FIELD TRIP PLANNER 2015

Union Station & Science City
This is your *ultimate* field trip planning guide for Science City and Union Station! We have every minute of your trip planned out, from hands-on activities to live theater performances, a place to enjoy your lunch and easy access for bus drop off and pick up. Your day with us will be fun filled and stress free. We have several awesome new exhibits as well as traditional student favorites. We know your students will be talking about this field trip for weeks!

In addition to our dynamic science center and hands on learning, our great traveling exhibits are relevant to science and history curriculum. Read through this guide; we break down the best programs that Union Station and Science City have to offer. It’s easy to customize your trip! You pick the programs that best fit your curriculum and we take care of the rest. We can’t wait to see you on your next field trip!

– The Staff at Union Station and Science City

**Union Station and Science City are located at:**

30 West Pershing Road  
Kansas City, MO  64108

Before scheduling your visit, note open hours change depending on the date of your visit, please plan accordingly. [Visit UnionStation.org for current hours.](#)
Our Mission

The Kansas City Museums of History and Science, d.b.a. Union Station Kansas City, Inc., shall be recognized as the region’s finest educational and cultural resource committed to the preservation and interpretation of Kansas City’s regional history and the promotion of innovation, research and discovery in science and technology through the development of collections, exhibitions and other educational programs for all citizens of and visitors to the Greater Kansas City metropolitan area.

Our Goal

To educate people of all ages in the area of Kansas City regional history and in the exploration of science, and to assist in experiencing old and new technologies affecting our lives and inspiring others to become innovators in developing technologies for the future.

About Us

Union Station Kansas City is a historical landmark and civic asset renovated and reopened to the public in 1999. It features a science center, world-class traveling exhibits, a giant screen movie theater, planetarium, live theater, shops and restaurants.

Union Station receives no public funding. The Station’s operating costs are funded by general admission and theater ticketing, grants, private donations, commercial space leases and facility rental. Union Station is an affiliate of the Smithsonian Institution in Washington, D.C.

Great Science & History Programs

Learning and fun go hand-in-hand at Union Station. We offer a variety of curriculum-specific options, many of which are sure to fit the needs of your students and your lesson plans. Whether you visit us or we come to you with our popular Science City on the Road programs, we know you’ll be satisfied. Sign up on our website for our education e-newsletter and receive regular updates on programs and activities.

It’s easy to book. Review the information in this guide, make your choice, then complete and submit the online reservation form. Reservation forms are available online at UnionStation.org/Youth-Groups.

Questions? Call 816-460-2020 and select ‘5’ for groups, or email USKCGroups@UnionStation.org. Available Monday-Friday, 9 a.m. - 5 p.m.
Groups of 15 or more can enjoy discounted group rates. Price listed is price per student. One adult chaperone is required for every ten students. Advanced reservation and a nonrefundable payment is required for booking.

**Pricing**

<table>
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<tr>
<th>Activity</th>
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<tr>
<td>Xtreme BUGS!</td>
<td>$7.50</td>
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<tr>
<td>Add Science City to Xtreme BUGS!</td>
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<tr>
<td>Science City</td>
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<td>Discovery Areas (Science City Admission Required)</td>
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<td>Planetarium</td>
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<td>Extreme Screen</td>
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<td>Theatre for Young America</td>
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<td>Science City on the Road</td>
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<td>Scavenger Hunts</td>
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<td>Centennial</td>
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<td>(Traveling Exhibit Admission Required)</td>
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<td>Lunchroom (Reservation Required Prior to Visit, Space is Limited)</td>
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<td>Groups (1 - 150)</td>
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<td>Groups (151+)</td>
<td>$65</td>
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**Funding Assistance**

Bus transportation funds are available to schools in the bi-state region—Jackson, Clay and Platte counties in Missouri; Johnson and Wyandotte counties in Kansas. Funds are limited and must be requested at the time the field trip is originally scheduled and cannot be combined with other scholarships.

**Scholarships**

To inquire about additional funding opportunities for field trips to Science City call 816-460-2226 or email Education@UnionStation.org.

While Members receive complimentary year-round general admission, these admission privileges do not extend to Group Admission. Please include any Members in your overall headcount.
To Book Your Field Trip

☐ Review all field trip options and pricing on page five

☐ Complete the reservation form, available online at UnionStation.org/Youth-Groups

☐ Reserve the lunchroom on reservation form (if needed) for your visit as space is first come, first serve

☐ Submit reservation form online

☐ Coordinating teacher will receive confirmation email within two business days of submitting reservation

☐ A confirmation packet, which includes pre-visit educational materials, field trip guidelines, maps and more will be sent via email to coordinating teacher

Confirmation/Payment Information

Confirmation of visit and final numbers are required three weeks before the scheduled date of field trip. Payment is required two weeks before the scheduled date of field trip. If confirmation of visit, final numbers and payment are not received one week prior to your visit date, your reservation will be deleted and you will be notified via phone and email. In the event additional tickets are needed the day of your visit (add students and/or adults) the group leader will pay for the additional tickets in one transaction upon arrival. Please allow extra time for this transaction.

Lunchrooms

In an effort to make your day with us as easy and worry free as possible, we have a dedicated lunchroom space for groups to enjoy sack lunches. Groups may choose between four different times: 10:45AM, 11:30AM, 12:15PM, 1:00PM. Each time gives groups 30 minutes and can hold a maximum of 225 individuals. Please note: space permitted, multiple groups may be inside the lunchroom at the same time.

*Educators! School groups booking a Science City visit on Tuesday or Wednesday during the 2014-15 school year will receive a free lunchroom (lunchroom must be used on the same day as the Science City visit). Mention this special offer in the additional comments section of your reservation form.

