



FLANDRAU TEACHER GUIDE

From customizable planetarium shows to hands-on exhibits, discovery program add-ons or a scavenger hunt in our world class Mineral Museum, Flandrau offers a variety of options to make your field trip the **best one ever.**

FIELD TRIPS

A standard field trip includes an age-appropriate, interactive planetarium show for your pre-kindergarten through high school group, presented by a knowledgeable presenter. Your class will also explore hands-on exhibits representing various sciences.



Field Trips are available by reservation to school groups Monday through Friday mornings. Afternoon field trips are available on select days. Discovery programs are available at various times throughout the year, see our website for more details on specific availability of these programs. Shows, exhibits and programs are aligned with Arizona State and Next Generation Science Standards.

COST

Field Trip (45min. planetarium show, approx. 2hr. visit)	\$6.00
Discovery Program (Workshop only, 1-2hrs.)	\$5.00
Planetarium Show Add-On (45min.)	\$3.00
Science Center Exhibit Experience Add-On (45min.)	\$2.00

**Prices per student; Title I discounts available*

A minimum of 10 students is required for the group rate.

PLANETARIUM SHOWS



Asteroid: Mission Extreme

Asteroid: Mission Extreme takes audiences on an epic journey to discover how asteroids are both a danger and an opportunity. The danger lies in the possibility of a cataclysmic collision with Earth; the opportunity is the fascinating idea that asteroids could be stepping stones to other worlds – veritable way stations in space – enabling us to cross the Solar System.

Type of Show: FullDome film followed by a live OSIRIS-REx talk

Recommended for: 4th grade and up

Back to the Moon for Good

Immerse yourself in a race to return to the Moon forty years after the historic Apollo landings. See how a competition among privately funded international teams is ushering in a new era of lunar exploration. Learn about the Moon's resources and discover what humanity's future on the Moon might hold. Narrated by Tim Allen, Back To The Moon For Good presents the Google Lunar XPRIZE, and the personal stories of competition and collaboration it inspires.

Type of Show: FullDome film followed by a live star talk

Recommended for: 4th grade and up

Desert Moon

Documentary of University of Arizona's contribution to the Apollo missions, the space race and mapping of the moon. Narrated by Mark Kelly

Type of Show: Front screen film followed by a live star/moon talk

Recommended for: 6th grade and up

Dynamic Earth

The award-winning Dynamic Earth explores the inner workings of Earth's climate system. Audiences will ride along on swirling ocean and wind currents, dive into the heart of a monster hurricane, come face-to-face with sharks and gigantic whales, and fly into roiling volcanoes. Narrated by Liam Neeson.

Type of Show: FullDome film followed by a live star talk (Film portion of show is also available in Spanish; the star talk would still be in English).

Recommended for: 3rd grade and up

Exploring New Horizons

This show tells the full story of the New Horizons mission and Pluto. From the discovery of Pluto in 1930, to the science of the icy objects that form the Kuiper Belt, to the launch of the New Horizons mission in 2006, this new show is the perfect introduction to the discoveries that will unfold once New Horizons reaches Pluto.

Type of Show: FullDome film followed by a live star talk

Recommended for: 3rd grade and up

From Earth to the Universe

The night sky, both beautiful and mysterious, has been the subject of campfire stories, ancient myths and awe for as long as there have been people. A desire to comprehend the Universe may well be humanity's oldest shared intellectual experience. Yet only recently have we truly begun to grasp our place in the vast cosmos. To learn about this journey of celestial discovery, from the theories of the ancient Greek astronomers to today's grandest telescopes, we invite you to experience From Earth to the Universe.

Type of Show: FullDome film followed by a live star talk

Recommended for: 3rd grade and up

Fractal Explorations

Filled with engaging graphics, Fractal Explorations is a feast for the eyes, as well as an exercise for the mind. It examines what fractals are, how they are made, algebraically and geometrically, and where they are found in nature.

Type of Show: FullDome film followed by a live star talk

Recommended for: 6th grade and up

IBEX

Join scientists who are investigating the boundary between our Solar System and the rest of our galaxy in IBEX: Search for the Edge of the Solar System. Designed for visitors with an appreciation for the challenges of space science and a desire to learn more about science research, the show follows the creation of NASA's Interstellar Boundary Explorer (IBEX). Audiences will get an in-depth look at the mission and how IBEX is collecting high-speed atoms to create a map of our Solar

System's boundary. Narrated by two inquisitive teenagers, audiences will hear from the scientists and engineers that developed the IBEX mission and created the spacecraft, and get the latest updates on the mission's discoveries.

