Planetarium Program Offerings

All programs can be adjusted to accommodate all types of groups.
Grade levels are suggestions. All programs can be tailored to various grade levels.
All programs spend various amounts of time seeing "what's up" in the sky tonight.

Grades Pre-Kindergarten and Kindergarten

"In My Backyard" The program introduces the children to the planetarium and its components. We then explore sky motions (Earth rotation and circumpolar stars) and examine the night sky and the wonders of stars, planets, and constellations. We'll follow the path of the Sun on its daily march across the sky and get up close to a few objects with our imaginary telescopes.

Connections to the Massachusetts Science and Technology/Engineering Learning Standards

PreK-ESS1-1(MA). Demonstrate awareness that the Moon can be seen in the daytime and at night, and of the different apparent shapes of the Moon over a month.

PreK-ESS1-2(MA). Observe and use evidence to describe that the Sun is in different places in the sky during the day.

Grade 1

"Sky Patterns: Rising, Moving, and Setting" The program uses the planetarium sky to have the students, through their own observations, discover the daily patterns of motion of the Sun, Moon, stars, and constellations over a period of three or four days. This includes the changing appearance of the Moon over time. We touch on the changing night sky (constellations) as the seasons change. We then explore why these patterns occur.

Connections to the Massachusetts Science and Technology/Engineering Learning Standards

1-ESS1-1. Use observations of the Sun, Moon, and stars to describe that each appears to rise in one part of the sky, appears to move across the sky, and appears to set.

Grade 3

"Our Neighborhood - The Solar System and Gravity, the "super glue" that holds it all together." Take a journey through the Solar System and explore the wonders of our celestial neighborhood. We'll examine how the Solar System is organized, how all the bodies are similar and different from each other, and, how gravity keeps all of the bodies in their proper place. We'll return to Earth to gaze at the night sky and search for stars and constellations that are currently visible.

Connections to the Massachusetts Science and Technology/Engineering Learning Standards

3-PS2-1. Provide evidence to explain the effect of multiple forces, including friction, on an object. Include balanced forces that do not change the motion of the object and unbalanced forces that do change the motion of the object.

Clarification Statements:

- Descriptions of force magnitude should be qualitative and relative.
- Force due to gravity is appropriate but only as a force that pulls objects down.

Grade 5

"How and Why: the Observable Sky Changes" The program uses the planetarium to model and communicate Earth's relationship to the Sun, Moon, and other stars that explains why people on Earth experience day and night, and, the changes in the position of the Sun, Moon, and, constellations at different times during a day, over a month, and over a year.

Connections to the Massachusetts Science and Technology/Engineering Learning Standards

5-ESS1-1. Use observations, first-hand and from various media, to argue that the Sun is a star that appears larger and brighter than other stars because it is closer to Earth.

5-ESS1-2. Use a model to communicate Earth's relationship to the Sun, Moon, and other stars that explain (a) why people on Earth experience day and night, (b) patterns in daily changes in length and direction of shadows over a day, and (c) changes in the apparent position of the Sun, Moon, and stars at different times during a day, over a month, and over a year.

Grade 6

"The Sun and Moon: Eclipses and Phases" The program models and explains the causes of solar eclipses, lunar eclipses, and the phases of the Moon. The program ends with a summary of our cosmic address — our place in space.

Connections to the Massachusetts Science and Technology/Engineering Learning Standards

6.MS-ESS1-1a. Develop and use a model of the Earth-Sun-Moon system to explain the causes of lunar phases and eclipses of the Sun and Moon.

6.MS-ESS1-5(MA). Use graphical displays to illustrate that Earth and its solar system are one of many in the Milky Way galaxy, which is one of billions of galaxies in the universe.

Grade 8

"The Reasons for the Seasons" The program explains the causes of the cyclical pattern of seasons, which includes Earth's tilt and differential intensity of sunlight on different areas of Earth during the year. We compare and contrast the path of the Sun across the sky during the solstices and the equinoxes.

