

May 24, 2012

ENVISION YOUR FUTURE

Bridgewater State University

ACTIVITIES (AS OF 5/15/2012)

NOTE: **Workshops** are scheduled activities lasting 30-45 minutes that will take place in a classroom. Participating schools will receive a list of workshops and make selections at the end of April. **Activities** will take place in a large open area and last 10-20 minutes; some may require students to sign up. **Demonstrations** are ongoing. **Displays** provide opportunities for students to talk to STEM professionals and gather career information as well as resources for teachers and school district teams.

<u>AGRICULTURE</u> & <u>NATURAL</u> <u>RESOURCES</u>	<p>Benefits of Oil – What You Do If It Spills! Students will observe an “oil spill” and then collaborate as a team to clean it up. Concepts emphasized in the activity will include scientific method, the engineering process, properties of solutions, hydrophobic effect, viscosity and flow, and the potential effects of chemicals on natural resources. <i>Lori Noble, Laurie Norman, David Schmitter, Massachusetts Maritime Academy.</i></p>	Activity
	<p>Intro to Mass Envirothon: Identifying Native Turtles Students will observe three different species of turtles native to Massachusetts and identify characteristics such as color, markings, tail length, and shell shape. After a brief introduction to the use of field guides, they will compare their observations with the descriptions in a field guide, fill in a simple data sheet (provided), and try to identify each of the three turtles. <i>Presented by Susan Benoit, Vice Chair, Mass Envirothon and Promotion Specialist, Massachusetts Division of Fisheries and Wildlife.</i></p>	Activity
	<p>Building Links to the Marine World Are you interested in art, writing, photography, protecting animals, and /or solving problems? Find out how your interests link to marine sciences. Learn about human and natural threats to the marine food chain. View the underwater world through the eyes of photographers and see how adults and children have used sanctuary marine life as models for their artistic creations. Using animal ID cards, create a food chain and expand it into a food web. <i>Presented by Anne I. Smrcina, Education Coordinator, Stellwagen Bank National Marine Sanctuary.</i></p>	Activity
	<p>Life on the James: The town of Aquaville is home to the beautiful James River. It is also home to a chicken factory and a water treatment plant. Are these two facilities polluting the James River? Students will work in teams of water quality specialists to determine the health of the James River. By analyzing samples of macroinvertebrates (tiny animals living at the bottom of the river) the teams will determine the relative water quality of seven sites along the James. Information will be available on the Mass Math + Science Initiative and how it helps students attain excellence in math, science, and English and to transform school culture. <i>Presented by Barbara Plonski, Director of School Services and MMSI Advancing College Readiness, Mass Math + Science Initiative and John Smolenski, Regional Director, Enrollment and Advising Services, Mass Math + Science Initiative.</i></p>	Activity
	<p>The Weensy Wildlife of the Wetlands Small critters can be BIG indicators of wetland health. Find out what a wetland is, and why some very small creatures can help us monitor our waterways. Learn who these little animals are, and how they are relevant to environmental impact assessment work and stream monitoring. <i>Presented by Kathy Morgan, Associate Professor, Dept. of Psychology, Wheaton College.</i></p>	Activity
	<p>The World of Green through STEM Explore activities that link to “Green” careers. Learn about occupations in the STEM arena with a focus on “Green” and the tie in with STEM. Copies of the guide “Why Green Is Your Color: A Woman’s Guide to a Sustainable Career” will be displayed and the guide will also be available on flash drives for teachers, school counselors and members of School District Community Teams or for a copy you can go to http://www.dol.gov/wb/Green_Jobs_Guide/index.htm. <i>Presented by Angela M. Rizzolo, Program Analyst, U.S. Dept. of Labor Women’s Bureau.</i></p>	Display