Questions?
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Available Monday – Friday, 9 a.m. – 5 p.m
What if the ants crawling on your counter, the spider in your doorway, or the butterfly in your garden were the size of your car? What would they look like at that giant size? What bizarre physical characteristics would you notice? And what mind-boggling behaviors would you observe? Students can find out beginning October 17, 2014 at Union Station’s newest traveling exhibition—Xtreme BUGS.

Union Station’s new Xtreme BUGS exhibition will feature over 100 giant bugs, including many that are powered by robotics, in vibrant, naturalistic habitats. Insects include a 15-foot-long Japanese hornet, a fluttering monarch butterfly, a ladybug, a line of marching ants, an orchid mantis, stinkbugs, spiders, honeybees, and more.

Enveloped in the larger-than-life landscape of Xtreme BUGS, visitors will be transported into a vivid, dynamic, and awe-inspiring environment where insects gather together in extreme populations to survive. The exaggerated size of each animatronic model offers an up-close look at the bizarre structures, features and physical characteristics of these (usually) tiny creatures.

Not only are the bugs larger-than-life, so are their naturalistic settings. The guest truly experiences how the world would appear from a bug’s eye view. Vibrant backdrops illustrate bug habitats found around the world. From a dewy rainforest floor to the expanse of sub-Saharan Africa, a gentle meadow to a boggy burrow, each giant, moving bug is surrounded by exhibition elements like giant mushroom caps and giant blades of grass.

We are very excited to announce Xtreme BUGS as our next featured exhibition. Guests have come to expect great educational content, impressive interactive displays and world-class productions that capture imaginations and leave one feeling enriched from an amazing journey. Xtreme BUGS will continue that Union Station tradition. The exhibit truly includes something for everyone: Science, Robotics, Conservation and Nature.

As guests descend in the world of Xtreme BUGS, they will see, hear and feel the wonder of a world around us rarely considered. This exhibition is a perfect complement to our wildly popular Nature Center within Science City. Groups can make a day of it with the Xtreme BUGS exhibit and our living Nature Center. We even have a bug movie planned for our Planetarium.
Science City is a cityscape themed, hands-on science center with more than 125 exhibits in different environments and neighborhoods. Students benefit by engaging in these self-guided, hands-on activities related to national and state standards. A description of the national and state standards can be found at UnionStation.org/EdInfo.html.

**Every Last Drop**
Water feels ordinary to us because it’s so familiar, but it’s a truly extraordinary molecule. EVERY LAST DROP explores water and our relationship to it. The exhibit — packed full of interactive elements — covers three vital topics. In What is Water?, dive into the fascinating scientific properties of H2O. Explore the interaction between Water & Life, from watersheds to water treatment. In Tapped Out, learn more about how we use water and why we should conserve it.

**Genetics: Unlock The Code**
You are 99.9% percent identical to the person standing next to you. GENETICS: UNLOCK THE CODE helps visitors discover the science and wonder behind that fraction of a percent. Through interactive discovery, you’ll gain a better understanding of the human genome — the set of instructions that tells your body’s cells how to operate. Genetics is what makes you, well ... you! It’s science, supercharged — you have to see it to believe it.
Science City is a cityscape themed, hands-on science center with more than 125 exhibits in different environments and neighborhoods. Students benefit by engaging in these self-guided, hands-on activities related to national and state standards. A description of the national and state standards can be found at UnionStation.org/EdInfo.html.

Science of Energy
The Science of Energy explores energy and our relationship to it. Visitors will actively examine their own human energy and understand what it means to be unplugged. Through interactive discovery, they earn a better understanding of where our energy comes from, with an emphasis on renewable sources like wind and solar. They’ll also gain global perspective that provides valuable insight into the world’s relationship with energy, now and in the future.

*Science Concepts:* energy, health, investigate and test, magnet, circuit, wind, work, force, technology, observation, insulator and conductor, light and electricity

Science on a Sphere
Science on a Sphere (SOS) presents a stunning and powerful visual perspective of Earth and other objects in our solar system. Designed and supported by the National Oceanic and Atmospheric Administration, SOS utilizes a unique projection system to display animated images using a six-foot suspended carbon fiber sphere. Visitors of all ages can take an out-of-this-world tour of our solar system and explore our planet’s dynamic landscapes, oceans and weather.

Live 20-30 minute shows lead by Science City educators. Ask about reservations for your group!

*Science Concepts:* analyze, energy, moon, star, sun, water cycle, weather, wind, temperature, technology, rock, earth material, observation, light and habitat

Nature Center
Our newly renovated Nature Center allows visitors the opportunity to observe a diverse group of animals; compare and contrast their physical characteristics, behaviors and habitats; explore the animal kingdom; and meet interesting creatures that call the Nature Center home. Agnes our giant Green Iguana and Beaker our outspoken Sulfur-Crested Cockatoo await your visit!

*Science Concepts:* biology, biomechanics, ecology, evolution, environmental science, physiology, classification and taxonomy
Science City Favorites

Sky Bike
Our Sky Bike allows visitors the opportunity to put the law of physics to the test! This exhibit challenges guests to put the law of physics to the test while seated on a bicycle that happens to be suspended on a high wire 30 feet above the ground. Visitors will experience the importance of their center of gravity and discover the relationship between counterweights and balance, all while enjoying a beautiful view of the science center! Must meet height and weight requirements.

Science Concepts: fluid mechanics, buoyancy, air pressure, air foils and lift, gravity, mass distribution, force and motion and magnetism

Music Park
Create your own music at this park area. Play the drums, walk the floor piano, knock on the huge standing xylophone, or wave your hand over the motion harmonicas at this favorite neighborhood stop in Science City.

