Field Trips & In-Classroom Programs
EDUCATION GUIDE
With NGSS curriculum codes for STEM, History & Social Studies programs

Call (810) 237-3409 to plan your field trip or in-school experience!

TABLE OF CONTENTS

PLAN YOUR FIELD TRIP ........................................... 2
ADMISSIONS & GENERAL INFORMATION ............. 4
KINDERGARTEN .................................................. 5
1ST GRADE ...................................................... 7
2ND GRADE ...................................................... 9
3RD GRADE .................................................... 11
4TH GRADE ..................................................... 13
5TH GRADE .................................................... 15
MIDDLE SCHOOL ................................................. 16
LONGWAY PROGRAMS & PORTABLE DOME ........ 17
TAKE-OUT PROGRAMS .......................................... 18
FAMILY STEM NIGHTS & MORE ............................ 19

IMMERSIVE .............................................................
INTERACTIVE ....................................................
INSPIRING .........................................................
Michigan’s largest planetarium offers a state-of-the-art Digistar 7 digital system for an immersive experience in space and science topics, as well as fascinating high-resolution visuals of the night sky during interactive star talks.

EDUCATIONAL SHOWS
Live astronomy talks, such as “Skies Over Michigan,” and full-dome planetarium shows such as “Magic Globe,” “In My Backyard,” “Accidental Astronauts,” “Dinosaurs of Antarctica” and more are incorporated into the space and science learning programs.

MARS & JUPITER CLASSROOMS FOR INTERACTIVE STEM CLASSES
These classrooms are fully supplied for STEM classes that often correlate with the planetarium dome programming. They are conveniently located in the Longway building next to the Planetarium.

PLEASE NOTE: Each planetarium program runs 45-60 minutes. Full-dome shows that are less than the requested program time will be accompanied by a live, interactive star talk covering objects in the current night sky.

LONGWAY STORE
Features educational and fun souvenirs and gifts. We invite all student groups to shop at the end of their visit. We offer many affordable souvenirs and educational gifts that bring home the learning experience.
This totally renovated and interactive museum re-opened in July 2022, expanding to 107,000 square feet. The museum now has four state-of-the-art gallery spaces and three learning labs for social studies and STEM educational programming. A fifth gallery space, FUN Gallery exhibition hall, opened in July 2023 for special traveling exhibits. The FUN Gallery is 6,000 square foot with 23 feet high ceilings to accommodate larger exhibits.

**DISCOVERY HALL**
**HANDS-ON SCIENCE GALLERY**
Engaging visitors of all ages in earth and physical science exploration, this gallery features a multi-story earth climber exhibit, water table, fly wheel and more hands-on, interactive science exhibits.

**3 LEARNING LABS**
Increasing field trip capacity from 60,000 to 90,000 students per year, these classroom spaces are outfitted with drop-down power and smart boards. These labs are available for school meetings and trainings as well.

**HISTORY GALLERY**
A re-imagined, inclusive, and interactive gallery featuring Genesee County’s history from its earliest inhabitants, through WWII artifacts, to current history-in-the-making. An authentic Anishinabek learning lodge is used to immerse kids and adults in the culture of Michigan’s First People.

**SLOAN MUSEUM STORE**
The new store features educational and fun souvenirs and gifts. We invite all student groups to shop at the end of their visit. We offer many affordable souvenirs and educational gifts that bring home the learning experience.

**DISCOVERY LAB**
Located inside the Discovery Hall, this fully-equipped, state-of-the-art maker space will teach about building, designing, art and technology. The space includes a laser cutter, 3D printer and a painting room.

**HAGERMAN STREET EARLY CHILDHOOD LEARNING**
This children’s gallery prepares kids for Kindergarten through play-centric exploration in their own kid-size community and the ABC Tree House.

**DURANT VEHICLE GALLERY**
The Durant Vehicle Gallery showcases Flint’s rich automotive history with a collection of historic vehicles built in Genesee County, concept cars showcasing the ingenuity of engineers, and a new interactive of an assembly line to educate about car manufacturing.

**DESIGNATED BUS AND GROUP DROP-OFF ENTRANCE**
Buses may unload at the East entrance (facing Whiting Auditorium) in the connector street between East Kearsley Street and the roundabout off of Robert T. Longway Blvd.
Group Rate Admission
Sloan Museum of Discovery (20 or more)
• $6 per student/$6 per adult.
Longway Planetarium (20 or more)
• $5.50 per student/$5.50 per adult.

Please Note:
• Teachers are admitted at no charge.
• Chaperones are not charged for Hands-On Science at Longway Planetarium and Sloan Museum of Discovery. Chaperones will be charged general admission to Sloan Museum of Discovery and Longway Planetarium shows.

Book More Than One Program & Save!
Sloan Museum of Discovery and Longway Planetarium are within easy walking distance of one another. Book a second or third program for the same day at Sloan Museum or Longway Planetarium for only $4 per student. You can mix and match programs between the institutions to make your trip twice as educational and twice as fun! Admission to Real Bodies: The Exhibition at Sloan Museum is not included.

