



Recent Grants: Taconic IPA Science Education Grants

2017 Grant Recipients:

Brent Boscarino, Poughkeepsie Day School

\$1,035.21

Funds from this grant will purchase equipment to detect the presence of invasive species in the Hudson River. This project will bring students together from lower, middle and high school divisions on cutting edge research to help control the most recent threat to Hudson River food webs (the bloody-red shrimp), and will enlist over 90 Hudson Valley schools in an eDNA sampling protocol through the NYS Department of Environmental Conservation "Day in the Life Program."

Grace Johnston, Kingston High School

\$1,010

Through purchase of updated equipment, students will have the opportunity to create activities with more accurate measurements while exploring physics. Funds will purchase a photogate timer system, a force platform and handle set, an interface device, and data analysis software site license. This equipment will allow students throughout the school to analyze experimental data across devices.

Elyse Joy, Orville A Todd Middle School

\$970

Science equipment will be purchased to help aid students in developing an understanding of the following life science topics: Structure, Function, and Information Processing, Matter and Energy in Organisms and Ecosystems, Interdependent Relationships in Ecosystems, Growth, Development and Reproduction of Organisms, and Natural Selection and Adaptations. This equipment will foster three dimensional learning, summarized by the formulation of a question; discerning patterns, similarity, diversity and relationships; and cultivating understandings necessary to proficiency in life science.



Glen Morris, Rombout Middle School

\$800

Students will be introduced to programming and robotics in their technology class through use of Lego League computer code assembly software and robotics hardware. Through grant funding, this equipment will be made available for students to use in learning and participating in an annual design challenge. Participants will learn how to identify obstacles, brainstorm solutions and assemble code. The top performing teams will then move on to the regional competition.

Christine Pizer, Poughkeepsie High School

\$424.38

Grant funding will purchase protective gear and a full body fetal pig specimen for Anatomy and Physiology students to dissect. Having the protective gear will ensure the safety of students in this project, and can be used for other science projects and students throughout the high school.



2016 Grant Recipients:

Brent Boscarino - Poughkeepsie Day School

\$899

An underwater Remotely Operated Vehicle (ROV) will be purchased to enhance understanding of animal behavior and distribution in aquatic systems. ROVs provide a high level of maneuverability and precision that classic SCUBA and net sampling technologies cannot provide. The ROV can be modified to suit specific project needs, so students will be able to manipulate and modify the ROV according to the task at hand including monitoring fish behavior and net avoidance during the sampling season on the Fall Kill as part of the NYS DEC eel monitoring and conservation program; using it for early detection and prevention initiatives involving the invasive aquatic invertebrate, the bloody red shrimp (BRS) in the Finger Lakes and Hudson River watersheds; and enabling the distribution of live video feeds from the trout tank for data analysis and observation of tank behaviors as part of the Trout in the Classroom program.

Christine Gillette - Eugene Brooks Intermediate School & Webutuck High School

\$499.80

Universal cell phone adapter mounts for microscopes will be purchased to allow students to capture a picture or video of the microscopic world with their cell phones. These microscopic images and videos will then be shared on the SmartBoard through projects, shared with parents, and shared on the website.



Christine Pizer - Poughkeepsie High School

\$990.04

The funds will purchase a model of how water moves through the ground which will help students visualize what is happening below the soil surface. It comes with various dyes that demonstrate how contaminants flow along with our water and how easily, or not, they dissipate. It also demonstrates the different structures of water storage. A model of a water treatment system will be purchased which will allow a closer look at how contaminants are removed to make it safe for human consumption. This equipment will be used to discuss water and soil quality as it relates to pollution, resiliency and sustainability. It will be used to demonstrate how water filtration works and then extend the investigation into the local environment by looking at soil composition and the local infrastructure of our sewers and waste disposal systems. A follow up unit on the specifics of the Hudson Valley will require students to make connections between clean water and the overall health of the Hudson River and therefore its populations both human and non-human.

