



McAuliffe-Shepard Discovery Center

NECAP Assessment

Professional Development

HQT

School Visits

Outreach

NH State Science Frameworks

EDUCATOR'S GUIDE TO THE UNIVERSE 2011-2012

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SCHOOL VISIT BASICS

- Students \$5 each, either choice, \$8 for both
- Chaperones FREE (1 per 10 students required)
- Additional adults at the student rate
- Bring lunch or a snack - eat inside or picnic outside.
- Visit our science store - items in all price ranges!
- If possible, let us know ahead if your students have any special needs.

Your Premier Field Trip Destination

- Up-to-date science - the latest in astronomy, aviation, Earth & space science
- Captivate and inspire your students - a delightful, memorable way to learn
- Guided activities - planetarium shows - interactive exhibits - observatory - activity guides
- Hands-on, interactive field trips for all ages and learning styles
- Science Store stocked with affordable science tools, kits and more
- Easy to combine Discovery Center field trips with a visit to the NH State House and Museum of NH History

Call 603.271.7827 to plan your visit and make a reservation!

ADVENTURES IN SCIENCE

Choose from (a) a variety of guided exhibit-centered experiences for your students, (b) a planetarium show preceded by an introductory program, or (c) both! Each Adventure in Science can last from 60 to 90 minutes. If you select two adventures, please plan on adding an extra 60-90 minutes plus time for your snack or lunch break.

If possible, let us know ahead if your students have any special needs. We will do all we can to accommodate them so that they have the best experience possible!

Ask your bus driver to drop you off by the Mercury-Redstone Rocket, at the special school group entrance to the McAuliffe-Shepard Discovery Center, and then park in the special zone for buses in our free parking lot. We'll greet you at the door.

Choose an Exhibit-Centered Experience

Include instruction, hands-on activities, investigations and demonstrations geared to your students' grade level.

Expedition Mars Grades 3-12

Be part of humanity's continued exploration of space! Your students will study Mars, from early beliefs to current and future exploration, then work in teams to plan a trip to the Red Planet.

Planets & Moons: Let's Compare Grades 3-8

What makes Earth unique? How do scientists search for life beyond Earth? How do they find planets outside our solar system? Your students will role-play as scientists and compare Earth to other objects in our solar system and beyond.

The Space Shuttle Grades 3-12

From the intricate details of its launch configuration to the onboard systems key to accomplishing a mission, your students will explore the Space Shuttle "stack" and learn how astronauts actually live and work on the space shuttle orbiter.

Imaging our Universe Grades 6-12

How do satellites and space probes help us understand our universe? Your students will discover how telescopes, basic optics, light, color, imaging devices and data transmission work, and investigate properties of objects being imaged.

Choose a Planetarium Show

Our Place in Space* Grades Pre-K-2

Basic astronomy for younger students. Explore the Sun, the rotating Earth, day & night, gravity, our solar system, the current night sky and more.

Family of the Sun Grades 3-4

Travel with your students to other planets, moons, comets and transneptunian objects in this live, grade-appropriate presentation of our solar system.

Tonight's Sky Grades Pre-K-12

Customized for your class – students will learn to recognize constellations, locate key stars, find planets, and explore other topics in this interactive tour of the night sky.

Breathing Space* Grades 5-8

Take a wild skateboard ride through cyberspace to investigate Earth's changing climate and the climates of other planets and moons in our solar system.

Black Holes Grades 9-12

Explore the latest scientific knowledge on black holes. Your students will discover what black holes are, how they form, and the roles they play in our universe.

Ice Worlds Grades 5-8

Discover the critical relationship between ice and life. Your students will experience the sky at both of Earth's poles, then travel to other ice worlds in our solar system.

Infinity Express* (available in the traveling planetarium only) Grades 4-12

Your students will discover astronomy and space exploration throughout the ages - from the analysis of our solar system to the mapping of the universe.

The Amazing Telescope Grades 7-12

Take a dynamic look at the development and types of telescopes from Galileo's time to the high-powered observatories of today.

