



# McWane Science Center

## EDUCATION GUIDE

*Spring 2023*





# SCIENCE, LEARNING, FUN



**Peggy Chowning**  
Vice President of Education

Every school day you lead your students down an educational path, teaching them the required science, technology, engineering, and math (STEM) learning concepts relevant to their grade level. McWane Science Center knows how challenging it can be to incorporate hands-on, engaging experiences—especially as they relate to STEM. Well, we want you to know that we have your back. McWane Science Center wants to be a part of the science education journey with you and your students for the 2022-2023 school year. Together, we can make learning a fun and engaging adventure for all students.

As you explore the Spring 2023 Education Guide, notice the various standards-based programs that we have for the upcoming semester—serving Pre-K through 12th grades. You will find McWane-based programs as well as some incredible opportunities that can take place in your own classrooms. You will also learn about the exhibits, IMAX documentaries, and additional learning experiences that will make STEM relevant for your students. While you are previewing this guide, I would also like you to note what is missing. What programs do you need? What barriers do you and your students have to using McWane Science Center and our services? How can we help? Reach out to me directly for comments or questions, and I look forward to getting to know you this school-year. I can be reached at [pchowning@mcwane.org](mailto:pchowning@mcwane.org).

Have a great school-year, and I look forward to doing science with you and your students.

*Peggy*





# WHAT'S INSIDE

The McWane Resource Directory is your one-stop shop for planning your science learning adventures! Read about everything McWane Science Center has to offer in science education, exhibits, special programming, and events.

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ENGINEERS WEEK	FEB 22-25
WORLD WILDLIFE DAY	MAR 3
LEFT-OVER PI DAY	MAR 15
WORLD WATER DAY	MAR 22
SPRING BREAK	MAR 27-31
BRAIN AWARENESS DAYS	MAR 30 - APR 2
ROBOTICS WEEK	APR 12-16
EARTH DAY	APR 22
ASTRONOMY WEEK	APR 26-30
MATH IN THE MUSEUM	MAY 12-14

## CELEBRATE SCIENCE

ATTENTION ALL 3RD - 5TH GRADE TEACHERS!

You and your students are cordially invited to apply for McWane Science Center's year long exhibit design competition, Celebrate Science! Your students will become exhibit designers and compete against other schools by creating innovative exhibit prototypes. The project will help incorporate STEM across the curriculum with a chance to win cash prizes. The winning prototype will be on display at McWane science Center for a full year! **Applications will open August 1, 2023.**

## TEACHER'S NIGHT OUT

Tuesday, Sept 19, 2023

Teacher's Night Out returns! To say thank you for being loyal friends to McWane Science Center, you, and an adult guest\* are invited to join us for a special complimentary evening. Explore the Adventure Halls, see a special screening of a film in the all new, digital IMAX Dome Theater, enjoy refreshments, and enter to win great door prizes, including a one-year family membership to McWane Science Center!

\*Guests must be 18 years old or older  
Teacher's Night Out RSVP to  
[pchowning@mcwane.org](mailto:pchowning@mcwane.org)  
by September 15, 2023.





# COMMUNITY SUPPORT

## Science is for everyone

McWane Science Center has developed the Educational Scholarship Fund to provide better access to hands-on science education programs for pre-Kindergarten through twelfth grade students from Title I and other qualifying schools and organizations in Alabama.

The Educational Scholarship Fund will cover the cost of admission into the Adventure Halls for students, as well as an education program. Funds will NOT cover transportation, parking, and other options such as IMAX films, group lunches, concessions, etc.

***To see if your school or organization is eligible, fill out the application form on our website at [www.mcwane.org](http://www.mcwane.org) and a grant administrator will contact you.***



## Thank You to Our Educational Program Supporters



- McWane Foundation
- City of Birmingham
- Wells Fargo
- PNC Financial Services Group
- Robert R. Meyer Foundation
- Hugh Kaul Foundation
- Hill Crest Foundation, Inc.
- Alabama Power Foundation
- Blue Cross Blue Shd of Alabama/The Caring Foundation
- Susan Mott Webb Charitable Trust
- Shelby County Commision
- Oakworth Capital
- Harbert Management Corporation
- Vulcan Material Company
- City of Vestavia Hills
- Leon Aland Family Foundation
- Kinder Morgan Foudation
- Charles and Estelle Campbell Foundation
- City of Bessemer
- Protective Life
- Wall-Whatley Foundation
- Coca-Cola Bottling United
- Ratliff Charitable Foundation
- Truist Foundation
- Medical Properties Trust
- Brasfield & Gorrie
- Altec/Styslinger Foundation
- CRC Group
- GCP
- Dunn-French Foundation
- Mercedes-Benz US International



# IMAX DOME THEATER

## McWane's All-New Movie Experience

The IMAX® Dome Theater puts your class in the center of the action with IMAX with Laser technology - a next generation laser projection system and 6-channel sound system exclusive to IMAX theaters. IMAX with Laser is immersive by design, developed from the ground up to deliver crystal clear, lifelike images and precision sounds for a movie-going experience unlike anything else.

IMAX with Laser is IMAX's most advanced theater experience. It is set apart by a groundbreaking 4k laser system that features a new optical engine, custom designed lenses, and a suite of proprietary technology

that delivers sharper and brighter images with increased resolution and the widest range of colors exclusively to IMAX screens worldwide.