Reservations & Payments
• For reservations, call (810) 237-3409, weekdays 8:30 a.m.-4:30 p.m.
or email Reservations@SloanLongway.org
• A fee will be charged to all groups that give less than 72 hours’ notice of cancellation.
• Groups arriving late for their scheduled program will receive the next available timeslot, and/or may receive a change in scheduled programming.
• Please request arrangements for students with special needs when you make your reservation.
• All admission monies must be collected by the teacher prior to arrival. Any uncollected admissions will be charged the regular admission rate.
• All programs have minimum admission charges.
• All monies received must be by school-issued check, money order, credit card, or cash. No personal checks, please.
• The Genesee County Arts Education & Cultural Millage benefits do not apply to field trip activities.

Museum and Planetarium Stores
We invite all student groups to shop at the end of their visit. We offer many affordable items that bring home the learning experience of our institutions.

Lunch
Longway Planetarium
Longway Planetarium has limited space available for groups to eat lunch on tables located in the lobby. Arrangements must be made in advance. Availability is on a first-come, first-served basis.

Sloan Museum of Discovery
Sloan Museum of Discovery cafeteria provides tables and chairs for seating up to 84 guests. Group Reservations for lunch must be made in advance. Groups may bring their own bag lunches, OR may order box lunches from the Coffee Beanery Café in the Sloan Museum cafeteria.

Coffee Beanery Café Lunch Options - Boxed lunches or Pizza lunches: $6.50/person and include a bag of chips and an 8 oz. bottled water with choice of either a sandwich or a slice of pizza.
- Pizza options (one slice):
  - Cheese
  - Pepperoni
- Sandwich options:
  - Ham and Cheddar
  - Turkey and Cheddar
  - Peanut butter and Jelly (non-nut version)

Groups must reserve their box lunch orders a minimum of 10 days prior to scheduled visit. Boxed lunches can be ordered at the same time you schedule your field trip, or by calling (810) 237-3430 or email KWilcox@SloanLongway.org. Please note any allergies when placing your box lunch order.

Note: NO food or beverages allowed in the planetarium or museum galleries.

Other Information
• Programs last 45-60 minutes unless otherwise stated.
• Teachers and chaperones are asked to supervise students at all times.
• Please request that chaperones do not bring siblings or additional children.
• Buses may load and unload at the front entrance of Longway Planetarium. At Sloan Museum of Discovery, buses may unload at the East Entrance across from the Whiting Auditorium.

REAL BODIES: THE EXHIBITION
Field Trips

Please Note:
• Available September 2023 through January 12, 2024.
• Recommended for students age 12 and older.
• Timed exhibit.
• Call for pricing: (810) 237-3409.
HOG HOUSES
*Storybook STEM*
The Big Bad Wolf is back for more! Protect the three little pigs from their furry predator by helping them build strong, safe houses. Students will use open-ended materials to plan, design, and build a structure to keep the pigs safe from the Big Bad Wolf’s “huff and puff” antics.

**NGSS:** K-PS2-1, K-LS1-1, ETS1.A, ETS1.B CCSS RL.K.10

TRIP TRAP BRIDGE-BUILDING
*Storybook STEM*
“Who’s that tripping over my bridge?!” the troll shouted angrily. Oh no! That grumpy old troll is at it again. Students will be engineers as they plan, design, and build a bridge to escape the clutches of the mean troll.

**NGSS:** K-LS1-1, K-ESS2-1, ETS1.A, ETS1.B

COLOR CRAZE
*Storybook STEM*
Poor Camilla Cream... Her skin has turned green. And red, orange, yellow, blue, and purple, too! Our skin cannot change color like Camilla Cream’s, but we can create the color of the rainbow ourselves. Students will create a self-portrait then use primary colors to give themselves “a bad case of stripes.”

WEATHER BOOKS
*Weather*
What’s the weather like? Design a weather report folder to use for observing and describing the weather. Students will see how weather affects our daily lives as we discuss the importance of dressing for the weather.

**NGSS:** K-ESS2.D, K-ESS3-2

PLANT IN A BOTTLE
*Needs of Living Things*
Students will build their own terrarium to take home, while investigating living and non-living things.

**NGSS:** K-LS1-1, K-ESS3-1, K-ESS3-3

SHEEP IN A JEEP
*Forces and Motion*
Use a ramp, a sheep, and a jeep to investigate how pushes and pulls make objects travel various distances.

**NGSS:** K-PS2-1, K-PS2-2
LEARNING LABS

RAMP IT UP
*Engineering Challenge*
Students will build a model car then use open-ended materials to construct a ramp for their car. This activity reinforces the concept that outside forces and intended design solutions can change the way an object travels.


HISTORY & SOCIAL STUDIES

TIME TRAVELERS
Students will travel back in time to explore historical objects and learn about people from the past through hands-on activities. Compare and contrast historical artifacts with the objects used in the present, and think about what people in the future may use for a similar purpose.

GLCE: K-H2.0.1, K-H2.0.4

PLANETARIUM

“IN MY BACKYARD”
*Full-Dome Feature Film*
Students will learn about what can be seen in their backyard. Students will explore creatures and plants, the Moon, the Sun, the Solar System, and the movement of the stars in this engaging show designed for early childhood learning.