<u>ARCHITECTURE</u> & <u>DESIGN</u>	<p>Design & Construct a Sustainable Structure The basic objectives of sustainable design are to reduce consumption of non-renewable resources, minimize waste, and create healthy, productive environments. Working alone or in pairs, participants will create a structure that incorporates the principles of sustainable design and illustrates the interconnectivity between people, nature and buildings. <i>Presented by Susan Casey, Master Teacher, Learning by Design and students from Northeastern University, Engineering Department.</i></p>	Workshop
	<p>ART & STEM See how middle school students demonstrate their understanding of the design engineering design process, how the process applies to architectural design projects and how it connects to academic areas. Information will demonstrate the importance of interdisciplinary efforts and how involving students in community projects illustrates the relevancy of STEM to all aspects of life in the 21st Century and reinforces STEM concepts fundamental to developing STEM literacy, which is the foundation for STEM expertise. Also on exhibit will be <i>Amazing Attleboro Architecture</i>, a sketchbook created by Coelho students for adults and children. <i>Developed by Susan Casey, K-8 Arts Coordinator.</i></p>	Display
	<p>The Power of Wind Students have a hands-on experience with engineering design. Working in small teams, students will design and test blades for a working wind-driven generator. Each team will design and position blades on a pre-built wind turbine tower. They test their designs using a voltmeter to measure the amount of electricity produced. <i>Presented by Carolyn DeCristofano, President Blue Heron STEM Education and Deb Dempsey, Director, Blue Heron STEM Education.</i></p>	Workshop
	<p>Marshmallow Construction Company Have you ever wondered how really tall buildings stay up? Why do sky scrapers not fall down when wind hits them? Engineers work with architects and scientists to understand what makes materials break, and then use what they learn to design strong structures. Sometimes, engineers may be able to find very strong materials, but they cannot use them in a structure because the materials are too expensive. Sometimes, engineers cannot use as much material as they might like due to budget or supply limitations. Just like an engineer, students will be constrained; they can only use a limited amount of materials. Their job is to design and build a structure that is as tall and strong as possible, using only marshmallows and toothpicks. As they build, they will think about what forces will be acting upon their structure. Which parts will be pushed together — that is, which will experience compression — and which parts will be pulled apart — that is, which will be under tension. Is it better to have a piece of spaghetti or a marshmallow under tension? Under compression? How will they design the tallest, strongest structure using limited resources?</p> <p>Marshmallow Construction Company - Team Challenge: In eighteen minutes, student teams must build the tallest free-standing structure out of 20 sticks of spaghetti, one yard of tape, one yard of string, and one regular size marshmallow. The marshmallow needs to be on top. <i>Presented by Cambridge Science Festival and the MIT Museum.</i></p>	Workshop
	<p>Marshmallow Construction Company – Individual Challenge Have you ever wondered how really tall buildings stay up? In this activity, students will have the opportunity to figure out how to make strong structures. Using toothpicks and mini-marshmallows individual students build a structure capable of supporting a weight. <i>Presented by Cambridge Science Festival and the MIT Museum.</i></p>	Activity
	<p>IDEAS Challenge Project See winning middle school and high school student projects from the Cambridge Science Festival’s 2012 IDEAS Challenge, as demonstrated by student IDEAS Challenge team members. Also, view winning entries from the Cambridge Science Festival’s Curiosity Challenge. Learn how your school can participate in the 2013 Cambridge Science Festival IDEAS and Curiosity Challenges, and other Cambridge Science Festival events. <i>Presented by Cambridge Science Festival and the MIT Museum.</i></p>	Display
<u>BIOLOGICAL</u> & <u>BIOMEDICAL</u> <u>SCIENCES</u>	<p>Amgen-Bruce Wallace Biotechnology Program Participating schools are provided self-contained biotechnology kits, research grade biotechnology equipment, DNA, enzymes, and reagents needed to perform biotechnology activities at their schools. The kits are loaned to schools free of charge for a three-week period. The program also offers teacher training workshops. <i>Presented by Tara Bennett, Program Manager, Life Sciences and Systems Biology Outreach, Harvard University and David Vito, University of Rhode Island, Coordinator, Amgen-Bruce Wallace Biotechnology and Assistant Professor of Biology, Community College of Rhode Island.</i></p>	Display

	<p>Making Silly Putty Using several elements, students will learn how to make silly putty. Participants will be introduced to simple chemistry, cross linking, and polymers, which are found in plastic and biopolymers like DNA. <i>Presented by Dr. Sam Lone, assistant professor of chemistry, BSU City Lab, Bridgewater State University.</i></p>	Activity
	<p>pH for all Ages Using pH paper, students will determine the approximate pH of solutions. A simple pH meter will help students make more accurate measurements. Students will learn how to make a an inexpensive pH meter for their school. <i>Presented by Dr. Jack Driscoll, member of the Northeastern Section of the American Chemical Society and President of PID Analyzers, LLC, Director of Nova Biomedical.</i></p>	Activity
	<p>PID Analyzers, LLC and Cape Cod Science Cafés See a demonstration of equipment that measures pollutants (Volatile Organic Compounds) in air and water. Information will be available on careers in scientific instrumentation including chemists and electrical, mechanical and software engineers. Information will also give an overview of the products manufactured by PID Analyzers, which includes instrumentation for monitoring air, water and chemical processes (made in the USA) and is located on Cape Cod. Find out how to provide a free Science Café to students in your area. Cape Cod Science Café is an organization that is dedicated to promoting science to K-12 students and the general public. It is sponsored by Northeastern section of the American Chemical Society (NESACS) and PID Analyzers. <i>Presented by Jennifer Maclachlan PID Analyzers, LLC, Member of NESACS and Public Relations chair of the ACS Div. of Small Chemical Businesses</i></p>	Demonstration
	<p>BLOOD CHEMISTRY - Reproducing Famous Scientific Experiments Students will participate in an activity that demonstrates testing the compatibility of blood types. Students will use common household chemicals to simulate blood types. Students will learn about the life and contributions of Dr. Charles Drew, African American physician who developed ways to process and store blood plasma in blood banks. The Northeastern Section of the American Chemical Society (NESACS) is a regional affiliate of the American Chemical Society, the world's largest scientific society, with 164,000 members. NESACS is the largest section with 7,500 members from New Hampshire to Cape Cod and is involved in a number of STEM programs with the Museum of Science, Boston Children's Museum, Burlington High School and MA STEM programs. <i>Presented by Dr. Paul Reibach, Smithers Viscent, Wareham, MA, member of Northeastern Section of the American Chemical Society (NESACS).</i></p>	Activity
	<p>NOVA Biomedical Corp. Participate in an activity that uses a NOVA home diabetes meter for measuring whole blood. Information will be available on careers in biomedical engineering & manufacturing. Nova Biomedical is the world technology leader in the development of fast whole blood analyzers to support the care of critically ill patients. Compared to any competitive alternative, Nova analyzers have the most extensive stat test menus and deliver these tests in the shortest time at the lowest costs. One of NOVA's subsidiaries, NOVA Diabetes manufactures handheld test meters for the home and hospitals. <i>Presented by Howard Deahr, VP of Marketing, Nova Biomedical Corp.</i></p>	Activity
	<p>CSI and the WOWster Campaign Meet a Crime Scene Investigator (CSI). Learn what STEM skills you need to be a CSI from the supervisor of the Crime Scene Response Unit, Massachusetts State Police. View the WOW video and find out about other exciting STEM careers. Take away a WOW poster. <i>Presented by Daniel Pratt, Supervisor, Crime Scene Response Unit, Massachusetts State Police.</i></p>	Display
<p><u>COMPUTER, COMMUNICATION & INFORMATION SCIENCE</u></p>	<p>Create a Simple Math Game Using SCRATCH Using Scratch, students will create a math program that they can take with them. Scratch is a programming language that makes it easy to create your own interactive stories, animations, games, music, and art - and share your creations on the web. Scratch is a free application that students can download and use at home. Students from Tri-County Regional Vocational Technical High School (Tri-County RVTHS) will assist participants in using Scratch. STUDENTS MUST BRING A FLASH DRIVE (1GB OR LARGER) IF THEY WANT TO TAKE HOME A COPY OF THEIR MATH PROGRAM. Developed by the Lifelong Kindergarten Group at the MIT Media Lab, with financial support from the National Science Foundation, Microsoft, Intel Foundation, MacArthur Foundation, Google, Iomega and MIT Media Lab research consortia. <i>Presented by Kimberly Zogalis, CIS Instructor, Tri-County RVTH.</i></p>	Workshop
	<p>Verizon FiOS – fiber-optic communications What is a fiber-optic communications network and what does it have to do with high definition TV, Internet, and making phone calls? Find out how fiber-optic works and how this technology links people around the globe. Explore the technology behind the technology that you use every day. Learn about careers in the communication industry that include scientific innovation, information technology</p>	Demonstration

