Berkshire STEM Network

Strategic Plan 2006-2009

Goal 1: Increase students' interest in science, technology, engineering, & mathematics

Increasing student interest in science, technology, engineering and mathematics, both as fields of study and as potential careers is critical to the economic development of Berkshire County. The Network and its members will nurture students' interest by expanding the number and range of activities that introduce students to STEM fields in innovative and engaging ways. Our primary measure of success with this goal will be the number of students who participate in activities designed to build interest in STEM fields. By 2009 we hope to expose 10% of Berkshire county K-12 students to at least one STEM interest-building activity per year. In addition, we will track students' intentions to major in STEM fields in college as a long term indicator of our progress.

Activity	**Lead Agency/ Contact**	**FY 2006 (7/1/05 to 6/30/06)**	**FY 2007 (7/1/06 to 6/30/07)**	**FY 2008 (7/1/07 to 6/30/08)**	**FY 2009 (7/1/08 to 6/30/09)**
Got Math?	BCC/ Charlie Kaminski	--	Target: 100 students Actual:	Target: 100 students	Target: 100 students
High School Science Fair	MCLA/ Monica Joslin	Actual: 69 high school students	Target: 75 students Actual: 116 students	Original Target: 90 students Revised Target: 139	Target: 120 students
Middle School Science Fair	North Adams Schools/ Melodie Goodwin	Actual: 67 middle school students	Target: 75 students Actual: 100 students	Original Target: 90 students Revised Target: 120	Target: 120 students
STEM Career Fair	BCC/ Julie Hannum	--	Target: 300 Actual: 300	Target: 300 students	Target: 350 students
Bose In Harmony with Education	MCLA/ Lisa Provencher	Actual: 1244 middle school students	Target: 2000	Target = 2000	Target = 2000
Living Landscapes	Berkshire Museum/ Maria Mingalone	--	Actual: 408 elementary students	Target: 400 students	Target: 400 students
Connected for Success	Conte Community School/Berkshire Museum	Actual: 45 students	Actual: 45 students	Target: 45 students	Target: 45 students
Creative Schools Partnership	Crosby Elementary/ Berkshire Museum	Actual: 173 elementary school students	Actual: 162 elementary school students	Target: 180 students	Target: 180 students
Living Landscapes--Teaching in Nature (Classroom Modeling and Museum Visit)	Berkshire Museum and Adams-Cheshire Regional School District		Actual: 408 students	Target: 408 students	Target: 408 students
Berkshire Wireless	North Adams &	North Adams: 147	North Adams: 370		

Learning Initiative	Pittsfield Schools	Pittsfield Public: 497 Pittsfield Catholic: 61	Pittsfield Public: 1434 Pittsfield Catholic: 148		
Middle School Robotics Camp	MCLA Physics Dept.	Actual : 20	Actual : 20	Target: 20	Target: 20
Elementary Summer Science Camp	North Adams Schools/Noella Carlow	Actual: 97	Actual: 125		
Space Race	MCLA/ Mike Dalton		Actual: 28	Target: 25	Target: 25
Berkshire Robotics Challenge	BATC/Denise Johns	Actual: 166 students	Actual: 130 students		
Young Women in Science Summer Program	Flying Cloud Institute/Jane Burke	Actual: 25	Actual: 25	Target: 28 Actual: 24	Target: 28
Young Women in Science School Year Program	Flying Cloud Institute/Jane Burke	Actual: 450	Actual: 450	Target: 450	--
Robotics After School Program	Flying Cloud Institute/Jane Burke	Actual: 15	Actual: 24	Target: 30	--
Berkshire Environmental Education Network Annual Conference	Flying Cloud Institute/Jane Burke	Actual: 70	Actual: 150	Target: 180	--
Flying Cloud Summer Programs (sessions I, II, and III)	Flying Cloud Institute/Jane Burke	Actual: 100	Actual:125	Target: 125	--
STOMP (Student Teacher Outreach Mentoring Program)	Flying Cloud Institute/Jane Burke	Actual: 170	Actual: 230	Target: 500	--
GIRLS! In Science	Flying Cloud Institute/Jane Burke	Actual: 14	Actual: 22	Target: 25	--
Mt. Everett After Hours—Science Programs	Flying Cloud Institute/Jane Burke	--	Actual: 20	Target: 25	--
Math/Art/Science Residencies	Flying Cloud Institute/Jane Burke	Actual: 160	Actual: 300	Target: 350	--
Creative Schools Program (teaching math and science through the arts)	Flying Cloud Institute and SBRSD/Jane Burke	--	Actual: 275	Target: 350	--

Goal 2: Increase availability of STEM K-12 teachers

Shortages of STEM faculty at the middle and high school levels and of mathematics specialists at the elementary level pose a significant challenge to Berkshire County School Districts. Institutions of higher education can play a critical role in the development of STEM-qualified faculty.

