

2010 Toyota TAPESTRY Large Grant Awardees

Integrating Literacy and Science

Watching the Wild Things: Linking Life Science & Literacy

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Lincoln students will investigate the question, “What are the dominant species in our urban ecosystem, and how do they change throughout the year?” To reach their conclusions, the students will learn to safely monitor local animals, both vertebrates and invertebrates, through the use of stop-action cameras and population counts. At the same time, they will design and conduct controlled experiments both in and out of the classroom to improve literacy skills, science process skills, and to understand the role of living things in their urban environment. The goal is to fuse our language arts instruction with our hands-on life science program so that our students deepen their understanding of science concepts and improve their reading, writing and communication skills.

I, Robot: Finding the Facts in Science Fiction

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“I, Robot: Finding the Facts in Science Fiction” will involve fifth grade students in a Title I school in hands-on scientific inquiry, close reading, and creative writing. In conjunction with mentors from the high school and local community, students will use Lego NXT robots to investigate and build conceptual understandings of force and motion. They will apply their understanding as critical readers when they examine science fiction trade books for accuracy in the depiction of science-related content. Finally, they will synthesize their experiences by writing original, robot-related science-fiction stories which will be published as hardbound books through a print-on-demand publishing site.

The World is Our Classroom

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Over the course of the next year students at Philo Magnet Academy will begin a three part journey that will culminate in the completion of a Global Garden in the central courtyard of the school. The initial phase will encompass building partnerships with other middle school classrooms around the world in order to research soil and foliage similarities with our own local environment and forge friendships that will allow for continued discovery. Phase two will focus on inquiry and research as students undertake an integrated, multi-grade level project based effort. Science classes will research all aspects of soil composition, the individual roles of plants and aquatic life in an ecosystem and how to maintain these separate but related ecosystems. Social Studies classes will continue the global partnerships forged in Phase One and continue research on similarities and differences in culture. Math classes will be crucial in helping to plan the layout and design of the various areas and Language Arts classes will create poetry plaques and stepping stones to display throughout the garden. Finally students will develop a stewardship plan to maintain the beauty and integrity of this world outside the classroom.

Rocket Boys and Girls

Peggy Carlisle

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Through "Rocket Boys and Girls" 3rd, 4th and 5th grade students will explore fundamentals of flight using inquiry-based investigations, employing the natural excitement that science inquiry inspires as a springboard to literacy through documentation, writing, and research. Students will explore the fundamentals of flight, including properties of air, air pressure, air resistance, shape, angles and propulsion. Literacy skills will be built as students write and publish our original hardback book series: The Story of Flight. Students will also plan and present lessons to other classes in order to share their new ideas about flight.

WildScience Film Club - After School Science Film Club

Mark Davis

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Brain science tells us that sensory integration is important for student learning. Sights, sounds, and motion from films in the classroom provide students' brains with multiple pathways and engagement to increase both motivation and retention. But what if the students made their very own science films? Imagine the powerful student learning that will take place when members of the WildScience Film Club produce short films by integrating literacy skills and science to demonstrate their learning. Members of WildScience Film Club will write, produce, and film their own science videos through the integration of literary arts, science, and technology to demonstrate learning and increase their interest in science.

Bronx River Eco-Leadership Program

Carol Kennedy

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Students at Satellite Academy High School, a small alternative high school located in the South Bronx, will become Bronx River Eco-Leaders through environmental science education, field studies, on-water experience, and leadership training. These Eco-Leaders will gain a deeper understanding of the part they play in making their community a place where they want to live, as well as a place where they want their families and future generations to live. The students will be exposed to science, scientific research, and the natural environment in authentic and meaningful ways. These Eco-Leaders will collaborate with two community based organizations, Rocking the Boat and the Bronx River Alliance, to learn the skills necessary to navigate the Bronx River with hand-built wooden boats and canoes, and will collect new (and needed) data about the biodiversity and water quality of the Bronx River. After the initial training, they will introduce and mentor other members of the Satellite Academy and Bronx communities to the unique natural and social history of the Bronx River. Students will maintain written and video journals of the students' Eco-Leadership experiences, and, in collaboration with Lehman College, they will analyze the collected data. This data analysis will lead to new knowledge about the health of the Bronx River ecosystem, and the student Eco-Leaders will present it in a credible way to a variety of audiences in several venues.

Miswak Biochem Project

Noha Kolkailah

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High School Students will work at Cal Poly State University's Chemistry and Biochemistry laboratories to extract and isolate antibacterial agents from the *Salvadora Persica* species, also known as the Arak tree. The tree's twig, known as miswak, has been recommended by the World Health Organization in international consensus reports for maintenance of oral hygiene, as it has served that purpose for many countries over the past 1400 years. High school students will extract the chemicals from miswak to confirm its anti-bacterial effects. Students will then use High Performance Liquid Chromatography (HPLC) to separate the extract into its component chemicals. Each component will then be tested for anti-bacterial properties. The compounds that display antibacterial activity will be analyzed by Nuclear Magnetic Resonance spectroscopy (NMR). Students will then learn to analyze the NMR spectra and determine the structure of the extract's chemical components. The culmination of the students' work will be to formulate a scientifically written research paper.