	(IT), sales and customer service. <i>Presented by Thomas Sneed, Customer Service, Verizon. www.verizon.com</i>	
	<p>Straw Towers, Design Animation, GTEC See examples of STEM projects students have completed and hear them explain the process they use to collaborate, design and finalize a project. Learn how they work with students in Russia to work on design projects via Skype. Information will be available on how Dennis Yarmouth Public Schools identifies interested students for the STEM Program. <i>Presented by teachers Jay Krystofolski-science, Kris Hanson-robotics, Julia Sigalovsky-chemistry, Jen Govoni-computers, and students from the Dennis Yarmouth Regional School District.</i></p>	Display
	<p>Learn How to Create a Computer Game In a computer lab using Kodu, students will use simple visual programming language to create a game that they can take with them. Kodu is a game programming environment for children that is free and downloadable. It is a visual programming language that emphasizes logic through the process of game development. STUDENTS MUST BRING A FLASH DRIVE (1GB OR LARGER) IF THEY WANT TO TAKE HOME A COPY OF THEIR MATH PROGRAM. <i>Presented by Priscilla Grocer, Professor & Chair, Computer Information Systems, and Rose Ferro, Adjunct Faculty, Computer Information Systems, Bristol Community College.</i></p>	Workshop
	<p>Youth Leadership – Work Readiness - Entrepreneurship Curriculum and resources will be available for faculty and staff on youth leadership, work readiness for teens, and entrepreneurship. Additionally, web resources for career awareness and assessment will be made available. <i>Presented by Sheila Sullivan Jardim, Executive Director, Brockton Area Workforce Investment Board (BAWIB).</i></p>	Display
<u>ENGINEERING</u> <u>&</u> <u>ENGINEERING</u> <u>TECHNOLOGY/</u> <u>TECHNICIANS</u>	<p>Underwater Remotely Operated Vehicles (ROVs) ROV stands for: "Remotely Operated Vehicle". The ROV is an underwater robot that is connected to the surface by an umbilical cord and operated via a control box by the pilot on shore or on a boat. Participants will learn about ROVs, how they are built and where they are used as well as have an opportunity to pilot an ROV to complete a simple mission (collect a biological specimen from the ocean floor). An online interactive ocean program will give participants the opportunity to circumnavigate an iceberg in search of whales, penguins, fish, krill, and a killer whale. Additional information on the BCC Sustainability and Green Energy (SAGE) Lending Laboratory and professional development workshops for teachers will also be available. <i>Presented by Meghan Abella-Bowen, Director, SAGE Project.</i></p>	Activity
	<p>New Bedford High School Robotics Team Students in grades 9-12 from New Bedford High School, New Bedford Massachusetts will demonstrate their (FTC) First Tech Challenge robot used in the December 2011 FTC Regional Competition where they won a trophy for first place overall and a second trophy for the Think Award for the team's outstanding engineering notebook. The team will compete March 10, 2012 at Andover High School in the Massachusetts States First Tech Challenge Competition. This is the second time that the students have competed in the FTC. The Lego and Tetrix kits were purchased through a grant from the Naval Undersea Warfare College (NUWC) and donated to New Bedford High School. The team was led by Christopher Parker, a technology education instructor at New Bedford High School, Mr. Bill Ferreira, a retired engineer from the Navy, as well as Mr. Michael DeSousa, presently employed by NUWC. <i>Presented by the New Bedford High School's Robotics Class.</i></p>	Demonstration
	<p>Create a Lemon Battery Today batteries provide the power for an amazing variety of devices, everything from flashlights to robots, computers, satellites and cars. Inventors and researchers continue to improve the battery, designing batteries that last longer and that are more friendly to our environment. Using a lemon, a copper penny and a zinc coated nail, participants will see a demonstration of how a battery is created. <i>Presented by Mark Whalen, Engineering Manager, Lockheed Martin Sippican.</i></p>	Activity
	<p>Lockheed Martin Lockheed Martin supports a wide-range of diverse and sustainable STEM activities that reach students and educators from elementary school through college. Through its Engineers in the Classroom STEM education outreach initiative, Lockheed Martin provides numerous opportunities for employees to interact with the next generation of engineers and technologists by serving as local school advisors, extracurricular activity mentors and career role models for students in communities where they live and work. Locally, the company's UMass Dartmouth Pre-Introduction to Math, Engineering and Science (UMDPrimes) program provides math and science tutoring to high school students throughout the school year. Information on Lockheed Martin's STEM activities is available at http://www.lockheedmartin.com/us/who-we-are/community/education.html. <i>Presented by Tracy McNeil, Communications and Public</i></p>	Display

