

Group Admission + Science Theme Day:

\$11 per student

Group Admission + Workshop:

\$12 per student

Group Admission + Lab:

\$12 per student plus materials fee

National Geographic 3D Films

20-minute film: \$1 per person

40-minute film: \$3 per person

GUIDED TOURS

ALL AGES

(45 mins-1 hour)

Join our docents on an engaging tour through the Museum's science studios.

MUSEUM'S COLLECTION

Using the Museum's collection, explore the different people, places, and environments around the world. Choose two or three areas to visit during this interactive tour.

SENSORY TOURS

Use your senses to learn in a different way! Experience the natural world in new ways using sight, sound, touch and even smell. Recommended for special needs groups.

WORKSHOPS

(45 mins-1 hour, unless otherwise stated)

Enrich your school's trip with special themed activities with our team of facilitators!

GRADES PRE K-4

DINOSAURS, MASTODONS AND MORE

Discover Earth's history through hands-on exploration. Students can examine fossils from the Museum's collection and make connections between extinct animals and those alive today.

SIMPLE MACHINES

Discover the world of simple machines. Students will learn to identify the common simple machines and work together to create compound machines to solve a challenge.



NATIONAL GEOGRAPHIC 3D CINEMA

Presented by

M&T Bank

BMS WORKSHOPS (PRE K-4)

(Continued...)

HEALTHY BODIES

Learn the basics of a healthy lifestyle! Students will participate in hands-on, interactive activities about tooth brushing, hand washing, healthy eating and exercising.

INSECTIGATION

Discover the roles insects play in our everyday lives. Students will examine the stages of life cycles, analyze their adaptations and learn how scientists classify insects and other arthropods.

GRADES K-8

BODIES ARE US

Explore the body systems and how they are all interconnected. Examine how the choices people make impact their quality of life. Build your workshop by choosing up to three topics. **See website for options.**

CIVILIZATIONS

Explore major world civilizations through the real artifacts. Students will compare civilizations' traditions, beliefs and geography through hands-on learning. Build your workshop by selecting up to three civilizations. **See website for options.**

DYNAMIC EARTH

Using the Museum's collection of rocks and minerals, students will examine the geological process that make up the rock cycle, including plate tectonics, weathering and erosion.

OUR PLACE IN SPACE

Visualize our place in the solar system, understand the motions of objects across the sky and investigate the engineering possibilities of future space travel and living.

WILD ADAPTATIONS

From the Arctic to tropical rainforests, students will investigate what adaptations help plants and animals survive in their natural habitats, and how changing habitats affect organisms.

WEATHER AND CLIMATE

Investigate weather's impact on the world around us. Students will develop an understanding of global climate systems and the interactions between air, water and land.

GRADES 2-8

CRIME INVESTIGATION

(1.5 hours)*

Analyze evidence and clues to help solve a crime! Students will examine the properties of matter, classify fingerprints and use the science of chromatography.

DESIGN CHALLENGE

Using an assortment of everyday items, students will work as a group to design, construct, test and evaluate a prototype solution to a given problem. Challenges include:

Marooned: What would you do if you were stranded in the wilderness? Work as a team to brainstorm and innovate creative ways to reuse materials to survive and get rescued.

Energy Conservation: Learn about energy use and conservation by using various materials to insulate a cardboard house and test its efficiency.

LABS (GRADES 5-12)

(1 hour-1 hour 15 mins, unless otherwise stated)

Give your classroom a hands-on immersive experience in the Buffalo Museum of Science labs. Material fees apply.

COMPARATIVE ANATOMY DISSECTIONS

Choose from a wide selection of specimens. Students will analyze how structure relates to function and evolution. Additional lab fees apply. Book a minimum of 4 weeks in advance.

SPARKS LAB

What happens when science meets art?

OXIDATION ART

Students will investigate reduction-oxidation reactions, and will be able to create their own work of art using copper and iron paint.

OPERATION: TITAN

Explore Saturn's largest moon through scientific illustration! Students will create their own vision of Titan by interpreting data to create scientifically accurate paintings.

RECYCLE SPIN ART

Combine technology and art appreciation. Participants will deconstruct appliances and use the electronic "junk" to create their very own mini-spin art machine.

MAKER LAB

Inspired by the Maker Movement, students will use the methods of science and engineering to experiment and create. Choose from one of the following topics:

ROBOTS

Students will investigate the mechanics and electronics of robots and will create their own Scribble Robot.