Connections to the Massachusetts Science and Technology/Engineering Learning Standards

8.MS-ESS1-1b. Develop and use a model of the Earth-Sun system to explain the cyclical pattern of seasons, which includes Earth's tilt and differential intensity of sunlight on different areas of Earth across the year.

Grade *9*

"Your Cosmic Connection to the Elements" The program explores the astronomical origins of the elements from the Big Bang through stellar evolution — the elements that we are made of.

Connections to the Massachusetts Science and Technology/Engineering Learning Standards

HS-ESS1-1. Use informational text to explain that the life span of the Sun over approximately 10 billion years is a function of nuclear fusion in its core. Communicate that stars, through nuclear fusion over their life cycle, produce elements from helium to iron and release energy that eventually reaches Earth in the form of radiation.

Grade 10 Biology, History

"Celestial Navigation" The program's focus is on the methods of celestial navigation used on sailing ships in the 1830's. It is presented as an interdisciplinary program involving Charles Darwin's voyage on the HMS Beagle.

Grade 11 Chemistry

"*The Periodic Table of the Elements*" The program focus is on the fusion reaction in the core of various types of stars and the formation of the elements that present themselves in the Periodic Table of the Elements.

Connections to the Massachusetts Science and Technology/Engineering Learning Standards

HS-ESS1-1. Use informational text to explain that the life span of the Sun over approximately 10 billion years is a function of nuclear fusion in its core. Communicate that stars, through nuclear fusion over their life cycle, produce elements from helium to iron and release energy that eventually reaches Earth in the form of radiation.

Grade 11 Chemistry/Physics

"Cosmic Colors - Spectroscopy in Astronomy" The electromagnetic spectrum, light, from celestial objects contains much information. The program examines the history and many applications of spectroscopy in astronomy from the measurement of the Sun's temperature to the identification of the elements in distant stars, to the spectroscopic evidence that the universe is expanding.

Grade 10 United States History 1

"Lewis and Clark: Their Voyage of Discovery" The program focus is the Lewis and Clark expedition (1804-1806) and how they navigated and mapped the region during their trip using celestial navigation.

Connections to the Massachusetts History and Social Science Curriculum Framework

HSS.USI.T2.03. Analyze the causes and long and short term consequences of America's westward expansion from 1800 to 1854 (**e.g**., the Louisiana Purchase, the War of 1812, growing diplomatic assertiveness after the Monroe Doctrine of 1823; the concept of Manifest Destiny and pan-Indian resistance, the establishment of slave states and free states in the West, the acquisition of Texas and the Southwestern territories as a consequence of the Mexican-American War in 1846-48, the California Gold Rush, and the rapid rise of Chinese immigration in California).

Grade 11 United States History 2

"Americans in Space" This program focuses on the history of America's humans in space efforts from the Sputnik era to today's International Space Station and our future plans.

Connections to the Massachusetts History and Social Science Curriculum Framework

HSS.USII.T3.11. Analyze Dwight D. Eisenhower's response to the Soviet Union's launching of Sputnik (1957) and the nation's increased commitment to space exploration and education in science.

Grades 9-10 Math/Geometry

"Eratosthenes and the Circumference of Earth" The program connects math (Geometry) to astronomy. Its focus is on how in 240 BC an early Greek astronomer using a few measurements, logic, and Geometry calculated the circumference of the Earth. We use the planetarium sky to simulate his observations and measurements.

Grade 9-12 Mythology

"Why the North Star Stands Still" For thousands of years, the night sky and its shining stars mystified ancient peoples from all around the world. They looked to Polaris, the North Star, for direction and stability. We will explore some of the myths and science surrounding the most popular star in the night sky. In our program, *Why the North Star Stands Still*, we'll hear the Native American legend of Negah's journey up the magical mountain and how he became the star that does not move. We'll also examine the science connected to the North Star and how to find it in the night sky.

Grades K-2
"The Sky Above" A program designed for young children and the child in all of us. We begin by meeting some of the people and animals (constellations) that live in the heavens above, discover Jack and Jill on the Moon, and with imaginary telescopes zoom in on the Moon and any planets that are up in the sky tonight. We end with a trip to the North Pole and observe the sky from there.