Science Concepts: non-verbal communication, hands on discovery, introduction to sound and variations, group cooperation and interaction and creative opportunities

Giant Lever
A lever is a simple machine that transfers a force to a load to provide a mechanical advantage. During the tug-o-war, the Giant Lever’s high rope at six feet has a 3 to 1 mechanical advantage over the low rope at two feet. It takes three times as many people on the low side to have a chance of winning the tug-of-war. The higher rope is easier to pull since it is further away from the Giant Lever’s fulcrum – the point where the lever pivots.

Encourage guests as a group to do the Giant Lever ‘tug-of-war’. This exhibit is best experienced when multiple people use it at the same time.

Science Concepts: work and simple machines, force and motion and scientific inquiry
**Dig Site**

Unearth the fossil remains of mosasurs, pterosaurs, ferocious Mesozoic fish and other ancient ocean creatures at the Dig Site. Use brushes, shovels and goggles to explore the Dig Site and become a paleontologist for a day.

*Science Concepts: biology, geology, paleontology, fossils, extinction, evolution, biomechanics, earth history, science careers and science as inquiry*

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**Dino Lab**

See the cleaning and restoration of Lyle the Camarasaurus as fossil bones are pieced together in the Dino Lab. Developed in partnership with the University of Kansas, this fully functional laboratory demonstrates the equipment and process involved in preparing dinosaur specimens for display. Handle real fossils and observe them under a magnifying lens. Identify creatures that once inhabited Kansas and Missouri millions of years ago and observe tools and methods of paleontology.

*Science Concepts: biology, geology, paleontology, fossils, extinction, evolution, biomechanics, physiology, earth history, science careers and science as inquiry*

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**Mister E. Hotel**

The famed illusionist, Mr. E, has loaded this hotel with more than 21 different illusions to confuse and astound hotel guests. Unravel the “magic” that invokes the illusory perceptions and sensations experienced here. Shock your friends as you appear to become a disembodied head and torso at the Diner Table, watch your body dissolve in the Washroom Mirror, see objects bend and distort at the Vision Warper and learn the secrets to dozens of other illusions at the Mister E. Hotel.

*Science Concepts: optical illusions, perception, camouflage, visual queues and color theory*
Science City Favorites

Light Alley
A stroll down Light Alley allows you to observe how light and energy go hand in hand. Cast your outline on the Shadow Wall, add blue, green and red on the Color Wall and watch the effects of a black light on different materials.

Science Concepts: science as inquiry, forms of energy, color theory, light spectrum and photo luminescence

KinderLab
Enjoy this new, permanent exhibit space designed for early learners, ages 1-7. Explore, build, imagine, read, pretend and play while engaging in science concepts and science literacy in this safe, hands on interactive space designed by early childhood educational specialists. Build structures, operate a miniature crane and much more!

Science-Themed Activities
In addition to our Science City favorites our education team has created a monthly schedule of science themes. Please see below for the 2015 schedule. Each month our educators will facilitate daily, ongoing demos inside the science center based on these monthly themes. The demos can be a great addition to your Science City visit!

January: Inside Science
February: Food Science
March: The Science of Water
April: Far Out Science!
May: Health Science
June: Maker Month
July: Science on the Move
August: Extreme Science
September: Sports Science
October: Science is Reactive
November: Scientific Structures
December: Merry Science
Discovery Areas

What is a Discovery Area?
Youth groups participate in facilitated and themed grade-level specific programs that extend and reinforce science principles required for district and state testing. Discovery Areas provide in-depth learning with a structured environment and offer pre and post visit activities for students to prepare and reflect on the visit. Programs are scheduled at 9:30 a.m. and 12 p.m., Tuesday - Friday.

MAKER STUDIO – NEW 2014
Become a maker and be inspired to create new and unique things through hands-on learning.

Science Concepts for all Maker Studio Programs: engineering, design, problem solving, creativity, cause and effect, ratio and proportional relationships, transfer and direction of energy, measurement and data, geometry, electricity, electrical circuits, motion and energy, motors, gears and gear ratios, logic and probability and computer programming.

3D Printing
Grades 2-12 | 15-30 Students | Two Hours
The activity will focus on students learning about and observing the 3D printing process from design to completion. Students will have the opportunity to see complex 3D models and also make their own. Students will learn how a 3D printer manipulates its materials to make its finished product. Each student will go home with a 3D printed object they have witnessed being created.

ArtBots
Grades 2-12 | 15-30 Students | Two Hours
Students will make a robot able to create art by combining various electronic components with art materials. In this activity students will gain an understanding of basic electrical circuits and the functionality of different types of motors. Students will design and create robots that can draw patterns, then alter their robot’s design to change and guide the patterns that are drawn. They will use logic and problem solving skills in the design and implementation of their robots. Students can take home their robotic art at the end of the class.

Circuits
Grades 2-12 | 15-30 Students | Two Hours
The activity will focus on students gaining knowledge and practical understanding of electricity, its functionality and uses through building and testing simple electrical circuits. Students will also learn about the design process and problem solve as they implement their designs. Lessons will include using switches and sensors to turn lights, sounds and other functions on and off through modular electrical component blocks and individual electrical parts placed together into a circuit. Students will also gain skills in soldering by making a simple circuit, like using a switch to turn battery powered, LED lights on and off.

Mold Making & Casting
Grades 2-12 | 15-30 Students | Two Hours
Students will learn basic mold making and casting techniques with a variety of materials and get custom crayons they’ve made to take home. For a one-hour class the students will focus on non-traditional mold making materials and will cast both crayon wax and plastic into final products. In these activities students will gain an understanding of chemical reactions and the changing states of matter. They will also use problem solving skills and mathematics throughout the mold making processes.
**TEST KITCHEN**

Students, working as food scientists, discover the science behind some of our favorite foods.

