Goal 2. Elementary and Secondary Education:

Improve the elementary and secondary education system's ability to consistently deliver excellent instruction aligned with rigorous academic standards while providing effective support services to close achievement and opportunity gaps, and ensure all students graduate high school college- and career-ready.

Goal Leader: Ann Whalen, Senior Advisor to the Secretary, Delegated the Authority of the Assistant Secretary, Office of Elementary and Secondary Education (OESE)

Public Benefit

The goal for America's elementary and secondary educational system is clear: every student should graduate from high school ready for college and a career. Every student should have meaningful opportunities from which to choose upon graduation from high school. Over the past several years, states, districts, and schools have initiated groundbreaking reforms and innovations to try to meet this goal. For the first time, almost every state is supporting higher standards that will demonstrate that students who meet those standards are truly college- and career-ready. Many states are implementing assessments that are not only aligned with these new standards, but also gauge essential skills such as critical thinking, problem solving, and the application of knowledge. At the same time, states, districts, and schools are working to meet the challenges of ensuring that every classroom has an excellent teacher and every school has a strong and effective leader; building local capacity to support successful school turnarounds; redesigning high school education by building stronger connections among secondary education, postsecondary education, and the workplace; and improving teacher preparation and classroom instruction in STEM education.

However, while many schools are increasing the quality of instruction and improving academic achievement, there is also broad agreement that the United States education system fails to consistently provide all students with the excellent education necessary to achieve college- and career-readiness. The result is that too many of our students are failing to reach their full potential. Data from the 2015 National Assessment of Educational Progress (NAEP) show that low-income students scored 24 to 28 points below their more advantaged peers. The achievement gaps between black and white students were between 24 and 32 points and achievement gaps between Hispanic and white students were between 18 and 24 points.[1]

Many children, particularly children from low-income families, students with disabilities (SWDs), ELs, and children of color, confront not only an achievement gap, but also an opportunity gap. Today, a student attending a high school with high minority enrollment is much less likely to be offered calculus and physics than a student in a high school with low minority enrollment. Closing the opportunity gap will require that school resources, talent, and spending be targeted toward kids who need help the most.

The Department's elementary and secondary education reforms focus on the building blocks needed for schools, school districts, and states to more consistently deliver excellent classroom instruction for all students. The foundation of these reforms is a system for improving learning

[1] U.S. Department of Education, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2015 Reading and Mathematics Assessments, http://www.nationsreportcard.gov/reading_math_2015/#/

and teaching that aligns with college- and career-ready standards, high-quality formative and summative assessments, and engaging and effective instructional content. Ensuring that U.S. students have the critical thinking skills and other tools they need to be effective in the 21st-century economy means improving teaching and learning in all content areas—from language arts and STEM to history, civics and government, geography, foreign languages, the arts, economics and financial literacy, environmental education, computer science, health education, and other subjects.

On December 10, 2015, the President signed a reauthorization of the ESEA, the ESSA. The law requires that all students in America be taught to high academic standards that will prepare them to succeed in college and careers and that vital information is provided to educators, families, students, and communities through annual statewide assessments that measure students' progress toward those high standards. It also continues the ESEA's focus on ensuring that states and school districts account for the progress of all students, take meaningful actions to improve the lowest-performing schools, and ensure equitable access to excellent educators. The Department is developing approaches to best support the implementation of the ESSA. The FY 2016 APR will provide additional detail on the impact of the ESSA for the Department's work.

Analysis and Next Steps

Objective 2.5: STEM Teaching and Learning. Increase the number and quality of STEM teachers and increase opportunities for students to access rich STEM learning experiences.

Objective Leader:
Russ Shilling, Director, Office of STEM, Office of Innovation and Improvement (OII)

Explanation and Analysis of Progress:

The Department, in consultation with OMB, has highlighted this objective as a focus area for improvement. Efforts such as the expansion of 100Kin10, the nonprofit organization created in response to the call to recruit 100,000 STEM teachers from 2011 to 2021, and the recent awards made to support effective STEM teachers via the Supporting Effective Educator Development Grant program show continued attention and progress toward the Department's goal of increasing the number and quality of STEM teachers. Across the administration, there has been a significant emphasis on improving STEM instruction, most directly through the CoSTEM Education's interagency working groups. The Department leads this formally chartered group on P-12 STEM Instruction, which includes regular participation from the National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, Department of Energy, U.S. Department of Agriculture (USDA), National Institutes of Health, NSF, Department of Defense, and White House (Office of Science and Technology Policy and OMB). All participating agencies have committed to align efforts to support the preparation of high-quality STEM teachers and to support authentic STEM experiences[2] for P-12 educators. Not only do these agencies work together within the context of the CoSTEM Education, but the goals of the interagency working groups align to the CAP Goal for STEM Education across the administration. All activities that are being undertaken by the interagency working groups feed into the CAP process, and all milestones for that process align with the CoSTEM goals.

[2] Authentic STEM experiences means laboratory, research-based, or experiential learning opportunities in a STEM subject in informal or formal settings.