NGSS: K-ESS2-1

IT ALL STARTS WITH ME
Students will explore the past, present, and future from the perspective of their own lives. Join a museum educator for historical story time, identify the important details and people from the story, and compare life today with life in the past, while creating a hands-on project to take home.

GLCE: K-H2.0.1, K-H2.0.2, K-H2.0.3, K-G5.0.1
LEARNING LABS

LIGHT & SHADOWS
Investigate the properties of this form of energy, while exploring shadows, mirrors and the light spectrum. Discover how you can block, reflect, and bend light with hands-on activities.

NGSS: 1-PS4-2, 1-PS4-3

LIGHT SURPRISE BOX
Maker Project
Students will use tools and materials to design their own light surprise box. This project will shine light on the concept that objects can only be seen if there is light to illuminate them.

NGSS: 1-PS4-2

SOUND
What makes sound? Students will find out as they investigate vibrations, pitch, and loudness with fun hands-on activities.

NGSS: 1-PS4-1, 1-LS1-1

BUILD YOUR OWN ECOSYSTEM – PLANT PARTS
Students will build an independent ecosystem to take home, while exploring plant parts. See how each of these structures help plants survive and grow.

NGSS: 1-LS1-1

MOON PHASE BOOKS
Make a glow-in-the-dark moon phase book that will help students explore the predictable pattern of the shapes of the Moon we can see on Earth.

NGSS: 1-ESS1-1

HISTORY & SOCIAL STUDIES

TIME TRAVELERS
Students will travel back in time to explore historical objects and learn about people from the past through hands-on activities. Compare and contrast historical artifacts with the objects used in the present, and think about what people in the future may use for a similar purpose.

GLCE: 1-H2.0.5, 1-H2.0.6

IT ALL STARTS WITH ME
Students will explore the past, present, and future from the perspective of their own lives. Join a museum educator for historical story time, identify the important details and people from the story, and compare life today with life in the past, while creating a hands-on project to take home.


IF I COULD BUILD A CITY
What is a community? It’s never too soon to learn how communities work. Join our educators as they focus on the importance of transportation, location, communication, and infrastructure to help “build a city” and make it successful. Each team will discuss, plan, and build a two-dimensional model city.

GLCE: 1-G5.0.1, 1-E1.0.1
1ST GRADE

PLANETARIUM

“IN MY BACKYARD”
*Full-Dome Feature Film*
Students will learn about what can be seen in their backyard. Students will explore creatures and plants, the Moon, the Sun, the Solar System, and the movement of the stars in this engaging show designed for early childhood learning.

*NGSS: 1-ESS1-1*

“MAGIC GLOBE: A STORY OF THE SEASONS”
*Full-Dome Feature Film*
Students will explore the seasons in this visually stunning and engaging show. The show will discuss the cause and effect of the seasons including the tilt of the Earth, the motion of the Sun, and how the seasons affect ecosystems on Earth.

*NGSS: 1-PS4-3, 1-ESS1-2*

SKY SLEUTHS
*Live Planetarium Program*
Investigate the sky and discover patterns of motion of the Sun and stars throughout the year. Students will embark on a quest with handy clues to find glowing constellations in the night sky, engage in an interactive reading to identify patterns of the day and night cycle, and view the seasonal shift of the Sun along the horizon.

*NGSS: 1-ESS1-1*

“ACCIDENTAL ASTRONAUTS”
*Full-Dome Feature Film*
Follow the adventures of Cy and Annie as they embark on an unexpected journey to space. Students will learn about the properties of the Earth, Moon, and Sun. Topics include the day/night cycle, phases, composition, and temperature of the Moon, as well as physical and electromagnetic properties of the Sun.

*NGSS: 1-ESS1-1*
## 2nd Grade Learning Labs

### GROUNDWATER
Build and manipulate a model groundwater system, while learning how removing, adding, and polluting water impacts our underground water system.

**NGSS:** 2-ESS2-3

### GALACTIC GOO
Chemistry at its finest and most fun! Matter, molecules, and polymers will be discussed in this hands-on activity. Each student will make and take home a bag of their own goo!

**NGSS:** 2-PS1-1, 2-PS1-2, 2-PS1-3, 2-PS1-4

### LANDFORMS
Explore Earth! Students will use clay to sculpt mountains, valleys, plains, plateaus, and other major landforms. Investigate where on earth these landforms can be found and what forces help shape our world. Discover the many different landforms that are located in our state of Michigan.

**NGSS:** 2-ESS2-2

### BUILD YOUR OWN ECOSYSTEM – NEEDS OF LIVING THINGS
Investigate ecosystems and the water cycle, and learn what living things need to survive. Students will build an independent ecosystem to take home. Work collaboratively to design an investigation that explores how light affects plant growth.

**NGSS:** 2-LS2-1

### ICE CREAM
A sweet way to study solids, liquids, and gases! Working in groups, students will use beakers, measuring cups, and measuring spoons to mix up solids and liquids into an ice cream base. Educators will add the “magic liquid” that changes their liquid into solid ice cream. Each student gets some ice cream to taste.

