

THE DEPARTMENT OF DEFENSE  
**STEM**  
STRATEGIC PLAN  
FY2021 - FY2025



## DOD STEM VISION

A diverse and sustainable science, technology, engineering, and mathematics (STEM) talent pool ready to serve our Nation and extend the Department of Defense's (DoD's) competitive edge.

## DOD STEM MISSION

Inspire, cultivate, and develop exceptional STEM talent through a continuum of opportunities to enrich our current and future DoD workforce poised to tackle evolving defense technological challenges.



### DR. JIHFEN LEI

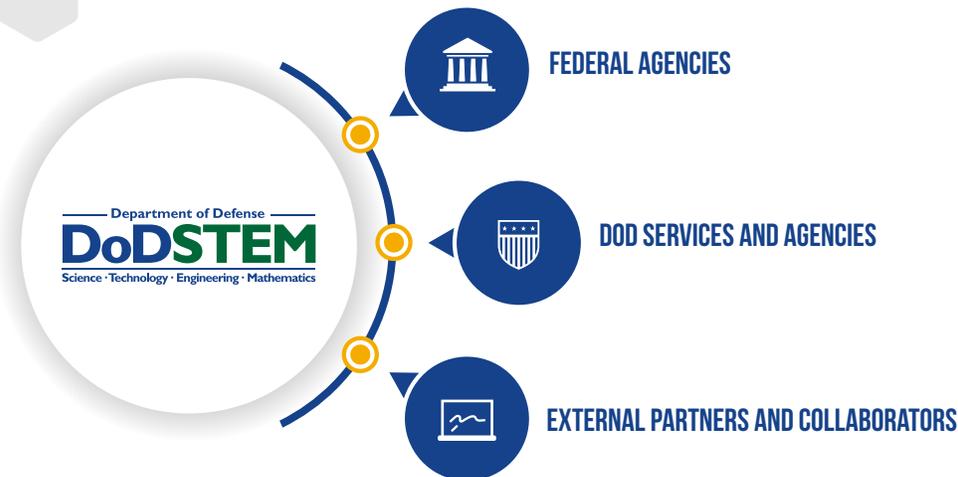
Acting Director of Defense Research and Engineering for Research and Technology

## A LEADERSHIP IMPERATIVE

"The exceptional scientists and engineers in the Department of Defense, along with our industrial and academic partners, are the reason the United States of America is a world leader in science and technologies that are critical to our national security. The Department is cultivating the future STEM workforce by providing unique education opportunities to students and educators of all ages and across all demographics throughout the country. These efforts are vitally important to maintaining our Nation's competitive advantage, ensuring we are prepared for the ever-changing global landscape."

DoD STEM's network of partners includes academia, industry, not-for-profit organizations, local government, and federal government.

[dodstem.us/about/partners/](http://dodstem.us/about/partners/)



# OVERARCHING APPROACH

## Foundations of Our Strategic Plan

The Office of the Secretary of Defense (OSD) and the Components are invested in developing current and future STEM talent throughout DoD to meet its unique mission. This Department-wide STEM strategic plan, coupled with its follow-on implementation plan, provides an overarching framework for achieving the DoD STEM mission and vision. These are driven by Federal priorities while addressing and leveraging DoD's unique mission, needs, and resources. Specifically, DoD will operate with transparency and accountability to:

- Spearhead a DoD-wide implementation plan to track progress toward achieving the goals and objectives of the DoD STEM strategic plan.
- Ensure STEM education and workforce development programs, activities, and outreach are aligned with DoD priorities.
- Cultivate multiple pathways to DoD employment through STEM workforce development programs, activities, and outreach.
- Apply and expand use of evidence-based practices across DoD's STEM networks and communities.
- Use common metrics to measure progress and encourage growth of STEM education and workforce development programs, activities, and outreach.
- Ensure performance and outcomes of STEM education and workforce development programs and activities are made publicly available.
- Report participation rates and understand the participation of underserved and underrepresented groups in DoD STEM education and workforce development programs, activities, and outreach.

