



GREAT LAKES
Science Center

Stay Curious.

2019 - 2020

EDUCATOR GUIDE

Plan your field trip today!

NEW!

Outreach to
Your School!

NEW!

Spy Science
Workshops!



GreatScience.com/educators
216-621-2400

OUR CORPORATE AND FOUNDATION SUPPORTERS

100K +



25K +



MARTHA HOLDEN
JENNINGS FOUNDATION



ELIZABETH RING MATHER
AND
WILLIAM GWINN MATHER FUND



Oatey
Foundation



15K +



10K +

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Frederick W. & Janet P. Dorn Foundation · The Char and Chuck Fowler Family Foundation
The Lincoln Electric Foundation · MTD Products Inc · The Sherwin-Williams Company
ShurTech Brands, LLC · Timken Company

5K +

Airgas USA, LLC · BakerHostetler · Best Buy Foundation · Cleveland-Cliffs Inc.
The Cleveland Clinic Foundation · Cleveland Indians
The George W. Codrington Charitable Foundation · Ernst & Young LLP
Forest City Realty Trust · The John and Sally Morley Charitable Fund
The Murch Foundation · Nordson Corporation · The Pentair Foundation · PwC
The Billie K. and John A. Rawot Fund · The Sisler McFawn Foundation

WELCOME!

Great Lakes Science Center is ready to help you kick off another fantastic school year! We bring science, technology, engineering and math to life for more than 65,000 field trip students every year, and this year we're adding in-school outreach to our growing menu of hands-on programming, so we can bring STEM to life and directly to you! In this booklet you'll find everything you need to know to plan a field trip, or in-school visit that fits your curriculum and your budget, from add-on workshops to larger-than-life science documentaries in our DOME Theater. We thank you for choosing Great Lakes Science Center and hope to see you and your students soon!

Discounted Family Memberships

Ohio certified educators receive a 10 percent discount on all Family Level memberships. You and your family can enjoy free general admission to the Science Center, NASA Glenn Visitor Center, Steamship *William G. Mather* and most traveling exhibitions all year long. Receive discounts on our camp programs and free general admission to 360+ reciprocal science centers and museums. Proof of teacher status is required. Call 216-696-4576 for details.

FREE Admission Every Day

Who says kids should have all the fun? The Science Center offers free general admission to Ohio teachers every day. Just bring a copy of your teaching certificate, OEA card, union card or school ID listing teacher/educator and preview the exhibits before your next field trip.



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NEW!

NOW OFFERING OUTREACH TO YOUR SCHOOL!

IN-CLASSROOM WORKSHOPS

Our new outreach workshops bring the fun and energy of the Science Center directly to your students, and include integrated professional development for you.*

Programs are developed for a classroom of up to 30 students.

PRE-K-KINDERGARTEN \$135 *Duration: 30 minutes*

WEATHER WATCHERS

What do we see and feel during different seasons? What change can happen within a season? What is the water cycle? Study the "ingredients" of weather and how they affect each other.

STICKY SCIENCE

How and why do things stick? How does a gecko climb a wall? Why does a sticker stick in a book? How can we un-stick something? Learn how scientists work to get the right level of stickiness.

GRADES 1-8 \$175 *Duration: 60 minutes*

WEATHER ALERT

What "ingredients" are needed for wild weather? What parts are dangerous and how can we be safe? Watch us recreate components of weather inside the classroom.

BLAST OFF!

What do we need to launch a rocket into space? Why is the launch angle important? Construct and test various types of rockets and launch systems. Explore some of the problems that NASA engineers might face.

MOTION MANIA

Create a coaster! How do we start the movement, slow it down or speed it up? Observe how energy transfers between objects. What are some problems that engineers face when creating coasters that people can ride?

**Teachers will be asked to participate within the workshop to gain knowledge on content and pedagogy. Teachers will receive an outline of the activities presented and extension activities to further the lesson beyond our visit.*

WE BRING THE “WOW” TO YOUR STEM NIGHT!

\$150/per hour

Let us provide a fun, hands-on STEM learning table activity for your family night. Students and their families will be able to engage with one of our pre-determined activities. Choose from subjects such as electricity, sound, space and others.