Dan Weiser - Hudson Valley Sudbury School

\$972

The Vernier "LabQuest 2," a stand-alone interface used to collect sensor data with a built-in graphing and analysis application with wireless connectivity and the digital microscope, colorimeter, temperature probe and turbidity sensor purchased with this grant will offer students the opportunity to initiate their own investigations into the water quality and issues of the region, such as exploring the effects of runoff from local farms or testing for enteros in the upper, middle, and lower Hudson. The HVSS campus includes over 50 acres of woods and water and is adjacent to Onteora Lake, minutes away from the Ashokan Reservoir, and a few miles from the Esopus and Rondout Creeks, and the Hudson River.



Grace Johnston - Kingston High School

\$740.53

The grant will be used to purchase a diffraction grating spectrometer and a spectrum tube power supply. Both chemistry and physics students will learn that each element has its own characteristic fingerprints which can be identified in an absorption or an emission spectrum. Spectrum tubes with different elements, such as hydrogen, helium, argon, mercury, nitrogen, etc., can be discharged with the spectrum tube power supply. The emission lines of each element can be analyzed with the diffraction grating spectrometer. From the unique spectrum produced by each element, chemistry students can see how the electrons jump from a higher energy level to a lower energy level within an atom and release energy as light. The purchased diffraction grating spectrometer has sufficient resolution so that physics students can carefully measure the emission wavelengths of hydrogen and mercury atoms.

Gwen Saylor - Arlington High School

\$865

In order to demonstrate electricity and magnetism, the funds will be used to purchase materials to demonstrate quantum locking which involves cooling a superconductor with liquid nitrogen and levitating it over super strong NdFeB magnets. The quantum levitation starter kit consists of 300 magnets attached to a flexible steel track which allows a super cooled superconductor to move over the track without friction. A smaller handheld levitator demonstrates quantum locking and spinning on a smaller more interactive scale. The students will investigate the nature of magnets, the relationship between temperature and resistance and the nature of superconductors.

Jacob Lawrence - Arlington High School

\$669.96

Funds will purchase three light meters in order to implement a new, student-led "daylighting" project for the school. The students will use heavy-duty light meters to map out the "lighting footprint" of the school during varying daylight and sky conditions. Using computer software they will create a data set that will allow them to analyze which portions of the building could have the lighting levels changed and bring that to the school's Maintenance Supervisor. The project will be expanded to other school buildings in the school district.



Maribel Pregnall - Arlington High School

\$1,217

Funds will purchase scientific monitoring equipment and starter fish and herbs for the Aquaponics program. In the fall, the engineering, biology and culinary classes will team up to design and build a system where they grow their own Tilapia fish and herbs in a self-sustaining ecosystem. The 2,000 or more elementary students that travel to the high school will be involved in observing the fish and taking their own measurements.

Nancy Rypkema - Valley Central Middle School

\$1,918

The purchase of probeware which includes carbon dioxide and oxygen sensors as well as the wireless connections for each, will allow students to collect data electronically to conduct experiments to mimic the natural world and the impact humans are having on ecosystems by setting up experiments and monitoring the gas levels. Students will be able to monitor how photosynthesis changes the gas levels in a container and how climate change can also impact real time data. The probeware will be used for both long and short term collection activities and will show students how scientists can monitor data over extended periods.

Nicholas Malgieri - Wallkill High School

\$982.26

Funds will be used to purchase equipment for conducting gel electrophoresis tests and examining skeletal models as part of the Forensics class. Students will be able to perform gel electrophoresis tests which will give them a real-life, hands-on scientific experience that will engage them in the process of science and better prepare them for genetics in college and a possible career in the future. It will promote problem solving skills and critical thinking as students will analyze their results to determine which suspect committed the crime. The comparative human bone set purchased will bring the crime scene to life as students will analyze skeletal remains to determine the victim's gender, probable height, and weight.



Richard Ronzoni - Warwick Valley Middle School

\$988

The funds will be used to purchase glassware and a digital microscope which will allow eighth-grade students to use the equipment in earth science classes and will also allow seventh graders to test and analyze evidence to solve medical mysteries about the human body as part of the "Medical Detectives" unit created by Project Lead the Way, a non-profit national provider of K-12 STEM curriculum.

Samantha Rocario - Abilities First School

\$434

Funds will purchase monocular compound microscopes and a digital microscope camera that will be used in science lessons exploring everything from nature and the animal world to acids and bases and bridges. The camera will be tied into the classroom Smartboard to enlarge specimens.