The proportion of middle and high school STEM positions held by appropriately licensed faculty will be our chief measure of success in increasing the availability of STEM teachers.

Activity	***Lead Agency/ Contact***	***FY 2006 (7/1/05 to 6/30/06)***	***FY 2007 (7/1/06 to 6/30/07)***	***FY 2008 (7/1/07 to 6/30/08)***	***FY 2009 (7/1/08 to 6/30/09)***
MMSP Science PD	MLCA/	Actual: 11	Actual: 15	--	--

	Adrienne Wootters				
MMSP Math PD	MCLA/ Freda Bennett	Actual:11	Actual: 7	--	--

Goal 3: Increase the quality of STEM education through professional development for K-12 faculty

Student interest in STEM fields will also benefit through more engaging and innovative STEM education in our regular education curriculum. Providing professional development for faculty to improve their knowledge of STEM fields and share best practices in STEM education will help the Network enhance the quality of STEM education in Berkshire County. In addition, access to resources such as equipment, curricula, and opportunities to share information and ideas with colleagues can enable faculty to improve the quality of their teaching.

Our major indicators of success in advancing the quality of STEM education through professional development will be the number of faculty exposed to STEM-related professional development on an annual basis, as well as the number of faculty who access resources from the STEM Resource Center housed at MCLA.

Activity	***Lead Agency/ Contact***	***FY 2006 (7/1/05 to 6/30/06)***	***FY 2007 (7/1/06 to 6/30/07)***	***FY 2008 (7/1/07 to 6/30/08)***	***FY 2009 (7/1/08 to 6/30/09)***
STEM Saturday Seminars	MCLA/ Lisa Provencher	--	--	Target: 20	Target: 20
STEM Summit	MCLA/ Lisa Provencher	Actual: 59	NA	Target: 100	Target: 100
STEM Resource Center/website	MCLA/ Lisa Provencher	Actual:1106 hits	Target: 1300 hits	Target: 1300 hits	Target: 1300 hits
STEM Fellows Program	MCLA/Lisa Provencher	--	Target: 6 Actual: 4	Target: 6	Target: 6
MITS (Museum Institute for Teaching Science)	Berkshire Museum/ Joanne Harnden	Actual: 15 teachers	Actual: 13 teachers	Target: 15 teachers	Target: 15 teachers
Living Classrooms--Teaching in Nature Professional Development	Berkshire Museum/ Maria Mingalone		Actual: 10 teachers	Target: 30 teachers	Target: 30
Living Landscapes--Teaching in Nature Professional Development In-Service for Adams Cheshire Reg. School District	Berkshire Museum/Maria Mingalone		Actual: 63 teachers (k-6)	Target: 63 teachers	Target: 63 teachers
Engineering is Elementary	Boston Museum of Science/ Lisa Provencher		Actual: 14 Teachers	Target: 20 Actual: 14	Target: 20
Renewable Energy Course	MCLA/ Center for Ecological Technologies/ Monica Joslin		Actual: 12	Target: 20	Target: 20
Evolution Workshop	MCLA/ Lisa Provencher		Actual: 20	NA	Target: 20
Upper Housatonic River Valley Course	MCLA/BCC/ Monica Joslin		Actual: 9	Target: 16 Actual: 16	Target: 15
Berkshire Environmental School Team	CET/ Nancy Niland Cynthia Gribaldi	--	Actual: 11	NA	NA
Robotics	Flying Cloud Institute/Jane Burke	Actual: 7	Actual: 11	Target: 28	--
Berkshire Environmental Education Network (conference prep workshop for teachers)	Flying Cloud Institute/Jane Burke	Actual: 32	Actual: 34	Target: 40	--

Creative Schools Grant	Flying Cloud Institute/Jane Burke	--	Actual: 22	Target: 25	--
Math/Art/Science Residencies	Flying Cloud Institute/Jane Burke	Actual: 10	Actual: 15	Target: 20	--

Goal 4: Increase interactive involvement of business and education in STEM-related fields

To ensure that STEM education is aligned with the needs of county employers, the Network seeks to develop a closer collaboration between business and education in the planning and delivery of STEM education. Moreover, student interest in STEM fields and careers is greatly enhanced when students can see first hand the practical application of their developing skills to real-world problems.