MILEAGE

Up to 40 miles from Great Lakes Science Center is included in the program fee. A mileage fee of \$2/per mile will be charged for mileage beyond the initial 40 miles. The maximum distance we can serve is 120 miles from the Science Center.



HANDS-ON WORKSHOPS PRE-K - 2

PRE-K – KINDERGARTEN

\$4 per student. 20 minimum/30 maximum. Additional sessions will be scheduled for groups larger than 30. Duration: approximately 30 minutes.

SOUND EXPLORERS

Can we see sound? Use your senses to explore vibrations that allow us to hear, feel and even see sound. This workshop promotes science and literacy.

PSK; RLK; SLK; LK

ENGINEERING CHALLENGE: THE THREE LITTLE PIGS

Students will become engineers while performing hands-on experiments and exploring which materials can withstand the big, bad wolf. This workshop promotes science and literacy.

PSK; MK; RLK; SLK; LK



GRADES 1 – 2

\$5 per student. 20 minimum/30 maximum. Additional sessions will be scheduled for groups larger than 30. Duration: approximately 45 minutes.

STATES OF MATTER: ICE CREAM SCIENCE

Can we turn hot chocolate into ice cream? Explore the properties of solids, liquids and gases in a tasty and hands-on format. (Students with dairy/chocolate allergies are asked not to participate.) *ESS1; PS1; ESS2; SL1; SL2; L1; L2*

ENGINEERING CHALLENGE: SKYSCRAPERS

Students will transform into engineers when they are challenged to build a tower out of simple paper that can hold weight! *PS1; PS2; M1; M2; SL1; SL2; L1; L2*

NEW! SCIENCE SLEUTHS

Students work together to crack the code and reveal patterns that help them solve the caper. We explore codes and communication to become "Science Super Sleuths" and help save science. *1.OA.1; 1.OA.3*



HANDS-ON WORKSHOPS 3 - 8

GRADES 3 – 5

\$5 per student. 20 minimum/30 maximum. Additional sessions will be scheduled for groups larger than 30. Duration: approximately 45 minutes.

JUMPING JITTERBUGS

Students explore how circuits and electricity work together while designing and creating their own Jumping Jitterbug. An additional \$1 per student materials fee will be applied for this workshop. *PS3; PS4; PS5; SL3; SL4; SL5; L3; L4; L5*

ENGINEERING CHALLENGE: RESCUE MISSION

Students use the engineering and design process to construct a mini trampoline as they work in small groups to complete their mission.

PS3; PS4; PS5; M3; M4; M5; SL3; SL4; SL5; L3; L4; L5

NEW! AGENTS OF STEM

Manipulate matter and uncover the mysteries behind light and sound waves as students experiment with invisibility and sound amplification to become "Science Spies."

GRADES 6 – 8

\$5 per student. 20 minimum/30 maximum. Additional sessions will be scheduled for groups larger than 30. Duration: approximately 60 minutes.

INTRODUCTION TO CODING & ROBOTICS

Students will be introduced to the basic coding language of C++ as they learn how to navigate a robot through a series of challenges. *PS6; PS7; PS8; M6; M7; M8; SL6;*

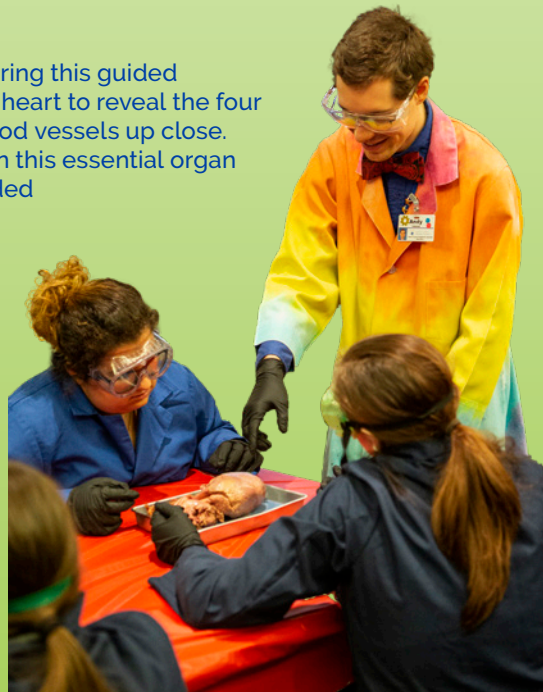
SL7; SL8

OPERATION HEART DISSECTION

Students will get a tour of the body's pump during this guided dissection of a pig heart. They will cut into the heart to reveal the four chambers, peer into the aorta, and inspect blood vessels up close. They will see how cardiac surgeons operate on this essential organ with expertise and care with a narrated, recorded surgical procedure. (Must be reserved at least four weeks in advance.) An additional \$2 per student materials fee will be applied for this workshop. *PS6; PS7; PS8*