**NGSS:** 2-PS1-1, 2-PS1-3, 2-PS1-4

### WATER FILTRATION
**Engineering Challenge**
Explore how water is treated in a municipal water treatment system while students select materials to design, build and test their own filtration system.

**NGSS:** 2-ESS2-3

### CREEPING SAND DUNES
**Engineering Challenge**
A sand dune is pushed closer and closer to a house by the wind. Is there a way to save the structure? Students will be invited to design, build, and test a solution to the creeping sand dune and save the house.

**NGSS:** 2-ESS2-1

### BIRD FEEDERS
**Maker Project**
Birds help move seeds from place to place. Explore the different ways animals help disperse seeds, while designing and building your own bird feeder to take home.

**NGSS:** 2-LS2-2

(CONTINUED ON PAGE 10)
**2ND GRADE**

**HISTORY & SOCIAL STUDIES**

**RESOURCEFUL RED HEN**

Using her entrepreneurial skills, the Little Red Hen invested natural, capital, and human resources to produce some delicious goods! The cat, dog, and mouse learned a hard lesson about incentives and opportunity costs. Using a reader’s theater format, kids will hear the story of “The Little Red Hen.” Students will use natural, capital, and human resources to plant wheat seeds to take home.

*GLCE: 2-E1.0.1, 2-E1.0.4*

**IF I COULD BUILD A CITY**

What is a community? It’s never too soon to learn how communities work. Join our educators as they focus on the importance of transportation, location, communication, and infrastructure to help “build a city” and make it successful. Each team will discuss, plan, and build a two dimensional model city.

*GLCE: 2-G2.0.2, 2-G4.0.1, 2-G4.0.2, 2-G5.0.1, 2-G5.0.2, 2-E1.0.2*

---

**PLANETARIUM**

**“DINOSAURS OF ANTARCTICA”**

*Full-Dome Feature Film*

From the Permian through the Jurassic, journey to the south polar landscapes of Antarctica hundreds of millions of years ago. Roam the primitive forest and thick swamps with bizarre dinosaurs and colossal amphibians. Join Antarctic scientists on a quest to understand the ice continent’s profound transformation through time.

*NGSS: 2-ESS1-1, 2-LS4-1*

**PLANETS: ROCKY WORLDS**

*Live Planetarium Program*

Students will visit the inner planets while comparing and contrasting their geological characteristics. Students will travel to mountains, volcanoes, canyons, and craters on the planets and investigate their origins.

*NGSS: 2-ESS1-1, 2-ESS2-1, 2-ESS2-2, 2-ESS2-3*
LEARNING LABS

AMUSEMENT PARK SCIENCE
Investigate balanced and unbalanced forces acting on a marble as students use a variety of interesting materials to build a roller coaster that moves a marble through upside-down loops, curves, and drops.
NGSS: 3-PS2-1, 3-PS2-2

BUILD YOUR OWN ECOSYSTEM – CHANGING ENVIRONMENTS
Investigate ecosystems and the water cycle, and learn what living things need to survive. Students will build an independent ecosystem to take home. Work collaboratively to design an investigation that explores how changing environmental features affect plant growth.
NGSS: 3-LS4-4

FOSSIL SCIENCE
Make a plaster fossil model to take home and touch real fossils, while learning how fossils are formed and how they provide evidence of life long ago.
NGSS: 3-LS4-1

TORNADO CONSTRUCTION
Engineering Challenge
The wind howls as the tornado touches down. Can you design a house that can withstand the forces of a twister? Design, build, and test a wind resistant structure.
NGSS: 3-ESS3-1

CRANKY CONTRAPITIONS
Maker Project
Twist, crank, push, pull, spin. Are you ready to create a moving sculpture? Discover patterns of motion, while designing a cranking mechanism that puts your artwork in motion.
NGSS: 3-PS2-1, 3-PS2-2

PLANETARIUM

MOTION OF THE SKIES
Live Planetarium Program
The program investigates the motion of the Sun, Moon, Planets, and stars in the sky. Students investigate the causes of motion including Earth’s rotation, the orbits of the Earth, Moon, and planets. Students will use this knowledge to predict future motions and occurrences in the sky.
NGSS: 3-PS2-2

EARTH’S ECOSYSTEMS
Live Planetarium Program
Students will explore the diversity of Earth’s ecosystems by digitally taking a trip around the globe. Students will learn about different types of climates and use real world data to make observations about their properties.
NGSS: 3-ESS2-1, 3-ESS2-2

“DINOSAURS OF ANTARCTICA”
Full-Dome Feature Film
From the Permian through the Jurassic, journey to the south polar landscapes of Antarctica hundreds of millions of years ago. Roam the primitive forest and thick swamps with bizarre dinosaurs and colossal amphibians. Join Antarctic scientists on a quest to understand the ice continent’s profound transformation through time.
NGSS: 3-LS4-1, 3-LS4-3, 3-LS4-4, 3-ESS2-2
RESOURCESFUL RED HEN
Using her entrepreneurial skills, the Little Red Hen invested natural, capital, and human resources to produce some delicious goods! The cat, dog, and mouse learned a hard lesson about incentives and opportunity costs. Using a reader’s theater format, kids will hear the story of “The Little Red Hen.” Students will use natural, capital, and human resources to plant wheat seeds to take home.
GLCE: 3-E1.0.1, 3-E1.0.2, 3-E1.0.4