2015 Grant Recipients:

Christine L. Pizer - Poughkeepsie High School

\$998.15

The creation of a Dream Home will infuse creativity and mathematics into future aspirations. Students will then engage in different sustainable technologies by first investigating them, then employing them in their models. They will invest in these technologies both educationally and through a simulated budget process. Once the homes have been constructed and experimentation with the electrical processes and green building has been explored, we will look into local companies and their products. The students will observe how science and the local economy fuse. They may see potential employers and a vision for the future as they construct a sustainable mentality and new inspiration.

Cindy Binnie - Arlington High School

\$1,126

Precision data collection in a laboratory setting is absolutely essential to students' success in Chemistry classes. Chemistry is the study of the composition and behavior of matter. The students' ability to observe and collect quantitative data about chemical changes is critical to their understanding of the central concept of the course.

Dana Intravaia - Valley Central Middle School

\$2,822

Funds will be used to purchase animal specimens which will give the students a better understanding of the nervous system by allowing them to examine the anatomy and physiology of the organs that aid in our senses. Having the actual specimens would be more motivational to students than merely showing them a picture or a video.



Elyse Joy - Orville A. Todd Middle School

\$496

With the digital microscopes purchased through this grant, students will be able to capture images and video of specimens viewed in class and transfer them directly from the eye tube to YouTube or share them on Google Drive. Middle school students will use the microscopes to study bacteria, cells, and live protozoa. They will also use them to compare healthy cells to cancerous cells, and insects to arachnids. By placing images and video on the web, students will have 24 hour access to their research and work and be able to share data collaboratively on the web.

Erin M. Nelson - M. Clifford Miller Middle School

\$1,500

Students will use the probeware provided by this grant to construct lab reports, analyze real-time data, draw conclusions, develop hypotheses, and become high school, college and career ready. They will develop skills that will help them both inside and outside the classroom. Students will acquire real-life accurate data and graph, manipulate, and relate to it in multiple formats.

Grace Johnston - Kingston High School

\$652.99

This grant will provide dual color green and red laser pointers and a refraction block, as well as dynamics track optics carriages and lens holders to benefit many science students. Optics carriages allow us to easily convert the dynamics tracks in our physics lab into steady optical benches. Powerful laser pointers will allow physics students to study various properties of light. Additionally laser pointers can be used in forensic class to determine the thickness of a hair, indices of refraction of different types of glass, and the trajectory of a bullet.



Gwen E. Saylor - Arlington High School

\$1,100

Access to predictable and repeatable equipment for experimentation allows students to learn through inquiry and discovery. The launchers allow students to accurately alter multiple variables in a controlled way which leads to a discovery of a pattern. Students can then verify the discovery through predicting the effect of altering a variable and testing. This equipment will be a first step toward realizing the Next Generation Science Standards which emphasize the process of inquiry, cross-cutting concepts such as establishing patterns and establishing strong understanding of the core concepts in science.

Lisa Reece - Warwick Valley High School

\$945

Infectious diseases continue to be a major cause of human suffering and death, both in the U.S. and around the world. Immunology is the study of how the body protects itself against foreign, potentially disease-causing microorganisms. Our immune systems function to recognize intruders and to respond appropriately in a way that protects the body. We produce molecules called antibodies that recognize intruder molecules with incredible specificity. Like magic bullets, antibodies locate and attach themselves to their targets. Students must grasp that by attaching to the invading foreign entities, antibodies make the invaders recognizable to other cells so that they can be destroyed. The goal is for students to realize that learning about the immune system, particularly about antigen-antibody interactions and the unique properties of antibodies have become vital high-tech tools that have revolutionized modern medicine.

Lisa Reece - Warwick Valley High School

\$620

The study of ecosystems is a core part of biological science. Within ecosystems, complex interactions exist between organisms and the physical environment. Humans are a key species in almost all ecosystems on the planet. We interact with our environment in a myriad of ways, often without thought to the consequences. Unfortunately, we often do things that result in disrupting an ecosystem, and even though these actions may seem small, they can have large effects. In this interactive activity, freshman biology students will recognize the importance of studying ecosystems and investigate how they work.