A variety of Network activities will give businesses meaningful roles to play both in helping shape our STEM initiative and in working directly with students and faculty.

Our indicator of success for this goal will be the number of businesses actively involved in the STEM Network and its activities.

Activity	***Lead Agency/ Contact***	***FY 2006 (7/1/05 to 6/30/06)***	***FY 2007 (7/1/06 to 6/30/07)***	***FY 2008 (7/1/07 to 6/30/08)***	***FY 2009 (7/1/08 to 6/30/09)***
STEM Career Fair	BCC/ Julie Hannum	--	--	Target: 25 employers	Target: 30 employers
Got Math?	BCC/ Charlie Kominsky	Actual: 4	Actual: 6	Actual: 4	
STEM Steering Committee Meetings	MCLA/ Monica Joslin	Actual:	Actual: 3	Actual: 4	Target: 4

Appendix--Activity Descriptions

Activity	***Lead Agency/ Contact***	***Activity Description***
Berkshire Environmental Education Network Annual Conference	Flying Cloud Institute/Jane Burke	Brings together educators and non profits across Berkshire County to discuss their programs in environmental education and to make plans for collaboration. Provides services of a consultant for teacher support. Annual Student Environmental Expo for students grades 4-12 share their work through lecture presentations and workshops.
Berkshire Environmental School Team	CET/ Nancy Nylen	This program is a collaboration between MCLA and CET. It offers a one-week, three-credit course for elementary school teachers in developing environmental education units.
Berkshire Robotics Challenge	BATC/Denise Johns	The BRC is a competition in which students ages 8 to 15 build their science and technology skills while designing and programming a robot. Students work in teams toward a competitive goal, while learning problem-solving, teamwork, and good sportsmanship. This event, based on First Lego league challenge, prepares students for potential participation in the state-wide contest.
Berkshire Wireless Learning Initiative	North Adams & Pittsfield Schools	Beginning in 2005-06, the Berkshire Wireless Learning Initiative introduced 1:1 laptops into area middle schools to transform teaching and learning. Every teacher and every 6th, 7th, and 8th grader has access to a their own laptop throughout the school day in the St. Mark School; Herrberg and Reid Middle Schools in Pittsfield; and the Conte Middle School in North Adams. Teachers also receive significant training to help them learn to use laptops as effective instructional tools.
BWLI Instructional Technology Training	North Adams/ Pittsfield Schools/ Mary Nash	The BWLI program places laptop computers on the hands of each middle school student and provides training to faculty on the integration of technology into instruction. Currently, three middle schools in Berkshire County are involved in the project.
Bose In Harmony with Education	MCLA/ Lisa Provencher	In Harmony with Education" is an interdisciplinary hands-on music curriculum for middle schoolers taught by college students that allow the participants to see, hear and feel the power and beauty of music as it demonstrates the nature and science of the sounds that surround them. Held at MCLA 2006.
Creative Schools Program (teaching math and science through the arts)	Flying Cloud Institute and SBRSD/Jane Burke	FCI designs and implements year-long interdisciplinary project where artists work in the classroom with math and science teachers. Students learn concepts through dance, visual arts, music, and theater. FCI also coordinates environmental education with staff training on topics such as Wetlands Trail, Housatonic River, Winter Ecology and residencies in dance to teach concepts in math and science.
Elementary Summer Science Camp	North Adams Schools/Noella Carlow	Since 2005, the Elementary Summer Science Camp has met for 4 weeks at Brayton Elementary School in North Adams. Children entering grades 1 to 5 are engaged in hand-on science exploration activities by certified teachers, and also practice their math and reading skills through the camp's integrated approach to curriculum.
Engineering is Elementary	Boston Museum of Science/ Lisa Provencher	Engineering is Elementary is a new research-based series of 20 curriculum units for grades 1-5 developed by the Boston Museum of Science that introduces elementary students to engineering and technology concepts and skills. Activities include real-world problem-solving such as designing bridges, windmills, water filters, plant pollinators, alarm circuits, erosion control, solar-powered homes, dams, prosthetics, and more.
Evolution Workshop	MCLA/ Lisa Provencher	This course is a general introduction to evolution intended for high school and middle school science teachers to help teachers address the Massachusetts State Learning Standards and MCAS for teaching evolution. The format of the course will be lecture, group discussions, presentations, hands-on experiences and short field trips. Collaboration between UMass, MCLA, Williams College and BCC.
Flying Cloud Summer Programs (sessions I, II, and III)	Flying Cloud Institute/Jane Burke	Children ages 5-14 to explore their creativity in the Sciences, Visual Arts, and Performing Arts guided by professionals in these fields.
GIRLS! In Science	Flying Cloud	Advanced secondary students from Young Women in Science are trained by women scientists to lead this weekly