*Science Concepts for all Test Kitchen Programs: science as inquiry, chemical reactions, physical reactions, solutions and mixtures, elements and compounds*

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**Food for Thought**

*Grades 4-8 | 15-30 Students | Two Hours*

Students will put food to the test as they discover many food attributes. A variety of food choices will be tested and even tasted to determine qualities such as carbohydrates, proteins, sugars, fats, starches and more. The results will guide student teams in their choice of foods to take on a picnic excursion. Along the way, historical, cultural and scientific perspectives about food help in the decision-making process.

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**Gross Science**

*Grades 4-8 | 15-30 Students | One Hour*

Add some gross to your students’ Science City experience. Discover some gruesome tricks and mix up some ooey, gooey messes. Investigate the real science behind some spooky fakes.

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**Science of Popcorn I**

*Grades 1-3 | 15-30 Students | One Hour*

Students experiment with how popcorn is prepared and learn some of the physical science behind how it “pops.” Students will compare and contrast types of corn, predict results with different popcorns and taste the outcome.

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**Science of Popcorn II**

*Grades 4-8 | 15-30 Students | Two Hours*

Students experiment with popcorn and discover the science behind these mini explosions. Working in teams, students will experiment with variables that affect popcorn’s ability to pop, and compare and hypothesize reasons for kernels popping or not and test methods or products that may affect results. Conclusions will be discussed with class.

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**Thinking Like a Scientist**

*Grades 1-3 | 15-30 Students | One Hour*

Using food as the context, students learn to use the scientific process in the kitchen. They observe types and traits of foods and describe differences in similar food products. Students will also predict scientific outcomes and test the results.

*Programs can be adapted for higher levels or ages*
ENGINEERIUM
Learn and work in the new headquarters for Engineerium scientists. Through the generosity of Burns & McDonnell, a Kansas City-based engineering, architecture and construction firm, the design environment has been upgraded to a contemporary studio to challenge today’s young engineers.

Science Concepts for all Engineerium Programs: robotics, engineering, motion, technology and computer programming

**Green Engineering Challenge**
Grades 5-8* | 15-30 Students | Two Hours
Are you ready to take your students to the next level with a more advanced robotics program? This challenging program focuses on students developing and growing their programming skills using LEGO® MINDSTORMS® Education EV3 software and hardware. The Green Engineering Challenge allows students to apply and adapt their programming skills while problem-solving their robot through missions related to renewable energy.

- Controlling speed and power using a motor
- Working with gear ratios
- Using data from specialized sensors such as rotation, sound, light, ultrasonic and touch
- Programming and controlling input and output devices
- Brainstorming solutions
- Choosing a solution, building it, testing it, evaluating it and revising it
- Using data involving distance, time, turning angle, degrees of rotation, sound volume, reflected and ambient light and gear ratios
- Converting between decimals and fractions and between metric and customary units
- Practicing applied math

**Robot Adventures**
Grades 1-4 | 15-30 Students | Two Hours
Looking for a fun, hands-on way to introduce your students to science, technology, engineering and math concepts? We have the answer! Featuring LEGO® Educator WeDo Robotics, this program challenges students to problem solve while building and programming their own mode of transportation (boat and airplane), wild animal (alligator and lion) or soccer star (goal keeper or striker). During this program, your students will accomplish the following learning targets:

- Working with simple machines, gears, levers and pulleys
- Transmission of motion
- Programming
- Measuring time and distance
- Adding, subtracting, multiplying, dividing, estimating and randomness
- Using variables
- Problem solving

*Programs can be adapted for higher levels or ages*
DINO DISCOVERY
Students work as part of a team of paleontologists to explore life as it was long ago.

Science Concepts for all Dino Discovery Programs: biology, geology, paleontology, fossils, extinction, evolution, biomechanics, earth history, physiology, classification, science careers and science as inquiry

Prehistoric Dig Site
Grades K-3 | 15-30 Students | One Hour
With the help of our experienced expedition leaders, your young explorers will uncover the mysteries of the ancient world of dinosaurs and prehistoric monsters. Each participant will hunt for the fossil remains of giant creatures that lived 80 million years ago. Teams will work together to learn what they have found and piece together the environment and ecosystem these creatures lived in during the Late Cretaceous Period. When the excavation is over, we will explore Science City’s Dino Lab behind the scenes to learn how unearthed fossils are prepared and studied by paleontologists.
KINDERLAB PROGRAMS

Beginning scientists experience the fun of science with hands on activities using real laboratory tools. Educators involve the students through multi sensory learning. Children are encouraged to use their natural curiosity and imagination to experiment, discover and learn.

Grades Pre-K–3 | 10-15 Students | One Hour
All KinderLab science programs relate to literacy, vocabulary building and fun with music. Programs are scheduled at 9:30 a.m. and 12 p.m., Tuesday - Friday

**Fossils Galore**
Imitate some activities of paleontologists with tools and materials similar to those used in dig sites. Hands on activities include reference to dinosaurs and fossils from many kinds of plants and animals. Children will experience comparative measurement activities.

Science Concepts: scientific inquiry, changes in ecosystems and interactions of organisms with their environments, impact of science, technology and human activity on resources and the environment; explore, investigate and problem solve physical properties of objects and materials and observe the physical world in a variety of ways

**Measuring Matters**
Science tools are introduced and young scientists are guided through activities in weighing and making comparisons. Children learn to use balance, spring and digital scales for their measurements. Science process skills of wondering, thinking, predicting, hypothesis making, testing, observing and sharing aloud are emphasized.