Come join us here at McWane Science Center and treat yourself to an all-new, mind blowing cinematic experience. Visit [www.mcwane.org](http://www.mcwane.org) for a complete list of movies and showtimes!



### **Serengeti** NOW PLAYING

Life happens in the Serengeti on an unprecedented scale. It's home to most of Africa's iconic animals, and hosts one of the world's greatest natural events — the annual wildebeest migration. Nature has orchestrated a perfect symphony in which every species has a very distinct role to play in a larger story — the balance of an entire ecosystem. We'll see it through the eyes of the youngest members of our animal cast as they imitate their parents, and learn about the mighty roles they'll play. Prepare to be awed by this film about how nature works in one of the world's greatest ecosystems.



### **Arctic: Our Frozen Planet** OPENS MARCH 24

Embark on a yearlong adventure across the seasons and three continents. Be immersed in the astounding world of narwhals, belugas and polar bears as they navigate ice floes. Hear the thunderous sound of stampeding caribou and muskox trying to escape hungry wolves. Be amazed by hooded seals that blow up red balloons and ice-covered bumblebees that emerge glorious from their winter lairs.

As the planet's climate is experiencing rapid changes, so is the Arctic. But the changes here are happening faster and more dramatically than anywhere else. Can it keep pace?



# INSIDE THE MUSEUM

## Four Floors of Fun!

You can only learn so much from a text book or even watching a YouTube video. Tangible, hands-on learning is so often the best way to experience and understand a scientific principle that may elude you. This is why McWane Science Center's interactive exhibits serve as a great extension to classroom learning.

By exploring all four levels of our Adventure Halls and experiencing engaging live science demonstrations, science concepts such as gravity, combustion, and even electricity become real so that students can

understand them better and apply those concepts to their daily lives. Sometimes, interaction is key to "getting it," and seeing is truly believing.

At McWane Science Center, we believe that nothing satisfies the curiosity as much as learning in a hands-on environment, and that is what you will find in every exhibit offered throughout our Adventure Halls. Check out what experiences we have available each and every day for our most curious learners!

### LOWER LEVEL

#### Under the Sea

Explore our aquarium which features over fifty species of aquatic life in a wide variety of salt and fresh water tanks. Highlights of Alabama's largest aquarium include the popular Shark and Ray Touch Tank, the Jellyfish Tank, the Cahaba River Biorama and a variety of fresh water fish.



#### Shark and Ray Touch Tank

Soak up the science in the Shark & Ray Tank! This aquarium features a large, unique tank where visitors can observe the Sharks and Rays. It is a great opportunity to learn about these fascinating creatures in an up close and personal way.





# LEVEL ONE

## So much science

Your students can lie on a Bed of Nails, test out the pulley chairs, experiment with bubbles, and interact with dozens of other exhibits inside the museum's Adventure Halls.



## GENEius Lab

GENE-ius is an engaging, day-long laboratory experience in molecular biology and genetics designed for high school biology students, grades 9-12.



## Rushton Theater

Several live science demonstration stations are also on this level. Be sure to reserve an educational show in Rushton Science Theater to enhance your field trip.



# LEVEL TWO

## Itty Bitty Magic City

Itty Bitty Magic City is an early-learning exhibit for McWane's youngest visitors. Explore Mainstreet and discover STEM in a space designed to encourage the four major types of play: physical, exploratory, constructive, and imaginative. Itty Bitty Magic City is open to kindergarten and below fieldtrips on a first come, first serve basis. A chaperone count of 1 adult per 3 children is required for entry.



## Dino-Fever

This level is where you will find the Alabama Dinosaur exhibition featuring rare finds from the Alabama tyrannosaur to dangerous raptors. Your class can also meet the faces and fins that swam in Alabama's oceans 80 million years ago in the Sea Monsters of Alabama exhibition.

## Explore Lab

McWane is not only a science museum; it also houses the state's largest fossil collection. Many of these specimens can be seen in the Explore Lab.



# LEVEL THREE

## Art and Tech

On the third floor you will discover exciting interactive exhibits about Art & Technology. The third floor is a location for changing seasonal exhibits.



## Rotating Exhibits

Each year, McWane Science Center hosts a number of traveling or temporary exhibits located on the third floor of the museum.

## Class Time

The third floor is home to a variety of classrooms designed to provide the best science education. Various camps and special programs are conducted in these classrooms.





# TEACHER RESOURCES



**BE  
BETTER  
TOGETHER  
WITH  
MCWANE  
SCIENCE  
CENTER**

## **Educator Advisory Committee**

This committee works to foster collaboration and learning among teachers and they are an advocate for our mission, sparking wonder and curiosity about our world through hands-on science experiences. Members are involved in evaluating, piloting, and developing programs produced by McWane's Education Department. Educators must be willing to serve on the Advisory Committee and meet three times per year, for a two year term. Teachers will receive one free McWane on the Move classroom program and a one-year family membership to McWane Science Center.

Contact Peggy Chowning at [pchowning@mcwane.org](mailto:pchowning@mcwane.org) to receive an application.

The Educator Advisory Committee is open to all classroom teachers, PreK to 12th grade, college professors, informal educators with teaching experience, and community representatives working directly with children ages 0-18.