NEW! ELECTRICITY INVESTIGATORS

Students investigate circuits and electricity as they are challenged to design and build a device that will help them escape the science villains. Try not to get caught! *PS6; PS7; PS8*



Call 216-621-2400 to book your field trip

HANDS-ON WORKSHOPS 9 - 12

GRADES 9 – 12

\$5 per student. 20 minimum/30 maximum. Additional sessions will be scheduled for groups larger than 30. Duration: approximately 60 minutes.

ENGINEERING CHALLENGE: PARACHUTES

Combine the forces of lift, drag and gravity with materials and design elements to create parachutes. Students will test their designs by dropping a parachute 80 feet. Can they do it without cracking the raw egg payload?

PHY; SL; RST; WHST

OPERATION HEART DISSECTION

Students will get a tour the body's pump with the guided dissection of a pig heart. They will cut into the heart to reveal the four chambers, peer into the aorta, and inspect blood vessels up close. They will see how cardiac surgeons operate on this essential organ with expertise and care with a narrated, recorded surgical procedure. (Must be reserved at least four weeks in advance.) An additional \$2 per student materials fee will be applied for this workshop. *BIO; SL; RST; WHST*



NEW! CRYPTOGRAPHY CHALLENGE

Students get hands-on to learn how the evolution of technology is carving a more secure digital landscape. We explore how coding and cryptography contributed to the invention of Blockchain and how this technology secures our digital assets leading to safer transactions and social equality.

Government and the Economy.23,24; Economic Decision Making and Skills.2; Fundamentals of Economics.4; Global Connections.2; Technology.14,15; The Global Economy.19,21



PROFESSIONAL DEVELOPMENT FOR EDUCATORS

STEM EDUCATOR RESOURCE FAIR

OCTOBER 16, 2019

4-7 P.M.

What's the best way to plan a field trip to the Science Center? Experience it yourself before you bring your students!

- Sample Science Center workshops
- Learn what's new at the Science Center
- Watch a movie in the Cleveland Clinic DOME Theater
- Explore ways to tie your field trip into your curriculum
- Browse partner tables and collect valuable STEM resources



The STEM Fair includes time to explore the Science Center. You will also enjoy complimentary food and a drink ticket for beer or wine. Three hours of CPE credit available upon conclusion of the event. Attend this event and receive a 10 percent discount on a future field trip. Registration is available at GreatScience.com or 216-621-2400.



NASA FREE DAY & CAREER DAYS

NASA FREE DAY

THURSDAY, NOVEMBER 7, 2019

Free general admission for all Ohio schools. Celebrate World Space Week and enjoy NASA speakers and space-themed activities and demonstrations.

CAREER DAYS FOR GRADES 6-12

Programs are free for students with paid general admission. Advance reservations are required. Availability is limited.

HEALTH CAREERS DAY

NOVEMBER 14, 2019

Meet local medical professionals and higher education representatives to explore a variety of biomedical education programs and diverse career options in health and medicine.

ENGINEERING CAREERS DAY

FEBRUARY 20, 2020

Celebrate the National Week of Engineering and find out what engineers do! Discover the wide variety of career paths in the many fields of engineering.

DON'T MISS!

CURIOSITY CARNIVAL



Step right up for an exhibition
like no other, featuring
amazing feats of science!

**OPENS
NOVEMBER 15**

MIDWAY GAMES

FEATS OF PHYSICS

**TRICKS &
PERFORMANCES**



Your mission, should you choose to accept it –
enter the world of espionage and experience the
science behind being a top secret spy!

It's a hands-on, over-the-top covert op!

Coming in March 2020 from the Science Center.