Science Concepts: scientific inquiry, explore and investigate physical properties of objects and materials, problem solving involving physical properties of objects and materials and observations of the physical world in a variety of ways

**Kinder Testing**
Safe laboratory tools such as graduated cylinders, beakers, test tubes, pipettes, tongs and Petri dishes are used in multi-sensory learning activities. Scientific vocabulary is modeled and encouraged as children participate in beginning scientific studies.

Science Concepts: scientific inquiry, explore and investigate physical properties of objects and materials, problem solving involving physical properties of objects and materials and observations of the physical world in a variety of ways

**Science Meets Literacy**
A facilitated program at Science City or offered as a Science City on the road program is for early childhood settings. See Science City on the Road offerings, page 23 for details.

Science Concepts: scientific inquiry, changes in ecosystems and interactions of organisms with their environments, impact of science, technology and human activity on resources and the environment; explore, investigate and problem solve physical properties of objects and materials and observe the physical world in a variety of ways
Science City wants to be part of your school or community event with our interactive, educational science programs. Vocabulary and science concept descriptions are available upon request. All programming may be tailored to your specific event or classroom. To request booking information call 816-460-2226 or email Education@UnionStation.org

Standard Fee is $200 per show, workshop, demo, or program. Additional performances of the same program on the same day at the same location are only $150 more. No mileage fees are assessed for locations within 30 miles of Union Station KC. Union Station administrative staff will calculate the distance between Union Station and the event location using navigational software. Distance surcharges are as follows: $60 (31-50 miles); $120 (51-75 miles); $180 (76-100 miles).

### Science Meets Literacy

**Grades Pre-K–2** - Multiple themes connect science concepts through popular book titles. Interactive programming follows story time introduction of themes. Children delight in using science tools and materials while learning about their world. May be adapted to many popular classroom topics. Choose from our topics below or request a customized theme for your program.

- **Is it a Bird?**
- **Insects & Arachnids**
- **Kitchen Chemistry**
- **From Moo to You**
- **Music to my Ears**
- **H Two Oh!**
- **Feathered Friends Fun**
- **Is it a Fruit or Vegetable?**
- **From Head to Toe: Animal Tools**
- **Pairs: The Science of Two**
- **Air, where is it?**
- **Sleepers & Nappers**
- **Animals We Call Mammals**

### Classroom Workshops

**Limit 30 Students per Session**

Bring Science City’s Discovery Area programs into your classroom. These advanced, hands-on workshops put technology in the hands of your students. Give your class the chance to collaborate and overcome obstacles as teams with critical and computational thinking in these challenging Science City educator-guided 2-hour sessions. Customized sessions available upon request.

#### Maker Studio:

**ArtBots**

**Grades 2-12 | 15-30 Students | Two Hours**

Students will make a robot able to create art by combining various electronic components with art materials. In this activity students will gain an understanding of basic electrical circuits and the functionality of different types of motors. Students will design and create robots that can draw patterns, then alter their robot’s design to change and guide the patterns that are drawn. They will use logic and problem solving skills in the design and implementation of their robots. Students can take home their robotic art at the end of the class.

**Circuits**

**Grades 2-12 | 15-30 Students | Two Hours**

The activity will focus on students gaining knowledge and practical understanding of electricity, its functionality and uses through building and testing simple electrical circuits. Students will also learn about the design process and problem solve as they implement their designs. Lessons will include using switches and sensors to turn lights, sounds and other functions on and off through modular electrical component blocks and individual electrical parts placed together into a circuit. Students will also gain skills in soldering by making a simple circuit, like using a switch to turn battery powered, led lights on and off.

#### Engineerium:

**Green Engineering Challenge**

**Grades 5-8* | 15-30 Students | Two Hours**

Are you ready to take your students to the next level with a more advanced robotics program? This challenging program focuses on students developing and growing their programming skills using LEGO® MINDSTORMS® Education EV3 software and hardware. The Green Engineering Challenge allows students to apply and adapt their programming skills while problem-solving their robot through missions related to renewable energy.

**Robot Adventures**

**Grades 1-4 | 15-30 Students | Two Hours**

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#### KinderLab:

**Science Meets Literacy (Grades Pre-K–2)** - Multiple themes connect science concepts through popular book titles. Interactive programming follows story time introduction of themes. Children delight in using science tools and materials while learning about their world. May be adapted to many popular classroom topics. Choose from our topics below or request a customized theme for your program.

- **Is it a Bird?**
- **Insects & Arachnids**
- **Kitchen Chemistry**
- **From Moo to You**
- **Music to my Ears**
- **H Two Oh!**
- **Feathered Friends Fun**
- **Is it a Fruit or Vegetable?**
- **From Head to Toe: Animal Tools**
- **Pairs: The Science of Two**
- **Air, where is it?**
- **Sleepers & Nappers**
- **Animals We Call Mammals**

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18
Stage Shows
Appropriate for Assembly Setting

These exciting interactive presentations are each 45 minutes long (sometimes longer with extended Q & A). These shows are appropriate for audiences of all ages and sizes.

- **Flames, Smoke & Sizzle** – Learn about the science of combustion in super hot enlightening demonstration. Observe the effect of heat on different substances in these controlled explosions. Important fire and safety practices are emphasized.

- **Force and Motion** – Explore the often invisible yet amazing forces of physics! The concepts of gravity, centripetal force energy and collisions are explained using bouncing basketballs, pinning wheels and upside down water glasses.

- **Radical Reactions** – What is happening during chemical and physical reactions? Properties of everyday materials are the reasons for some extraordinary results.

- **Science of Sound** - Did you hear that? That’s the sound of science! Students will witness the unseen dynamics of sound in this aural extravaganza. We examine various vibrations and how they travel through materials to create what we perceive as sound. This show is certain to have everyone listening!

