



GREAT LAKES
Science Center

Stay Curious.

EDUCATOR GUIDE

2017 - 2018



- **NEW!** Price Drop!
- **NEW!** Try the New Mission to STEM App in the NASA Glenn Visitor Center
- **NEW!** Professional Development Opportunities
- Cross Disciplinary Standards including Science, Math, Literacy & Social Studies
- Heart Dissections Available for Middle School Students

GreatScience.com
216-621-2400



We make STEM come alive!

At Great Lakes Science Center, we are transforming field trips with engineering design programming, new virtual and augmented reality exploration of authentic NASA artifacts and professional development opportunities offered in collaboration with cutting-edge corporate partners. From pre-K to 12th grade, our workshops meet standards not only in science and math, but also literacy and social studies. And we have reassessed and reduced our field trip fees! See for yourself — educators receive **free admission** every day at the Science Center.

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WHAT'S NEW FOR 2017-2018

Cleveland Clinic DOME Theater

Large screen films inspire students' interest in STEM careers by bridging the gap between entertainment and science learning. They provide immersive and entertaining experiences that heighten students' sense of wonder and encourage them to consider their roles as global citizens and future STEM leaders.

Enhance your students' educational experience by adding a film shown in our six-story 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!

Amazon Adventure Opening January 2018



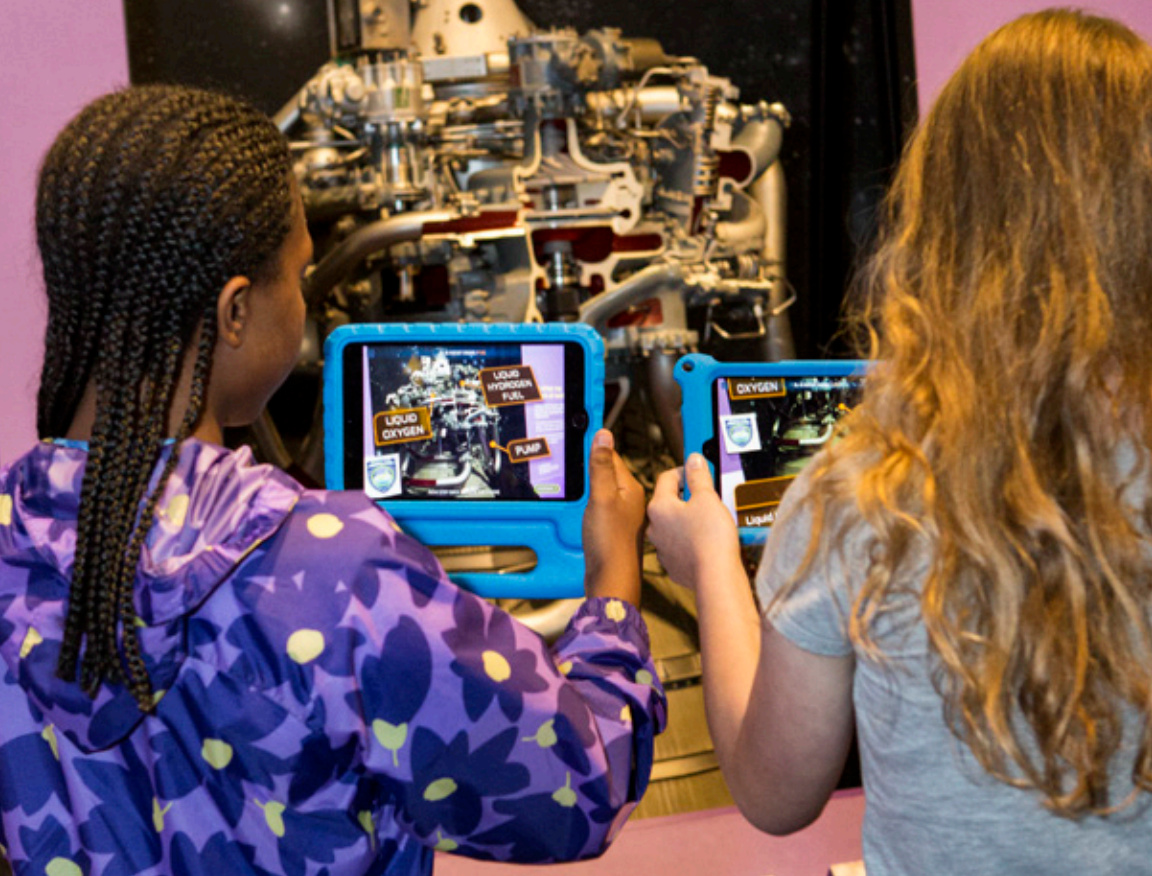
Dream Big Now Playing



Or choose one of these recent favorites including Journey to Space, Tiny Giants, Incredible Predators, or National Parks Adventure.

