Astronomy- *Planetarium*

*Ancient Sky Lore: (Gr. 6 • Any month) This live presentation meets Social Studies standards and looks at “star stories” from a cultural perspective. Stories from ancient cultures around the world are told as the presenter points out associated constellations on the planetarium dome.

*Dark Shadows: (Gr. 4, 8, 9-12 • Sept) Through hands-on activities and stunning images, students learn what causes the phases of the Moon and both lunar and solar eclipses.

*Engineering the ISS: (Gr. 6, 8, 9-12 • Oct, Dec, Jan, Mar) How do you build a million-pound object that will stay in orbit and sustain human life? This interactive show describes how 15 nations worked together to engineer the International Space Station (ISS), a unique scientific laboratory and home in space. A rap and animations explain how weight, mass, gravity and speed are related, and why astronauts are weightless on the ISS even though there is gravity in space.

*Explorers of Mauna Kea: (Gr. 8, 9-12 • Feb) Learn about telescopes, volcanoes, and plate tectonics as we visit the world’s largest observatories on Mauna Kea, a dormant volcano in Hawaii. Students use mirrors to simulate the reflecting surface of a telescope and experience the night sky at various locations on Earth via Digistar special effects.

*Follow the Drinking Gourd: (Gr. 2-12 • Feb) This planetarium show explains how American slaves used astronomy and song to escape bondage and flee north.

*In My Backyard: (Gr. K-2 • Nov, Apr) Children will enjoy story telling, poetry, and song as they learn about the seasons, constellations, planets, meteors and the Moon.

*Larry Cat In Space: (Gr. 4K-1 • May) Younger students will enjoy this playful program about a cat that takes a trip to the Moon!*

*Mission to Mars: (Gr. 4, 8, 9-12 • Oct, Mar) Take a trip to Mars via NASA imagery of spacecraft and the red planet! Compare surface features and rock types on Mars with Earth’s, and view the Martian night sky and compare it to ours through the power of Digistar.

*More Than Meets The Eye: (Gr. 4, 8, 9-12 • Apr) Students learn to identify objects in the sky using the naked eye, binoculars and telescopes. Planets, galaxies, nebulae and stars are shown and discussed.

*Solar System Adventure Tour: (Gr. 4 • Apr) Your students will be actively engaged as Planet Specialists, Math Experts or Flight Engineers as your planetarium “spaceship” takes you on an exciting, interactive adventure past the Sun, Moon and planets of our Solar System!*

*Star Stories: (Gr. 1-2 • Any month) Using a 3-D model, we show how the Sun, Earth and Moon are related in space. Then, we connect the stars on the planetarium dome to make constellations and share some of the stories about them. We also discuss the difference between stars and “shooting stars.”*

*Tis the Season: (Gr. K-12 • Dec) ‘Tis the Season traces the development of many holiday customs and how they involve lighting up the winter season. The reasons for our seasons are explained in the show, and possible explanations for the star of Bethlehem are discussed.

*To the Moon and Beyond: (Gr. 4-12 • Sept, May) This exciting, interdisciplinary program features the past, present, and future of lunar exploration and celebrates the success of NASA. It addresses science and social studies standards, including the Space Race during the Cold War.*

**Astronomy- Classroom**

**Kinesthetic Astronomy: (Gr. 4, 8, 9-12 • Sept, Jan, May) Students get a feel for the scale of the universe as they sort images of celestial objects; then they model the Earth, Moon and Sun. By doing appropriate movements, they discover why stars appear to move across the sky each day/night, why we see different stars during the year, and how Earth’s tilt causes seasons.**

**Lunar Design Challenge: (Gr. 4 & 8 • Oct, Jan, May) Students will design, build, and test a Lunar Buggy to transport astronauts and cargo on the Moon. They will collect and analyze data, take measurements, and refine their models using the Engineering Design Process.**

**Walk Across the Solar System: (Gr. 4, 8 • Oct, Apr) Students learn about the planets and the size of the solar system as they create a model of the solar system using a scale of 1 inch = 100,000 miles. This requires walking outside for about a mile, so please wear appropriate shoes!**

**Earth Science**

*Blown Away: Wild World of Weather: (Gr. 6 • Jan, Mar) Students will be swept into a thunderstorm, immersed in a hurricane, and caught up in a tornado - all in the comfort of the planetarium! Learn about the water cycle, the Sun’s effect on weather, methods used to predict storms, and safety in hazardous weather.*

**Dig In!: (Gr. 1 • Apr, May) Students will examine, compare, and sort Earth materials. Using magnifiers and sifting screens, they will investigate and describe properties of minerals, rocks, sediments, and soil.**