	Institute/Jane Burke	after school club for girls in grades 4 and 5 at Undermountain Elementary. Girls have laboratory experiences in biology, physics, engineering, and chemistry.
Got Math?	BCC/ Charlie Kaminski	Got Math? is an after school program designed to connect elementary school students, college student mentors and local businesses together to explore mathematics. The focus of the program is to discover and understand how mathematics is used in the work place. The program runs during the school year two days per week for a 6 to 10 week session.
High School Science Fair	MCLA/ Monica Joslin	MCLA and the Berkshire STEM Pipeline host the annual Region I State Science Fair for high school students. This fair provides students the opportunity to explore and share their knowledge of science and technology with peers from surrounding communities. It serves as a preliminary competition to the state and International Science and Engineering Fairs.
Living Landscapes	Berkshire Museum/ Maria Mingalone	Living Landscapes: Teaching in Nature uses outdoor experiential learning to support core subjects in the elementary classroom—math, English language arts, science, and the arts—and provides easy to-follow lessons that use the school grounds and on-hand materials. This program consists of three components: professional development for teachers, classroom modeling by museum educators, and museum visits.
MCLA Middle/High School Math Teacher Certification Program	MCLA/ Ellen Barber	
MCLA Technology Integration Specialist Program	MCLA/ Dawn Rodriguez	The emphasis of the program is on inquiry and project-based approaches to technology integration across the curriculum. Teachers design standards-based units or projects for their technology-enhanced classrooms.
Middle School Robotics Camp	MCLA Physics Dept.	This camp is designed for students ages 9-14. Working with the Legos Mindstorms Robotics System, campers will learn all the skills they need to construct new robotics kits. Additional science projects, field trips, swimming, games and movies provide campers with a well-rounded learning and recreational experience.
Middle School Science Fair	North Adams Schools/ Melodie Goodwin	MCLA and the Berkshire STEM Pipeline host the annual Region I State Science Fair for middle school students. This fair provides students the opportunity to explore and share their knowledge of science and technology with peers from surrounding communities. It serves as a preliminary competition to the state and International Science and Engineering Fairs.
MITS (Museum Institute for Teaching Science)	Berkshire Museum/ Curtis Asch	"The Museum Institute for Teaching Science (MITS) is dedicated to promoting inquiry-based, hands-on learning in the classroom through collaborations with Museums and other institutions. MITS provides Summer Institutes for educators, with a different focusing topic each year. Past topics include: Design, Models, Integrating Science Across the Curriculum, Watery Worlds, and Backyard Science. Participating educators visit places like Pleasant Valley Wildlife Sanctuary and the Berkshire Botanical Garden, while gaining new ideas from workshop presenters and other educators."
MMSP Science PD	MLCA/ Adrienne Wootters	Provided content-based professional development through graduate courses aimed at middle school science teachers. The program offered three year-long courses from 9/05 to 6/07.
MMSP Math PD	MCLA/ Freda Bennett	Provided content-based professional development through graduate courses aimed at middle school math teachers. The program offered four semester-long courses from 9/06 to 6/07.
Mt. Everett After Hours—Science Programs	Flying Cloud Institute/Jane Burke	FCI offers workshops for grades 7-12 in music, dance, visual arts and science and Staff Development Day Workshops for grades 1-6 (three hour sessions once a month covering science, visual and performing arts topics).
Project Lead the Way	McCann	PLTW is the pre-engineering program at McCann Technical School, which focuses on hands-on, project-based learning and connections with real-world science applications at area businesses.
Renewable Energy Course	MCLA/ Center for Ecological Technologies/ Monica Joslin	This one-week course is a comprehensive introduction to environmental science for elementary and middle school teachers. Co-taught by Mike Ganger, Adrienne Wootters of MCLA and Nancy Nylen and Cynthia Grippadi, representatives from CET based in Pittsfield. Topics to be explored : recycling, energy conservation and renewable energy in the home and school environments. Participants will apply their knowledge to lessen the environmental impact of their schools and in turn their homes and communities.