Type of Show: FullDome film followed by a live star talk

Recommended for: 6th grade and up

Legends of the Night Sky

Take a lighthearted and imaginative look at the myths and stories associated with the constellation Orion or the constellations of Perseus and Andromeda.

Type of Show: Laser animation followed by a live star talk

Recommended for: Kinder to 8th grade

Max Goes to the Moon

An adaptation of the fictional, but science-based, children's book of the same title by author and astronomer Dr. Jeffrey Bennett. Max the Dog and a young girl named Tori take the first trip to the Moon since the Apollo era, and their trip proves so inspiring to people back on Earth that all the nations of the world come together to build a great Moon colony. From the colony, the views of Earth make everyone realize how small and precious planet Earth is.

Type of Show: Front screen film followed by a live star/moon talk

Recommended for: Pre-K to 3rd

Mysteries of the Unseen World

Visually stunning and rooted in cutting-edge research, Mysteries of the Unseen World will leave audiences in complete thrall as they begin to understand the enormity of the world they can't see, a world that exists in the air they breathe, on their own bodies, and in all of the events that occur around them minute-by-minute, and nanosecond-by-nanosecond. And with this understanding comes a new appreciation of the wonder and possibilities of science.

Type of Show: FullDome film followed by a live star talk

Recommended for: 5th grade and up

Phantom of the Universe

The show reveals the first hints of its existence through the eyes of Fritz Zwicky, the scientist who coined the term "dark matter." It describes the astral choreography witnessed by Vera Rubin in the Andromeda galaxy and then plunges deep underground to see the most sensitive dark matter detector on Earth, housed in a former gold mine. From there, it journeys across space and time to the Large Hadron Collider at CERN, speeding alongside particles before they collide in visually stunning explosions of light and sound, while learning how scientists around the world are collaborating to track down the constituents of dark matter.

Type of Show: FullDome film followed by a live star talk

Recommended for: 7th grade and up

Season of Light

An updated “fulldome” version of a holiday classic, this show traces the history and development of many of the world’s most endearing holiday customs, all of which involve lighting up the winter season — from the burning Yule log to the lighting of luminarias in the American Southwest. Audiences will learn a selection of Northern hemisphere winter constellations, and find out why we have the seasons. Season of Light is visually rich, culturally inclusive, musically satisfying, and soothing as a warm drink on a cold winter’s night!

Type of Show: FullDome film followed by a live star talk

Recommended for: All ages

Sunstruck

Discover the wonders of our sun. Its incredible energy has supported life on earth for millennia, but is now threatening our technology and way of life. Travel to the distant future to discover our sun’s connection to the universe’s cosmic cycle of life and death.

Type of Show: FullDome film followed by a live star talk

Recommended for: 3rd grade and up

Tucson Sky and Beyond

This is our “classic” night sky show, but not like you remember it! Take a relaxing look at the night sky as one of our skilled “Console Captains” gives you a guided tour of the stars, planets, constellations and current events happening in the night sky. This live show is never the same and there is always a surprise in store

Type of Show: Live FullDome Presentation

Recommended for: All ages, show can be tailored to your grade level

Touring the Planets

Zoom away from planet Earth and take a guided tour through the Solar System! In this show we stop by each of the planets and learn why they are unique. We’ll even explore moons, asteroids, the Milky Way and beyond. Hold on, this is one fun ride.

Type of Show: Live FullDome Presentation

Recommended for: All ages, show can be tailored to your grade level

We Are Stars

We follow a group of Victorian time travelers as they learn about the origins of atoms. We witness the formation of the first hydrogen atoms after the Big Bang and then watch how those hydrogen atoms gather into galaxies and stars. We learn how the stars forged all the atoms needed to make life. We see the creation of planet Earth and follow the atoms and molecules through evolution, back to where the time travelers started their journey.

