INSPIRING THE FUTURE

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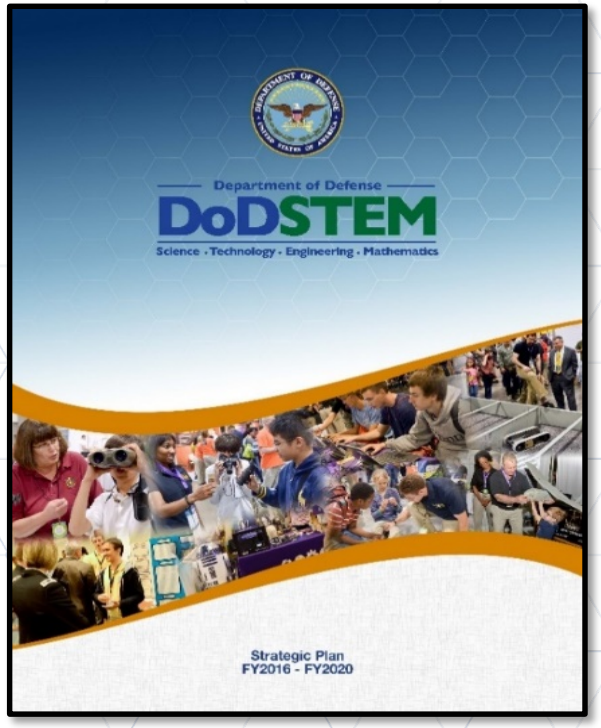
Department of Defense DoDSTEM
Science · Technology · Engineering · Mathematics

DSEC DEFENSE STEM EDUCATION CONSORTIUM

DoD STEM

Providing unique STEM learning experiences for K through College students and teachers through scholarships, competitions, research internships/apprenticeships, fellowships, and other STEM enrichment activities

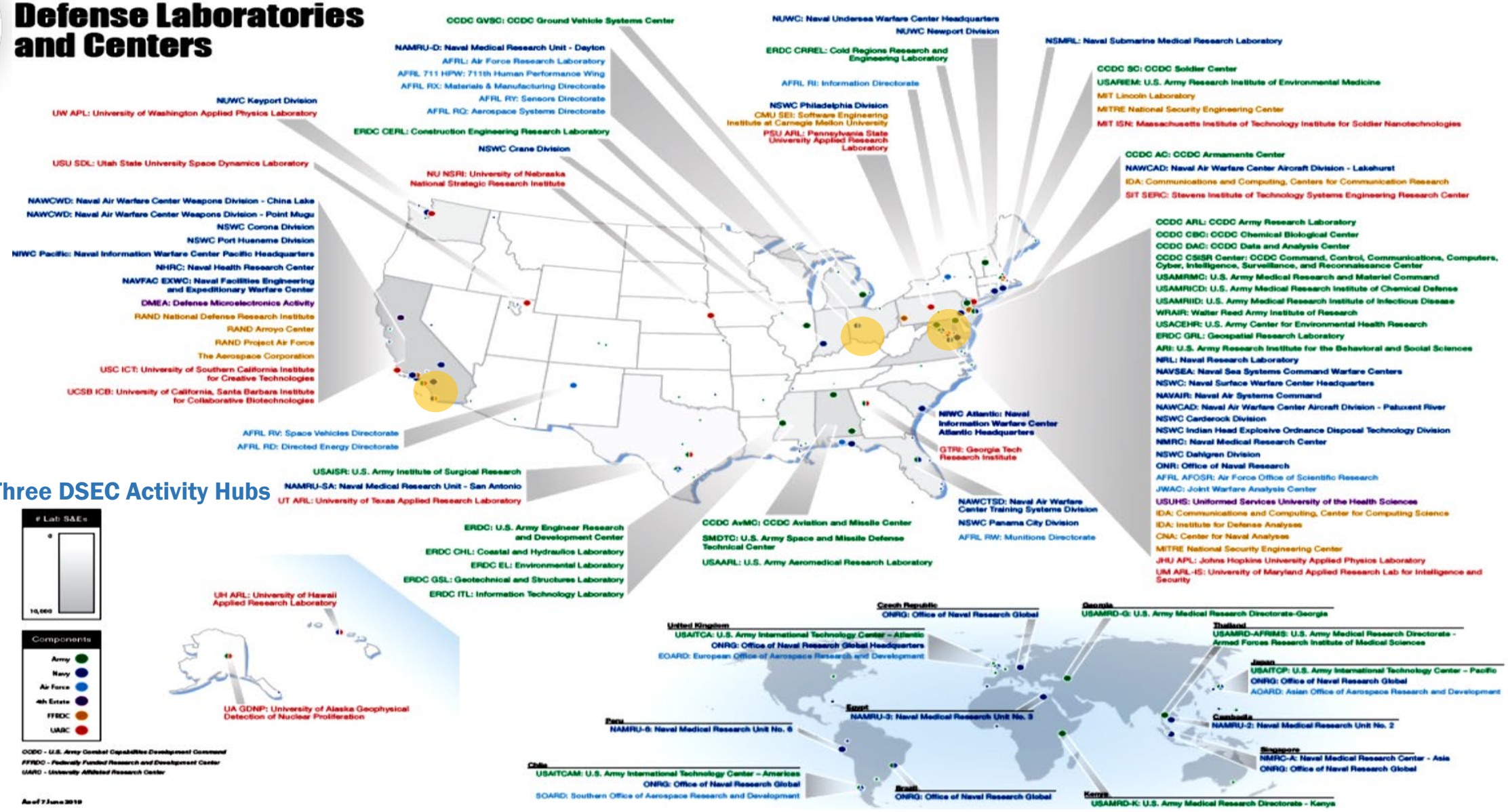
- **Vision and Mission:** Create a STEM talent pool with minds for innovation, diversity of thought, and the technical agility to sustain the Department's competitive edge. Attract, inspire, and develop exceptional STEM talent across the education continuum to enrich our current and future DoD workforce to meet defense technological challenges.
- **National Defense Education Program** (NDEP)
  - SMART Scholarship
  - K through College STEM Education & Outreach
  - Manufacturing Engineering Education Program
- **DoD Component Programs**
  - Army, Navy, Air Force, Fourth Estate