Robotics After School Program	Flying Cloud Institute/Jane Burke	FCI offers a weekly after school program in Robotics as well as a 4 week teacher training on developing curricular units on robotics.
Space Race	MCLA/ Mike Dalton	A high school computer programming contest is held each year in May; the theme of the 2007 competition was "Space Race." Contestants wrote programs to help their fictitious Space Race team win the race.
STEM Career Fair	BCC/ Julie Hannum	The STEM Career Fair, to be held in Fall 2007 at BCC, will connect high school students with career opportunities related to STEM subjects through interactive employer booths and displays, an educational resource center, student workshops, and networking and curriculum development panels for teachers.
STEM Fellows Program	MCLA/Lisa Provencher	The STEM Fellows Project provides six teachers in the region with tailored professional development each year. The participating Fellows will create curriculum modules to implement in their classrooms and will participate in a year-long astronomy fellowship using the Starlab Inflatable Planetarium**.** This frameworks-based experiences provides the fellows with science and math content (based on the State Science and Technology/Engineering Frameworks) through inquiry and project-based instruction.
STEM Resource Center/website	MCLA/ Lisa Provencher	http://www.mcla.edu/pipeline/
STEM Saturday Seminars	MCLA/ Lisa Provencher	Saturday Seminars are half-day professional development opportunities for STEM teachers offered in the fall of 2007and funded by the Pipeline Grant. The five topics covered were: Lego Mindstorms, Project Based and Inquiry Based learning, McGyver Electronics Camp, BioTechnology Workshop, and Toying with Science.
STEM Steering Committee	MCLA/ Monica Joslin	The STEM Steering Committee consists of members from the business and education communities; the committee focuses its work on oversight of the STEM Pipeline grant and the advancement of STEM-education activities throughout Berkshire County.
STEM Summit	MCLA/ Lisa Provencher	Berkshire County institutions gathered at MCLA to put together a strategy that would increase STEM activities, student awareness, and participation in STEM careers and teaching opportunities.
STOMP (Student Teacher Outreach Mentoring Program)	Flying Cloud Institute/Jane Burke	This program offers training in LEGO robotics for elementary school teachers and girls from the advanced Young Women in Science program who assist in the classroom. FCI develops curriculum units that use robotics to teach Astronomy, Biology, and Physics learning standards in third through sixth grades. It also supports LEGO teams at Undermountain Elementary
Tech Prep	BCC/ Heather Shogry	Tech Prep is a collaboration between Berkshire Community College and 11 Berkshire County high schools. This 2+2 program begins in a students' junior year with academic, technical, and workplace-based learning and culminates in the attainment of an associates' degree from BCC.
Upper Housatonic River Valley Course	MCLA/BCC/ Monica Joslin	Intended for K-12 teachers of history, social studies, English, science, business and industrial technology, this course introduces and integrates various aspects of the heritage of the Upper Housatonic River Valley – the social, cultural, economic and industrial history of the valley, the ecology of the river throughout that history. Teachers design projects that will infuse this information into their classrooms while meeting the appropriate standards. Field trips to local cultural, environmental, and business sites and presentations by guest lecturers will be a major portion of the course.
Young Women in Science School Year Program	Flying Cloud Institute/Jane Burke	Young Women in Science (YWIS) program supports middle and high school girls who are interested in science by providing them with the opportunity to work directly with women who are practicing research scientists. FCI works with classroom teachers to bring women scientists directly into the classrooms to enhance learning. The scientists deliver lectures and demonstrations about fields of expertise matching topics studied by students: Astronomy,

		Engineering; Chemistry; DNA; Environmental Science.
Young Women in Science Summer Program	Flying Cloud Institute/Jane Burke	One week intensives are held at the Fisher Science Center at Simon's Rock College to enable girls to have authentic hands-on experiences in the well equipped laboratories under the supervision of women research scientists. Middle school girls (in the Introductory Session) are introduced to different fields by spending a half day with each of the eight women research scientists from around the Northeast who volunteer to be presenters. They discuss their lives in science and involve the girls in hands on laboratory research. High school girls (in Emily's Project) investigate of one area of study. In the 2006 it was engineering with a project to design and build boats, then race in them across a pool. The visiting women scientists included project advisors in physics, robotics, and biochemical and tissue engineering.