PIONEER JOURNEY
Students will travel back in time to the opening of the Erie Canal and learn how it led to a significant population growth in Michigan. Go on a journey with a pioneer family who is migrating from New York to the wilderness of Michigan through hands-on activities. Discover how pioneers had to make difficult decisions, and trek through the harsh landscape with few possessions.
GLCE: 3-H3.0.1, 3-H3.0.2, 3-H3.0.3, 3-H3.0.7, 3-G5.0.1, 3-G5.0.2

LANDFORMS
Explore Earth! Students will use clay to sculpt mountains, valleys, plains, plateaus, and other major landforms. Investigate where on earth these landforms can be found and what forces help shape our world. Discover the many different landforms that are located in our state of Michigan.
GLCE: 3-G1.0.1, 3-G1.0.2

LUMBER CAMP
Explore how Michigan and the Great Lakes region was once the center of the American lumber industry. Examine how Flint and other Michigan cities used the abundance of trees and waterways to develop economic growth. Investigate life in a lumbering camp through primary and secondary sources. Discover how lumber barons used natural, human, and capital resources to make their businesses successful.
GLCE: 3-G4.0.2, 3-E1.0.3, 3-E1.0.4, 3-G5.0.1, 3-G5.0.2

ANISHINABEK: CONNECTING WITH THE LAND
Explore how the people of the Three Fires Confederacy (Ojibwe, Odawa, and Potawatomi) adapted to and used their environment and natural resources to meet their basic needs for survival. Investigate primary sources, visual evidence, artifacts, and replicas through hands-on activities in order to answer historical questions about daily life for the Anishinabek in the early history of Michigan.
GLCE: 3-H3.0.1, 3-H3.0.2, 3-H3.0.4, 3-H3.0.5, 3-G5.0.1, 3-G5.0.2, 3-G4.0.4
LEARNING LABS

CATCH A WAVE
Energy moves in waves! Students will use duct tape, skewers, and modeling clay to build wave models that demonstrate how energy moves through matter. Students will explore mechanical waves, wave frequency, and amplitude.

NGSS: 4-PS4-1

EARTHQUAKE CONSTRUCTION
Engineering Challenge
Seismic waves move energy through the earth. Students will work in teams to engineer earthquake resistant towers. Students will test their designs on the earthquake shake table to see if they can survive the quake.

NGSS: 4-PS4-1, 4-ESS3-2

MARKER ROBOTS
Maker Project
Using markers, a battery, a motor, and a hot glue stick, students will build a simple robot that draws. Will it draw a circle? Dotted lines? You won’t know until you turn it on and let it go! Students will explore electrical circuits and the forces necessary to make their robots move.

NGSS: 4-PS3-2, 4-PS3-4

EYE DISSECTION
Students will explore the structure and function of an eye while learning how objects are seen when light reflects off the surface and enters the eye. Students will dissect a sheep eye.

NGSS: 4-PS4-2, 4-LS1-2

JITTER CRITTERS
Maker Project
Students will create their own vibrating critter using a battery and vibrating motor from a cell phone.

NGSS: 4-PS3-2, 4-PS3-4

FOSSIL SCIENCE
Make a plaster fossil model to take home and touch real fossils, while learning how fossils are formed and how the presence and types of fossils can provide clues to the formation of rock layers.

NGSS: 4-ESS1-1
**PLANETARIUM**

**AN EVER-CHANGING WORLD**

*Live Planetarium Program*

Students will examine how the Earth can change from long-term processes such as erosion and tectonic drift to fast processes including deforestation, volcanos, and severe weather events. Satellite images and simulations will be used to show changes using real data from agencies such as NOAA and NASA.

*NGSS: 4-ESS1-2, 4-ESS3-2*

**“TWO SMALL PIECES OF GLASS”**

*Full-Dome Feature Film*

Telescopes come in many different shapes and sizes. Students will learn about the different types of telescopes— including reflectors and refractors—the components that make them work and the types of objects that can be seen with a telescope.

*This full-dome feature includes a 20-minute star talk. Students will have an opportunity to ask questions and engage with an educator during this time*

*NGSS: 4-PS3-2, 4-PS4-2*

---

**HISTORY & SOCIAL STUDIES**

**HISTORY DETECTIVES**

Working in teams, uncover the history behind mysteriously abandoned artifacts from the past. Investigate each object using keen detective skills, historical thinking, visual evidence, and primary and secondary sources. Can you figure out what the mystery objects are?

*GLCE: 4-H3.0.4*

**LUMBER CAMP**

Explore how Michigan and the Great Lakes region was once the center of the American lumber industry. Examine how Flint and other Michigan cities used the abundance of trees and waterways to develop economic growth. Investigate life in a lumbering camp through primary and secondary sources. Discover how lumber barons used natural, human, and capital resources to make their businesses successful.

*GLCE: 4-H3.0.1*
LEARNING LABS

PHYSICAL & CHEMICAL CHANGES
Students will explore how matter changes, while observing changes in state of matter and making separating mixtures. Students will follow procedures and look for evidence of chemical changes, while measuring and mixing chemicals to create chemical reactions.

