

Penn State
SCIENCE

2015 **Day and Resident Camps**
for Students Entering Grades 2-12

SCIENCE-U

Penn State Summer Science Camps

www.ScienceCamps.psu.edu



What will your child **discover** this summer?

DIRECTOR'S CORNER

Dear Science-U Campers and Parents,

Welcome to the 2015 Science-U camp season! Science-U, the Penn State Science Camps, are designed to develop critical thinking skills in every camper and encourage participants to pursue their personal interests in the science, technology, engineering, and math (STEM) fields. Every camp has something new and unique to offer this year, and we are excited that there is such a high interest in science! Earning a science degree takes time, but that doesn't mean that one has to wait in order to think like a scientist, right? We believe young individuals can act like a scientist and make a difference right now! The Science-U camps are designed to be brief, one-week journeys that investigate something fantastic and meaningful. Science-U campers are encouraged to ask a lot of questions and design a new framework of possible answers. The more you know, the more ways you have to design possible solutions to a problem. My sincere hope is that every camper continues to grow, and that the experience of Penn State science leaves each enriched and wanting to learn more. We look forward to seeing you this summer!

— **Michael Zeman**, Director, Outreach and Science Engagement



About Our Program

Penn State University's Eberly College of Science encourages students to pursue both their personal interests and the intellectual excitement that science offers. Science-U (formerly Action Potential Science Experience) began in 1999 as an outreach initiative of Penn State's Eberly College of Science. Science-U builds on the notion of intellectual freedom, encouraging students to let their imaginations soar with endless scientific possibilities. Through the camps, students are pushed to think critically and explore science freely while holding fast to Science-U's guiding belief that students who learn what they love will invest deeply in their futures as scientists, inspired to pursue academic success!

Science-U Mission Statement

Science-U is dedicated to advancing science literacy in youth through the sharing and discovery of scientific knowledge within the intellectual foundations at Penn State. Our chief goals are to educate and inspire students, encourage critical thinking, and prepare them to become responsible, skilled and caring citizens, as well as capable scientists and teachers when faced with tomorrow's challenges.

Program Goals

1. To create exciting and engaging science experiences for all participants (to promote the pursuit of personal interests in the STEM fields).
2. To boost matriculation and retention in the STEM disciplines, at both K-12 and post-secondary levels.
3. To increase science literacy (STEM content learning).
4. To improve scientific thinking including creativity, critical thinking, problem solving, and leadership (i.e., communication, teamwork, collaboration, and advocacy).

Science-U Staff

Science-U camp curriculum mentors, lab coordinators, instructors, and program facilitators play a critical role in creating a successful learning environment for youth. Each year the staff members complete a training program and team building events to prepare for the campers. Science education and safety are our priorities. We look forward to making this the best summer yet!



REGISTER ONLINE AT www.ScienceCamps.psu.edu



NittanyBots: Penn State Mindstormers

JUNE 15–19 • 9:00 A.M.–4:00 P.M. • GRADES 3-4

Science-U has partnered with Way Cool STEM Education to offer this camp that challenges young students to explore the world of engineering through complex control systems...using LEGOS! Design creativity is strongly encouraged. Through this program, students will build and program LEGO WeDo and Mindstorm kits to find solutions to problems and to collaborate as a team. When their robot is complete, they will have fun watching the many things it can do (or not do if it doesn't work). But hey, troubleshooting can be fun, too! Spaces are limited!

Busted: Myth Meets Science

JUNE 22–26 • 9:00 A.M.–4:00 P.M. • GRADES 2-3

Do you think you can unravel the science mysteries you hear everyone talking about at school? Ever hear a myth or legend and wish you could prove if it were true? Do you want to learn how to determine if something is true? Well, wonder no more! Come to this camp and you will be part of an investigative team that unlocks the secrets to some of the fun, silly, and crazy science misconceptions you've heard about! Campers will be myth busters and use critical thinking skills to design experiments and test many of the confusing misconceptions they confront from day-to-day!