2014 Grant Recipients:

Christine Pizer - Poughkeepsie High School

\$840

Students will have the opportunity to perform a number of activities using the new greenhouses, seeds, pots and grow lights. They will learn how to monitor and collect data as they plant, water, feed and wait for seeds to grow. Students will design their own experiments with the plants, collect appropriate data and share their findings through presentations. Several species of flowers have been selected so the mature plants can be shared both with family members and/or the beautification projects that surround the high school graduation program each year.

Edith Rivera - Dutchess County BOCES

\$1,290

Students participating in the Intensive Day Treatment transition program will benefit from this grant for science lab kits. Students with added needs for support are usually considerably behind in their academics and require some quick catching up. The grant will begin to fill the gap in the supplies and equipment required to complete lab work, and greatly improve the opportunities for learning.

Elyse Joy - Orville A Todd Middle School

\$680

In the face of developing technology many students have lost touch with the very foundation of nature and the cycles within it. Through building worm beds, feeding class turtles and creating natural filters through plants, students will have an opportunity to see these cycles in process and to have a direct impact on an ecosystem. By allowing students to be active participants in every stage of the food web, they will learn hands on how delicate the balance is.



Elyse Joy - Orville A Todd Middle School

\$980

Funds will be used to purchase equipment for 7th and 8th grade science students to gather data and engage in evidence-based arguments. Physical and life science topics covered will include biofuels, pollution, batteries, buoyancy, motors, viruses, and engineering. Learning how to conduct experiments, analyze and utilize data to defend their arguments are skills which students can use in any subject area in their future.

Grace Johnston - John A. Coleman Catholic High School

\$380

A safety shield will be purchased to benefit all high school science students. As some experiments performed in front of students are potentially dangerous, the safety shield will ensure any fragments from an explosion or chemical splash will be contained. Scientific demonstrations are educational and are often entertaining, and will ultimately enhance students' learning.

Gwen Saylor - Arlington High School

\$1,100

The purchase of motion detectors, force meters and accessories will make a series of computer aided lab investigations of forces and motion more accessible to physics students. Students will be able to investigate displacement, velocity, acceleration and force with ease. The equipment will be used across the physics curriculum as part of class demonstration and as part of a four different hands on lab investigations, creating a direct line between curiosity and discovery.

Jacob Lawrence - Arlington High School

\$945

The purchase of a weather station and Weather Link IP will be used to record and transmit weather information from the roof of the school, into classrooms and onto an internet weather website. Students will engage in a year-long study of weather using the more accurate, local data. Additionally, students with a strong interest in weather will be able to work directly with the Television Productions class to write and report the school's weekly TV weather updates.



Lisa Reece - Warwick Valley High School

\$915

The purchase of pH meters and electrode racks will provide students the tools to grasp how reactions can form acids or bases, as well as what effect that has on pH. Aligned to national standards, exciting inquiry-based lessons will address key areas of life and physical science, and technology/innovation using common materials found in the classroom and household. Students will be able to make real world connections in their study of pH and bring to life a topic that for far too long has lived only on the pages of textbooks.

Maribel Pregnall - Arlington High School

\$1,450

A new state of the art LED lighting system will be purchased for the marine aquarium that has been maintained in the classroom for over 18 years. Sufficient lighting is vital for growing healthy coral and other photosynthetic organisms in an aquarium and will allow the students to continue to care for, measure and observe a healthy classroom marine ecosystem. As the Marine aquarium room is a shared resource in the school, nearly 400 high school students, and over 900 elementary school students will visit the aquarium over the next year.

Miriam Straus - Oakwood Friend's School

\$720

Equipment to create a season extended vegetable garden will allow upper school students to sow, grow and harvest for two seasons during the school year. As students are learning about sustainable agriculture, environmental and biological processes, the garden provides a practical and hands-on "classroom" to learn about these concepts in a more authentic setting. The garden will not only be created by the students, they will also learn about the food system, human health and plant and soil biology. Students will grow, harvest and donate vegetables to the local lunch box, and also learn the health benefits of eating fresh and organically grown food.