CLEVELAND CLINIC DOME THEATER

ADD A MOVIE TO YOUR FIELD TRIP!

Giant-screen films can inspire STEM careers by bridging the gap between entertainment and science learning.

Enhance your students' educational experience by adding a film shown in our six-story high domed theater to your visit! Educator guides that include information on national content standards as well as pre- and post-visit activities are available for our films. Please visit GreatScience.com and click on "Educators" for more details. Pricing is also available for movie-only field trip experiences. Please see page 14 for details.

NEW!

NEW!



OR CHOOSE FROM ONE OF THESE RECENT FAVORITES!

Tiny Giants (20 and 40 minute versions available), Incredible Predators, Journey to Space, Backyard Wilderness, Dream Big, Amazon Adventure, National Parks Adventure, America's Musical Journey, Great Barrier Reef

WHAT TO SEE AND DO

NASA GLENN VISITOR CENTER

Great Lakes Science Center is home to one of only 11 NASA Visitor Centers in the nation. Reinforce your curriculum as students take a look at the past, present and future of space travel, see a real space command module, learn how astronauts live and work on the International Space Station, and explore propulsion, power, materials science and much more!

MISSION TO STEM

Field trips have moved into the realm of augmented reality at Great Lakes Science Center! The state-of-the-art Mission to STEM app brings our NASA Glenn Visitor Center to life with virtual and augmented reality. In this interactive digital mission, students will virtually climb into the Apollo capsule, fire up a rocket, conduct International Space Station experiments and more. Your class will be provided with iPad minis or download the app and bring your own set of iOS devices.

CLEVELAND CREATES ZONE

Tinker, create and test, with more than 3,000 square feet of engineering design exhibits. In these maker experiences students are encouraged to identify variables, compare results and redesign their creations.

Critical thinking skills are emphasized here including defining the problem, testing solutions and developing perseverance. In the Zone they learn what engineers already know: failure is always an option -- and a great learning opportunity.

SCIENCE PHENOMENA

Get hands-on with science! Our Science Phenomena exhibits encourage students to observe, investigate, predict and test the principles behind light, sound, motion, weather, electricity and magnetism.



BIOMEDTECH: ENGINEERING FOR YOUR HEALTH

Enter the world of biomedical technology and engineering. Students explore interactive exhibits, videos, and educational displays focusing on genomics, stem cells, prosthetics, functional electrical stimulation (FES) and medical imaging as they learn about the work being done by local researchers to develop innovative medical technologies. The BioMedTech's nano exhibit engages guests through a series of interactive experiences that make a world we cannot see come alive through real-life applications and small-scale, but powerful technologies.

DAILY SCIENCE DEMONSTRATIONS

Science comes to life every day in our spectacular science demonstrations. Current demonstrations include:

- Bubblemania
- Magic of Matter
- Force and Motion
- Energize It!
- It's Electric
- Seeing Sound

Daily science demonstrations are free with paid general admission. Seating may be limited as daily demonstrations are open to the public. You will be notified of the current day's times and themes at check-in.



PLANNING YOUR FIELD TRIP

1. FIELD TRIP PRICING

We offer multiple field trip options for groups of 10 or more people. Rates apply to schools (public, private, charter or home school) visiting during the school year. Advanced reservations are required.