The Department's STEM strategic plan addresses critical STEM challenges through talent inspiration and cultivation, with an emphasis on diversity using evidence-based approaches and evaluation. The Department is committed to a continuous learning structure, aligned to the Federal STEM Education Strategic Plan's<sup>1</sup> aspirational goals:

- Build Strong Foundations for STEM Literacy.
- Increase Diversity, Equity, and Inclusion in STEM.
- Prepare the STEM Workforce for the Future.

1. <https://dodstem-assets.dodstem.us/files/2018-23-Federal-STEM-Education-Strategic-Plan.pdf>

# DEPARTMENT OF DEFENSE STEM STRATEGIC PLAN

## Goal 1.0

### **Inspire community engagement in DoD STEM education programs and activities to provide meaningful STEM learning opportunities for students and educators.**

**Obj. 1.1** Amplify public awareness of DoD STEM education and career opportunities by leveraging partnerships across the Department, STEM education ecosystems, and Government agencies.

**Obj. 1.2** Enhance DoD STEM education program and activity experiences by leveraging DoD's unique resources.

**Obj. 1.3** Empower DoD STEM professionals across DoD, especially those within the defense enterprise, to participate in STEM education and outreach activities.

**Obj. 1.4** Emphasize an inclusive and adaptable continuum of available STEM education programs and activities across the Department.

## Goal 2.0

### **Attract the Nation's and DoD's current and future STEM workforce through multiple pathways to educational and career opportunities.**

**Obj. 2.1** Sustain engagement of DoD professionals in STEM fields in workforce development programs, activities, and outreach.

**Obj. 2.2** Enhance internship, apprenticeship, and fellowship opportunities in DoD laboratories and facilities for high school, undergraduate, vocational, and graduate students.

**Obj. 2.3** Increase awareness of workforce development opportunities by fostering pathways to participation through a continuum of enriching DoD STEM education and workforce development programs, activities, and outreach.

**Obj. 2.4** Encourage DoD STEM professionals to participate in mentoring activities and other opportunities to engage with the future DoD STEM workforce.

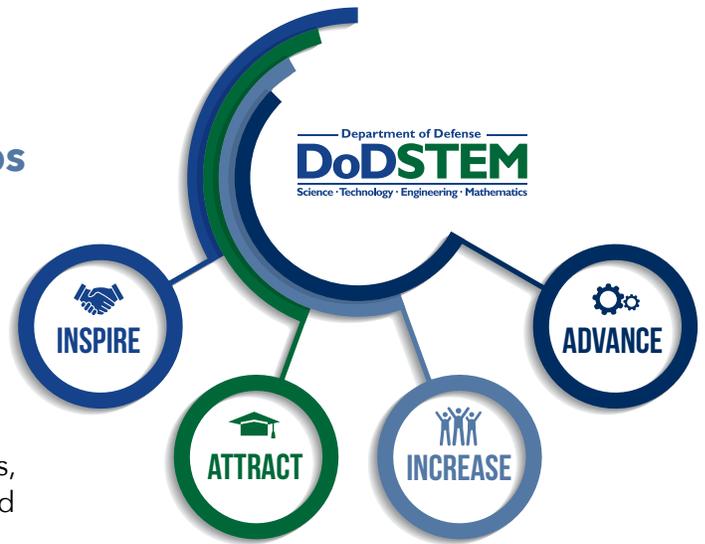
Goal  
3.0

## Increase participation of underserved and underrepresented groups in STEM education and workforce development programs, activities, and outreach.

**Obj. 3.1** Measure the effectiveness of current DoD STEM education and workforce development programs, activities, and outreach to underserved and underrepresented groups.

**Obj. 3.2** Expand the outreach of DoD STEM education and workforce development programs and activities to underserved and underrepresented communities through consideration of the barriers faced by these populations.

**Obj. 3.3** Sustain and increase underserved and underrepresented communities' engagement in STEM activities by identifying specific best practices and strategic partnerships.



Goal  
4.0

## Advance the efficiency and effectiveness of STEM education and workforce development programs, activities, and outreach through evaluation and assessment.