Grades K-3
"George and Oatmeal Save Santa" This program is particularly appropriate for young children. Santa Claus is missing! Mrs. Claus is worried and asks Oatmeal the snowman to help find him. Join Oatmeal and his friend, George, the planetarium wizard, as they travel the world in search of Santa. Along the way they are told constellation stories from many cultures and how to use the stars of the Big Dipper to find north. We will also see what's up in Weymouth's December sky and observe the sky from the North Pole.

Grades 3-12
"Halloween Celestial Origins" What do you associate with Halloween? Trick-or-Treating, costumes… astronomy? After all, Halloween is an astronomical holiday! Learn the history of Halloween and how it fits into the seasons as a "cross-quarter day". We will also explore the night sky and learn what planets, constellations, and stars will be out on your Halloween evening. Come along on a journey of exploration into the origins of this magnificent and often misunderstood holiday.

Grades 3-12
"Winter Wonder Lights" Winter provides us with the best sky viewing of the year. What planets are visible this time of year? When will we be able to see Orion the Hunter and other winter constellations? What's the name of the brightest star in our sky? We'll end our sky visit with a trip to the North Pole to learn how Santa uses the North Star to find his way back home after a long winter's night of travel.

Grades 3-12
"The Autumn Sky Tonight" Constellations, mythology, names of bright stars, the visible planets, and telescopic objects in the night sky are the topics of this program. What's Halloween's connection to astronomy? Join us and find out what wonders the night sky has to offer from your backyard. **This program can be adjusted for the other three seasons.**

Grades 5-12
"A Winter's Solstice" At the time of winter solstice, the day with the shortest day light and longest night of the year, our ancestors celebrated the beginning of the return of the Sun to the higher heavens. The program explores the astronomical events associated with the first day of winter and discusses the history of various ancient observances of the winter solstice including a look at some of the monuments built by prehistoric peoples to the winter solstice.

Grades 3-12
"To Pluto and Beyond" Since its discovery in 1930, Pluto had been just a dot among the stars. We finally know what it really looks like thanks to the New Horizons spacecraft's voyage. This was the very first visit to Pluto by a spacecraft from Earth. See how Pluto and its moons were discovered and named, and appreciate how hard it has been to find out anything more about Pluto until now. Follow the New Horizons spacecraft to the former ninth planet and see it up close for the very first time and see what else, beyond Pluto, New Horizons has discovered.

Grades 3-12
"Follow Your Curiosity - The Curiosity Rover on Mars" NASA landed on Mars the biggest and most advanced science laboratory ever to investigate another planet. The 2000 pound robotic rover named Curiosity started its 98 week mission with a near perfect landing on August 6, 2012. Its assignment — investigate whether conditions on Mars have ever been favorable for life, and search for clues in the rocks about possible past life. Curiosity is still going strong. We'll look at the most current news from the red planet and explore how and why Mars has fascinated us through time.

Grades 5-12
"Mayan Astronomy" A program about the astronomy of the ancient Mayan civilization and their unique interpretations of the heavens. Over hundreds of years they observed and documented astronomical events with great accuracy. They built cities and temples aligned to movements of the sun, moon and planets, especially Venus. We'll examine how the Mayan's created a calendar more accurate than the one we use in modern times. Journey back in time to see how the Mayan's used the sky to understand their world and their place in it.

Grades 5-12
"Aurora Borealis: The Northern Lights" The most spectacular example of the way that the Sun and Earth are invisibly connected is the phenomenon of the Aurora Borealis (Northern Lights). What are they? How did the people of ancient cultures feel about these mysterious and unpredictable wonders? It wasn't until the mid-1800's that scientists finally began to discover many of their mysteries.

Grades 5-12
"What's Your Sign" For centuries, people have been fascinated by the motions of the Sun, Moon, and planets among the stars. Special importance was placed on the position of the Sun along the Zodiac. In *What's Your Sign* you'll learn why the Zodiac is important in Astronomy and Astrology. Join us as we explore the legends behind the constellations in the Zodiac. Come find out where and when to see your Zodiac sign.

