NSRDEC STEM Brief
August 2010

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Workforce Development

US Army – Massachusetts STEM K-12+ Outreach

US ARMY RDECOM

US ARMY NATICK SOLDIER RD&E CENTER

NSSC STEM Program – 2009

Approach:

- Teachers from Hopedale, Framingham, Natick, Franklin, Holliston & Needham (plus Framingham State College Curriculum Advisor)
- Sub-workgroups partnering with ARMY STEM Professionals

Results:

- Critical gap areas identified - content support for
  1) Engineering and technology curriculum
  2) Real world materials to support science curriculum

Challenges:

1) Budgetary concerns
2) Link to MCAS
3) Time constraints

Near Term Objectives:

- Materials World Modules
- Boston Museum of Science middle school pilots
- US Army NSRDEC STEM Teaching Lab
- Math Enrichment - Dimension M Tabula Digita

Key Enablers

- National Defense Education Program
  - LabTV
  - Materials World Modules
  - US First Robotics
  - Boston Museum of Science
  - SMART Scholarship Program
- Army Educational Outreach Program
  - eCYBERMISSION
  - Army Outreach Coordinator Network
- MA STEM Alliance and Networks
- Most valuable resource
  - DoD/ARMY STEM professionals

Teacher Training: Science and Math

MWM Materials World Modules

Material science based:

- Training on Inquiry-based learning
- Compelling introductory exercise for classroom
- 4-5 hands-on exploratory activities (repeatable)
- Final team based design project

*** Mentoring by STEM Professionals**

* **Partner w/ Framingham State College = Graduate Credit/Follow-up**

Over 100 teachers Trained in 2010

tabula digita™

Enhancing math education:

- Video game based learning
- Enabling mastery of multifaceted math concepts
- Highly interactive

*** Mentoring by STEM Professionals**

Sponsored site license for 4 schools

Engineering and Technology

- National Defense Education Program:
- Supporting 3 high school Robotics Teams
  - Tri-County Regional Vocational, Franklin (Rookie Team)
  - Natick, 2nd year team
  - Holliston, seasoned team
- Lego League Team
  - John F. Kennedy Middle School Natick
- Over 25 S&Es participated as mentors/coaches
  - Including Army prototype shop tours
- Hosted Robotics Day May 2010
- NEW SEASON: 8 grant applications

Engineering & Technology

- Natick HS partnership
- Land & sea robotics – 2010 summer camp
- Robotics program (2010/2011 school year):
  - SeaPerch based curriculum
  - Real world design objective
  - Linked to biology & other subjects (e.g., sample from local pond)
- Real world community project: design for Natick Fire/Rescue Dive Team

seaperch TEACH • BUILD • BECOME

FRC FIRST Robotics Competition

NATICK FIRE DEPT

Content: Engineering & Technology

Parachute Development Challenge

Developed by Army Parachute Technologist

- Textile Technology
- Engineering
- Material Science

Design kit

- Build a “payload”
- Design various size parachutes
- Drop test to analyze performance

Materials investigation

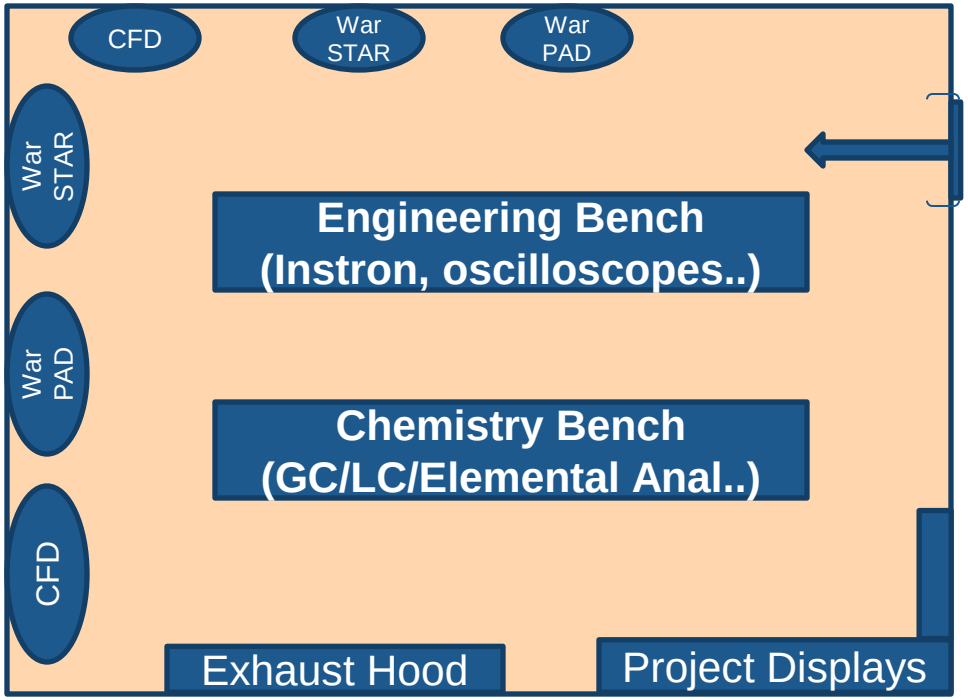
- Understanding the properties of materials
- Performance using different materials