Wizards, Olympians, and Science Heroes

JUNE 29–JULY 3 • 9:00 A.M.–4:00 P.M. • GRADES 2-5

What do Harry Potter and Percy Jackson have in common? Well, all great wizards and Olympians started the same way you did: as students learning more about who they are! If they can be great at something, why can't you? Join Harry, Percy, and more of your favorite fictional characters at Penn State and learn what it takes to be the best scientist you can be! Using your curiosity and imagination, you will unravel the mysteries and wonders of science in popular literature. Be sure to read up before coming, and bring a sense of discovery and imagination!



"My daughter came home mid-week and announced she was going to be a 'scientist or engineer' when she grew up."

—Parent of camper

"We loved the opportunity for our child to be in an environment that would stimulate his curiosity and enrich his intellectual development."

—Parent of camper



New!

Penn State CSI: The Microbial Menace

JUNE 15–19 • 9:00 A.M.–4:00 P.M. • GRADES 4-8

In the United States, it has been estimated that there are millions of illnesses, thousands of hospitalizations, and approximately 5,000 deaths each year attributed to eating contaminated foods. Given the global nature and complexity of the food system, identifying the cause of a food-borne illness outbreak is much like finding a 'needle in a haystack' and requires the CSI detective-like skills of trained food microbiologists to uncover. In the weeklong search for the Microbial Menace, food microbiologists-in-training will be introduced to the food system. They will learn what steps go into harvesting some of our food from plants and animals and what it takes to make our foods safe and wholesome. When things go awry—and they can—food microbiologists-in-training will learn the skills needed to determine the source and cause of the contamination including laboratory methods in microbial forensics that are required to identify, track down, and eliminate the offending organism(s).



Engineering a Sustainable World

JULY 6–10 • 9:00 A.M.–4:00 P.M. • GRADES 4-7

What is a sustainable world? It would be a world where humans can continue to produce all the goods we want and need in a continual manner. In Engineering a Sustainable World, campers will not only discover the resources required by humans to survive, but they will also consider innovative solutions to solve our sustainability issues. As campers make their own windmill, solar home, and recommendations about America's future energy usage, they will overcome many of the challenges our engineers currently face in building a sustainable world.

Ecology Camp: The Wild Wonders of Your Own Back Yard

JULY 13–17 • 8:30 A.M.–4:30 P.M. • GRADES 4-7

Ecologists-in-training will spend a week traveling to different parks and locations around Centre County exploring and learning about the unique ecosystems, flora, and fauna of our region. Daily hands-on "Creature Features" will give campers the opportunity to learn to identify fish, amphibians, and reptiles and use kick seines and hand nets to sample streams, rivers, and ponds for invertebrates. During the week campers will paddle a canoe in our watershed, take several hikes in ecologically significant areas, tour a fish hatchery, learn about acid mine damage to streams, build water filters and gain awareness, understanding, and appreciation of all the 'wild things' Centre County has to offer.



"My son could see that science is not dry and abstract but rather something alive and exciting."
—Parent of camper



Camps for kids entering **grades 5-8** in fall 2015

Water Heroes

JUNE 22–24 • 9:00 A.M.–4:00 P.M. • GRADES 6-8

There's been a spill! We're not sure how, but State College's water supply is contaminated. We need Water Heroes like you to find a creative solution to this problem and prevent it from happening in the future. In this three-day camp, you will learn about where our water comes from, investigate the different types of water pollution, and use cutting-edge technologies to purify water. Join Penn State engineering faculty in this adventure that will include experiments in the laboratory that you design, field investigations of real water sources, interviews with water treatment experts, and detective work to solve the mystery.



Nittany Lion, M.D.

JULY 19–24 • 9:00 A.M.–4:00 P.M. • GRADES 5-8

Blaring sirens, frenzied medical crises, and quick responses by medical personnel are all part of daily life in the ER. What if you could transport the chaos of an ER scene into a pre-medical training camp? We have. Science-U presents Nittany Lion, M.D.—a fast paced pre-medical experience for your young doctor-in-training! Campers will learn the basics of anatomy while dissecting mammalian organs such as the brain and heart. Each camper will be trained in physiology and pathology to gain a better understanding of the human body and the origins of diseases. At Nittany Lion, M.D., Science-U staff will put your future pre-med students to the test as they diagnose mysterious diseases and conditions and solve cases that are puzzling even to licensed medical professionals. Do you have what it takes to be a doctor? Register early and join us at Nittany Lion, M.D. to find out!