Grades 5-12
"Ancient Horizons" Explore the astronomy of the ancient Egyptians in this program. These people sought to explain the order of the Universe: the cycles of life and death, the annual flooding of the Nile, the succession of divine kings, and the nightly march of the stars across the sky. This quest to understand the cosmic order motivated the Egyptians to study the sky, worship celestial objects, create a calendar, and build their great pyramids. Part of this program has audio available in Spanish.

"Scout Nights - The Sky Map Plus Program" A program for girl and boy scouts of all ages seeking astronomy achievements. The main goal of this program is to help guide scouts through the night sky. Part one of the program includes how the sky works, how to read a sky map, and where to locate visible planets. Scouts will practice using star maps in the planetarium, and take them home to use in their own backyard. Because the sky maps are for the current sky, this program never gets old. Part two of the program will be tailored to specific achievement requirements for the specific type of scout group and what the group is working towards. **Scout to Adult Ratio:** 1 adult for every 5 scouts is required.

The following programs have video portions produced by other planetariums.

Grades 4-12
"Journey to the Stars" launches visitors through space and time to experience the life and death of the stars in our night sky, including our own nurturing Sun. Tour familiar stellar formations, explore new celestial mysteries, and discover the fascinating, unfolding story that connects us all to the stars. Those who come along for the journey may never see the night sky in the same way again. Part of this program has audio available in Spanish, French, German, or Italian with English subtitles. This program is great for foreign language classes.

Grades 4-12
"Cosmic Collision" At first glance, the night sky appears calm and peaceful. But travel beyond your line of vision deep into space and the reality is altogether different. Brilliant planetary impacts and wondrous celestial fireworks are commonplace. ***Cosmic Collisions*** reveals the explosive encounters that shaped our solar system, changed the course of life on Earth, and continue to transform our galaxy and universe today. Images from space and visualizations based on cutting-edge scientific data showcase catastrophic planetary meetings, the merging of massive galaxies, and the continual explosions that occur in the center of the Sun. Part of this program has audio available in Spanish, French, German, or Italian with English subtitles. This program is great for foreign language classes.

Grades K-4
"Perfect Little Planet" Imagine the ultimate space vacation. Discover our solar system through a different set of eyes – a family from another star system seeking the perfect vacation spot. Fly over the surface of Pluto, our best known Dwarf Planet. Dive over the ice cliffs of Miranda. Sail through the rings of Saturn. Feel the lightning storms at Jupiter. And walk on the surface of Mars. Which destination would you choose for your vacation? This is the solar system journey for space travelers of all ages.

Grades K-2
***"The Secret of the Cardboard Rocket*"** Climb aboard a magical cardboard rocket with two young adventurers, Bonnie and Marcus, and experience a breathtaking, up-close look at each of our solar system's planets with guidance from a talking "Astronomy Book" - a character personified by a wise, kind old man. It's not until the end of the adventure when you find out what the true secret of the rocket is - something that makes this apparently impossible trip to the edges of the universe and back become possible.

Grades 4-8
"Attack of the Space Pirates" *Space Pirates* is an exciting planetarium adventure with the crew of the starship 'Intrepid'. Our heroes race across the galaxy in a desperate bid to prevent the space pirates from locating an alien technology so powerful it threatens fate of the galaxy itself. This science fiction journey helps us to learn and understand real science facts. Topics discussed include the life cycles of stars, supernovas, and the way planetary systems evolve over time.

Grades 5-10
"Exploding Universe" The program follows the path of one particle, a proton, as it participates in some of nature's most astounding events of rebirth and renewal: from supernovae and colliding black holes to supervolcanoes and proton collisions.

Grades 2-8

"Comets & Discovery" The program takes us on a journey of discovery. We follow two intrepid comet hunters in first-person: one, a modern explorer; the other, Caroline Herschel, the famous 18th century comet huntress. We learn how they each searched the skies, made their discoveries, and reported them for other astronomers to verify. We also learn about, depending on the century of the observer, what people thought comets were and their importance to them.