## Professional Development Workshops

McWane Science Center can help you infuse your teaching with innovative ideas and strategies to engage students in science learning. Workshops may be held at your school or at McWane Science Center. We also have a Teacher's Day In field trip experience for pre-service teachers.

### PreK-2nd Grade:

#### Building Blocks: Finding STEM in Everyday Moments

In this interactive workshop, we'll take a close look at STEM learning in an early-childhood classroom. Join us as we uncover the foundations of STEM and explore budget-friendly enrichments that compliment your existing classroom schedule without adding to it. From preschool themes to elementary curriculums, we'll show you how to find STEM in simple, everyday moments.

**Duration: 1.5 hours**

### 3rd-8th Grade:

#### Design Challenge in the Classroom

The Engineering Design Process is an essential skill for creative problem solving. In this workshop, we will discuss how to run successful and relatable Design Challenges--engineering activities that use this process to guide students through critically approaching solutions to real-world problems--in the classroom.

## COMING SUMMER 2023

### McWane Summer Science Institute

Come learn with us at McWane Science Center during our multi-day professional development workshop, focused on turning science concepts into hands-on opportunities for 2nd-5th grade students. Join the education team and invited presenters for this engaging and interactive program.

For more information on our Professional Development Workshops, please contact Peggy Chowning at [pchowning@mcwane.org](mailto:pchowning@mcwane.org).





# EDUCATION RESOURCES

## Check Out Our Awesome STEM Kits

Looking for ways to cover curriculum standards with your students? McWane can help with our free library of science kits. These loaner kits contain directions for activities, background information, equipment, and materials. Kits may be checked out for three weeks. Some materials are consumables, and others must be returned in good condition.

To reserve your kit, or for more information, contact Jonah Cohen at [jcohen@mcwane.org](mailto:jcohen@mcwane.org) or Marie Wilson at [mwilson@mcwane.org](mailto:mwilson@mcwane.org)

## SUBJECTS

### Chemistry and Conservation of Mass

**Grades:** 5 & 8

**Standards:** 5.1, 5.2, 5.4; 8.5, 8.6

This kit includes enough chemicals, laboratory equipment, and other materials to accommodate one class of 32. There are 3 activities in total. One demonstrating the Law of Conservation of Mass for physical changes (takes up to 30 minutes to complete) and two demonstrating the Law of Conservation of Mass for chemical changes (each takes up to 45 minutes to complete).

### Light and Sound

**Grades:** 1, 4, & 8

**Standards:** 1.1, 1.2, 1.3, 1.4; 4.6, 4.7, 4.8; 8.17, 8.18, 8.19

This kit includes prisms, lenses, color filters, tuning forks, and other materials for 6 lessons, each taking between 30 and 60 minutes to complete.

### Water Testing

**Grades:** 5 & 6

**Standards:** 2.1; 5.1, 5.3, 5.4; 6.15, 6.16; 8.2

This kit includes laboratory plasticware, refractometers, pH/nitrate testing strips, dissolved oxygen testing kits, household chemicals, and worksheets to accommodate 30 students. There are materials for 5 activities, each taking approximately 60 minutes to complete.

### Natural Selection

**Grades:** 3, 4, 5, & 7

**Standards:** 3.7, 3.8, 3.10, 3.11; 4.9; 5.11; 7.6, 7.7, 7.8, 7.10, 7.18

This kit provides enough materials for a class containing 32 students. This will include seeds, worksheets, forceps, and artificial fur. There are four different activities, covering the heredity of traits and natural selection, which will take approximately three hours to complete.





# MCWANE ON THE WEB

## Get connected with McWane's virtual programs!

McWane Science Center is taking our educational programs and demonstrations to the web! Virtual learning will be available in multiple formats, Digital Workshops, Live Streams and on-demand videos!

### Digital Workshops

Using pre-recorded video segments and hyperdocs, your students will be challenged to answer questions, make observations and form predictions! These flexible workshop activities can be done as one continuous lesson or split into individual mini-lessons.

**\$100 for access for 4 classes**

**\$20 per each additional class**

#### Dinosaur Detectives

**DISCIPLINE:** Physical Science

**GRADES:** PreK-3

Grab your magnifying glasses as we travel back in time to the prehistoric period and uncover the footprints of ancient plants and animals. Downloadable teacher and student resources are included.

**SCIENCE:** K:3, 2:8, 3:9

**APKS:** S.P. 1.4

**DIGITAL LITERACY:** K:5, K:13, 1:1

#### Method Mix-Up

**DISCIPLINE:** Physical Science

**GRADES:** PreK-3

Meet McWane's Mad Scientist and help him unscramble the how-to's of science. From wacky experiments to amazing tricks, you'll see the scientific method up close and in action. Downloadable teacher and student resources are included.

**APKS:** S.P. 1.1, 1.2, 2.2

**SCIENCE:** 2:1

**DIGITAL LITERACY:** K:10, 1:3, 1:14, 1:15, 1:19, 2:2, 2:3, 2:4, 3:3, 3:5

#### Wild Kingdom

**DISCIPLINE:** Life Science

**GRADES:** K-12

Meet some of McWane's animal ambassadors as we explore their adaptations, diets, habitats and more!