	<p><i>Affairs, Lockheed Martin Sippican, Marion, MA.</i></p> <p>Museum of Science, Boston. Find resources for teachers and others who work with K-12 students, including Museum and online programs. Information on STEM curriculum and professional development will include Engineering is Elementary, Building Math, Engineering Adventures, Traveling Exhibits, Educator Resource Center and Engineering the Future. <i>Presented by Jeff Odell, Outreach Program Manager, Engineering is Elementary, Museum of Science, Boston.</i></p> <p>What Will Help You Catch the Wind? What will help you catch the wind? Index cards, popsicle sticks, felt? Create a sail for a foam raft that needs to get across a track. With the help of the wind and some creativity you can engineer a sail that will get the raft all the way to the end of the track. <i>Presented by Martha Hass, Senior Consultant, Bridging Engineering, Science and Technology (BEST) for Elementary Educators Grant and Erin Fitzgerald, Senior Professional Development/Curriculum Associate, Engineering is Elementary, Museum of Science, Boston</i></p> <p>Lego NXT Mindstorm Robotics Students (Grades 6-8) from Galvin Middle School (GMS) in Canton, MA will demonstrate various robots built using Lego NXT programming. This is the first year of our after school program and a total of 32 students participated. We've incorporated an existing FLL Canton team into the after school program and these students serve as mentors. Through a grant, GMS obtained 12 robotic kits including all hardware, software, and a site license. They are led by a Technology & Engineering Teacher, (Steve Bauer) and math teacher (Kathy Lam). GMS is preparing to join the First Lego Robotics competition for fall 2012 or 2013 after becoming proficient with building various robots and learning the NXT software. For information on Lego Robotics go to http://gms-legorobotics.wikispaces.com. <i>Presented by Steve Bauer, Technology & Engineering teacher and Galvin Middle School Students.</i></p> <p>Lego League The Weymouth Public Schools understand the importance of starting early to capture student interest in STEM/STEAM. At the Academy Avenue School (grades K-4), students ages six to ten participate in LEGO Robotics. Academy Avenue established the first Lego League in 2010. The 2012 Lego League is made up of ten girls and forty boys. The team includes students in grade one, two, three, and four. The Academy Avenue Lego League will demonstrate the robot they built for their after-school enrichment activity. <i>Presented by the Academy Avenue Lego League and the Weymouth Public Schools.</i></p> <p>FIRST (For Inspiration and Recognition of Science and Technology) Information display with operational robots. Information will explain how FIRST gives children, from elementary through high school, the chance to create technological solutions to human problems in events based upon sport contests and expositions of ideas. FIRST's vision is "...to create a world where science and technology are celebrated ... where young people dream of becoming science and technology heroes..." There are four programs, Jr.FLL, FLL (FIRST LEGO LEAGUE), FTC (FIRST Tech Challenge) and FRC (FIRST Robotics Competition) for students as young as 5 years of age through HS graduation. <i>Presented by Steve Cremer, Massachusetts Regional Director, FIRST www.usfirst.org and Marilyn Decker, Director of Science K-12, Milton Public Schools.</i></p> <p>Introduce a Girl to Engineering For ten years Nitsch Engineering has presented "Introduce a Girl to Engineering" in order to increase the interest of girls in STEM. See the varied projects girls have participated in over the years. Learn how you can connect with National Engineers Week Foundation. Go to http://www.eweek.org to find out how the girls in your school district can be involved. <i>Presented by Michelle DiBenedetto and Jennifer Johnson, Nitsch Engineering.</i></p> <p>Children & Adults Learning STEM Concepts Together The Attleboro Public Library (APL) and The Literacy Center (TLC) will show simple ways for children and adults to explore STEM concepts together. Book lists for children will be available as well as examples of manipulatives that can be used in adult basic education or with children to reinforce math and engineering concepts. Community programs presented by the APL utilize hands-on activities, everyday reading, and traditional books. Examples include classics like <i>The Three Little Pigs</i> to provide an introduction to the engineering design process. <i>Developed by Krystal Brown, Children's Librarian, Attleboro Public Library and Joan Ricci, Executive Director, The Literacy Center.</i></p>	<p>Display</p> <p>Activity</p> <p>Demonstration</p> <p>Demonstration</p> <p>Demonstration</p> <p>Display</p> <p>Display</p>
	<p>Saving Lives Through Technology Use iPads to link to Meditech software that saves lives and improves the quality of healthcare. Learn how building and implementing</p>	<p>Activity</p>