www.dodSTEM.us

Why DoD Invests in STEM Education

Defense Laboratories and Centers



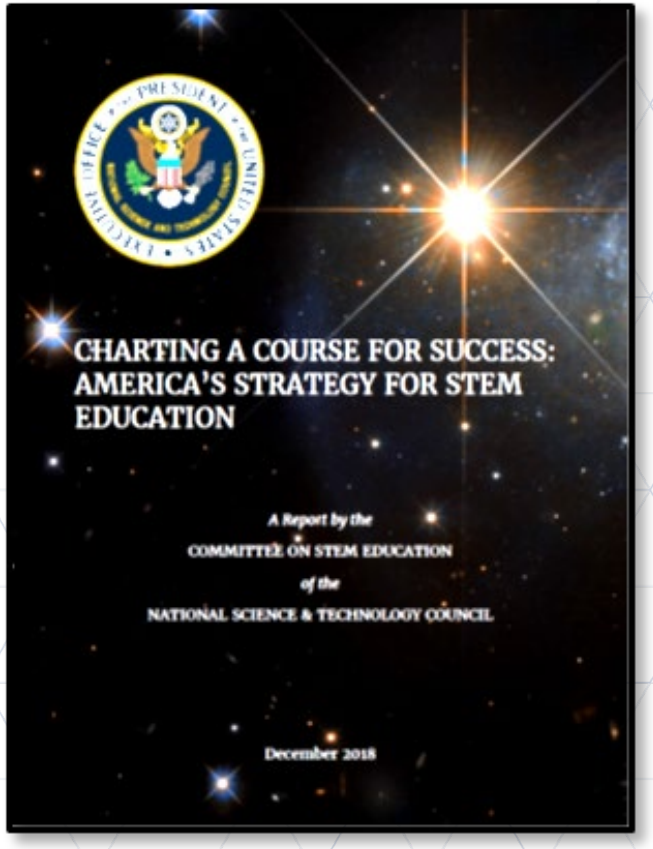
- Three DSEC Activity Hubs

Leveraging the 60 Defense Laboratories and the 50K+ Science & Engineering Workforce