**Obj. 4.1** Implement a systematic evaluation and assessment approach to develop, refine, and collect common metrics; identify and share best practices; capture and monitor relevant metrics; and improve the communication of DoD STEM evaluative efforts.

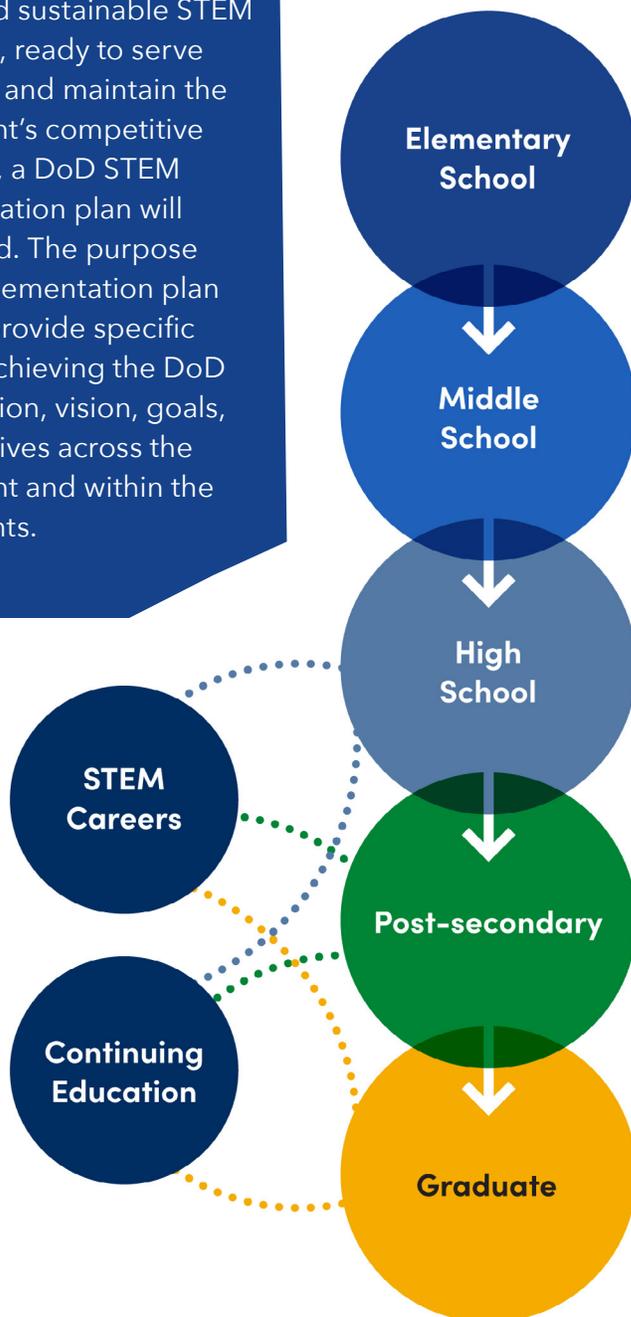
**Obj. 4.2** Engage with STEM education ecosystems, Government agencies, and other stakeholders to identify evidence-based emerging concepts for STEM education and workforce development programs, activities, and outreach, evaluation and assessment, and communication.

**Obj. 4.3** Generate and make publicly available results-oriented reports to guide decisions and evolve approaches based on evaluation and assessment of STEM education and workforce development programs, activities, and outreach.

**Obj. 4.4** Amplify DoD STEM education and workforce development programs, activities, and outreach by using current data and metrics along with success stories to communicate and demonstrate the value of DoD STEM programs.

# NEXT STEPS AND IMPLEMENTATION

In order to achieve the goals and objectives outlined within this strategic plan and to make progress toward the Department's vision of a diverse and sustainable STEM talent pool, ready to serve our Nation and maintain the Department's competitive advantage, a DoD STEM implementation plan will be released. The purpose of this implementation plan will be to provide specific steps for achieving the DoD STEM mission, vision, goals, and objectives across the Department and within the Components.



