National Defense Education Program
K-12 Pre-Engineering Program

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ASEE 7th Annual Workshop
K-12 Workshop Program

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"So I want to persuade you to spend time in the classroom, talking – and showing - young people what it is that your work can mean, and what it means to you… Think about new and creative ways to engage young people in science and engineering, like science festivals, robotics competitions, and fairs that encourage young people to create, build, and invent – to be makers of things."

President Barack Obama to the National Academies of Science and Engineering, 27 April 2009
Why DoD Cares

- Undergraduate and Graduate STEM Students: 500,000 U.S. university students studying STEM Fields
- Extended DoD Technical Workforce: > 7.4 million technical workers at industries, universities and colleges related to DoD mission areas
- DoD’s Technical Workforce:
  - 100,000 DoD S&E’s
  - 200,000 Federal S&E’s
  - 670,000 DoD employees
  - 2,700,000 Federal employees
- Elementary, Middle School and High School Students: Approximately 42,000,000 students

The Department of Defense employs nearly half of all Federal physical scientists, technologists, engineers, and mathematicians.
Defense Department Interest in STEM Education

What we are doing
• Stimulating and encouraging student interest in STEM fields
• Establishing teacher-scientist/engineer partnerships for STEM
• Providing professional development training to teachers
• Mentoring students, providing career and technical expertise guidance
• Exploring long-term STEM education and outreach commitments
• Establishing Department-wide policies / resources for STEM education
• Promoting STEM education integration across the federal government

What we are not doing:
• Recruiting for DoD military (or civilian) service
• Taking over the classroom
• Dictating STEM curricula to participating communities
NDEP Programs (K-12)

- Local partnerships
  - Collaboration with schools near DoD research laboratories, engineering centers and bases
- Providing STEM support to teachers
  - LabTV makes STEM career options “come to life”
  - Summer Institute Teacher Training Workshops
  - Local community STEM Learning Module training workshops
  - NDEP website portal with local emphasis for resource sharing
- Student mentoring

Community partnerships between teachers and defense scientists and engineers. Hands-on classroom activities – where the students are!
NDEP K-12 Program States

Army locations: AL, AR, IL, MD, MA, MI, MS, MO, NJ

Navy locations: CA, FL, HI, SC, RI, MS, PA, MD, VA, WA

Air Force locations: AK, CO, FL, GA, NM, NY, OH, TX, UT
Pre-Engineering Program (K-12)

- National partnerships
  - Museum of Science, Boston
  - US FIRST Robotics
  - MATHCOUNTS
  - Center for Excellent in Education
  - Professional Societies
    - American Society of Engineering Education (ASEE)
  - Federal Agencies
    - Dept Ed, NSF, DoE, NOAA, NASA, etc
- Industry

Leveraging stakeholder agencies and organizations for high quality STEM educational content, outreach opportunities and human capital expertise.
NDEP website = http://www.ndep.us
Summary:

• National Partnerships
  • US FIRST, MATHCOUNTS Club Teams
  • Museum of Science (Boston)
  • Professional Society’s
    • ASEE, etc.

• Local Partnerships
  • Support Teacher – S&E professional development training
    • CASE Summer Institute workshops (July)
    • Professional development training workshops (in local communities)
    • Lab visits, guest lecturers, etc.
  • STEM Learning tools
    • MWM, Tabula Digita, Calc Robot, Sea Perch, etc.
  • Community information and needs
    • “Bubble Charts” show community footprint
    • Quad charts of local K-12 education and outreach activity

• Communication
  • NDEP website
    • Nation-wide STEM collaboration portal
      • STEM content, material sharing
      • K-12 home pages for participating sites
    • Expanded LabTV topics, LabTV supplemental material
    • Public service messages (NCIS)
NDEP K-12 Program

Highlights:

• Lab/School District partnership in (23+ states)
  • More than 463 teachers, 111 Defense S&E trained, 380+ Defense S&E participants
  • Approx 215 schools and 46,300 students
• Support MATHCOUNTS Club Program 7,500 kits
• Sponsor students at CEE Summer Research Institute at MIT
• Support STEM module development and conduct professional development training
  • Four 1-Week Summer Teacher Training Institutes in McHenry, MD
  • Multiple SLM professional development training workshops conducted in Defense communities
  • Training to enhance Teacher/S&E partnership
  • “Tabula Digita” for MS mathematics
  • Calculator Robot module for MS mathematics
• Support school district need for training and inquiry-based tools
• NDEP website (www.ndep.us): developed defense laboratory-based high impact video’s (LabTV) to promote STEM career opportunities.
  • LabTV
  • K-12 home page for participating sites
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