Collaboration w/ Franklin Middle School teachers to link to current curriculum

Coming in November 2010: STEM Resource Center

Teachers need more specialized equipment than their school districts can provide. This is an affordable method to provide this resource to a broader audience.

- Lab capabilities:
  - Engineering Bench
  - Chemistry Bench
  - 2 flat topped lab benches
  - Exhaust hood
  - Floor space for exhibits
- ** Army STEM Mentors



MA Math & Science Initiative -2010

- Partner/mentor MA school districts:
  - Bellingham – lead school
  - 2 addt'l schools will be added
  - AP focus
- Schools meet the following criteria:
  - Outreach schools in rural areas
  - Historically low enrollment/scores in AP
  - Willingness to invest in improving
- Value of Grant: ~230k to each school
  - Teacher support
  - Student support
  - Program management
  - Awards
- Army/NSSC as school partner/mentor
  - Focus in life sciences area
  - SMEs/mentors
  - Materials World Modules (biodegradable and biosensors)
  - Collaborate with other industry partners

TEACHERS - LIFT2 Program

Leadership Initiatives
for Teaching and Technology

Philosophy: No education variable matters more than a highly qualified TEACHER

Program Includes:
- Industry Externship
- 3 graduate level courses
- Inclusion in STEM learning community

Final Products:
- Leadership presentations
- Integrating technology in the classroom
- Classroom instructional units

Supported by MA STEM Pipeline

MA participating organizations:

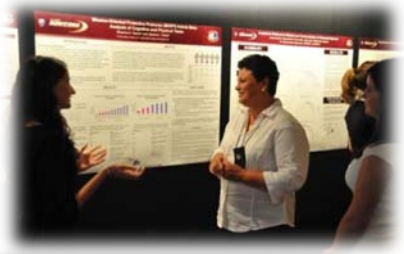
NSRDEC Student Programs

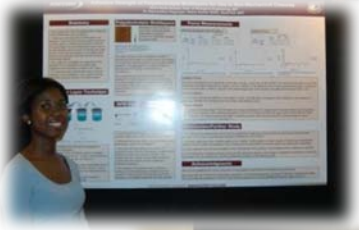
GOAL:

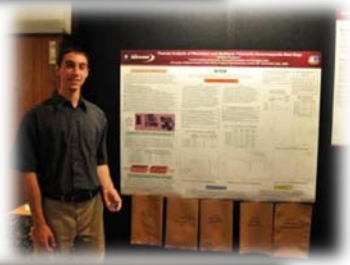
Engage students in real world projects that provide hands-on practical experience; develop well-rounded skills; invest in our future workforce

CURRENT PROGRAMS:

- 120+ Student Temporary Employment Program (STEP)
  - High School / Undergrad / Grad programs
- 25 Career Related Experience in Science & Technology (CREST)
  - Undergrad / Grad programs
  - Leads to full time employment & may include tuition assistance
- 8 DoD Science, Mathematics, and Research for Transformation Program (SMART) Scholars
- 4 NEW Vocational Technical Co-op Program







Reaching Diverse Groups

- Saturday STEM Academy
- New England Latino STEM Alliance
- Boston College Urban Ecology
  - College Bound Program
- Future - Talent Connect

Proposed Investment: Talent Connect

- Establish a “community of practice” among STEM Stakeholders in MA
- On-line recruitment tool with direct access to national colleges/universities
- Match talent prospects early in the student’s education
- Tool to improve diversity recruitment efforts (tap into national talent)
- Track
  - Outcomes of education program investments
  - Student progress (through transcripts)
- Provide opportunities to link STEM professionals to teachers

NSSC STEM Program

- Program has full support of NSSC Leadership

- DoD Model Program
  - Multiplier effect through partnerships
  - Involvement of STEM professionals
  - Link to workforce development

- Goal is to develop partnerships
  - Sustain outreach efforts
  - Share program costs
  - Ensure interest long term