Impact Earth Grades 5-8

What are the differences between asteroids, meteors and comets? Your students will learn how these objects are discovered and how potential impacts might be deflected.

Ring World (available in the traveling planetarium only) Grades 4-12

Saturn and its rings are the most visually delightful – and mysterious – objects in our solar system. Your students will travel to Saturn and learn all about this exotic gas giant.

Dawn of the Space Age Grades 5-6 & 9-12

Your students will experience the excitement and drama of the early days of space exploration, from the launch of Sputnik to lunar landings and privately operated space flights.

Interstellar Boundary Explorer Grades 7-12

What is the nature of the boundary between our solar system and the galaxy? Is anything out there? Introduce your students to NASA's IBEX mission and what it has revealed!

Digital Universe Grades 8-12

Don't tell your students about the universe, **SHOW** them! Go on a warp-speed journey to the edge of the observable universe, based on real data from the latest scientific surveys.

Inside Einstein's Universe Grades 9-12

Students will explore Albert Einstein's provocative ideas that changed the way we look at our universe, including gravity, time dilation, black holes and more.

*Activity guide available

Upcoming Planetarium Shows

A new featured planetarium show opens periodically at the Discovery Center for two months only! Incorporate one of these new shows into your class visit. For full Experience options, call 603.271.7827 or go online to www.starhop.com.

JANUARY – FEBRUARY

Kaluoka'hina, the Enchanted Reef

JULY – AUGUST

TBA

MARCH – APRIL

Fractal Zooms!

SEPTEMBER – OCTOBER

TBA

MAY – JUNE

TBA

NOVEMBER – DECEMBER

Tales of the Maya Skies

OUTREACH

Can't come to us? We are happy to come to you!

We will adjust the content of any of the following interactive programs to suit your students' needs.

Traveling Planetarium

In our inflatable, digital Discovery Dome planetarium, our educators will customize shows about constellations, stars and the night sky for groups of 30-40 students at a time.

Full-dome planetarium shows available: Tonight's Sky, Infinity Express, Ring World, Ice Worlds, The Amazing Telescope, Interstellar Boundary Explorer, and Impact Earth.

Cost: \$235, plus round-trip mileage from Concord, NH for one session - additional sessions are \$100 with a maximum charge of \$500 for 5 sessions, plus mileage. The traveling planetarium is accessible; please let us know about special needs in advance.

Traveling Educators

Each of the following programs/demonstrations is \$100 per hour per educator, plus round-trip mileage.

- Telescopes-to-Go: Limit 50 people per hour per telescope. Day or night programs are available.
- International Space Station
- The Incredible Vacuum of Space
- Imagine Mars
- Comets
- Star Life
- Inside Einstein's Universe
- Your Call: a customized program geared toward topics you would like covered.

Scientist in Residence

The McAuliffe-Shepard Discovery Center offers schools a Scientist in Residence Program! The program offers schools the chance to have a Discovery Center educator on location for a full week. Each day features 45 minute sessions for each grade level on topics like living in space, the solar system, or comets and asteroids. Classes experience a range of engaging activities, like making a comet out of dry ice or acting out the motions of planetary orbits. Students also get to experience a planetarium show in the Discovery Center's traveling planetarium, and have hands-on experience with telescopes. For more details on this innovative program for your school, call 603.271.7827.

PROFESSIONAL DEVELOPMENT

Targeting NH State Science Frameworks and NECAP assessment topics, our professional development workshops and summer symposia are geared to boost your content knowledge and enjoyment of these fascinating areas of study, and to practically equip you to teach these required topics.

2012 Professional Development Workshops

Workshops are held periodically at the Discovery Center in addition to workshops we can provide at requested locations. \$75 includes a four or six contact-hour certificate (depending on the length of your chosen workshop). To enroll, call us at (603) 271-7827; a 50% non-refundable deposit will hold your place. Graduate Credit available from Plymouth State University for an additional cost; a special project is required (\$165 per credit and \$25 per registration form).