<u>HEALTH PROFESSIONALS & CLINICAL SERVICES</u>	software such as mobile point-of-care technologies makes a real difference in the day-to-day routines of physicians, nurses, and health care providers and the patients they serve. Meet professionals that contribute their STEM skills at Meditech to successful careers in sales, programming, management, and marketing. <i>Presented by Greg Clarkin, senior recruiter and a representative from Meditech's Marketing Department.</i>	
	ECGs and Spirometry - Explorations in Health Care During this activity, participants will work in teams learning about electrocardiograms (ECG's) and spirometry. In the first part of the activity, students will record each other's ECG's using Vernier ECG probes and laptops. They will perform a simple analysis on their ECG's learning about what the waves on the ECG represent. During the second half of the activity, students will record lung volumes and capacities using a Vernier Spirometer and laptop. <i>Presented by Marc Simmons, Biology Department, Massasoit Community College.</i>	Workshop
	Conduct a Medical Examination of a Stranded Sea Turtle (model) Students will serve as animal care technicians and conduct a medical examination of a sick sea turtle. They will conduct a visual examination, then weigh and measure their model turtle and record all data in the animal's medical chart. They will report findings in a mock Rounds: discuss treatment, then implement treatment and husbandry orders. <i>Presented by Sarah Trudel, Marine Science Instructor, and Kathy Zagzebski, Executive Director, National Marine Life Center. Please note that no live animals are used in this lesson; activities will be conducted with models and specimens.</i>	Activity
	Well Baby Checkup Participants will practice the skills needed for taking care of a six month old baby in a healthcare setting. Participants will be assessing newborns for their vital signs and fontanel, and learn how to record and analyze the results of the assessment. Using the simulated healthy baby manikin, students will make observations, listen to lung and breathing sounds and feel the manikin to conduct this assessment. <i>Presented by Jean Ivil, MSN, RN, RRT, Brockton Hospital School of Nursing, Signature HealthCare-Brockton Hospital</i>	Activity
	Wolf Pack Experiment Why do humans use perfume and cologne? Why are odors important to animals? Conduct an experiment and explore pheromones. Explore careers in animal science. <i>Presented by Janet Trombley, Veterinary Technician, University of Connecticut.</i>	Activity
	Collaborating to Close the STEM Gap See an interactive hands-on demonstration on how STEM fits into our daily lives and the importance of group think/collaboration to solve physics and math calculations that one person alone can't solve. Informational material will illustrate the role of the American Association of University Women (AAUW) in fostering STEM literacy and expertise for girls and women. AAUW research reports will also be available including: Why So Few? Women in Science, Technology, Engineering and Math. Presently, men outnumber women in STEM fields, approximately 73% vs. 27%, one way to close the STEM Gap would be to increase the number of girls and women in STEM fields. AAUW works collaboratively with national and local organizations to close the STEM Gap for girls and women. <i>Presented by Kimberly Edgar, AAUW STEM Liaison.</i>	Activity
	Awesome STEM Games: Playful Approaches to STEM Learning Students will have the chance to play one or more our prototype games (as well as one of our more recent games currently available in a board game and iPad format), offer their feedback and suggestions, and meet and chat with Dr. Geoff Kaufman, a game researcher at Tiltfactor Lab. We will demonstrate and discuss several of our prototype board games and card games that aim to change cultural understandings of, and approaches to, STEM. The games we have designed address this critical goal using such strategies as: (1) giving players practice with STEM-related skills in an engaging and accessible way; (2) encouraging discussion and role play of personal experiences within STEM domains; and (3) challenging biased beliefs or expectations held by players regarding the role of women and girls in STEM classes and careers. <i>Presented by Geoff Kaufman, postdoctoral researcher at Tiltfactor Laboratory, Dartmouth College.</i>	Activity
	African-American Inventors The African-American Inventors exhibit will showcase historic and contemporary African-American entrepreneurs, inventors, and innovators. Along with informational material, a quilt created by Coelho Middle School students, Attleboro Public Schools, and essays from Attleboro area students will present a colorful and engaging story about the achievements of African-American inventors. The exhibit is supported in part by a grant from the Attleboro Cultural Council, a state agency. <i>Developed by The Rev. Dr. Martin Luther King, Jr. Memorial Committee of Greater Attleboro.</i>	Display