NGSS: 5-PS1-2

MYSTERY POWDER
Someone has spilled white powder in the Learning Lab. Students will use observation and a series of chemical tests to collect data on known powders and then compare that data to the unknown powder’s tests to identify it.

NGSS: 5-PS1-3

MOON PHASES & ECLIPSES
Students will make a glow-in-the-dark Moon phase book and an eclipse project, while exploring the motion of the Earth and Moon.

NGSS: 5-ESS1-2

TRASH CART DERBY
Maker Project
Humans make tons of trash. Why not reuse some refuse and save it from the landfill? Use clean trashables and your engineering and design skills to build a trash cart to use in the Trash Cart Derby drag race. Investigate useful properties of materials, build and test axles and wheels, and explore how shapes affect motion in this fun and creative class.

NGSS: 5-ESS3-1

WATER FILTRATION
Engineering Challenge
Where does the water come from? Where does it go? Students will explore the hydrosphere as they clean dirty water with filtration systems that they design, build, and test.

NGSS: 5-ESS2-2

HISTORY & SOCIAL STUDIES

HISTORY DETECTIVES
Working in teams, uncover the history behind mysteriously abandoned artifacts from the past. Investigate each object using keen detective skills, historical thinking, visual evidence, and primary and secondary sources. Can you figure out what the mystery objects are?

GLCE: 5-U1.4.1

PLANETARIUM

“WE ARE STARS”
Full-Dome Feature Film
Where did it all come from? Students will learn about the evolution of the Universe from the earliest moments of the Big Bang to the beginnings of life on Earth. Other topics include the formation of stars, nuclear fusion in stars, and the creation of elements from fusion.

NGSS: 5-PS1-1, 5-ESS1-1

“STARS”
Full-Dome Feature Film
Stars focuses on the lives of stars, how they are born, what happens when they die, and how human understanding of the universe changes over time. Cultural connections to the stars are explored through Native American, Ancient Egyptian, and Ancient Greek connections. The history of the Solar System is discussed starting with Copernicus through Einstein.

NGSS: 5-ESS1-1
LEARNING LABS

EYE DISSECTION
Students will explore the structure and function of an eye while learning how objects are seen when light reflects off a surface and enters the eye. Students will dissect a sheep eye.

NGSS: MS-LS1-8

TRASH CART DERBY
Maker Project
Humans make tons of trash. Why not reuse some refuse and save it from the landfill? Use clean trashables and your engineering and design skills to build a trash cart to use in the Trash Cart Derby drag race. Investigate useful properties of materials, build and test axle and wheels, and explore how shapes affect motion in this fun and creative class.

NGSS: MS-ESS3-3

PLANETARIUM

“WE ARE STARS”
Full-Dome Feature Film
Where did it all come from? Students will learn about the evolution of the universe from the earliest moments of the Big Bang to the beginnings of Life on Earth. Other topics include the formation of stars, nuclear fusion in stars, and the creation of elements from fusion.

NGSS: MS-LS1-1, MS-LS1-3, MS-LS1-6, MS-PS1-1, MS-PS5-1, MS-ESS1-2, MS-ESS1-3

“DINOSAURS OF ANTARCTICA”
Full-Dome Feature Film
From the Permian through the Jurassic, journey to the south polar landscapes of Antarctica hundreds of millions of years ago. Roam the primitive forest and thick swamps with bizarre dinosaurs and colossal amphibians. Join Antarctic scientists on a quest to understand the ice continent’s profound transformation time.

NGSS: MS-ESS1-4, MS-ESS2-3, MS-ESS3-3, MS-ESS3-5, MS-LS4-1

BUILDING A BETTER TOMORROW
Live Planetarium Program
This program discusses the human impact on our world. The effects of resource consumption, pollution, and harmful emissions will be analyzed in a data driven process. Present and future solutions to minimize human impact will be explored on both an individual and global scale.

NGSS: MS-ESS3-3, MS-ESS3-4, MS-ESS5
Looking for more? Check out one of the topics from our live Space Academy series, featuring:

**ECLIPSE**
A total solar eclipse will be passing near Michigan in April of 2024. Come discover the science and mythologies behind solar and lunar eclipses and learn how to safely view the upcoming eclipse.

**AURORAE**
Discover the beautiful aurorae on Earth, also known as the Northern and Southern Lights! Learn the Sun’s role in creating these arrays of color, their presence on different planets in our solar system, and the best times and places to view them.

**PLANETS**
Tour the Solar System, learn how to find planets in the night sky, explore what makes each planet unique, and discuss the importance of gravity.

**STARS**
Explores the life, birth, and death of stars including stellar formation, the electromagnetic spectrum, supernovae, and star lore through the ages.

**TIME & MOTION**
Investigate the recurring patterns in the night sky including the day and night cycle, moon phases, and seasonal changes of the Sun and stars.

**BLACK HOLES**
Uncover the secrets powering some of the most mysterious objects in the universe. What is a black hole and how are they formed? Can nothing truly escape their gravitational clutches? Learn all about the fascinating studies of our universe’s black holes.