WHAT'S NEW FOR 2017 - 2018

MISSION to STEM





MISSION TO STEM

Field trips are moving into the realm of augmented reality at Great Lakes Science Center! The new Mission to STEM app radically changes students' visits to our NASA Glenn Visitor Center with virtual and augmented reality. In this interactive digital mission through the exhibit galleries, students will virtually climb into the Apollo capsule, test new capsule designs that will take us to Mars, fire up a rocket, conduct International Space Station experiments developed by NASA Glenn Research Center and more. Your class will be provided with iPad minis or download the app and bring your own set of devices.



WHAT'S NEW FOR 2017-2018

Keep Your
Curiosity on Track

ALL ABOARD! *The Science of Trains*

November 3, 2017 -
February 19, 2018



Build It!

Engineering fun, one brick at a time

**Back by
popular demand!**
March 9 - April 9, 2018



PROFESSIONAL DEVELOPMENT FOR EDUCATORS

Evening for Educators

October 11, 2017 & February 7, 2018

4:30 - 7:30 p.m.

Meet Science Center staff and participate in brief professional development sessions and activities including:

- Enjoy live demonstrations
- Sample hands-on workshops
- Explore ways to tie your field trip to your curriculum
- Preview what's new at the Science Center

Evening for Educators includes time to explore the museum. You will also enjoy complimentary dinner 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. To register for either date, call 216-621-2400, or visit GreatScience.com.

Discounted Family Memberships

Discounted memberships are available for teachers. You and your family can enjoy free general admission to the Science Center, NASA Glenn Visitor Center, Steamship Mather and most traveling exhibitions all year long. Get discounts on our camp programs and free admission to 360+ reciprocal science centers and museums. Call 216-696-4576 for details.

Don't forget - educators receive free general admission every day!

New! Teacher Workshops

Learn new ways to bring technology to your classroom, and network with teachers and industry professionals. Three hours of CPE credit awarded at completion of each workshop. Limited to 20 participants per workshop, so book early. (Workshop fee is \$20 per person, per workshop. Detailed descriptions are available at GreatScience.com.) To register, call 216-621-2400, or visit GreatScience.com.



- Introduction to 3-D Printing with MakerGear
November 15
4:30-7:30 p.m.
- Introduction to Robotics with Rockwell Automation
December 6
4:30-7:30 p.m.
- Advanced 3-D Printing with MakerGear
January 10, 2018
4:30-7:30 p.m.
- Intermediate Robotics with Rockwell Automation
March 7, 2018
4:30-7:30 p.m.

FREE Online Resources

View our online videos and learn the science behind our most popular exhibits. Find links to Ohio Revised Content Standards in physical sciences, earth and space sciences and life sciences. Visit GreatScience.com and click on "Educators."

OUR CORPORATE AND FOUNDATION SUPPORTERS

100K +



The Fred A. Lennon Charitable Trust



ELIZABETH RING MATHER
AND
WILLIAM GWINN MATHER FUND



50K +



MARTHA HOLDEN
JENNINGS FOUNDATION

25K +



15K +



Frederick W. & Janet P. Dorn Foundation

THE THOMAS H. WHITE FOUNDATION

10K +

The Abington Foundation | BakerHostetler | BASF Corporation
Best Buy Foundation | M.E. & F.J. Callahan Foundation
Cleveland Clinic Lerner College of Medicine
Cleveland Coca-Cola Bottling Co., Inc. | MilliporeSigma | MTD Products Inc
Northeast Ohio Regional Sewer District | PolyOne Corporation
PPG Industries Foundation | PricewaterhouseCoopers LLP
The Sisler McFawn Foundation | Swagelok Company | Time Warner Cable

5K +

Automation Tool & Die, Inc. | Bank of America | Cargill Incorporated
Cleveland Indians | The George W. Codrington Charitable Foundation
Day-Glo Color Corporation | Dish Network | Dominion Energy Foundation
Forest City Realty Trust | The Giant Eagle Foundation
Frank Hadley Ginn & Cornelia Root Ginn Charitable Trust | Keithley Instruments
KPMG LLP | The Maker Education Initiative | The Murch Foundation
RPM International Inc. | United Black Fund of Greater Cleveland, Inc.