Type of Show: FullDome film followed by a live star talk

Recommended for: 5th grade and up

CURRENT EXHIBITS



Puzzles, Proofs & Patterns

Experience the power and perception of mathematics, and feel your brain get supercharged. In this exhibit you'll see how math touches everything in our daily lives, and you'll learn about the history of mathematics through the stories of the men and women who made it happen. Math is a powerful tool that has enabled us to both measure and transform our world. It has also enabled us to explore new worlds. We've described the laws of nature using mathematics, and that's why math has been called "the language of the universe." Many people don't think of math as a "science" but in fact has been called the "Queen of the Sciences" because of its essential role in our understanding of physics, chemistry, astronomy and many other disciplines. Packed with more than twenty games and puzzles for all ages, this new exhibit will tickle your brain as you hunt for solutions. And you'll start to realize how math touches everything around us. Teacher materials coming soon, appropriate for students of all ages.

Welcome to the Critical Zone

Welcome to the Critical Zone: Our new Earth Science exhibit explores the wonders of the "Critical Zone," the thin layer on the surface of the Earth where life occurs. In this family-friendly exhibit, you'll learn about groundbreaking UA science through hands-on activities. The Critical Zone extends from the tops of the trees down through the soil to the groundwater. You will explore how rocks, water, soil, and microbes interact while you learn about Critical Zone science. The Critical Zone Observatory here at the U of A is part of a network of Observatories around the country, 10 Critical Zone Observatories in all, that are funded by the National Science Foundation. This collaborative approach to research promises exciting science about the Critical Zone. Our air. Our water. Our food. It all comes from this thin layer that makes life possible.

Destination Mars

Explore Mars through its rovers, orbiters and landers and discover how much in common we might have with our red planetary neighbor, and how soon we might visit.

HiRISE: Eye in the Martian Sky

Discover the Martian surface up close through the HiRISE camera as it orbits and photographs Mars.

The Solar System Revealed

Featuring scale models of the planets, you be amazed to see just how tiny planets like Earth and Mars seem in comparison to our Sun. You'll discover cool facts about all 8 planets, and Pluto the dwarf planet. Plus, you learn about NASA's OSIRIS-REx mission to return a sample from an asteroid – the University of Arizona leads this breakthrough mission and mission headquarters is right here in Tucson!

The UA Mineral Museum

With over 2,000 minerals presently on display, the UA Mineral Museum offers your students the opportunity to explore the world of rocks, minerals and gems and understand the differences between them. Also on display are meteorites from localities around the world. The collection itself is divided into roughly ten major exhibits, including exhibits of the minerals from Guanajuato, Mexico and famous Arizona localities such as Bisbee, Ajo, Morenci, Ray, and Tiger.

Each visit includes a scavenger hunt that looks at what makes minerals unique from each other, to learning how minerals impact our every day lives. This tour is both exciting and educational, and staff will share their knowledge about the minerals and their uses, as well as answer questions from your new rockhounds. The Mineral Museum scavenger hunt encourages students to take closer look and differentiate between various specimens found throughout the museum.

The Fossil Corner

This exhibit showcases the many different forms of life that flourished on the earth long ago, from dinosaurs to cave bears to exotic sea creatures. You'll look back into deep geologic time to see how species rise and fall as life evolves over millions of years. You'll see two huge dinosaur bones that were found here in Arizona near Tucson! And you'll learn what kinds of dinosaurs used to live here (they were much bigger than people!) and see where the bones fit into the skeletons of these massive reptiles.

DISCOVERY PROGRAMS

Discovery Programs encourage students to “think like scientists” using their observation, critical thinking and problem-solving skills. They introduce students to the amazing science of everyday life in a very hands-on way. They also provide a great opportunity to encourage higher education by allowing interaction with university students, who facilitate the programs. Most discovery programs are approximately two hours, although shorter programs can be booked in order to accommodate large groups or to combine workshops with exhibit exploration time and a planetarium show.

Marine Discovery



Sponsored by the Department of Ecology and Evolutionary Biology, Marine Discovery is an outreach program designed to teach 3rd-8th grade students about the importance of our oceans. Marine Discovery workshop stations are hands-on, activity-based explorations which provide students with the opportunity to work with live marine animals and teaching specimens. Students are exposed to living and preserved organisms found in the Gulf of California and gain a general understanding of the scientific relationships between them. Students learn about the rocky intertidal zone; the plankton in our oceans & their importance as the base of the marine food chain; fish diversity and how the shape of a fish can inform you about what it does for a living; shark and squid dissections are explored with an emphasis on body form and function, and adaptations to the marine environment. Workshops are offered from September-November on Tuesday-Friday mornings.