In addition, through the Teacher Incentive Fund national activities the STEM office is engaged in work around STEM Teacher Leadership and STEM Master Teachers that will continue into FY 2016. Six research action clusters will be convening every couple of months and developing resources to support STEM teacher leadership efforts.

2014 data from the College Board shows an overall increase in the number of graduating high school students taking Advanced Placement (AP) STEM exams: 555,119 compared to 527,001 in 2013 data. In all subgroups, the total number of participants increased, ranging from an approximate 15 percent increase for Hispanic/Latino students to a 3 percent increase for Black/African American students. Females still outnumber males in terms of AP STEM exam participation (which has been the case since 2002).

Challenges and Next Steps:

While efforts continue to support P-12 STEM instruction, only two current federal programs are focused on preparing new STEM teachers—the Teacher Quality Partnerships program at the Department and the Noyce Scholarship program at NSF. Proposals for a dedicated program to prepare new STEM teachers have not yet been acted on by Congress, and the majority of teachers are prepared at colleges and universities that do not receive direct NSF or Department funding aimed specifically at STEM teacher preparation. The Mathematics and Science Partnership (MSP) program, which is no longer authorized under ESSA, does not have a national activities set-aside to provide technical assistance and, although each project within MSP must complete an evaluation for the state, these evaluations are not submitted to the Department. While the overall numbers of students taking STEM AP exams have increased—including through Department-supported programs such as the Investing in Innovation (i3) program—AP courses are only one way to provide students with rich STEM learning experiences. Additional support should be given to both formal and informal STEM opportunities for students within the entire P-12 spectrum.

In FY 2016 and beyond, continued collaboration within the Department to better coordinate awards made to support STEM educator development will be important. In addition, ESSA authorizes new activities for STEM educator preparation. For example, the new STEM Master Teacher Corps program provides an opportunity for states to utilize their STEM master educators in the development of new STEM educators. Further, ESSA authorizes states and districts to use funds to provide all students access to advanced STEM coursework through the Student Support and Academic Enrichment grants. There is opportunity to infuse STEM into other Department priorities, including for example a possible collaboration with the Office of Early Learning to support P-3 STEM educators, as well as continued collaboration across agencies like NSF to support educator development and support, especially in disciplines like engineering and computer science. Disparities in computer science are emblematic of the large gaps in student access and engagement in STEM courses overall; only half of high schools offer calculus, and only 63 percent offer physics. The 2017 Budget provides resources to empower states and districts to create high-quality computer science learning opportunities in grades P-8 and access to computer science courses in high school, dedicating $100 million in discretionary funding at the Department of Education for Computer Science for All Development Grants to help school districts, alone or in consortia, execute ambitious computer science expansion efforts, particularly for traditionally underrepresented students. Lastly, absent direct funding streams to support the preparation of new STEM educators, continued work with nongovernment partners like 100Kin10 who are making progress against the goal of preparing 100,000 STEM educators will be essential.

Subpopulation Breakout for Metric 2.5.B: Number of Graduates Taking an AP STEM Exam during High School: U.S. Public Schools, 2012–14

	Race/Ethnicity							Gender		Socioeconomic Status		
	American Indian/ Alaska Native	Asian, Asian American, Pacific Islander	Black or African American	Hispanic or Latino	White	Other	No Response	Female	Male	Low Income	Not Low Income	Total
Number of Graduates, 2012	2,363	73,503	36,689	64,237	298,859	15,001	7,270	256,705	241,217	114,658	383,264	497,922
Number of Graduates, 2013	2,918	78,886	37,816	74,015	312,917	16,785	3,664	271,217	255,784	128,782	398,219	527,001
Number of Graduates, 2014	3,103	83,412	41,108	82,595	323,887	17,723	3,291	287,424	267,695	142,307	412,812	555,119

Data Source and Frequency of Collection: College Board/AP administrative records; annually

U.S. Department of Education Indicators of Success	Baseline	2013 Actuals	2014 Actuals	2015 Actuals	2015 Current Year Target	Current Year Results	2016 Out-Year Targets	2017 Out-Year Targets
2.5.A. Percentage of high school and middle school teachers who teach STEM as their main assignment who hold a corresponding undergraduate degree	AY: 2011–12 62.2%	Not Collected	Not Collected	Not Collected	NA	NA	65.3%	65.3%
2.5.B. Number of public high school graduates who have taken at least one STEM AP exam	AY: 2011–12 497,922	AY: 2011–12 497,922	AY: 2012–13 527,001	AY: 2013–14 555,119	581,419	**NOT MET**	632,642	691,541

NA = Not applicable.

TBD = To be determined.

Academic Year (AY) is a collegiate year spanning August–May; School Year (SY) spans August–July and is aligned with a P–12 school year; Fiscal Year (FY) corresponds to a federal fiscal year; Calendar Year (CY) spans January–December.

Data Sources and Frequency of Collection:

2.5.A. Schools and Staffing Survey (SASS), NCES; quadrennially
2.5.B. College Board/Advanced Placement (AP) administrative records; annually