OHIO ACADEMIC STANDARDS

Example: *PS1* = "Physical Science, Grade 1"

Pre-K-8

PS = Physical Science
ESS = Earth and Space Science
LS = Life Science
M = Mathematics
S = Speaking and Listening
L = Language

High School

Bio = Biology
CHM = Chemistry
EVS = Environmental Science
PG = Physical Geology
PS-H = Physical Science – High School
PHY = Physics
SL = Speaking and Listening
RST = Reading for Literacy in Science and Technical Subjects
WHST = Writing for Literacy in History/SS, Science and Technical Subjects

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!

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 while learning 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.



FREE SCIENCE DEMONSTRATIONS

Demonstrations are adaptable for all grade levels

Bubblemania

(Recommended for Pre-K - 2)

Bubbles come alive while students investigate molecules, shapes, colors and recycling!

It's Electric

What is electricity? How do we get and use it? This shockingly fun demonstration activates historically significant equipment to illustrate the amazing effects of electrical energy transfer and transformation that is sure to spark curiosity.

Energize It

Thermal, chemical, potential, kinetic, oh my! Energy is all around us as we investigate how energy can transform in a variety of ways, sometimes with explosive results!

Magic of Matter

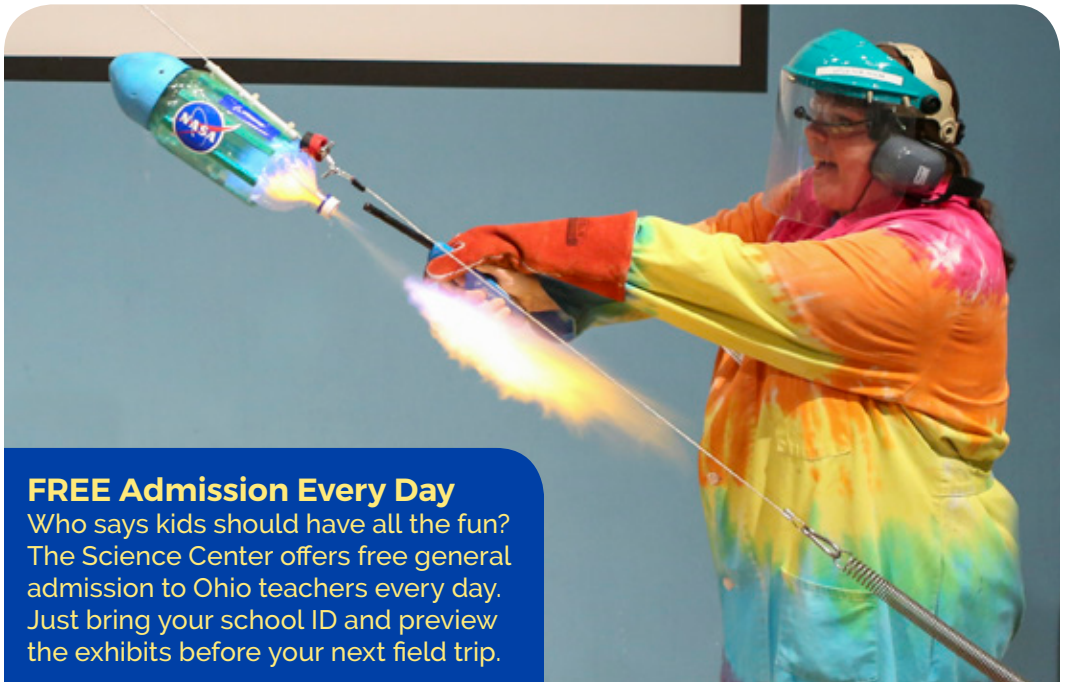
What's the matter with matter? We de-mystify the mystery of matter while exploring and experimenting with physical changes. We'll uncover the truth behind why some materials behave in unexpected ways.

Seeing Sound

This show gets the audience and the room shaking and grooving! Explore vibrations and the ways we can make sounds, and use our senses to hear, feel and even see sound!

Force and Motion

We know if we want to get an object in motion, we need to apply a force. Watch in amazement while objects launch through the room and explore how forces affect an object's motion.



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 your school ID and preview the exhibits before your next field trip.

HANDS-ON WORKSHOPS PRE-K-5

Pre-K-Kindergarten

\$75 per class (up to 30 students). Additional sessions will be scheduled for groups larger than 30. Duration: 30 minutes.