Blue and Gold Go Green!

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The purpose of the Blue and Gold Go Green project is to develop, implement and maintain a resource-rich organic school garden in collaboration with our community's commitment to battle obesity and hunger in children. The project through different modalities will create a connection to living things and a sense of purpose and achievement. Integrated into the curriculum, the Blue and Gold garden will connect the 1,088 sixth, seventh and eighth grade students, the teachers, and local community organizations, with a deep, hands-on experience to the food cycle, sustainable agriculture, and the natural environment. The development of this garden will be an outdoor extension of the classroom to support New York State Science, Math and Language Arts Curriculum Standards. Students will have the chance to visually and physically understand science and math concepts. Students will think, talk, and collaborate to learn to solve real-world problems.

Happily Ever After?

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"Happily Ever After? The Science Behind the Fairy Tales" allows students to explore scientific principles found in well-known fairy tales. As students read popular tales such as Rapunzel, Goldilocks and the Three Bears, and The Three Little Pigs, they will utilize the scientific method to examine various questions. In many stories, multiple scientific questions may be raised, as the fairy tales lend themselves to more than one area of inquiry. For example, students will test the strength of chairs and the temperature of porridge while reading Goldilocks and the Three Bears. Throughout the study, students will examine areas in earth science, physical science, life science, and health science, all the while exploring how science can occur anywhere at any time, even in the world of fairy tales.

Forensic Science and Literacy

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The goal of this project is to create a class utilizing the high interest topic of forensic science as a catalyst for developing scientific literacy. Students will be reading popular and historical forensic novels and learning the science of forensics. Each novel will be assessed by the students for accuracy of the forensic science methods used and compared to methods used by experts in the field today. Students will be taught and will model police and laboratory techniques of processing data for an authentic learning experience. Scientific literacy will be demonstrated not only throughout the project, but also through a culminating activity where the students will process a crime scene, test and analyze their own data, and prepare the data for an authentic court proceeding. A significant benefit of this project is that students will understand the relationship and interdependence of science, reading, technology and how it impacts their lives and the world around them.

WISD-FM

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The 21st century has been characterized as the century of information exchange. What we say, how well we say it, and how the information is delivered will define our place in the global society of the 21st century. This project will allow students to apply the scientific principles of physics and engineering through the design, construction, operation, and maintenance of an FM radio station transmitter and antenna. This project will also provide the method for literacy skills such as observation, research, writing, editing, evaluating, revising, oral communication, to be developed, practiced, used, and shared via the radio medium, along with practicing all the aspects of business management by running the radio station. In addition, this project is long term meaning future students will benefit from the laboratory field experience this venue will provide. The ability to communicate with parents while they are commuting to and from work or while in their cars will benefit the school district and all students and their families.

SSS Students Saving Salmon

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"Students Saving Salmon" focuses on similar environmental issues that impact the communities along the Klamath River and Coastal areas, will include the involvement of local resource management agencies, Klamath River Indian tribes, private industry, and the local community. The main components of this project are the development of supportive classroom instruction, extensive lab investigations, a watershed / coastal / marine center at each school where students can experience a hands on demonstration that will feature a new topic every month, the use of school gardens and outdoor learning areas, local field trips collecting salmon habitat field data of the Scott River, and two restoration / field study trips to the Klamath River Estuary and the near by coast line, where sixth grade students, along with parents and community members, will travel from Scott Valley down the Klamath River to the coast. Pre and post activities will take place by students and shared with our schools, community and other school districts. An end of the school year "Klamath River Connection Fair" will occur to display student projects, restoration reports, lab experiments, coast trip experiences, marine / coastal education, and project artwork. Students will focus on literacy in the form of non fiction reading, poetry, research papers, journals, news paper articles, letter writing, note taking, essays, movies, and oral reports to prepare for, document and reflect upon their project experiences.

The Power to Grow: An Environmental Science Literacy Project

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"The Power to Grow: An Environmental-Experiential Education Project" is a school-wide science/literacy venture that teaches the art of learning, designed by a team of science and language arts teachers. "The Power to Grow" project will build an environmental education center (EEC) that will include an indoor-outdoor garden, a wind turbine, a water collection and analysis hub, a 160-watt solar panel, a battery system, a weather station and pole, and laptops and software for student analysis and recording of the weather, wind, water quality, solar power, and gardening production. "The Power to Grow" will be headed by a team that includes an environmental engineer, an aerospace/astronautical engineer, a professional gardener/ landscaper, and the Academy's science teachers. This project will teach scientific principles surrounding pollution, water conservation, growing plants, and using various renewable energy resources, and it will use renewable energy sources to power the greenhouse and experiments. It will promote remarkable literacy/science projects for all 675 K-8th graders. These inquiry-based science projects will incorporate the development of language arts and reading literacy, and will use informative texts and writing projects to promote academic language development and oral/written communication skills. It will help students make strong connections between science and literacy, using hands-on investigations that invigorate interest, while writing for ongoing retention, assessment, and literacy-improvement. Students will experience the joy of science and of writing about science, and will be inspired to continue to study science.