# DEFINITIONS

**Components:** The OSD, the Military Departments, the Office of the Chairman of the Joint Chiefs of Staff and the Joint Staff, the Combatant Commands, the Office of the Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organizational entities within DoD.

**Defense enterprise:** DoD laboratories, warfare centers, and engineering centers across the United States and around the world, including any facility where DoD professionals working in STEM fields serve. The defense enterprise includes federally funded research and development centers (FFRDCs), university affiliated research centers (UARCs), depots, and shipyards.

**Evaluation and assessment:** A systematic study using research methods to collect and analyze data to assess program operations and outcomes. Program evaluation results may be used to assess a program's effectiveness, identify how to improve performance, or guide resource allocation.

**Meaningful STEM learning opportunities:** Meaningful learning opportunities are those that are personally relevant from the learner's perspective within appropriate social contexts and are equated to real communities of practice, giving the student "real world" experiences.

**Outreach:** Efforts designed to build awareness, develop relationships, and promote education products and services that support formal or classroom-based learning, as well as informal education that occurs outside the classroom, including the provision of services to people who might not otherwise have access to those services.



## STEM education and/or workforce development programs and activities:

- Formal or informal education that is primarily focused on physical and natural sciences, technology, engineering, social sciences, or mathematics disciplines, topics, or issues (including environmental science education or stewardship).
- STEM education includes one or more of the following as the primary objective:
  - Develop learners' knowledge, skills, or interest in STEM.
  - Attract students to pursue certifications, licenses, degrees (two-year degrees through post-doctoral degrees), or careers in STEM fields.
  - Provide growth and research opportunities for post-secondary, college, and graduate students in STEM fields, such as working with researchers or conducting research that is primarily intended to further education.
  - Improve mentor/educator (K-12 pre-service or in-service, postsecondary, and informal) quality in STEM fields.
  - Improve or expand the capacity of institutions to promote or foster STEM fields.
  - Support research on effective STEM teaching and learning practices.

**STEM education ecosystems:** STEM education ecosystems consist of multi-sector partners united by a collective vision of supporting participation in STEM through the creation of accessible, inclusive STEM learning opportunities spanning all education stages

and career pathways. A STEM education ecosystem continuously evaluates its activities and adapts as needed, plans for the long term, and communicates its work to build broad support and advance best practices.

Traditionally or historically **underserved and underrepresented** populations in STEM include the following:

- **Military-connected**, which may include:
  - **Military children:** dependents of members of the Active Duty Armed Forces.
  - **Military-connected:** military children plus the dependents of members of the National Guard and Reserves.
- Low-income (those whose family's taxable income for the preceding year did not exceed 150 percent of the poverty level;<sup>2</sup> those who qualify for free and reduced-price meals (FARM) programs).
- Racial and ethnic minorities that are historically underrepresented in STEM (i.e., Alaskan Natives, Native Americans, Black or African Americans, Latinx/Hispanic Americans, and Native Hawaiians and other Pacific Islanders).
- Individuals with disabilities, as defined by the Americans with Disabilities Act (ADA).
- Individuals with English as a second language (ESL) or English language learners (ELLs).
- First-generation college students.
- Students in rural, frontier, or other federally targeted schools, such as title 1 schools.<sup>3</sup>
- Females in STEM fields where they remain underrepresented (physical science, computer science, mathematics, and engineering).

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2. <https://www2.ed.gov/about/offices/list/ope/trio/incomelevels.html>

3. Title I, part A (title I) of the Elementary and Secondary Education Act, as amended by the Every Student Succeeds Act, provides financial assistance to local educational agencies and schools with high numbers or high percentages of children from low-income families to help ensure that all children meet challenging state academic standards. Federal funds are currently allocated through four statutory formulas that are based primarily on census poverty estimates and the cost of education in each state (<https://www2.ed.gov/programs/titleiparta/index.html#>).



Science, Technology, Engineering and Mathematics, or STEM, is the gateway to a world of wonder.



## DOD STEM PROGRAM OFFICE

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