Sheryl Hawks - Beacon High School

\$880

Lego renewable energy activity packs and motorized bases will aid physics students in studying renewable energy in the classroom. The solar panels and wind turbines will be connected to a device that shows how much energy is produced. Students will have an opportunity to write their own programs, record data and study the data produced. It will help students to see the connection between solar energy, wind energy and electricity.



2013 Grant Recipients:

Christine Pizer - Poughkeepsie High School

The Quiz Bowl remote response buzzer system allows teachers to create customized games that foster a creative and competitive environment in the classroom. The system reinforces lessons, provides review prior to tests and quizzes, and is completely customizable. Students participate by responding to teacher and student generated questions with buzzers. This represents a more engaging method for student review.

Cindy Binnie - Arlington High School

\$900

Precision balances, which are essential to students' success in Chemistry class, will be purchased. Experiencing mass measurement using the appropriate metric units is critical to understanding the central concept of the course. Hands-on operation of electronic balances offers a visual and tactile modality to supplement teacher-directed instruction in these various units in our chemistry curriculum.

Debra Neumann - Roundout Valley Central School District

\$1,000

A digital stereo microscope will be purchased to help magnify whole samples without using slides. Its ability to connect to a digital projector and computer will allow groups to engage in 'real-time' exploration and discussion of a specimen; also it will allow for images and videos to be saved for students to access electronically outside of class.

Erin Nagel - Marlboro Middle School

\$1,000

Lego mindstorms basic starter kits along with a green city challenge kit will be purchased to create an after school enrichment program for students to explore the world of robotics and programming. The program will guide students from simple to more advanced programming skills as they design, build and program robots. They will be challenged to apply their programming and problem-solving skills by making their robots solve real-world engineering challenges related to renewable energy.



Grace Johnson - John A. Coleman Catholic High School

\$1,000

A physics workshop system will be purchased to benefit all science and math students in the school. Currently, students are gathering, graphing and analyzing data by hand. With the new system students will be able to make more precise measurements and better understand motion, forces, energy and Newton's laws.

Greg Farris - Poughkeepsie Middle School

\$1,000

Various kits and basic equipment will be purchased to enable inquiry-based, hands on student investigations into various aspects of the physical sciences. The goal is to raise the analytical and critical thinking skills of our students, to challenge them with greater complexity and rigor with the use of appropriate science and laboratory equipment.

Gwen Saylor - Arlington High School

\$1,000

Various sensors will be purchased to enable students in Regents Physics, AP Biology and Science Research to measure the invisible with the tips of their fingers. In a typical high school laboratory investigation, students model the paths of discovery taken by others and they then apply that experience to what they are told about the discoveries made by others. Many physics concepts and living systems function through processes that are invisible to the human eye but follow predictable patterns that can be discovered with the proper tools.

Laurie Malin - Rombout Middle School

\$700

Tanks, a submersible pump, grow lights, plant grow media, red wigglers and more will be used to build a closed aquatic ecosystem. This set up can be used to teach many topics, including but not limited to, ecology, characteristics and needs of living things, microscopy, cells and sustainable agriculture. Students will be able to actively participate in all stages of development and maintenance of a complete ecosystem and study a sustainable form of agriculture that is available to everyone.



Lisa Reece - Warwick Valley High School

\$600

Triple beam balances and meter sticks will be purchased and used by more than 900 science students who will gain the hands-on experience necessary to understand metric measurement. This equipment will enable students to be on board with standardized measurements by giving them activities that emphasize the simplicity and importance of metrics. And their ability to practice metrics makes them have that much more in common with our fellow countries.

Stephen Pemberton - South Middle School

\$700

With GPS students are able to do field-based activities that focus on engagement during the learning process. Use of this tool will allow students to apply strategies for problem solving, collaborating, and communicating. When students use the GPS devices to explore, troubleshoot and find locations, they are provided a great opportunity for hands-on learning and an opportunity to experience how geography, science and math fit into their lives.

Thomas Blon - Middletown High School

\$800

There has been growing concern recently on the acute and long-term effects of concussions, notably in sports. The purchase of human skull models, force sensors and accelerometers will enable secondary students the means to investigate the basic physics of collisions and the possible effects on human health.