- **Sub Zero** – Examine the peculiar properties of dry ice and fundamentals of the three basic states of matter. Literally, “very cool!”

- **Under Pressure** – How much power is available from the air? What can we do with it? How is air used to make machines work? What do we mean by atmospheric pressure?

- **Volts & Jolts** – Electricity is illuminated in a series of shocking experiments! Explore electrons and protons as the Van de Graaff generator creates volts of hair raising excitement. Observe the Tesla Coil send arcs of electricity through the air and watch a lamp mysteriously light up.

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Tabletop Demonstrations
Appropriate for Events or Classroom Settings

A Science Educator will host a table with interactive demonstrations to fit your theme providing the scientific explanation and other assistance for groups and individuals to walk-up and observe or participate. Choose from the following themes:

- **Air, Air, Everywhere** – Learn some powerful everyday applications and facts. Predict the winner in air tug-o-war.

- **Dino Safari** – See and touch animals from millions of years ago and learn about their natural environment with this interactive demonstration. Attendees enjoy the opportunity to handle real dinosaur fossils and learn about the age of the dinosaurs.

- **Fun Chemistry** – Participate in cool chemical reactions. See, touch and hear what happens when everyday household ingredients get together.

- **Static Charge** – What materials store electric charge? Can electricity be conducted through people? Using a Van de Graaff generator watch your hair stand on end and see crispy cereal dance.

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Make It/Take It Activities
Appropriate for Walk-Up Activities for Large Events

- **Eewy Goo** - Basic chemical reactions become a fun toy

- **Spinwheels** - Simple shapes to complex action; air dynamics

- **Straw Trumpets** - Make it loud! The Science of sound amplification

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The Arvin Gottlieb Planetarium is one of the largest in the Midwest. You’ll be surrounded by this 360-degree experience featuring an all new projection system.

Shows Available at 9:30 a.m. & 11:30 a.m.  |  Capacity 150  |  Duration 30-45 Minutes

Groups of 15 or more have the option of attending a public show, while still receiving the group rate. See below for the new public Planetarium schedule:

Monday - Friday
9:30 - SCHOOL GROUPS
10:30 - Big Bird’s Adventure
11:30 - SCHOOL GROUPS
1:00 - Big Bird’s Adventure
2:00 - Earth, Moon & Sun
3:00 - Stargaze Kansas City
4:00 – Two Small Pieces of Glass

Saturday
10:30 - Big Bird’s Adventure
12:00 - Big Bird’s Adventure
1:00 - Stargaze Kansas City
2:00 - Earth, Moon & Sun
3:00 - Stargaze Kansas City
4:00 - Black Holes

Sunday
12:00 - Big Bird’s Adventure
1:00 - Stargaze Kansas City
2:00 - Earth, Moon & Sun
3:00 - Stargaze Kansas City
4:00 - Black Holes

Black Holes
(Produced by Clark Planetarium Productions, 2006)
Grades 4-12 | Running Time: 40 Minutes

Narrated by John de Lancie of Star Trek: The Next Generation, this full-length production features scientifically accurate 3-D simulations of black holes and the strange relativistic effects they can create.

Dawn of the Space Age
(Produced by Mirage3D Studios, 2007)
Grades 4-8 | Running Time: 40 Minutes

From the launch of the first artificial satellite Sputnik, to landing on the Moon and privately operated space flights, be immersed and overwhelmed by this historic reconstruction of mankind’s first steps into space and witness the drive, passion, and perseverance of the first humans to leave the Earth in exploration.
Dinosaurs at Dusk
(Produced by Mirage3D Studios, 2013)
Grades 2-8  | Running Time: 45 Minutes

*Dinosaurs at Dusk* is a whirlwind time travel adventure back to the time of the dinosaurs. Propel yourself back through the epochs to explore an Earth teeming with Pterosaurs and the ancestors of modern-day birds: the feathered Dinosaurs! Lucy, a budding pilot and amateur paleontologist, and her science teacher father fly through the Triassic, Jurassic and Cretaceous periods to soar with Quetzalcoatlus, escape from raptors and ride behind Argentinosaurus, all the while searching for the famous asteroid that killed the dinosaurs. You will feel as if you were truly transported to another era of Earth’s history and flying high with the dinosaurs!

Earth, Moon, and Sun
(Produced by: The Morehead Planetarium and Science Center, 2005)
Grades 1-4  | Running Time: 30 Minutes

This show explores the relationship between the Earth, Moon and Sun with the help of Coyote, a character adapted from Native American oral traditions who has many misconceptions about our home planet and its neighbors. His confusion about the universe helps viewers think about how the Earth, Moon and Sun work together as a system. Native American stories are used throughout the show to help distinguish between myths and science.

Into the Deep
(Produced by Ogrefish Productions, 2012)
Grades 2-8  | Running Time: 30 Minutes

*Into the Deep* is an exciting exploration of Earth’s oceans, using the immersive power of the Arvin Gottlieb Planetarium to transport audiences to the spectacular hidden depths of our home planet. The show shares glimpses of rarely seen marine organisms: bioluminescent fish, jellyfish, squid, and eels, all perfectly adapted to the extreme pressures and temperatures of their alien environment.

One World, One Sky: Big Bird’s Adventure
(Produced by Sesame Street Workshop, PNC, 2008)
Grades Pre-K–2  | Running Time: 25 Minutes

Through the lens of astronomy join Elmo, Big Bird and Hu Hu Zhu - a Muppet from the Chinese co-production of Sesame Street - on an adventure to the moon and to explore the night sky. *One World, One Sky* aims to provide young children in the U.S. and China with an age-appropriate introduction to astronomy, to promote positive attitudes toward science, and to foster cross-cultural appreciation.
Solar System Tour  
Produced by The Arvin Gottlieb Planetarium, Matt Christopher, 2012  
Grades 4-12 | Running Time: 40 Minutes  
Guests will be taken on a fantastic journey through our solar system, stopping at each planet, as well as a few noteworthy moons and dwarf planets. The audience will learn about the history of the planet or object’s discovery, its composition and its relationship to the other various bodies in our solar neighborhood.