Federal STEM Alignment

"Ensuring that ALL Americans will have lifelong access to high-quality STEM education and the United States will be the global leader in STEM literacy, innovation, and employment"

- **GOALS**
  - Build Foundations for STEM Literacy
  - Prepare the STEM Workforce of the Future
  - Increase Diversity, Equity, and Inclusion in STEM
- **PATHWAYS**
  - Develop and Enrich Strategic Partnerships
  - Engage Students where Disciplines Converge
  - Build Computational Literacy
  - Operate with Transparency and Accountability



Federal STEM Strategy URL:
https://www.whitehouse.gov/wp-content/uploads/2018/12/STEM-Education-Strategic-Plan-2018.pdf

DoD STEM Investments

- Over **$200M** invested in FY19 STEM programs across the **Department**
  - National Defense Education Program
  - Army Educational Outreach Program
  - Navy STEM (Office of Naval Research)
  - Air Force STEM
  - DoD STARBASE Program
  - National Defense Science & Engineering Graduate Fellowship Program
  - Other Organization-funded programs

DoD STEM Programs

www.dodstem.us

- Examples of DoD STEM Opportunities
  - Science and Engineering paid research internships / apprenticeships for high school and college students (undergraduate & graduate)
  - Army, Navy, and Air Force Junior Science & Humanities Program (JSHS)
  - National Math & Science Initiative – College Readiness Program
  - FIRST Robotics
  - DoD STARBASE Program
  - Army eCYBERMISSION competition (Mini-grants available for teachers, schools, and districts)
  - Joint Science & Technology Institute (JSTI) by Defense Threat Reduction Agency
  - Army Educational Outreach Program – Research Experience for STEM Educators and Teachers (RESET)

Defense STEM Education Consortium (DSEC) Overview

Initially scoped as up to
$75M investment over five years

Structured as a
Cooperative Agreement

Includes
15 organizations

- K-16 STUDENTS
- K-16 EDUCATORS
- DoD WORKFORCE
- PUBLIC

- AWARENESS
- INTEREST
- ENGAGEMENT
- KNOWLEDGE
- SKILL
- ABILITY

STEM PIPELINE

STEM WORKFORCE TALENT

DOD STEM GOALS:

COMMUNICATE the value and purpose of the DoD STEM Strategy and the need for engagement.

INSPIRE youth and community engagement in STEM education and outreach in the K-12 domain by supporting and enhancing student and educator participation in DoD-sponsored events.

CULTIVATE the future STEM talent pool through supporting and enhancing undergraduate and graduate students served by DoD-sponsored STEM programs.

PROMOTE increased participation of underserved groups in STEM activities and education programs.

ENHANCE the efficiency and effectiveness of STEM initiatives by gathering evidence using a systematic approach.

Consortium Strategy:
DSEC Fundamentals

LONGITUDINAL STUDENT ENGAGEMENT

We will engage students and educators at multiple entry points across the K-16 continuum through a connectivity initiative to build participation and deepen engagement of DoD scientists and alumni.

OUTREACH TO UNDERSERVED

We will cultivate STEM engagement of women and girls, traditionally underserved populations, and military dependents through an inclusion initiative focused on new outreach partners who bring expertise and credibility while expanding the pool of diverse STEM mentors.

DoD WORKFORCE ENGAGEMENT

We will sync outreach and awareness efforts with the needs of DoD STEM workforce pathways, and concentrate outreach efforts in military communities and regions surrounding DoD laboratories.

NETWORK AS FORCE MULTIPLIER

We will leverage the breadth and diversity of our consortium to amplify impact through collaboration and an innovation initiative while enhancing STEM opportunities for students, teachers, and communities.

DATA-BASED IMPROVEMENT

We will use purposeful evaluation and data-driven analysis to continuously improve outreach, increase participation, and strengthen impact while seeking real-world insight through a STEM advisory board.