Camp for kids entering **grades 9-12** in fall 2015

New!

Infection!

JUNE 22–26 • 9:00 A.M.–4:00 P.M. • GRADES 9-12

Join the experts at Penn State to examine the causes and consequences of an infectious disease outbreak! How do epidemics start and how can they be stopped, if at all? How do vaccines and health campaigns work? Campers will learn about specific pathogens (Ebola, malaria, zombie-ant fungus!) and how they spread among human, animal, and plant hosts. Additionally, campers will gain insight into how personal behavior can increase or decrease the chances of getting sick and they will get hands-on experience with the fascinating disease research currently happening at Penn State!



"Science-U brought out a fun, inquisitive aspect of science and related it to real life."
— Parent of camper

Artificial Intelligence

JUNE 28–JULY 3 • 9:00 A.M.–4:30 P.M. • GRADES 9-12

Last fall, respected artificial intelligence researcher Dr. Cassandra Pewter disappeared from her university laboratory during experiments to upload her mind into a mainframe. Recently, strange robots were discovered near her former lab area that were found to be scavenging electronic parts and actuators from nearby equipment. The area has been cordoned off as all attempts to send in remote-control robots have resulted in these systems being suddenly re-programmed and disappearing. When adults have interacted with this new intelligence, there has been only failure, as somehow this system interprets adults as threatening. The plan now is to train high-school students to use bomb disposal robots to explore critical areas of the laboratory, acquire some of these strange robot scavengers, and reprogram them to explore the extent of the robotic invasion in the building. There is a possibility to augment these student volunteers with robotic enhancements to allow communication with this new artificial intelligence, but there's a risk that these enhancements cannot be removed after they are installed. Volunteers are urgently needed in order to shut down this system or at least teach it to interact nicely with others. Will you help us navigate the ethical and technological challenges to save the campus from this robot invasion?



Forensic DNA: Next Generation Detectives

JULY 5–10 • 9:00 A.M.–4:00 P.M. • GRADES 9-12

The Penn State forensic science department invites you to master the ultimate detective skill of DNA analysis! Whether you're called to investigate a murder or determine a 'who dun it' case, the future of evidence-based crime solvers will often rely on DNA to determine the truth. Campers will be challenged to

work through unique crime scenes and process evidence that could lead to the conviction of possible offender(s). The young forensic scientist will learn how to process a crime scene, collect and examine evidence for the presence of biological stains that will yield DNA that can be "typed" in the laboratory. They will use **their** findings to help solve a crime. Join us and help solve the mysteries that await this summer!

Science Leadership: A Festival of Innovative Ideas

JULY 19–24 • 9:00 A.M.–5:00 P.M. • GRADES 10-12

Do you think the world of science needs leadership? Do you think and dream about the big picture? About the future? The Science Leadership Camp prepares participants for a successful future in scientific careers. This camp provides an integrated approach to leadership for young men and women interested in advancing academically while activating change in scientific environments. The success and growth of both this camp and the campers who attend it is attributable to the intense reflective nature of the program. Unique to the program is the integration of the arts (literature, visual arts, music, etc.) and field challenges (group projects, lab tours, competitions, and lab work) with the theory and practice of innovative and creative thinking. Come join us at Penn State University Park for an experience you can take with you through high school, college, and beyond!



"There are very few programs that I know of that are so practical and sound that really allows the children to be 'hands on' with this educational experience."