Stargaze Kansas City  
Produced by The Arvin Gottlieb Planetarium, Patrick Hess, 2014  
All Ages | Running Time: 20-30 Minutes  
Join the Arvin Gottlieb Planetarium in welcoming the triumphant return of our LIVE guided tours of the night sky! This show is an interactive, educator-led 3D astronomical experience which will teach guests about constellations, deep space objects and other features of our universe. We may even stop by a few neighboring planets in our solar system! And because the night sky is always changing, be sure to check out Stargaze Kansas City throughout the year and see the ever-changing, breathtaking views the heavens have to offer.

Two Small Pieces of Glass  
Produced by Interstellar Studios, ‘Imiloa Planetarium, 2009  
Grades 4-12 | Running Time: 25 Minutes  
While attending a local star party, two teenage students learn how the telescope has helped us understand our place in space and how telescopes continue to expand our understanding of the Universe. The students see how telescopes work and how the largest observatories in the world use these instruments to explore the mysteries of the universe.

Zodiac  
Produced by The Arvin Gottlieb Planetarium, Matt Christopher, 2012  
Grades 2-8 | Running Time: 35 Minutes  
Guests will learn about stars and constellations, focusing on the 13 main Zodiac constellations. Content covered includes the constellation’s history, mythology and meanings to various cultures and civilizations.
Union Station finished renovation of a new 3D digital theater and Innovation Center in the Extreme Screen Theatre. The new theatre will have a variety of educational, entertaining and first-run movies. It also offers digital, interactive conference space for large groups.

The new 3D projection system allows the theater to show movies in multiple formats; cinemascope, computer, DVD, Blu-Ray, high-speed Internet, cable and satellite programming. The projectors are the same type of digital projectors used in IMAX theaters and will allow a variety of films, images and interactive presentations to be made on the screen. Bring your students to see amazing 3D educational films on the largest screen in the Midwest.

Daily shows & times are subject to availability. Inquire for current schedule.

Jerusalem | Running Time: 45 Minutes
Filmed for the first time in 3D and for the giant screen, Jerusalem immerses audiences into one of the world’s most beloved cities. Discover why this tiny piece of land is sacred to three major religions through the stories of Jewish, Christian and Muslim families who call Jerusalem home. Join renowned archaeologist, Dr. Jodi Magness, as she travels underground to solve some of this city’s greatest mysteries. Find out why, after thousands of years, Jerusalem and the Holy Land continue to stir the imagination of billions of people. Unprecedented access to the city’s holiest sites, as well as rare and breathtaking aerial footage of the Old City and the Holy Land, combine to make Jerusalem a unique and stunning cinematic experience.

Lewis and Clark: Great Journey West | Running Time: 60 Minutes
Relive one of the greatest tales of adventure and exploration in history, as National Geographic brings to life the epic journey of Lewis, Clark, their guide Sacagawea, and the brave Corps of Discovery across the land that would become the United States. Now, two hundred years after the launch of this ambitious expedition, experience first-hand the danger and breathtaking beauty of the unknown West as it unfolded before the eyes of Lewis and Clark.

Rocky Mountain Express | Running Time: 43 Minutes
Retracing the original route aboard the majestic steam engine 2816, the audience is transported back to the age of steam to re-live this alpine nation-building odyssey. The film weaves together spectacular IMAX aerial cinematography, breathtaking vistas of the west, archival images and maps and the potent energy and rhythms of a live steam locomotive to immerse audiences in an era of remarkable ingenuity and struggle and a region of stunning natural beauty. Ride the rails along deep river canyons and over high mountain passes. Discover some of the most beautiful and rugged landscapes on earth and the heroic human drama and epic engineering that shaped a continent.

Tornado Alley | Running Time: 42 Minutes
Join “Storm Chasers” star Sean Casey and the researchers of VORTEX 2, the most ambitious effort ever made to understand the origins and evolution of tornadoes, on this heart-pounding science adventure. Armed with a 70mm camera, a fleet of customized vehicles designed to withstand gale force winds, torrential rains and unrelenting hail, and an arsenal of the most advanced weather measurement instruments ever created, the stars of TORNADO ALLEY take audiences on a thrilling quest to experience a tornado’s destructive power at point blank range. Experience the adrenaline and the science of nature’s most dramatic phenomena!

We the People | Running Time: 43 Minutes
We the People explores American Democracy through the ideals and tenets of the Declaration of Independence, the Constitution and the Bill of Rights. The buildings and monuments of Washington DC, historic paintings and photographs come alive making this film a riveting introduction to America’s cherished ideals. The film is designed to imbue audiences with respect for the founding documents of our republic and the sacrifices made by successive American generations to maintain our basic freedoms and ideals.
Presented by Theatre for Young America.
Shows Times Vary | Capacity 190 | Duration 60 Minutes

Theatre for Young America’s 40th Anniversary Season – Celebrating our past...looking to our future...
Theatre for Young America field trips include lively post-show discussions with the cast and study guides for select shows are available for teachers to prepare the students for their experience and to provide activities for curriculum connections to the play.