LONGITUDINAL STUDENT ENGAGEMENT

We will engage students and educators at **multiple entry points across the K-16 continuum** through a connectivity initiative to build participation and deepen engagement of DoD scientists and alumni.

National Math and Science Initiative

Content: Science, Math, Computer Sci
Type: Formal
Audience: Teachers, Students
Students Served: Underrepresented, DoD, Gifted and Talented

FIRST

Content: Computer Sci, Engineering
Type: Informal, Exhibition
Audience: Students
Students Served: Underrepresented, DoD, Gifted and Talented

Dayton Regional STEM Center

Content: Science, Math, Computer Sci, Engineering, Other
Type: Formal, Informal, Exhibition
Audience: Teachers, Students, Family
Students Served: Underrepresented, DoD, Gifted and Talented

Mathcounts

Content: Math
Type: Informal, Exhibition
Audience: Teachers, Students
Students Served: Underrepresented, DoD, Gifted and Talented

GRADES

K 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 +

Teaching Institute for Excellence in STEM

Content: Science, Math, Computer Sci, Engineering, Other
Type: Formal, Informal, Exhibition
Audience: Teachers, Students, Family
Students Served: Underrepresented, DoD, Gifted and Talented

USA Science and Engineering Festival

Content: Science, Math, Computer Sci, Engineering
Type: Informal, Exhibition
Audience: Students, Family
Students Served: Underrepresented, Gifted and Talented

National Center for Women and Information Technology

Content: Science, Computer Sci, Engineering
Type: Informal, Exhibition
Audience: Students, Teachers
Students Served: Underrepresented, DoD, Gifted and Talented

UC San Diego CREATE

Content: Science, Math, Computer Sci, Engineering, Other
Type: Formal, Informal, Exhibition
Audience: Students, Teachers, Family
Students Served: DoD, Underrepresented

Morgan State University

Content: Science, Math, Computer Sci, Engineering, Other
Type: Formal, Informal, Exhibition
Audience: Students, Teachers
Students Served: Underrepresented

Center for Excellence in Education

Content: Science, Math, Computer Sci, Engineering, Other
Type: Formal, Informal, Exhibition
Audience: Students
Students Served: Gifted and Talented