**BIOLOGY:** 9-12

**SCIENCE:** K: 3, 4; Grade 1: 6, 7; Grade 2: 6, 7; Grade 3: 5, 7, 10, 11; Grade 4: 9, 11; Grade 7: 6, 8, 1

#### Radical Reactions

**DISCIPLINE:** Chemistry

**GRADES:** 2-8

Your students will learn the difference between chemical and physical changes as they experience a plethora of dazzling reactions meant to awe and educate

**SCIENCE:** Grade 2: 1, 2, 3, 4; Grade 4: 4; Grade 5: 1, 3, 4; Grade 8: 2, 3a, 4, 5

#### Creatures from the Deep

**DISCIPLINE:** Biology

**GRADES:** K-12

Our McWane marine and aquatic organisms will showcase their unique habits and life histories. Learn what makes these creatures from the deep especially suited to their underwater homes.

**BIOLOGY:** 9-12

**SCIENCE:** K: 3, 4; Grade 1: 6, 7; Grade 2: 6, 7; Grade 3: 5, 7, 10, 11; Grade 4: 9, 11; Grade 7: 6, 8, 10

### Live Stream

Connect with us live to explore exciting demonstrations with follow-up activities for you to complete at school!

**\$75 per session (45 minutes)**

#### Dissection Live

**DISCIPLINE:** Biology

**GRADES:** 4-12

Explore animal specimens inside and out. We will identify and investigate the general functions of the major systems and structures of a preserved organism such as a squid, frog, or an eyeball. Contact us for more information on available dissection specimens.

**SCIENCE:** 2:1

**APKS:** S.P. 1.1, 1.2, 2.2

#### Surgical Systems

**Discipline:** Biology

**Grades:** 6-12

Get ready for a unique look inside an operating room, and inside the human body. This virtual program is a collaboration between McWane and the UAB Department of Surgery. Students will get a chance to learn about anatomy, STEM careers in medicine, robotics, and more! Connecting via Zoom, or other online meeting software, we'll talk live with a surgeon from UAB Hospital, who will take us through the steps of a surgical procedure, using a variety of surgical techniques. You'll see how medical staff works together and check out the human body as you've never seen it before with footage from a real, pre-recorded surgery.

This program will give students a singular opportunity to learn more about careers in medicine, see amazing robotics technology in action, and watch surprising innovations that help doctors every day.

SURGERY

**UAB MEDICINE**



# LEARN AT MCWANE

## Science Education Designed for Your Students

When scheduling your class field trip to McWane Science Center, choose from one of the many educational programs listed on the following pages. These programs are designed for specific grades and meet Alabama Course of Study, Next Generation Science Standards or Alabama Performance Standards for 4-year-olds (APKS) as established by the Alabama Department of Children's Affairs, Office of School Readiness.



## Rushton Theater

The Rushton Theater is a science learning environment capable of hosting many types of programming. This auditorium hosts some of our most amazing programs, filled with large scale demonstrations that will leave students wowed by science!

**CAUTION:** Loud noises may not be suitable for younger audience members. Hearing protection is provided.

**SEATING CAPACITY:** MAX 100, MIN 50

**PRICING:** Students (2nd - 12th) \$2.00 per student

**Programs are 30 minutes long**

## Lightning Strikes

**Discipline:** Physical Science

**Grades:** 2-12

A McWane favorite is back! Delve into the power of electricity, as we explore the attractive (and repulsive) nature of electromagnetic forces, while comparing alternating and direct current. Students will see the hair-raising power of static from the Van de Graaff generator, light up fluorescent tubes without the use of wires, and witness our incredible giant Tesla coils.

**Science:** 3.3, 4.2, 5.1, 8.12

## Science Spectacular

**Discipline:** Physical Science

**Grades:** 2-12

Brace yourself for some of our most incredible demonstrations, featuring a variety of topics such as electricity, combustion and liquid nitrogen!

**Science:** Grade 2: 4; Grade 3: 3; Grade 4: 2 & 2b; Grade 5: 3, Grade 8: 5

**Physical Science:** 3

**Physics:** 5 & 11

## Sonic Science

**Discipline:** Physical Science

**Grades:** 2-12

Learn about the science of sound via vibrations, waves, pitch and resonance. Hear screaming metal, heat sounds, a sonic boom, and a laser-assisted musical finale.

**Science:** Grade 1.1; Grade 4.6; Grade 8.17



# LEARN AT MCWANE

## GRADES K THROUGH 2

NOTE: Maximum capacity for grades K-2 programs is 25 students. Education programs are \$2.00 per student. Programs are 30 minutes long.

### Curious Critters

**Discipline:** Life Science

From scales to fur to exoskeletons, join us for a critter meet-and-greet as we investigate the environment, diet, and curious habits of some of McWane's animal friends.

**Science:** Grade K: 3,4; Grade 2:7

**ASELD:** SEK 1bOP-2, 1bOP-3

**Maximum Capacity is 45 students**

### New! Aqua Adventure

**Discipline:** Earth Science

Embark on a journey through the water cycle and discover how clean water makes its way to our faucets. Experiment with travelling water and learn what you can do to keep our waterways clean!

**Science:** K:6, Grade 1:5, Grade 2:9

**ASELD:** SEK 1dYP-2, 1cOP-2

### New! Frantic Friction

**Discipline:** Physical Science

Did you know that a racecar has smooth wheels? Learn how texture can make a big difference in speed as your car zooms (or slows) across our all-terrain ramps. The race is on!