---

**Let us bring the stars to you! with Longway’s PORTABLE DOME THEATER**

Longway Planetarium’s portable dome uses an inflatable dome to bring planetarium video technology to your location, immersing students in a dark, cloudless night sky during the daytime. Your students will experience the wonder of scientific exploration as the inflatable dome is rendered in a realistic model of the night sky over your school’s town on the date that we visit. With the aid of video images and simulations, students will get an up-close look at some of the most distant objects that can be seen from Earth.

**PRICING**

<table>
<thead>
<tr>
<th># SHOWS</th>
<th>TOTAL COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Show</td>
<td>$475</td>
</tr>
<tr>
<td>2 Shows</td>
<td>$610</td>
</tr>
<tr>
<td>3 Shows</td>
<td>$745</td>
</tr>
<tr>
<td>4 Shows</td>
<td>$880</td>
</tr>
<tr>
<td>5 Shows</td>
<td>$1,015</td>
</tr>
<tr>
<td>6 Shows</td>
<td>$1,150</td>
</tr>
</tbody>
</table>

Cost starts at $475 for the first show and $135 per additional show. Travel expenses are included in the rental fee.

**RESERVATIONS**

Make a reservation by calling (810) 237-3409. Groups with young children may include up to 30 students, plus the teacher. A few chairs can be included for adults, but the majority will be seated on the floor.

**PLEASE REVIEW THE VENUE REQUIREMENTS:**

- An area of at least 26’ x 26’ with a clear ceiling height of at least 13’.
- A level entry into the building and program area. Stairs are not an acceptable option for the equipment.
- The dome is a no-built-in floor. Please make sure the floor or any mats that might be used in the dome for seating are clean prior to the visit.
- Two grounded 120-volt standard electrical outlets on separate circuits are required. Extension cords will be run across the floor to provide power inside of the portable.
- No other activities are permitted to be schedule in the program space.
- Arrival time will be a minimum of one hour prior to the first scheduled program.
- At least one able bodied person will be available to assist in the loading and unloading the equipment from the van and assist in setting up the portable dome.
- The Longway Planetarium staff are required to have a one hour break for visits consisting of three or more programs.

**AVAILABLE SHOWS:**

<table>
<thead>
<tr>
<th>SHOW</th>
<th>NGSS/GLCE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRE-K THROUGH 1ST GRADE</strong></td>
<td></td>
</tr>
<tr>
<td>In My Backyard (40 min)</td>
<td><strong>GLCE:</strong> L.O.L.E.1, L.O.L.E.2, L.O.L.E.3, L.E.C.E.2, E.SE.E.2, E.E.S.E.4, E.E.S.E.5, E.ST.E.1, P.P.M.E.1</td>
</tr>
<tr>
<td><strong>1ST-4TH GRADE</strong></td>
<td></td>
</tr>
<tr>
<td>The Zula Patrol: Down to Earth (25 min)</td>
<td><strong>GLCE:</strong> E.ST.04.12, E.ST.04.22, E.ST.04.23, E.ST.04.24, E.ST.04.25</td>
</tr>
<tr>
<td>Secret of the Cardboard Rocket (50 min)</td>
<td><strong>GLCE:</strong> E.ST.04.12, E.ST.04.22, E.ST.04.23, E.ST.04.24, E.ST.04.25</td>
</tr>
<tr>
<td><strong>4TH-6TH GRADE</strong></td>
<td></td>
</tr>
<tr>
<td>Perfect Little Planet (45 min)</td>
<td><strong>GLCE:</strong> E.ST.04.12, E.ST.04.22, E.ST.04.23, E.ST.04.24, E.ST.04.25</td>
</tr>
<tr>
<td><strong>4TH GRADE &amp; UP</strong></td>
<td></td>
</tr>
<tr>
<td>Two Small Pieces of Glass: The Amazing Telescope (45 min)</td>
<td><strong>NGSS:</strong> 4-PS3-2, 4-PS4-2 <strong>GLCE:</strong> S.IP.M.1, S.IA.M.1, S.RS.M.1, E.ST.05.11, E.ST.05.21</td>
</tr>
<tr>
<td><strong>5TH GRADE &amp; UP</strong></td>
<td></td>
</tr>
</tbody>
</table>
# TAKE-OUT CLASSROOM PROGRAMS

**BRING OUR HANDS-ON PROGRAMS TO YOUR CLASSROOM!**

Let us deliver hands-on learning to your classroom with our in-school programs. These activities have been optimized to deliver engaging learning experiences right in your school. No need to stick to just one grade or subject; we can bring a variety of classes directly to you! We’ll provide all materials necessary and guide your students through hands-on activities.