Society for Science and the Public

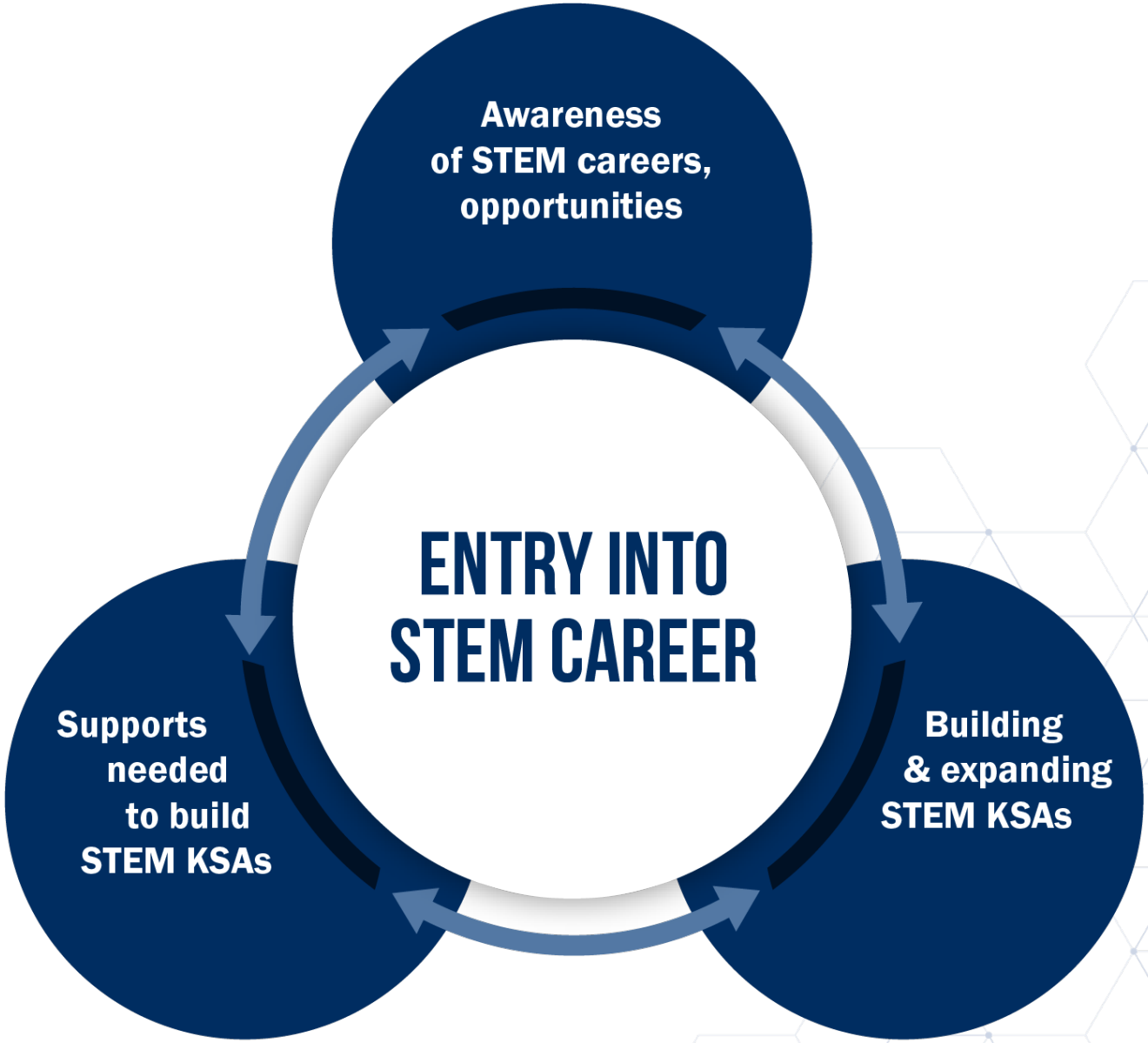
Content: Science, Math, Computer Sci, Engineering, Other
Type: Informal, Exhibition
Audience: Teachers, Students
Students Served: Underrepresented, DoD, Gifted and Talented

TGR Foundation

Content: Science, Math, Computer Sci, Engineering, Other
Type: Formal, Informal
Audience: Teachers, Students
Students Served: Underrepresented, DoD

OUTREACH TO UNDERSERVED

We will cultivate **STEM engagement of women and girls, traditionally underserved populations to include military-connected students** through an inclusion initiative focused on new outreach partners who bring expertise and credibility while expanding the pool of diverse STEM mentors.


Awareness
of STEM careers,
opportunities
ENTRY INTO
STEM CAREER
Supports
needed
to build
STEM KSAs
Building
& expanding
STEM KSAs

NETWORK AS FORCE MULTIPLIER

We will leverage **the breadth and diversity of our consortium to amplify impact** through collaboration and an innovation initiative while enhancing STEM opportunities for students, teachers, and communities.

DoD STEM Strategic Partners

DSEC | DEFENSE STEM EDUCATION CONSORTIUM

Department of Defense DoDSTEM Science · Technology · Engineering · Mathematics

RTI INTERNATIONAL

AIR AMERICAN INSTITUTES FOR RESEARCH

BEST

NATIONAL MATH + SCIENCE INITIATIVE

FIRST

STEM Center

MATHCOUNTS

TIES Uniting Partners. Transforming Learning.

USA Science and Engineering Festival

national center for women & INFORMATION TECHNOLOGY

SOCIETY FOR SCIENCE & THE PUBLIC Inform. Educate. Inspire.