The Adventures of Nate the Great
Ages 4 & Up
October 21 - November 14
Based on the popular book series by Marjorie Weinman Sharmat, this is a play in film noir style about the greatest kid detective ever. He is Nate the Great, the sharpest detective ever to solve his neighborhood’s mysteries. With his faithful dog, Sludge, and his friends, he solves important cases, always remembering to leave a note for his mother and wear his galoshes! It’s the Our Gang comedies meets Raymond Chandler.

Curriculum Connections: Live theatre, the scientific method of problem solving, logical thinking, mystery genre of literature, color blending in visual art.

Jingle ARRGh the Way! A Christmas Pirate Adventure
Ages 4 & Up
November 25 - December 27
From the creators of “How I Became a Pirate,” another pirate adventure—this one to the North Pole. A mysterious message left in the crow’s nest of their ship brings Captain Braid Beard and his pirate mates back to North Beach to seek out young Jeremy Jacob to help solve a riddle and find the Christmas treasure. The comical plot comes to life with extravagantly improper characters, rollicking adventures and great songs.

Curriculum Connections: Adventure, live theatre, holiday, pirates customs, nautical vocabulary, cultural diversity, literature.

The Toughest Kid in the World
Ages 9 - 14
January 20 - 24
A musical play that uses humor, songs and lively action to explore the difficult subject of violence and bullying in modern American society.

Curriculum Connections: Live theatre, conflict resolution, anti-bullying strategies, interpersonal communication skills, respect for others.

Starring Abe Lincoln
Ages 8 & Up
February 3 - 14
A born performer and fan of live theatre, President Abraham Lincoln takes the stage of the Ford Theatre in Washington D.C. Lincoln and with his signature humor recounts and re-enacts his life story, including his historic relationship with Frederick Douglass, who was the leading Civil Rights activist of his time and a factor in Lincoln’s Emancipation Proclamation.

Curriculum Connections: Live theatre, biography, American history, Civil War, character studies, overcoming prejudice.

This program is presented in part by the National Endowment for the Arts, a federal agency that believes a great nation deserves great art.
Charlotte’s Web  March 3 - April 11  
Ages 5 & Up

E. B. White’s masterpiece for young readers comes to life on stage with Wilbur the Pig; Fern, the little girl who loves him; and, of course, Charlotte, the wise and wonderful spider who saves Wilbur’s life.

Curriculum Connections: Live theatre, cycle of life, friendship, loyalty, literature.

If You Give a Cat a Cupcake  April 21 - May 16  
Ages 3 & Up

A sequel to If “You Give a Mouse a Cookie,” a classic ‘cause and effect’ story by Laura Numeroff. This musical play reveals the antics of Cat and his human friend Laura. Their many misadventures travel the full circle of unexpected effects which all lead back to cupcake sprinkles. Laura Numeroff’s book was dramatized by Ernie Nolan for the Emerald City Theatre in Chicago. The production by Theatre for Young America will be the Kansas City premier of this musical.

Curriculum Connections: Live theatre, cause and effect, literature, cooperation, humor.

The Princess & the Pea  June 9 - June 27  
Ages 3 & Up

Hans Christian Anderson’s classic fairytale leaps onto stage as a musical comedy and explores the world of the super sensitive.

Curriculum Connections: Live theatre, fairytale, fantasy, honesty, music, character differences and tolerance.

Triple Play Two Touring Show  Spring of 2015  
Ages 3 - 8

Different “three” stories adapted by the same group that brought you TRIPLE PLAY! Now the dramatized stories include THE THREE BILLIE GOATS GRUFF, PETER RABBIT AND HIS SISTERS and THE THREE SILLIES. This musical adaptation of stories includes audience participation!

Curriculum Connections: Live theatre, classic folk tales from Norway and England, Beatrix Potter literature, music, storytelling.
**Scavenger Hunts**

**Science City Scavenger Hunt**  
*Appropriate for Groups up to 100, Grades 6 - 12*  
Find your inner child in this 90-minute scavenger hunt as your team delves into the depths of scientific discovery. This informative, yet compelling hunt will guide your team through Science City’s vast cityscape and its distinctive themed areas. As you gather scientific knowledge and proof of your discoveries, your team will ultimately complete to be crowned winner and master of all things science!

**Traveling Exhibition Scavenger Hunt**  
*Appropriate for Groups up to 100, Grades 6 - 12*  
A very unique, yet always educational option, 90-minute scavenger hunts are available for all traveling exhibits. Please inquire for detailed information about our current exhibition.

**Union Station Centennial Scavenger Hunt – NEW!**  
*Appropriate for Groups up to 100, Grades 6 - 12*  
Travel back through the last 100 years of Union Station history in this 90-minute scavenger hunt, as you and your team trek through one of Kansas City’s most iconic buildings. Your team will complete to scavenge the halls of Union Station and along the way you will examine the architecture, learn fascinating facts and uncover the mysteries of this storied structure.
100 Years Of History

Building A Monument Exhibit
This new exhibit tells the story of building Union Station and how it came to be a historic monument in Kansas City, and a key transportation hub for The United States.

Union Station Stories Exhibit
Relive 100 years of fascinating Union Station history in this brand new exhibit located on four floors. Explore this permanent exhibit that exquisitely captures the rich and diverse cultural history of the station through significant stories and beautiful artifacts.

Model Rail Exhibit
Enjoy 8,000 square feet of toy trains, from tiny N-scale model trains to the big G-scale giants of the model train world, sample the hobby and experience the fun of model railroading. The Model Rail Exhibit is designed, built and maintained by volunteers.

Living History Digital Exhibit
Union Station’s new digital exhibit shares some of the most memorable stories of the people who have passed through The Station’s halls during the past 100 years. Using augmented reality in interactive formats and a cutting-edge virtual history tour, the exhibit illustrates how this iconic monument and transportation hub was a key driver in Kansas City’s growth and expansion to help it become the city it is today.