January 11 (9 AM–3:30 PM)

Hands-on Optics & Spectroscopy

Using instruments in the new optics/spectroscopy lab, explore the visible part of the electromagnetic spectrum and learn how mirrors and lenses are used to create and enlarge images. Use professional spectroscopes to see how elements can be “finger printed” to reveal the chemical make-up of stars, their motions, their size and temperature. Make a simple spectroscope (that you can have your students build) to enhance understanding of how they work.

March 7 (9 AM–3:30 PM)

The Math of the Universe

Examine how math is used to describe major relationships in our universe. From simple scale relationships to Kepler's and Newton's Laws, this will help you develop a deeper understanding of what keeps it all working together. And – experience the newest planetarium show, Fractal Zooms, which examines the never-ending patterns in our universe that are represented by algebraic equations.

May 9 (9 AM–3:30 PM)

Propulsion, Satellites, Rockets & Gravity

Build and launch a model rocket and discover how we get where we want to go in space. Learn about satellites, various propulsion methods, and investigate how gravity causes “weightlessness” and what we have to do to overcome it.

Workshops at Your Location

Now it's even easier to attend Discovery Center Professional Development Workshops with seminars that our educators can put on at a location convenient for you! Consider a one or two hour session after school, or a full or half-day workshop. All workshops can be tailored in terms of content to meet goals in the specified length of time. Other topics may be available upon request. \$15 per participant per hour (minimum of \$100 per hour), plus round-trip mileage to your location. \$75 per participant for a full day 6-hour workshop (minimum of \$500), plus round-trip mileage to your location.

Our Solar System

Earth, with its Moon, is only one of a number of fascinating planets that orbit the sun. Explore planetary characteristics, positions, and movement patterns in our solar system with available planetary data. Compare and contrast the planets and learn how gravitational forces affect solar system objects, what evidence has been gathered of planetary systems elsewhere in the universe, and hear an update on current solar system missions.

Comets, Asteroids & Meteors

This workshop will take a close look at some of the smaller members of our solar system. How is a comet different from an asteroid or meteor? What causes meteor showers? Why does a comet have two tails and what are they made of? What is the best way to get the most out of this summer's meteor showers? Content knowledge and practical demonstrations to enhance understanding will be provided, including meteorites to hold and examine.

Observational Astronomy

Become familiar with our celestial sphere and the basic movement patterns of the stars, moon, sun and planets. Consider the night sky for the current season in terms of constellations, prominent stars, planets and deep sky objects. The three major types of telescopes will be discussed along with how they work and the advantages of each.

Star Life

Investigate the characteristics common to most stars in the universe, including how they are born, their size, color,

shape, temperature and luminosity. Particular attention will be given to the Sun and how we are able to study it. Take a look at the Hertzsprung-Russell diagram, and consider the objects formed after a star's demise, such as neutron stars, white dwarfs and black holes. Class activity ideas will be shared to help teach these concepts to your students.

SUMMER STELLAR SCIENCE SYMPOSIUM

June 25-June 29, 2012 (9 AM – 3:30 PM)

This five-day symposium will bring K-12 educators together with NASA and university scientists and Discovery Center educators in an exploration of stars. Topics will include star formation and composition, types of stars, finding stars by name in the night sky, the Hertzsprung-Russell diagram, size, color, shape, temperature and luminosity, spectroscopy, telescope basics, how we observe stars with Earth and space based telescopes, and much more. Call 603.271.7827 to reserve your spot or for more information.

\$200; 30 contact-hour certificate, 1-3 graduate credits available through Plymouth State University.

NATIONAL GRID EDUCATION CENTER

Make the National Grid Education Center your home base for professional development! In a comfortable, high-tech environment specially created for educators, you'll find great professional development workshops and seminars led by educators, scientists and engineers - and a wealth of free materials from NASA in the east end of the Education Center, where NASA's Educator Resource Center for New Hampshire resides. The NASA materials include lithographs, astronomy software, posters, videos, slide sets, activity guides, and spectroscopy sets. The Resource Center is open Thursdays 3-5 PM, Saturdays 10 AM-1 PM, and by appointment.

The National Grid Education Center will equip you with the resources you need to increase your effectiveness in teaching instruction in science, technology, engineering and mathematics in the classroom.