**Science:** K:2, Grade 2:2

**ASELD:** SEK 1cYP-1, 1cYP-1

## GRADES 3 THROUGH 5

NOTE: Maximum capacity for grades 3-5 programs is 25 students. Education programs are \$2.00 per student. Groups of 2 or more children may be partnered for activities. Programs are 60 minutes long unless otherwise stated.

### Jr. Robotics

**Discipline:** Technology/Physical Science

Explore technology as we build and program robots using the LEGO WeDo 2.0 kits! These STEM-based challenges will help build teamwork, problem-solving skills, and critical thinking.

**Science:** 3.3, 3.4, 4.2, 5.5, 5.7

**Technology:** 3rd-5th grade: 1,2,3,7,12

**Digital Literacy Standards:** R4, Grade 3: 2, 3, 4, 5, 7, 18, 19; Grade 4: 3, 4, 7, 17; Grade 5: 2, 6, 8

**Program is 90 minutes long**

### Adventures in Chemistry

**Discipline:** Physical Science

Chemistry matters! Gear up with goggles and gloves as we explore chemical interactions and reactions!

**Science:** Grade 3: 4

### Energy in Motion

**Discipline:** Physical Science

Put your engineering skills to the test! Explore gravity, potential energy, kinetic energy, and so much more as we build and test innovative devices.

**Science:** Grade 3: 1; Grade 4: 1, 3, 5

**Program is 45 minutes long**

### Vet Tech

**Discipline:** Life Science/Engineering

Students will take on the role of biomedical engineers. Using the engineering design process, they will build tools for real-world veterinary surgical challenges.

**Science:** Grade 3: 5, 6 & 9

### Oceans of Energy

**Discipline:** Earth Science/Engineering

The ocean is a great source of renewable energy! Students will create energy farms over a model ocean. As various obstacles arise, they must use their critical thinking skills to adapt and harvest as much energy as they can!

**Science:** Grade 3: 5, 9, 11, 12 & 15; Grade 4: 1, 2, 3, 4, 5, 11 & 17; Grade 5: 14, 16, 17

### New! Ingenious Geology

**Discipline:** Earth Science

Rocks and minerals have a story. To discover it, prepare to engage all of the senses and employ scientific tools like microscopes and magnifiers, ultraviolet light, electricity, and density tests. Students will examine the properties of rocks for texture, shape, color, smell and more. By testing local rocks from Alabama and samples from distant locations, they'll become true junior geologists.

**Science:** 3.9, 4.12, 4.14, 5.3, 6.4, 6.5, 6.6, 6.8, 6.10

**Program is 45 minutes long**





# LEARN AT MCWANE



## GRADES 6 THROUGH 8

**NOTE:** Maximum capacity for grades 6-8 programs is 25 students. Education programs are \$2.00 per student.

### Engineering Challenge: Bridges

**DISCIPLINE:** Physical Science

Put those engineering skills to the test! Through this hands-on engineering challenge, students will design and build bridges to resist the pull of gravity. Their success depends on innovation, ingenuity and what they can make with a given set of supplies.

**SCIENCE:** Grade 8: 8,9,10

**Program is 60 minutes long.**

### Robotics Challenge

**DISCIPLINE:** Physical Science

Using the versatile Edison robotics system, students can program in multiple languages, like Scratch or Python, make their robots respond to visual and sound sensors - or other robots. Can they steer them through a series of challenges in a robo-obstacle course?

**SCIENCE:** Grade 8: 8, 9

**TECHNOLOGY:** 6th - 8th grade: 1

**MATH:** Grade 6:20 (6-EE9); Grade 7:10 (7-EE4)

**DIGITAL LITERACY:** R4, Grade 6: 5, 6; Grade 7: 3, 5; Grade 8: 3, 5

**Program is 90 minutes long.**

### Under the Scope

**DISCIPLINE:** Life Science

Students will use microscopes to explore life on a much smaller scale! While investigating what's under the scope, they will create tools and present their findings to the class.

**SCIENCE:** Grade 7: 2

**Digital Literacy:** Grade 6: 19, 20, 23, 26,30; Grade 7:5,7, 20, 22, 23, 27, 30; Grade 8: 16, 21, 23, 25

**Program is 60 minutes long.**

## LabWorks

**RESERVATIONS:** (205) 714-8454, [labworks@mcwane.org](mailto:labworks@mcwane.org)

**TIMES:** 9:00-11:00 am or 12:00-2:00 pm

**CAPACITY:** 25 students

LabWorks is a series of engaging experiments designed especially for middle school students. Developed through a partnership between UAB's Center for Community Outreach Development (CORD) and McWane Science Center, these labs include modern scientific protocols and equipment that enable students to investigate contemporary questions in biology, chemistry, and physics.