Insect Discovery

Sponsored by the Department of Entomology in collaboration with the Arizona Cooperative Extension and 4-H, Insect Discovery is an outreach program designed to teach 1st-3rd grade students science concepts through hands-on activities using live and preserved insects. Workshop stations are inquiry-based activities that address topics such as biological diversity, adaptation, and life cycles. In addition to field trips, the program provides classroom visits, outreach events, teacher training and lesson plans. Workshops are offered from February-May on Tuesday and Wednesday mornings.

Earth Science Discovery



This Earth Science Discovery experience explores the layer we call the Critical Zone. Earth is the only known planet that has life. However, compared to the size of the planet, life only occurs in a very thin layer on the surface of the earth. Scientists call this special layer the Critical Zone because it is critical for life on Earth. Students will participate in a series of hands-on activities exploring Earth's "Critical Zone" led by UA students. The stations, designed for 3rd-6th grade, explore earth science concepts like the rock cycle, the water cycle, and microbes. Activities align with AZ State and Next Generation Science Standards. Workshops are offered from September-December and February-April on Tuesday and Thursday mornings.

Chemistry Discovery

Chemistry Discovery is an outreach program with the goal of promoting and facilitating chemistry learning for middle-school students (grades 6-8). Workshops are designed and conducted by University of Arizona students in collaboration with several faculty members from the Department of Chemistry and Biochemistry. UA students learn to apply the knowledge acquired in their chemistry classes in order to develop activities that prompt visitors to discover chemical concepts in their daily experience and explore the chemical properties of common objects in the world around us. Workshops are offered during October and November on Wednesday mornings.

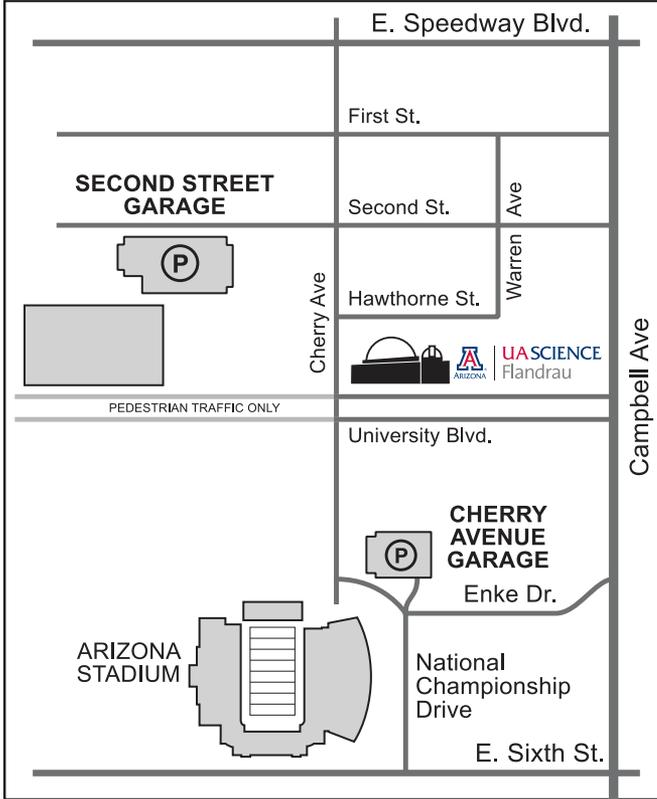
Physics Discovery

Sponsored by the Department of Physics, these hands-on workshops are designed to teach K-12 students about the simple laws that govern the physical universe. Guided activities include Newton's Laws of Motion, making liquids from gases, making magnetism from electricity, and exploring the optics of mirrors and lenses. Activities are covered at a level appropriate to the age group of visiting students. Workshops are offered during spring semester and days and times vary.

PARKING

We offer limited, free parking on the south side of Hawthorne Avenue long the yellow painted curb. This parking is available on a first-come, first-serve basis. Bus parking is also available along National Championship Drive, just east of the football stadium.

Convenient parking is always available at the Cherry Avenue Garage for a small fee.



For More Information

On all of our programs, hours, shows and more, please visit our website at flandrau.org or give us a call at (520) 621-4516.



UA SCIENCE

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Science Center & Planetarium