—Parent of camper



2015 Fee Schedule		Pre April 1st		After March 31st	
CAMP	DATES/TIMES	DAY	RESIDENT	DAY	RESIDENT
NittanyBots: Penn State Mindstormers	June 15–19 9:00 A.M.–4:00 P.M.	\$350	N/A	\$380	N/A
New! Penn State CSI: The Microbial Menace	June 15–19 9:00 A.M.–4:00 P.M.	\$350	N/A	\$380	N/A
Busted! Myth Meets Science	June 22–26 9:00 A.M.–4:00 P.M.	\$350	N/A	\$380	N/A
Water Heroes	June 22–24 9:00 A.M.–4:00 P.M.	\$210	N/A	\$240	N/A
New! Infection!	June 22–26 9:00 A.M.–4:00 P.M.	\$350	N/A	\$380	N/A
Artificial Intelligence	June 28–July 3 9:00 A.M.–4:30 P.M.	\$425	\$825	\$455	\$855
New! Wizards, Olympians, and Science Heroes	June 29–July 3 9:00 A.M.–4:00 P.M.	\$350	N/A	\$380	N/A
Forensic DNA: Next Generation Detectives	July 5–10 9:00 A.M.–4:00 P.M.	\$395	\$795	\$425	\$825
Engineering a Sustainable World	July 6–10 9:00 A.M.–4:00 P.M.	\$395	N/A	\$425	N/A
Ecology Camp: The Wild Wonders of Your Own Back Yard	July 13–17 8:30 A.M.–4:30 P.M.	\$425	N/A	\$455	N/A
Nittany Lion, M.D.	July 19–24 9:00 A.M.–4:00 P.M.	\$350	\$750	\$380	\$780
Science Leadership: A Festival of Innovative Ideas	July 19–24 9:00 A.M.–5:00 P.M.	\$395	\$795	\$425	\$825

Residential Program Information

Students in grades 5-12 can choose to stay at Penn State from Sunday evening (check-in and opening ceremony at 7:00 p.m.) until Friday afternoon (camp ends promptly at 4:00 p.m.). Resident campers stay in University Residence Halls. Evening mentors supervise activities and outings.

Note: Some camps do not have a residential option.

Financial Aid

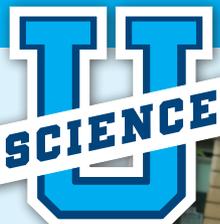
Applications will be accepted on a first-come, first-served basis, and aid will be awarded based on available funds. Please note that a complete application is necessary to be considered for financial aid.

Extended Care Option

Two sessions of extended care are offered for campers entering grades 2-8, and the cost is \$30/week for the morning session, \$30/week for the afternoon session, or \$50/week for both morning and afternoon extended care. Morning care is available Tuesday–Friday with drop-off as early as 7:45 a.m., and afternoon extended care is available Monday–Thursday with pick-up as late as 5:15 p.m.

***Extended-care will not be provided on Monday mornings or Friday afternoons. Week-long camps begin with an opening ceremony on Monday and conclude with camp-specific closing ceremonies on Friday afternoons, and campers will be dismissed following those ceremonies.*





What will your child *discover* this summer?



Information for Parents

The Pennsylvania State University is committed to providing a safe environment for all youth participating in activities offered through the University. All Penn State youth programs have policies in place to ensure the safety of youth participating in our programs and to ensure safety is not compromised. All camp staff are trained in emergency protocols and all relevant internal, external and parental reporting requirements.

Parents are encouraged to notify Michael Zeman, director of outreach and science engagement, immediately at mjz120@psu.edu / 814-865-0083 if they, or their child, are experiencing problems, difficulties, or concerns with the camp, other youth in the camp and/or camp staff. You may also contact Sandy Weaver, youth programs compliance specialist at stw126@psu.edu / 814-865-8785 or call the University's Ethics Hotline at 1-800-560-1637.

2015 Corporate Sponsors



An outreach program of the Eberly College of Science.

This publication is available in alternative media on request.

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The Pennsylvania State University encourages qualified persons with disabilities to participate in its programs and activities. If you anticipate needing any type of accommodation or have questions about the physical access provided, please call 814-865-0083 in advance of your participation or visit.

"Throughout the week we learned about things we never knew existed and how they could affect the world that we would grow up in in the coming years."

— Camper

PENNSTATE



Eberly College of Science

MORE INFORMATION? CALL 814-865-0083 OR VISIT www.ScienceCamps.psu.edu