	<p>Massachusetts Medical Society (MMS) and the New England Journal of Medicine (NEJM) Use a smart phone to scan QR code that links to websites and iPads to compare printed and on-line publications. See how doctors share information through on-line interactive medical procedures. Learn how writers, proofreaders, and artists work together to create articles. Meet professionals from MMS and NEJM and find out about the various career opportunities at the MMS and NEJM, including being a technologist, editor, proofreader, graphic designer or illustrator. For information about MMS go to www.massmed.org, or about NEJM go to www.nejm.org. <i>Presented by Ethel Garvin, proofreader, and Lori Messenger, illustrator, New England Journal of Medicine, Joe Curro, Web Integration Architect, and Mark Fung-A-Fat, Director, Business Systems Solutions, Massachusetts Medical Society.</i></p>	Activity
	<p>National Institutes for Health Find out about programs that provide information on careers in life science and curriculum supplements for classroom teachers. <i>Presented by Bradie Metheny, National Institutes for Health.</i></p>	Display
<p><u>MATHEMATICS</u> <u>&</u> <u>STATISTICS</u></p>	<p>Build a NFL Football Team Students are asked to join their classmates and serve on the management team of a new NFL team. Using budgets and statistics from the National Football League they analyze players' strengths, weaknesses and salaries to assemble the best offensive unit. <i>Presented by Peg Myers, Education & Tours Coordinator, The Hall at Patriot Place presented by Raytheon.</i></p>	Workshop
	<p>STEM and SPORTS See how science, technology, engineering and mathematical (STEM) principles are linked to sports at The Hall at Patriot Place presented by Raytheon. The Hall offers traditional museum artifacts combined with cutting-edge technology and interactivity perfect for ages 6 to 66 and beyond. The display will feature design challenges and educational modules offered to students of all ages that promote STEM. Design challenges require the application of the engineering design process and include the Power to Hear Engineering Design Challenge, which involves students building a parabolic microphone and testing it at Gillette Stadium, and the helmet design challenge in which students must design the shell and inside padding of a "helmet" and test the strength of their work by dropping a croquet ball on it. Students learn about force and the importance of the distribution of the impact in protecting a player's head. <i>Presented by Bryan Morry, Executive Director, The Hall at Patriot Place presented by Raytheon.</i></p>	Display
	<p>Who Wants to be a 'Money Smart' Millionaire? Learn about Money and win prizes while playing the interactive game Who Wants to be the 'Money Smart' Millionaire? Learn important tips on how to budget your allowance so you can buy the cool things you want now and also learn to save some money for bigger, cooler things later! <i>What is Money? Where Does Money Come From? What Should I Do with My Allowance? How Much Does that Cost? How Much Should I Save? What is Credit?</i> Join us for this fun interactive learning program that covers the origins of money, saving, spending and borrowing money. <i>Led by HarborOne U employees, Sheila Farragher and Maureen Wilkinson - HarborOne U®, a division of HarborOne Credit Union.</i></p>	Workshop
	<p>Be Your Own Boss – Make Money Doing What you Like What do you like to do? Sing, dance, play video games, watch sports – whatever your interests, learn how to create a business plan for a business that allows you to make money while you are doing what you like. <i>Presented by Senior Education Manager, South Shore, Cape, & Islands, Junior Achievement of Northern New England.</i></p>	Workshop
	<p>There's Math in How You Move Did you know that there's math in how you move? In this workshop, we will use software on the computer and motion sensors to import, graph, and analyze physical data and re-play these motions to see mathematics come to life! This workshop makes the students physical experience the subject of their own analysis, enabling them to interact in mathematical thought about walking a line, changing directions, and even adjusting their rate of speed so that their character "meets" another character. <i>Presented by Sara Dalton, James Burke & Stephen Hegedus, Kaput Center for Research and Innovation in STEM Education, University of Massachusetts Dartmouth.</i></p>	Workshop
	<p>Touch and Feel Mathematics Using the iPad, see how the latest research-based technology can transform how you explore mathematical ideas in radically different modes. Learn how to use dynamic mathematics on iPads and other haptic force-feedback technologies. <i>Presented by Ryan Robidoux, Stephen Hegedus & Beste Güçler, Kaput Center for Research and Innovation in STEM Education, University of Massachusetts Dartmouth.</i></p>	Workshop