**AVAILABLE CLASSROOM PROGRAMS BY GRADE LEVEL**

<table>
<thead>
<tr>
<th>KINDERGARTEN</th>
<th>INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hog Houses</td>
<td>page 5</td>
</tr>
<tr>
<td>Trip Trap Bridge-Building</td>
<td>page 5</td>
</tr>
<tr>
<td>Color Craze</td>
<td>page 5</td>
</tr>
<tr>
<td>Weather Books</td>
<td>page 5</td>
</tr>
<tr>
<td>Plant in a Bottle</td>
<td>page 5</td>
</tr>
<tr>
<td>Ramp it Up</td>
<td>page 6</td>
</tr>
<tr>
<td>Time Travelers</td>
<td>page 6</td>
</tr>
<tr>
<td>It All Starts With Me</td>
<td>page 6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1ST GRADE</th>
<th>INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sound</td>
<td>page 7</td>
</tr>
<tr>
<td>Build Your Own Ecosystem - Plant Parts</td>
<td>page 7</td>
</tr>
<tr>
<td>Moon Phase Books</td>
<td>page 7</td>
</tr>
<tr>
<td>Light Box Surprise</td>
<td>page 7</td>
</tr>
<tr>
<td>Time Travelers</td>
<td>page 7</td>
</tr>
<tr>
<td>It All Starts With Me</td>
<td>page 7</td>
</tr>
<tr>
<td>If I Could Build A City</td>
<td>page 7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2ND GRADE</th>
<th>INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galactic Goo</td>
<td>page 9</td>
</tr>
<tr>
<td>Build Your Own Ecosystem</td>
<td>page 9</td>
</tr>
<tr>
<td>Landforms</td>
<td>page 9</td>
</tr>
<tr>
<td>If I Could Build A City</td>
<td>page 10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3RD GRADE</th>
<th>INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amusement Park Science</td>
<td>page 11</td>
</tr>
<tr>
<td>Cranky Contraptions</td>
<td>page 11</td>
</tr>
<tr>
<td>Fossil Science</td>
<td>page 11</td>
</tr>
<tr>
<td>Build Your Own Ecosystem</td>
<td>page 11</td>
</tr>
<tr>
<td>Landforms</td>
<td>page 12</td>
</tr>
<tr>
<td>History Detectives</td>
<td>page 12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4TH GRADE</th>
<th>INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catch A Wave</td>
<td>page 13</td>
</tr>
<tr>
<td>Earthquake Construction</td>
<td>page 13</td>
</tr>
<tr>
<td>Jitter Critters</td>
<td>page 13</td>
</tr>
<tr>
<td>Marker Robots</td>
<td>page 13</td>
</tr>
<tr>
<td>Eye Dissection</td>
<td>page 13</td>
</tr>
<tr>
<td>Fossil Science</td>
<td>page 13</td>
</tr>
<tr>
<td>History Detectives</td>
<td>page 14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5TH GRADE</th>
<th>INFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moon Phases &amp; Eclipses</td>
<td>page 15</td>
</tr>
<tr>
<td>History Detectives</td>
<td>page 15</td>
</tr>
</tbody>
</table>

---

**PLEASE NOTE:**
- Programs last 45 minutes to one hour.
- Serves individual classes of 35 students or less.
- A minimum of one teacher from your school will be required to assist in presenting the activities.

- $200 per class.
- $700 for four classes on the same day.

Call (810) 237-3409 to plan your field trip or in-school experience!
FAMILY STEM NIGHTS

Join Sloan Museum of Discovery and Longway Planetarium for a fast-paced and fun review of science content with hands-on activity stations.

Book your own evening of hands-on learning—perfect events for PTAs and community organizations! Choose from one of our STEM themes or customize your own experience by selecting from our collection of station activities. Our educators will work with you to identify activities that meet your school’s needs. All activities support NGSS and state standards and are appropriate for students in kindergarten-6th grade. Host your family night event at your school OR enjoy an evening at one of our great sites.

EVENTS AT LONGWAY PLANETARIUM
$500 for 4 stations, and $50 for each additional station. Choose a planetarium show as one of your stations if your event is held at the planetarium!

EVENTS AT SLOAN MUSEUM OF DISCOVERY
$700 for 4 stations.

EVENTS AT YOUR SCHOOL
$600 for 4 stations, and $50 for each additional station. Schools located outside Genesee County will be charged mileage at the current IRS rate.

Hands-On STEM nights serve a maximum of 200 people. Sloan Museum of Discovery and Longway Planetarium will provide all supplies and materials. Schools must provide volunteers to work as station helpers. For school visits, museum educators will need tables and access to water and electrical outlets.

Share with your schools’ Scout Leaders!

GIRL SCOUTS OF AMERICA & SCOUTS BSA
Workshops and overnights at Sloan Museum of Discovery and Longway Planetarium. Activities all school year! Visit SloanLongway.org/Scouts for more details.

COMING TO SLOAN MUSEUM OF DISCOVERY FEBRUARY 2024!

EXPLOR EXPLORE new ways of problem-solving
CHALLENGE the relationship between the mind and eye
NUITU Nurture your inner creative genius
CATALYZE cross-generational interaction

Book your special exhibit learning experience at: Reservations@SloanLongway.org & (810) 237-3409

PRODUCED BY: minotaur mazes
BOOK YOUR LEARNING EXPERIENCE

Science, social studies, and history field trips, or let our educators bring hands-on learning programs to your classroom!

LOOK INSIDE FOR MORE INFORMATION!
Field trip program descriptions include the NGSS (Next Generation Science Standards) and GLCE (Grade Level Content Expectations) codes for integrated planning of your classroom curriculum.