UC San Diego

MORGAN STATE UNIVERSITY

Excellence Center for Excellence in Education

TGR FOUNDATION A TIGER WOODS CHARITY

aeop ARMY EDUCATIONAL OUTREACH PROGRAM

WIDMEYER COMMUNICATIONS A FINNPARTNERS COMPANY

NSTA National Science Teachers Association

THE MATHEMATICAL ASSOCIATION OF AMERICA

TSA TECHNOLOGY STUDENT ASSOCIATION

Tennessee Tech UNIVERSITY

MetriKsAmérique

THE WILLIAM & IDA FRIDAY INSTITUTE FOR EDUCATIONAL INNOVATION

Battelle The Business of Innovation

Office of Naval Research ONR Science & Technology

EDUCATION AND WORKFORCE NAVAL STEM

DoD STARBASE A Department of Defense Youth Program

AIR FORCE STEM

OAK RIDGE INSTITUTE FOR SCIENCE AND EDUCATION

JSTI Albuquerque New Mexico Joint Science and Technology Institute

dodea DEPARTMENT OF DEFENSE EDUCATION ACTIVITY

DATA-BASED IMPROVEMENT

We will use purposeful evaluation and data-driven analysis to continuously **improve outreach, increase participation, and strengthen impact** while seeking real-world insight through a STEM advisory board.

Resources needed to operate	If we have access to them then we can accomplish these activities	If we accomplish the activities then participants benefit in this way	If these outcomes are achieved, then these changes are expected to occur
RESOURCES / INPUTS	**ACTIVITIES**	**OUTCOMES**	**IMPACT**
Need for high-quality STEM education experiences for students and teachers	**1: Consortium Network** (E) Align DSEC activities to DoD STEM outreach strategy Enhance collaboration across outreach activities	Increased student interest and engagement in STEM (formal and informal)	Increase teacher use of effective instructional strategies in STEM
DoD funding and priorities for STEM education and career pathways	**2: Evaluation** (E) Assess STEM program effectiveness Enable continuous improvement of DoD STEM activity	Increased participant STEM competencies (STEM skills, knowledge, abilities, confidence)	Increase student skills and abilities in STEM
STEM education programs funded by the DSEC	**3: Communications** (C) (P) Strengthen DOD STEM digital presence and promote outreach activities Foster awareness and interest in STEM fields	Increased participant awareness of, and interest in, DSEC opportunities	Increase student college and career readiness in STEM
Expertise of DoD labs and Scientists and Engineers	**4: STEM Alumni** (I) (P) (E) Develop Alumni database and badging system Enable and expand STEM mentorship opportunities Map pathways to DoD careers	Increased participant awareness of, and interest in, STEM research and careers	Increase student pursuit of postsecondary STEM and DoD careers
Experience of former and current STEM educators	**5: STEM Outreach** (I) (U) (P) Provide professional development for STEM educators Provide robust STEM learning experiences for students Expand STEM opportunities for military-connected students Create connected STEM opportunities through regional hubs	Increase participant awareness of, and interest in, DoD STEM research and careers	Increase diversity among DoD Scientists and Engineers
Coordination, support, and evaluation through the DSEC		Increased Scientist and Engineer Mentor impact on DSEC participants	Greater STEM preparation for dependents of Armed Forces
Expertise and experience of legacy DoD STEM outreach partners		Increased teacher knowledge and skills in STEM instruction	Stronger Force of the Future
		Increase opportunities for underrepresented students in STEM	
		Implementation of evidence-based outreach program improvements	
		Improved coherence among programs	

DoD STEM GOALS:

- (C) **COMMUNICATE** the value and purpose of the DoD STEM Strategy and the need for engagement.
- (I) **INSPIRE** youth and community engagement in STEM education and outreach in the K-12 domain by supporting and enhancing student and educator participation in DoD-sponsored events.
- (U) **CULTIVATE** the future STEM talent pool through supporting and enhancing undergraduate and graduate students served by DoD-sponsored STEM programs.
- (P) **PROMOTE** increased participation of underserved groups in STEM activities and education programs.
- (E) **ENHANCE** the efficiency and effectiveness of STEM initiatives by gathering evidence using a systematic approach.

How LEAs Can Engage With DoD STEM and DSEC

- Explore programs, scholarships, internships, events: www.dodstem.us

- Contact Angela Quick (aquick@rti.org) or Joe Edney (jedney@rti.org) to learn how to:
  - Engage with ***location*** specific opportunities available in your area
  - Engage with ***partner*** or ***content*** specific opportunities that match your STEM priorities

CONTACT

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