### Toothpaste Chemical Engineering

You do it every day, but how much do you really know about brushing your teeth? In this minty fresh lab, students take the role of chemical engineers to design and test out their own toothpaste. One of the most mundane daily routines becomes one of the most fun activities your students have ever done in the lab! (Grade 8:2, 3, 5; MS Engineering)

### A Light in a Dark Room

How do we know what the universe is made of? In this lab, students explore the connections between elements and light as they investigate pigment, fluorescence, invisible ink, and even stars all while learning about chemical reactions and wavelength. (Grade 8:1, 2, 5, 17, 18)

### The Eyes Have It

Have you ever wondered how we know if everyone sees the same colors? How do we know what colors animals can see? Are there colors out there we can't see? Students will explore these questions and find answers as they participate in simulations, test out illusions, and dissect a real sheep eye. This eye-opening day in the lab is one students will be sure to remember. (Grade 7:3, 6, 8, 10)

### Isn't That a Crime?

One of McWane's most beloved animals has gone missing and we need help getting it back! In this exciting forensic lab, students learn to analyze multiple pieces of evidence including DNA, blood, and fingerprints. Put their critical thinking to the test in this fast-paced lab! (Grade 7: 12, 13)

### Superbugs!

Are antibiotic resistant genes in recycled water from a treatment plant a threat to human health? Students will interpret graphics that illustrate how bacteria can become resistant to multiple antibiotics and work together to explain how their presence in wastewater may lead to the evolution of multi-drug resistant bacteria known as "superbugs!" (Grade 7: 2, 3, 6, 7, 9, 11, 12, 13, 14, 18)

### Carter Creek Mystery

Business is booming at the local paper and plastic factory that employs most of the city. But there's a big problem - the city's water source has been polluted and the factory is being blamed. In this lab, students are called in as EPA agents to test the water, solve the mystery, and save the day! (Grade 6: 7, 15, 16)

### Sea Otter Forensics

Why are sea otters dying? Students follow a real life scenario to investigate this tragedy on the California coast. They will analyze evidence to determine cause of death and test for toxins. They will interpret lab tests, maps, and photos to explain the source of this deadly toxin. Students will understand how humans impact the environment and how the ecosystem is interconnected, including how we may harm ourselves by polluting our environment. Teachers will be given a follow-up lesson for students to take action in a meaningful project. (Grade 6: 7, 15, 16 and Grade 7: 4, 5, 6, 7, 8, 11)



# LEARN AT MCWANE

## GRADES 9 THROUGH 12

NOTE: Maximum capacity for grades 9-12 programs is 25 students. Education programs are \$2.00 per student. Programs are 90 minutes long.

### Robotics Lab

**Discipline:** Physical Science

Using the versatile Edison robotics system, students can program in multiple languages like Scratch and Python, make their robots respond to visual and sound sensors, – and other robots. They'll program their robots to successfully complete a series of challenges.

**Physics:** 1

**Technology:** 2, 10

**Digital Literacy Standards:** (HS) R4, 3, 6, 9, 10

**NSES:** Science as Inquiry. Science and Technology

### The Rube Challenge

**Discipline:** Physical Science, Physics

Take the Rube Challenge! Use the properties of physics to design a complex way to solve a simple problem. Explore the engineering process from start to finish in this fun-filled, hands-on program.

**Physical Science:** 11, 12

**Physics:** 5



## GENEius Lab

**RESERVATIONS:** (205) 714-8479, [geneius@mcwane.org](mailto:geneius@mcwane.org)

**TIMES:** 9:00-2:00 pm

**CAPACITY:** 25 students

**INFORMATION:** (205) 714-8479, [geneius@mcwane.org](mailto:geneius@mcwane.org)

GENE-ius is an engaging, day-long laboratory experience in molecular biology and genetics designed for high school biology students in grades 9-12. Using state-of-the-art equipment, participants work in small groups with guidance from UAB students and faculty to complete a challenging lab experiment. Students also have access to McWane Science Center exhibits and programs throughout the day.

### Huntington's Disease Lab

**Discipline:** Life Science

Students learn structure and function of the human brain as they work in small groups to dissect a sheep brain and test their olfactory systems. Then students will use DNA gel electrophoresis and microscopy to explore the genetics and neuro-pathology of Huntington's disease.

**Science:** Human Anatomy and Physiology: 1, 4, 8; Biology: 1, 7, 8; Zoology: 1; Genetics: 5, 6, 7

### DNA Fingerprinting Lab

**Discipline:** Life Science

Can we use DNA to predict an observable trait? Students focus on genetic diversity and use contemporary techniques in molecular biology to isolate DNA from their cheek cells, use PCR to amplify the gene for PTC taste and employ gel electrophoresis to analyze samples. Then they will compare their predicted result to their phenotype and hope for sweet (or in this case, bitter) success!

**Science:** Biology: 1, 7, 8; Genetics: 3, 7, 8, 9; Forensic Science: 2, 4, 5

### HIV Lab

**Discipline:** Life Science

Students explore the lifecycle of HIV and perform an Enzyme-linked Immunoabsorbent Assay (ELISA). They will address the public health issues related to HIV/AIDS through a series of small group discussions, activities and a mock fluid exchange.

**Science:** Human Anatomy and Physiology: 1, 4, 8; Biology: 1, 7, 8; Zoology: 1; Genetics: 5, 6, 7

### Sickle-Cell Anemia: Tracking Down an Inherited Trait

**Discipline:** Life Science

The molecular basis of this hereditary disease is the main focus as students use electrophoresis to analyze differences in the normal and sickle-cell hemoglobin at the protein and DNA levels. Microscopy of fresh blood smears allows students to observe phenotypic differences between normal and sickle red blood cells.

**Science:** Human Anatomy and Physiology: 9; Biology: 1, 7, 8; Genetics: 2, 5, 6, 7, 8





# MCWANE ON THE MOVE



## Can't Come to McWane? Order Science to Go!

### PLAN YOUR PROGRAM

All programs are 45 minutes long except where noted. Programs must be indoors.