FLIGHT SCIENCE

From low-tech paper airplanes to high-tech drones, students will explore the science of flight and evaluate different flying machines.

CIRCUITS

Explore electricity, conductive materials and energy transformation in this hands-on lab. Students will experiment with and create their own circuit creations.

OUTREACH TO YOUR SITE

(45 minutes - 1 hour)

Let us bring the Museum to you! Enjoy hands-on Classroom Programs, large-scale Assembly Programs, or exciting Science Fun Festivals! An additional mileage fee will be added for roundtrip travel for all programs. Must book a minimum of two (2) programs.

Daytime Classroom Outreach

Program:

\$100 per classroom, \$85 per additional program on the same topic and day

Evenings and Weekends: \$150 per classroom, \$100 per additional program on same topic and day

Pre-K Programs: Limit 20 students, 30-45 minutes

All other grade level programs: Limit: 30 students, 45-60 minutes

An additional materials fee may apply to some programs.

Due to the hands-on and interactive nature of our programs, we ask that you respect our class size limits. An additional fee of \$85 (daytime) or \$100 (evening/weekend) will be added if limits are exceeded.



TIFFT GUIDED TOURS

(Continued...)

LIFE CYCLES

Available May – August

Explore the Preserve in search of real animal and plant life cycles in action. This customizable tour will give students a look into insect and frog metamorphosis.

TIFFT HISTORY AND HUMAN IMPACT

Available All Year

Discover how Tifft's past, present and future are linked to our region's history. Students will read Tifft's landscape to understand the impact of human activity on the environment and ways of lessening our impact through resource conservation and habitat restoration. This tour can include a PowerPoint presentation on the history and future of Tifft. Please let the reservationist know if you are interested in this presentation. This tour is also ideal for college classes and adult groups.

GENERAL VISIT

A perfect choice for groups looking to trek at your own pace, observe nature's spontaneity and weave your teachings into an outdoor nature experience. Nature Scavenger Hunt worksheet available upon request.

PLEASE NOTE

Pre-registration required for any group of 10 or more. We reserve the right to turn away any group that does not make a reservation as they may interfere with other programming.

FEES

\$3 per person.

Additional fees may apply.



WORKSHOPS

In-depth science activities give students hands-on experiences both indoors and outdoors. Workshops include interactive activities as well as a guided tour of the Preserve. Indoor activity alternatives to the tour may be offered in the event of inclement weather. Engage your class in a unique, inquiry-based learning opportunity that supports the NYS MST Standards.

PLEASE NOTE

Pre-registration required

For more information or to reserve a date

Call: 716.825.6397 or

Email: tiftservations@sciencebuff.org

CAPACITY

Minimum: 10 students

Maximum: 60 students

One adult required for every ten students; Adults in 1:10 ratio and required aides are free.

GRADES PRE K-2

ANIMAL HOMES & HABITATS

Available September - June

Investigate real animal homes and various habitats of Tifft. Through hands-on explorations and a guided tour, students discuss survival needs, work together to construct animal homes and match animals to their proper habitats.

SEEDS & NEEDS

Available September - June

Explore the needs of seeds, plant parts and species diversity. Through hands-on activities and a guided tour, students investigate the shape and function of real plant seeds, create an imaginary seed designed for dispersal and plant seeds in pots to take back for observation.



FEES

STUDENTS:

\$10 per student (July – March)

\$12 per student Peak Season (April – June)

ADULTS:

\$7 per additional adult (September – March)

\$9 per additional adult Peak Season (September – March)

DURATION

PRE-K & K TOURS: 2 - 2 1/2 hours

ALL OTHER GRADE LEVELS: 2 1/2 - 3 hours

GRADES 3-12

ANIMAL HOMES & HABITATS

Available September - June

Investigate real animal homes and various habitats of Tifft. Through hands-on activities and a guided tour, students will discuss survival needs, design an imaginary animal and its adaptations and match animals to their proper habitats.

NATIVE AMERICAN LIFE & LORE

Available September - June

Explore the history and culture of the Haudenosaunee. Through indoor hands-on exploration and a guided tour, students will investigate and implement real tools and artifacts while discovering Seneca survival strategies and daily life activities.

AQUATIC ECOLOGY

Available April - October

Discover our essential connection to water and water habitats of the Great Lakes region. Through hands-on water quality testing and macroinvertebrate sampling, students will discuss watersheds, aquatic bio-diversity and human impact. To include fishing, add \$2 per student. This informative program is ideal for older students interested in an immersive study of the waters of the Great Lakes region.