**Marvelous Minerals: (Gr. 3 • Nov, Feb) Working together in small groups, students handle mineral specimens such as malachite, amethyst, mica, pyrite and copper. They learn to identify common minerals on the basis of their properties using a field guide and minerals identification key.**

**Minerals, Ores, & Fossil Fuels: (Gr. 8 • Feb) Students learn to identify minerals by examining key properties of museum quality specimens; then they identify 10 unknown minerals using a dichotomous key. Valuable products made from earth resources are discussed throughout the program.**

**Planet Earth Rocks (Exploring Earth Resources): (Gr. 3 • Dec, Mar) Students handle and observe excellent specimens of igneous, sedimentary and metamorphic rocks. They describe and compare physical properties, relate properties to processes of formation, and examine sand derived from various rocks. They also handle and classify fossils and products of earth resources.**

**Rockin’ & Rollin’: (Gr. 8 • Mar) Students handle and observe excellent specimens of igneous, sedimentary and metamorphic rocks and discover how they are related in the rock cycle. They examine sand from various rocks and classify rocks using a dichotomous key. Students also observe and classify fossils, sediments and products of earth resources.**

**NEW! Sun & Shadows: (Gr. 1 • Nov, Dec) Students will conduct investigations that help them discover how the Sun appears to move, how shadows change over time, and how the angle at which light shines changes the brightness and spread of the light.**

**Under the Sea: (Gr. 5 • Sept, Oct, Jan, Feb) In this deep-sea mapping expedition, students use depth probes, look for patterns, make inferences and map the ocean floor using a large 3D Landforms Puzzle. They compare continental landforms with oceanic landforms, discuss constructive and destructive processes, and discover connections between landforms and plate tectonics.**

**Environmental**

**EXTENDED HOUR! EcoHike in Hitchcock Woods: (Gr. 3, 5, 6, 7, 9-12 • 2 hours • Sept, Oct, Apr, May) This is a two-hour, two-mile guided hike through Hitchcock Woods. Native plants will be identified, evidence of animal life will be examined, and forest communities will be compared.**

**We All Live Downstream: (Gr. 5, 7 • Jan) Through creation of an interactive watershed model, students will investigate the intricate human-land-water connection. The importance of a healthy watershed will be evaluated and our effects on the water cycle will be explored. Students will discuss how we can have positive effects on water quality and quantity for other humans and all life that live downstream.**
NEW! Recycling Resources (Gr. 1 • Nov, Dec) Students will investigate ways to help reduce, reuse and recycle our waste. They will work together to build a landfill model, collect data, and build graphs to analyze the effects of our trash in the environment!

**Life Science**

Animal Adaptation Stations: (Gr. 6 • Nov, Dec) We will compare and contrast structures, processes, and behavior responses that help endothermic and ectothermic animals survive. Students will observe and interact with live animals including salamanders, frogs, turtles, snakes, an alligator, and an owl.

Animals with Backbones: (Gr. K, 2 • Nov, Dec, Apr) We will classify animals (fish, amphibians, reptiles, birds, and mammals) according to their physical characteristics. Students will observe live animals including salamanders, frogs, turtles, snakes, an alligator, and an owl.

NEW! Engineering Insects: (Gr. K, 2 • May) Students will learn about the major body parts of insects. They will test different insect “mouth parts” at feeding stations, and then use the engineering design process to brainstorm inventions based on insects.

*Journey into the Living Cell:* (Gr. 5, 7, 9-12 • Oct, Jan) Students “become” organelles and act out cellular processes before entering the planetarium for a journey into the intricacies of the living cell. Students grasp the structure and functions of major cell organelles through dynamic visuals and analogies.

Our Body, Our World: (Gr. 7 • Dec) Students will explore the connections between the health of the human body and the environment. Through a closer investigation of viruses and other microscopic critters in both physiological and historical perspectives, students will leave with a better appreciation of how amazing our bodies are and how connected we are to our world. Science, social studies, and art will all be a part of this interdisciplinary program.

Owls: Wise Guise: (Gr. 3, 9-12 • Nov, Mar) Silent flight, a curved, hooked beak and sharp, powerful talons are some of the adaptations that enable these nocturnal predators to survive at the top of the food chain! We will examine owls’ physical characteristics, behaviors, and habitat requirements. We will also meet a live owl and dissect owl pellets.

Plantastic: (Gr. 1 • Feb, May) Students compare plants and people, identify the functions of plant parts, and assemble plant life-cycle puzzles. They enjoy time-lapse videos of plants in motion and investigate methods of seed dispersal. As time permits, plants from different environments are compared and contrasted.

Ravenous Raptors: (Gr. 5, 7, 9-12 • Oct, Dec, Feb) What does a Red-Tailed Hawk eat? How is an osprey’s talon different from an owl’s? Students will have an up-close look at birds of prey and examine their role in the food chain. We will compare and contrast physical characteristics, adaptations, and habitats, use field guides, and examine real wing and talon specimens.