■ **1 Classroom Program:** \$150; maximum 30 students

■ **Each Additional Classroom Program:** \$125;

(must be the same program and be on the same day for discount to apply)

■ **Mileage charged for all outreaches outside of Jefferson County:** 63 cents/per mile

### Sun Blocks

**Discipline:** Physical Science  
**Grade:** Pre-K-K

Sun safety meets engineering as we explore UV light and build shelters for UV-sensitive critters. Choose your materials and test the outcome as we learn which methods are the most effective.

**Science:** K:7, 8; Grade 1:3

**ASEL:** SEK 1cYP-4, 1cOP-4

**Program is 30 minutes long.**

### New! Build-a-Bug

**Discipline:** Life Science  
**Grade:** Pre-K-2

We're uncovering the world of insects! Meet one of McWane's 6-legged friends and assemble your own unique species as we learn how some of the smallest animals make the biggest impact.

**Science:** K:4, Grade 1:7, and Grade 2:7

**ASEL:** SEK 2dYP-2, 1bOP-2

**Program is 30 minutes long.**

### Fossil Finders

**Discipline:** Earth Science  
**Grade:** Pre-K-3

What can we learn from a fossil? In this program, we will examine real specimens and explore what ancient remains can tell us about life during the prehistoric period.

**Science:** Grade 2: 1

**ASEL:** SEK 1bYP-4, 1bOP-1

**Program is 30 minutes long.**

### Amazing Animals

**Discipline:** Life Science  
**Grade:** K-12

Bring animals right into your classroom! Students will learn about each animal's natural habitat, diet, adaptations, and what makes them different from other living things.

**Science:** K: 3, 4; Grade 1: 6, 7; Grade 2: 6, 7; Grade 3: 5, 7, 10, 11; Grade 4: 9, 11; Grade 7: 6, 8, 10

**Biology:** 9-12

**Program is 30 minutes long.**

### Enlightening Electricity: Circuits

**Discipline:** Physical Science  
**Grade:** 2-6

It's electric! Students will explore circuits and how they work in order to create a functioning electrical systems.

**Science:** Grade 4: 2, 4

### Design and Construct

**Discipline:** Physical Science  
**Grade:** 3-6

Students become construction crews as they build tornado-proof structures. We will explore how people use science to deal with the powerful forces of nature

**Science:** Grade 3: 15, Grade 4: 17

### Reactions in Action

**Discipline:** Physical Science  
**Grade:** 3-8

Students will get fired up about science as we explore combustion and dazzle them with color-changing liquids. These fascinating experiments teach students about chemical and physical changes.

**Science:** Grade 2: 1, 2, 3, 4; Grade 4: 4; Grade 5: 1, 3, 4; Grade 8: 2, 3a, 4, 5

### A-MAZE-ing Robots

**Discipline:** Physical Science  
**Grade:** 3-8

Experience the world of computer coding using Ozobots, one of the world's smallest programmable robots.

**Technology:** Grade 3rd-5th 3, 7

**Digital Literacy:** Grade 3: 2, 3, 4, 5, 7, 18, 19; Grade 4: 2, 3, 4 & 7; Grade 5: 2, 4, 5, 6; Grade 6: 6,

15, 21, 30; Grade 7: 5; Grade 8: 5

### New! Solids and Liquids: The Science of Slime

**Discipline:** Physical Science  
**Grade:** 1-5

Prepare to examine the strange chemical chains called polymers, as students make their own long-lasting slime - and get to keep it! Is slime a solid? Or a liquid? Only testing for the properties of the different states of matter will tell.

**Science:** 2.1, 2.3, 2.4, 5.1

## ASSEMBLY PROGRAMS

**1 Assembly program:** \$300;  
150 maximum students

**Each additional assembly program:** \$225

(must be the same program and be on the same day for the discount to apply)

### Alabama Scientists

**Discipline:** Physical Science, Life Science  
**Grade:** 2-8

From electricity to rocket science, medicine to ecology, Alabama has a rich scientific heritage! Students will get an exciting introduction to famous Alabama scientists and amazing discoveries from our home state.

**Science:** Grade 2: 2; Grade 3: 3, 9; Grade 8: 3, 18

### Superhero Science

**Discipline:** Physical Science, Chemistry  
**Grade:** 2-8

In this super-powered presentation, we'll use exciting demonstrations to explore the science behind super heroes!

**Science:** Grade 2: 4; Grade 3: 3; Grade 4: 2a; Grade 5: 1, 3, 4; Grade 8: 2, 4, 5, 11, 12



# OVERNIGHT ADVENTURES



## Spend the night at McWane Science Center

McWane Science Center offers Overnight Adventure programs year-round for groups! We tailor the experience to fit the needs of school groups, scout groups, church groups, and families. Groups are required to have a minimum of 100 people for a private event. Open Nights are scheduled on select nights to accommodate multiple smaller groups. Visit [www.mcwane.org](http://www.mcwane.org) or call (205) 714 - 8414 for more info.