Sound Sleuths

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 and perform hands-on experiments exploring which materials can withstand the big, bad wolf. This workshop promotes science and literacy. *PSK; MK; RLK; SLK; LK*

Grades 1-2

\$100 per class (up to 30 students). Additional sessions will be scheduled for groups larger than 30. Duration: 30-45 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: Fairytale Towers

Students will transform into engineers as they are challenged to build a tower from paper that can hold up a princess and a dragon! *PS1; PS2; M1; M2; SL1; SL2; L1; L2*

Grades 3-5

\$100 per class (up to 30 students). Additional sessions will be scheduled for groups larger than 30. Workshops must be scheduled at least four weeks in advance to order required supplies. Duration: 45 minutes.

Jumping Jitterbugs

Students explore how circuits and electricity work together while designing and creating their own Jumping Jitterbug. *PS3; PS4; PS5; SL3; SL4; SL5; L3; L4; L5*

Engineering Challenge: Trampoline Rescue Mission

Students use the engineering and design process to construct a mini trampoline as they work in small groups to complete an assigned rescue mission. *PS3; PS4; PS5; M3; M4; M5; SL3; SL4; SL5; L3; L4; L5*

HANDS-ON WORKSHOPS 6-12

Grades 6-12

\$120 per class (up to 30 students). Additional sessions will be scheduled for groups larger than 30. Workshops must be scheduled at least four weeks in advance to order required supplies. Duration: 45-60 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?

PS6; PS8; M6; M7; M8; RST6; RST7; RST8; SL6; SL7; SL8; WHST6; WHST7; WHST8; PHY; SL; RST; WHST

Alternative Energy: Wind Power

Students will examine renewable and nonrenewable energy sources and apply their findings to design and build the most effective wind turbine.

PS6; PS7; PS8; M6; M7; M8; RST6; RST7; RST8; SL6; SL7; SL8; WHST6; WHST7; WHST8; PHY; SL; RST; WHST

Operation Heart Dissection

Students will get a tour of the body's pump during a 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.) \$150 per class (up to 30 students).

Duration: 75 minutes. *BIO; SL; RST; WHST*

Career Day Programs - Grades 6-12

Programs are free for students with field trip admission. Advance reservations are required. Call 216-621-2400 to register. Limited to 300 participants per session.

Health Careers Day

November 16, 2017

Meet local medical professionals and higher education representatives, and explore biomedical education programs and diverse career options in health and medicine.

Engineering Careers Day

March 1, 2018

Find out what engineers do! Discover internships and career paths in the field of electrical, biomedical, mechanical, aerospace, civil and chemical engineering.

NASA Free Day • Friday, October 7

Free general admission for all Ohio schools. Celebrate World Space Week and enjoy NASA speakers and space-themed activities and demonstrations. Advance reservations required. Please call 216-621-2400 for details. Does not include admission to the DOME Theater or Steamship *William G. Mather*.

PRICING AND RESERVATIONS

Planning Your Field Trip

1. Select your grade level

There's so much to see and do at Great Lakes Science Center. We've made it easy for you to find grade-appropriate experiences on the following pages.

Free Demonstrations, page 11 | Grades Pre-K-5 Workshops, page 12
Grades 6-12 Workshops, page 13

2. Select your admission package then add a hands-on workshop and FREE demonstration

We offer a variety of admission packages to fit your needs and budget, and ALL Ohio Title 1 schools receive free general admission. Don't forget to add a hands-on workshop and free demonstration specifically designed to support Ohio Revised Standards for science and math, social studies, and literacy Common Core Standards. Pricing for workshops varies by topic and grade level.

New Field Trip Pricing - Reduced Prices!

Now, even more affordable for your group! We offer multiple options for field trips for groups of 10 or more people. Rates apply to schools (public, private, charter or home school) visiting during the school year. Advance reservations are required.



General admission - \$5 per student

General admission & DOME Theater - \$8 per student

DOME Theater only - \$7 per student

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

3. Book your experience

Book early as many of our program dates and times fill quickly.

- Pre-register online: save time and pre-register online. Our reservations team will follow up and confirm your field trip by phone. Go to **GreatScience.com** and click on Educators>Field Trips>Book a Field Trip
- 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.

PRICING AND RESERVATIONS

Important Field Trip Information

Title 1 School Admission

Ohio schools with 40 percent or more of their students entitled to Title 1 services receive **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. Please call 216-621-2400 for details.

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).

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.

Cancellation Policy

Please let us know in writing at least 48 hours 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.

Chaperones

Great Lakes Science Center requires 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.

Prepare for Your Visit

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

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 72 hours before your visit.

The Science Store

The Science Store carries a large selection of educational items that complement our exhibits and films. Advance orders can be placed using the Grab Bag order form included in your confirmation packet. Please call the Science Store at 216-696-5575 for more details.

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.



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

Non-Profit
Organization
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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*