	<p>Dynamic Mathematics - Kaput Center Find resources and information on research projects that support student learning in math and STEM education for classroom teachers and school districts. Find out about activities that address NCTM Standards and Common Core State Standards within materials that include dynamic mathematics software for computers (i.e., SimCalc MathWorlds® for Computers) and iPads that can be used in K-12 classrooms. <i>Presented by Rebecca Moniz and Stephen Hegedus, Kaput Center for Research and Innovation in STEM Education, University of Massachusetts Dartmouth</i></p>	Display
	<p>DIGITS – Connecting STEM Professionals With Students In The Classroom DIGITS is a STEM education program that pairs STEM professionals – individuals who work in science, technology, engineering and math-based companies – with sixth-grade classes throughout Massachusetts to increase students’ interest in math and science subjects and careers. Volunteers from the science and technology industries are matched with sixth-grade classes to engage and motivate students with their own personal career stories and do interactive exercises with students. Volunteers who come from companies in key STEM sectors, including computers, software, robotics, video games, telecommunications, wireless, Internet, biotech, medical device, pharmaceuticals, energy, and engineering, are trained ahead of time, and are provided with all the materials necessary for a successful classroom experience. No work is required of teachers to prepare for DIGITS; there is no cost to the school to participate; the program takes just one class period. Go to www.digits.us.com to find out how teachers can host the program in their classrooms and STEM professionals can serve as volunteers. <i>Presented by Joyce Plotkin, CEO, and Carol Greenfield, Project Director, the DIGITS Project.</i></p>	Display
	<p>Arts – building blocks for STEM Literacy View the artistic efforts of kindergarten students who applied math concepts inspired by beloved nursery rhymes, stories and fairytales such as <i>There was a Crooked Man, Little Miss Muffet, Jack and The Beanstalk, and The Very Busy Spider</i>. Math concepts include: polygons, radial and orbital patterns and symmetry. These activities increase symbolic imagery, which is essential to understanding math concepts. Imagery is fundamental to the process of thinking with numbers. Albert Einstein, whose theories of relativity helped explain our universe, used imagery as the base for his mental processing and problem solving. He said, "If I can't picture it, I can't understand it." <i>Presented by Donya Haven, K-4Art Teacher, Attleboro Public Schools.</i></p>	Display
	<p>Career Planning: Plain and Simple Career plans are an excellent tool for helping students prepare for their future. However, finding the time and the resources to make career planning a meaningful process can be a challenge. Over the past several years, Upper Cape Tech has fine tuned their process to maximize the benefit for students. Come learn about UCT’s career plan, and how the counselors and teachers partner to make career planning a theme throughout the building, rather than just an annual event. Sample lessons and templates will be provided. <i>Presented by Rachel Kerrigan and Jennifer McGuire, School Counselors, Upper Cape Cod Regional Technical School.</i></p>	Display
<u>PHYSICAL SCIENCES</u>	<p>Smart Skies: air traffic control simulation Students will work at a computer with a Federal Aviation Administration (FAA) air traffic controller to explore how to solve a real-world air traffic control problem using the NASA Smart Skies air traffic control simulator. Students will explore how an aircraft flies and find out about the cockpit instruments that assist pilots. <i>Presented by Julie Ann Seltam-Wilps, FAA - New England Region Aviation Education Program Manager and Shelia Bauer, Director of Education, Massachusetts Air and Space Museum (MASM) and representatives of the MASM Fred Morin, John Garabedian, and Jeff Bauer.</i></p>	Workshop
	<p>EarthView Students step into a 20’ inflatable globe and explore the entire world. They will find out how they are connected to others around the globe and how geographers apply spatial understanding to problems in the real world. YOU MUST BRING A PAIR OF SOCKS TO WEAR WHILE INSIDE EARTHVIEW. <i>Presented by Geography professors Dr. James Hayes-Bohanan and Dr. Vernon Domingo and geography students on the EarthView team, Bridgewater State University Massachusetts.</i></p>	Activity
	<p>Flying Balsawood Gliders & Indoor Helicopters Students will build a balsawood airplane and use it to learn the parts of a plane and how planes fly. Students will also have an opportunity to control a small remotely operated helicopter. Students will test their skills and fly the helicopter from one platform to another. Students will meet a pilot and learn about his exciting experiences flying and find out about careers in aviation. <i>Presented by David Price, Dean, Aviation Science and Greg Bongiorno Aviation Program Manager, Bridgewater State University.</i></p>	Activity
	<p>Lighting & Energy Demonstration</p>	

	Students will have the opportunity to explore current issues in energy generation and energy efficiency through a series of exercises and demonstrations. Students will learn basic fundamentals of how we see, how light is generated, how much energy is consumed. There will also be a short discussion and demonstrations of methods of electrical power demonstration with a focus on renewable energy sources. <i>Presented by Matthew H. Kane, Ph.D., Associate Professor, Engineering Department, Massachusetts Maritime Academy.</i>	Demonstration
	Woods Hole Oceanographic Institute (WHOI) Participate in a demonstration of force (using steel bars and levers). WHOI is one of the largest employers of scientists in the area (> 1250 scientific personnel). Woods Hole is one of four centers in a program sponsored jointly by the National Institute of Environmental Health Sciences (NIEHS) and the National Science Foundation (NSF). The Woods Hole Center is a joint effort involving scientists from the Woods Hole Oceanographic Institution (WHOI), the Marine Biological Laboratory (MBL), and the Massachusetts Institute of Technology (MIT). <i>Presented by Josh Eaton, Mechanical Engineer, WHOI, Falmouth, MA</i>	Demonstration
	Train Like a NASA Astronaut - GO Mission X! Go Astro-Charlie! Students attending the STEM Expo can participate in the Astro Agility Course used to train astronauts as part of the NASA program. The display will include curriculum based materials for teachers. Created in conjunction with First Lady Michelle Obama's "Let's Move!" initiative, the NASA program Mission X: Train Like an Astronaut is part of an international initiative to promote space education. Sharon Public Schools was among three school districts in the United States selected to participate as part of Team USA with 16 other countries. Under the direction of Tim Vigorito, physical education teacher at the Sharon Heights Elementary School, 3 rd , 4 th and 5 th grade students participated in a six week international physical fitness program beginning in February 2012. Along with NASA and the European Space Agency (ESA), Lockheed Martin supported the program by providing curriculum and technical assistance. On March 30, 2012, via a webcast, NASA Houston and astronauts thanked the students in Sharon who made up an integral portion of "Team USA 2012. <i>Presented by Tim Vigorito, Physical Education Teacher Sharon Public Schools-Heights Elementary School and Todd Vigorito, Social Studies Teacher, North Attleboro Middle School.</i>	Activity
<u>OTHER STEM MAJORS</u> <u>Precision Production Military Technology Mechanic/Repair Technician</u>	From Blueprint to Assembly Line – How Fast Can You Go? Who produces components for the medical, dental, aerospace, defense, semi-conductor and emerging technology industries such as dental implants, orthopedic implants, surgical tools, pins and valves. AccuRounds located in Avon, MA does. Meet professionals in the field of precision machining and learn about the manufacturing process and the importance of tolerance and precision in today's market. Using a blueprint, two teams (5 students each team) will compete. Given round components, they will use the blueprint to plan and implement the fastest way to assemble the components. <i>Presented by Kayla MacGregor, Process Engineer, AccuRounds, Diane Ferrera, HR Manager, AccuRounds and CNC Machinist TBA.</i>	Workshop
	Fueling Your Future Students will build circuit boards using schematics and actually create a working fan and light model. This activity demonstrates the connection between all four academic subjects: Science, Technology, Engineering and Math. This problem-solving activity will reinforce skills needed to work in a team as well as open discussion around career pathways related to STEM. Message: Importance of finishing school, taking rigorous academic classes in high school, and finding your passion. <i>Presented by Janice Tkaczyk, Universal Technical Institute.</i>	Workshop
	Testing Electricity Generated by Solar Power Students will use five small hand-held solar photo voltaic (pv) modules. Students will hold them to a Halogen light to simulate the sun and test the amount of electricity generated with a small meter. Activities include using a screen to show the difference between full sun and shade, using yardsticks to demonstrate how distance affects light/electrical output, and using Christmas lights and/or small cars to demonstrate output of solar electricity. Students will also see a visual demonstration of the operation of a photovoltaic cell at the atomic level on a lap-top. Faculty will explain what is happening and a member from a solar company will be available to talk about potential careers. <i>Presented by James Tressel, Department Chair of Physical Science, Russell VerNooy, Adjunct Technology Faculty, Massasoit Community College and Jonathan Piers, Regional PV Solar Manager, My Generation Energy.</i>	Activity
	CAD & The Real World Advanced CAD students from Taunton High School will demonstrate how computer aided design (CAD) connects to the real world. Students have won Boston Globe Scholastic Art awards – considered the most prestigious recognition program for teen artists in the United States. Students will demonstrate the software and present CAD drawings they have created including architectural plans of	Demonstration