### BASIC FEATURES:

- Dinner
- Continental breakfast
- After-Hours admission to Adventure Halls

### CUSTOMIZE YOUR EXPERIENCE

- IMAX
- Concessions
- Science Program

### NUMBER OF PARTICIPANTS:

- Minimum 100 participants
- Must be kindergarten or older (accompanied by a parent)
- 1 adult required for every 5 children

### FEE:

- \$50 per person Base package
- \$60 per person Deluxe package, including IMAX movie
- Science Program add-on: \$150



## COOL STUFF STORE

Take science home with you!  
Located on Level 1 next  
to the Adventure Halls



# PLAN YOUR TRIP

## Want to book a trip to McWane Science Center?

1

### Let us know!

If you are a school, academy, or other educational organization providing care for children and students, visit [www.mcwane.org/learn](http://www.mcwane.org/learn) for information about our field trip offerings. Complete and submit our easy "Field Trip Online Form" at [www.mcwane.org/field-trip-request-form](http://www.mcwane.org/field-trip-request-form).

If you are not affiliated with an educational organization and would like to book a trip to McWane Science Center for 15+ people, visit [www.mcwane.org/group-trip-request-form](http://www.mcwane.org/group-trip-request-form).

2

### Look for an email!

Once we receive your "Field Trip Online Form," we will reach out to you to confirm your request and work through the details of your trip.

After our conversation and you are sure the details are correct, we will book your reservation, collect educational organization purchase order, and then send you a confirmation email with the final details.

3

### Come visit us!

We will reach out to you 5 days before your arrival. It will be the last opportunity to update your attendance numbers before you arrive.

Bring your field trip group and full payment and we will make sure you have all the information you need for the day: tickets, maps, education, and most of all: FUN!

## Price Breakdown

### Field Trips with Museum Admission Only

- Students: \$8
- Teachers: Free!
- Adult Chaperones: \$5 when included with group reservation.

### Field Trips with IMAX Documentary Only

- Students: \$8
- Teachers: \$7
- Adult Chaperones: \$7

### Field Trips with Adventure Halls and IMAX Documentary

- Students: \$13
- Teachers: \$7
- Adult Chaperones: \$12

### Add-on Options

- Educational Programs - \$2 per student
- Concession Package - \$6 (includes popcorn, small fruit juice, & Welch's fruit gummies)  
*Must be paid in full 2 weeks minimum notice*

## Attention Teachers:

Join us for a free visit to McWane Science Center prior to your Field Trip experience! Teachers are offered free admission to McWane Science Center Adventure Halls with a valid teacher's ID at any time. Come check out all that we have to offer your group!





# PLAN YOUR TRIP

## What defines a group?

Field Trips - directly related to educational organization or groups that provide care for students, both during the school year and in the summer. This includes schools, academies, YMCA, churches, etc. These groups may or may not request educational programming.

Groups - individual groups, families, and social organizations such as sororities and fraternities, community groups, and business organizations.

## Booking Information

### Group size requirements

Minimum number of attendees for special pricing general admission/IMAX reservations - 15

Minimum number of students to book classroom programs - 10

Minimum number of attendees to book Rushton programs - 15

### For last minute bookings

Bookings made within 2 weeks (14 days) of arrival date require 50% of payment (and full payment of pre-purchased concessions.)

Bookings made within 1 week (7 days) of arrival date require full payment.

## Confirmation and Communication Standards

A valid email address for confirmation documentation will be required. A confirmation email will be sent within 72 hours of receipt of all required information.

Final follow-up will be sent 5 days prior to your date. Cancellation Notices will be emailed if we have not received any communication with contact person(s) by 5 days prior to field trip date.

All cancellations must be in writing and e-mailed to [reservations@mcwane.org](mailto:reservations@mcwane.org)

**Schools/Groups who do not have an Alabama Tax Exemption form are not eligible for tax exemption at McWane Science Center.**

**\*\*Excluding educational scholarship groups**

## Chaperone Requirements

School staff are included in chaperone count.

- Pre K-Kindergarten - 1 adult per 3 students
- Elementary (1-5 grade) - 1 adult for every 6 students
- Middle School (6-8 grade) - 1 adult for every 8 students
- High School (9-12 grade) - 1 adult for every 10 students

Please note: McWane Science Center reserves the right to reject booking request and entry into the center should your group not meet chaperone requirements.

## Educational Program Information

Reserved educational programs are available for booking Wednesday - Friday

Reserved educational programs are limited and are booked on a first come, first served basis and are subject to approval by the McWane Science Center Education Department.

Educational programs are \$2 per student.

For more information, see Page 8 for full list of education programs

## Lunch Policies

Lunch times must be scheduled for use of McWane Science Center lunchrooms (subject to availability)

Scheduled lunchtimes are 30 minutes

Lunches may be brought from home or school

Lunches brought from home or school have the following restrictions: No commercially prepared foods

## Pre-purchased Concessions

If your group is planning on purchasing concessions during your visit for the IMAX Theater, consider pre-ordering your concession boxes. Pre-purchased concession packages assist in providing snacks to larger groups quickly. Packages are prepared ahead of time and ready for pickup by your group as they enter the IMAX Theater.

Pre-purchased concession packages must be requested a minimum of 2 weeks before date of arrival and paid in full at the time of booking.

Pre-purchased concession packages offer \$6 kid packs, which includes popcorn, small fruit juice, & Welch's fruit gummies. No substitutions of items.







200 19TH STREET NORTH — BIRMINGHAM, AL 35203 — [WWW.MCWANE.ORG](http://WWW.MCWANE.ORG)