General admission - \$7 per student

Admission & DOME Theater - \$10 per student

DOME Theater only - \$7 per student

**A 6 percent City of Cleveland admissions fee will be added to your visit.*

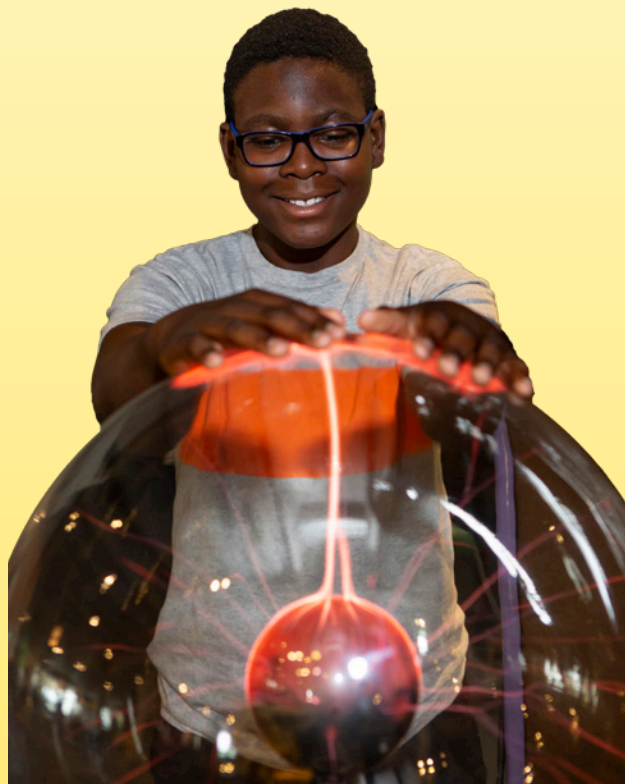
2. ADD ON A HANDS-ON WORKSHOP

Enhance your field trip experience with a hands-on workshop starting at just \$4 per student. All workshops are specifically designed to support Ohio's Learning Standards in science, math, literacy and social studies. More information on workshops can be found on pages 6-8.

3. BOOK YOUR EXPERIENCE

Reserve your trip by phone or email. Book early as many of our program dates and times fill quickly.

- By phone: Call our dedicated reservation agents at 216-621-2400 (Monday through Friday, 9 a.m. to 5:30 p.m.)
- By email at edhelp@glsc.org. Please be sure to include your school, grade level and full contact information.
- Pre-register online: save time and pre-register. Our reservations team will collect your information and confirm your field trip by phone. Go to GreatScience.com and click on Educators>Plan a Field Trip.



IMPORTANT FIELD TRIP INFORMATION

CANCELLATION POLICY

Please let us know in advance if you need to cancel. Payments are non-refundable and payments made toward a canceled visit will be held as a credit toward a future visit.

TITLE 1 SCHOOL ADMISSION

Ohio schools who receive federal Title 1 services are entitled to **free general admission** to the Science Center as part of a field trip on any school day. DOME Theater films, workshops and the Steamship *William G. Mather* are not included. Status is subject to confirmation.

PAYMENT AND CONFIRMATION

A confirmation packet will be emailed to you following the completion of your reservation. Please review the packet thoroughly to ensure you have everything you need. Payment for all field trips is due 14 days prior to your visit date. Acceptable forms of payment include credit card, check, purchase orders and cash (cash payments must be made in person at the Science Center).

EDUCATOR RESOURCES

We want to make it easy to prepare for your day at the Science Center. Visit **GreatScience.com** and click on Educators>Educator Resources where you'll find a wide range of materials to help prepare you and your classroom for your visit.

THE SCIENCE STORE

The Science Store carries a large selection of educational items that complement our exhibits and films. Advanced orders can be placed by calling the Science Store at 216-696-5575.

ADMISSIONS FEE

Please note that a 6 percent City of Cleveland admissions fee is applicable to all field trips and will be added to the cost of the visit.

CHAPERONES

Great Lakes Science Center recommends one adult chaperone for every five students. Chaperones within the one-to-five ratio will receive free admission. Additional adults must pay the posted student rates.

PARKING

Complimentary bus parking is available on a first-come, first-served basis. Buses will receive instructions on where and how to park upon arrival. Parking spaces for cars are available in our attached garage at the posted Science Center guest rates.

LUNCH OPTIONS

Please let us know at the time of reservation if you plan to eat lunch at the Science Center. A reserved lunch space is included with all field trip reservations. Schools are welcome to bring brown-bag lunches to be enjoyed in our group lunch space or outdoors along the harbor (weather permitting). Pre-ordered boxed lunches are also available through the Science Center Café. Please be sure to let our reservations specialist know if you plan to order lunch. A menu and ordering information is included in your confirmation packet. All pre-ordered lunches must be confirmed and paid for at least five business days before your visit.



Great Lakes Museum of Science, Environment and Technology
601 Erieside Avenue • Cleveland, OH 44114



PLEASE CIRCULATE TO:

- o *Math Teachers*
- o *Science Specialists*
- o *Teacher/Educators*
- o *Librarians*
- o *Science Club Advisors*
- o *Parent Coordinators*
- o *Home Schoolers*
- o *After School Coordinators*
- o *Community Leaders*

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