Vertebrate Taxonomy: (Gr. 4 • Sept, Jan, Mar) Students will classify animals (fish, amphibians, reptiles, birds, and mammals) according to their physical characteristics. They will observe and interact with live animals including salamanders, frogs, turtles, snakes, an alligator, and an owl.

**Mathematics**

Hiker: (Gr. 6 • Dec) This interactive program explores graphing concepts by using a computer program that creates graphs based on student movement. Students enjoy the challenge and fun of moving to create specific line graphs.

*Merry Measuring II:* (Gr. 3 • Feb, Mar) Students use Earth materials to investigate volume and mass, and engage in problem solving activities such as estimating, measuring, and ordering the masses of different mineral samples. They explore the difference between mass and weight and learn how and why their weight would change if they left the planet Earth.

Polygon Puzzle: (Gr. 6 • Mar) Students will explore properties and Greek roots of polygons and polyhedrons. They will be challenged to solve a puzzle as they construct acute, obtuse, right, isosceles, equilateral, and scalene triangles using Geometer’s Sketchpad, a dynamic, interactive geometry software package.

**Physical Science**

Are You Dense? (Gr. 8, 9-12 • Feb, Mar) Students explore density using Earth materials including minerals, water, sand, and iron filings. They will take measurements, collect data, plot coordinates, and interpret graphs as they analyze the mathematical relationship between mass and volume.

Center of the Atom - An Investigation of Protons, Neutrons, Electrons, Elements, and Isotopes: (Gr. 9-12 • Oct, Jan) Students explore atomic structure using a series of hands-on activities, concluding with the discovery of the uses of an atom they create using the Interactive Nucleus display and the Living Periodic Table.

Chemicals Matter: (Gr. 7, 9-12 • Oct, Dec, Jan) Students explore physical and chemical properties of matter. They compare physical and chemical changes and experience reactivity through several hands-on activities and explosive demonstrations!

Circuit City: (Gr. 3 & 4, 6 • Sept, Nov, Mar) Using batteries, bulbs, wires, motors, and propellers, students will construct simple, series, and parallel circuits and demonstrate energy transformations.

CSI Solutions: (Gr. 5 • Sept, Oct, Feb) Scotty’s dog is missing! Students use chromatography and sifting to separate mixtures; use indicators to make solutions and identify a mystery substance; and examine hair and fiber samples with microscopes in a simulated crime scene investigation.

Do You See What I See? (Gr. 4 • Jan, Apr, May) Students will investigate and explore ways that light can be reflected, refracted, and diffracted by various objects and learn how the eye converts light into images.

Elements, Compounds, and Bonds – Oh My! (Gr. 7 • Oct, Jan) Students “Meet the Elements” in a fun music video then work together to classify materials as elements, compounds, and mixtures. They will build atomic models, and discover why compounds are either ionic or covalent.

Magnets and Motions: (Gr. K, 2 • Nov, Apr, May) Students will predict, sort, test, and classify objects as being magnetic or non-magnetic. Using toys and fun hands-on activities, students will investigate properties of magnetism and demonstrate how the poles of magnets attract and repel.

May the Force Be With You: (Gr. 6, 9-12 • Dec, Mar) Students will conduct investigations to distinguish between force and work, and mass and weight. They will demonstrate how simple machines such as levers, pulleys, and inclined planes reduce the amount of force needed to do work.

Mixing Matter: (Gr. 5 • Jan) Students identify different types of mixtures and work in collaborative teams to make various solutions. They manipulate variables to change the rate of dissolving.

Probing the Periodic Table: (Gr. 9-12 • Oct, Jan) This program demystifies the periodic table and makes learning about atoms fun! Students grasp the organization of the periodic table as they construct a Periodic Table of Foods. Then, they build atomic models and use them to find patterns in the structure and behavior of elements.

Push Me, Pull Me: (Gr. 1 & 2 • Nov, Apr, May) Students will experiment with force and motion using toys including marble towers, gears, ramps, and dominoes. They will collect, analyze, and interpret data from observations and measurements as they investigate motion, gravity, and friction.

“Sound”-ational: (Gr. 3 & 4 • Oct, Nov, May) Students will learn about sound waves and how loudness and pitch may be manipulated. They will use teamwork to construct their own musical instruments and play a song.

What’s the Matter? (Gr. 2 • Dec, Apr) Students will investigate three states of matter: solid, liquid, and gas. They will observe, describe, and compare physical properties of solids and liquids and they will combine solids and liquids to create mixtures and solutions.

South Carolina standards correlations, pre- and post-visit activities, and more are available on our website:

[http://rpsec.usca.edu/student/](http://rpsec.usca.edu/student/)