	houses, buildings, and bridges, as well as 3D models. <i>Presented by Darla Hartung, Curriculum Supervisor, Industrial Technology (Co-CTE Director) and Taunton High School students.</i>	
	<p>Air Force Technology Information and models will illustrate the programs and advanced technology used by the U.S. Air Force. Technology includes aviation electronics, cyberspace and space programs. Complimentary items will be available such as key chains, mouse pads, water bottles and other goodies. <i>Presented by Staff Sergeant Derrick Mills, Air Force Recruiter Brockton, MA.</i></p>	Demonstration
	<p>The Civil War and STEM Innovation & invention is not unique to the 21st Century, as STEM skills have led to great advances in the past--often years before their time. Learn about the surprisingly advanced state of underwater salvage, exploration and warfare in the mid-nineteenth century, epitomized by the Civil War's first submarine, the Union Navy's Alligator. For information on the Alligator go to www.navyandmarine.org/alligator. <i>Presented by Chuck Veit, President of the Navy and Marine Living History Association and member of The Hunt for the Alligator Project (NOAA) and the Attleboro Area Civil War Commemorative Committee.</i></p>	Display
	<p>Iver2 - Autonomous Underwater Vehicle (AUV) Display and discuss the capabilities of the Iver2 Autonomous Underwater Vehicle (AUV). Show images of different types of sonar gathered from using the vehicle. Show the ability to manually operate the vehicle. Bring custom-made parts by mechanical engineers to display. Talk about the uses of the vehicles. Relate the science and technology of the AUV to various disciplines, subjects and careers. <i>Presented by Jane N. Staples, ATMC Intern Program Director, UMass Dartmouth Advanced Technology & Manufacturing Center (ATMC) and ATMC interns Christopher Hanna, Christopher Goonan, and Nick Polisenio.</i></p>	Display
	<p>Connections in Conductivity Experience the integration of science and the arts! Participants will explore design elements of simple circuits and create musical instruments using Arduino open-source prototyping micro-controllers. <i>Presented Clay Conley and Rebecca Tremblay, Cape Cod Community College STEM Club students.</i></p>	Demonstration
	<p>STEM Resources <i>The STEM Resources area provides information on a variety of programs that support STEM initiatives, including Museum Institute for Teaching Science (MITS), the MA STEM Plan and the SE STEM Network.</i></p> <p>Learn How to Establish a STEM Scholarship Learn how to work with a local college or university to establish a STEM scholarship for students in your school district. Information and sample templates will be available. Working with the Bristol Community College (BCC) Foundation, Michael Lasko, BCC student, established a STEM scholarship for a female and a male graduate of Attleboro High School as part of a community service learning project. Find out about the initial steps to establishing a scholarship, setting the criteria for recipients, finding an institution to manage the fund, and how to Involve the community, i.e., businesses, citizens, and local media, to fund the scholarship. <i>Presented by Michael Lasko, Bristol Community Student, and Ken Beauregard, Registered Nurse, Rhode Island Hospital-Neuro Intensive Care Unit.</i></p> <p>The RE-SEED Program Meet RE-SEED volunteers who work with K-12 classroom science teachers and enhance science education with experiments and demonstrations. See examples of experimental materials and class room demos. Learn about how you might use RE-SEED, which is an outreach program of the STEM Center at Northeastern University. <i>Presented by Randy Moore, retired mechanical engineer - former principal systems engineer on space telescopes , RE-SEED volunteer.</i></p>	Display