UNITED STATES DEPARTMENT OF EDUCATION

WASHINGTON, DC 20202

April 13th, 2016

Dear Colleague,

Ensuring that all students have access to science, technology, engineering, and math (STEM)[1] education is fundamental to the U.S. Department of Education's (Department) goal of providing equitable educational opportunities so that all students are prepared to succeed in college, careers, and life. To further the goal of STEM education for all and to better coordinate efforts across Federal agencies to provide high-quality STEM education, the Committee on STEM Education of the National Science and Technology Council developed a five-year STEM Education strategic plan. Coordination among Federal agencies, State educational agencies (SEAs), local educational agencies (LEAs), and private sector partners is essential to accomplishing the goals outlined in this plan.

The purpose of this letter is to help SEAs, LEAs, and their partners better understand how to use Federal funds to support innovative Pre-K–12 STEM education strategies to ensure equity in the 2016–2017 school year under the Elementary and Secondary Education Act of 1965 (ESEA), as amended by the No Child Left Behind Act of 2001 (NCLB).[2] In addition, this letter includes references to the Every Student Succeeds Act (ESSA). This information may be useful for SEAs, LEAs, and their partners as they contemplate the transition from NCLB to the ESSA, which explicitly mentions STEM.

In order to help SEAs, LEAs, and their partners identify potential ways to use Federal formula grant funds to support STEM education during the 2016–2017 school year, this letter provides examples of how funds from title I, title II, title III, and title IV of the ESEA, as amended by NCLB, the Individuals with Disabilities Education Act (IDEA), and the Carl D. Perkins Career and Technical Education Act of 2006 (Perkins) can support efforts to improve Pre-K–12 instruction and student outcomes in STEM fields.[3]

These examples fall into the following categories:

1. Increase students' equitable access to STEM courses and experiences, including out-of-school programs,[4] STEM-themed schools, and career pathways;

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[1] For the purposes of this letter, consistent with the Every Student Succeeds Act (ESSA), all references to STEM include computer science.

[2] In general, consistent with the ESSA transition provisions and the Consolidated Appropriations Act, 2016, fiscal year (FY) 2016 formula grant funds under the ESEA, as amended by ESSA, will be awarded and administered in accordance with the ESEA as in effect on the day before the date of enactment of the ESSA (*i.e.*, the requirements promulgated under NCLB). For additional information regarding FY 2016 ESEA formula grant funds, see the Department's Dear Colleague letter of January 28, 2016, at: www2.ed.gov/policy/elsec/leg/essa/transitionsy1617-dcl.pdf .

[3] Although the examples provided in this letter are limited to the ESEA, as amended by NCLB, Perkins, and IDEA, funds from other formula and competitive grant programs administered by the Department may also be used to support STEM learning. Also, references to possible uses of IDEA and Perkins funds apply beyond the 2016–2017 school year.

[4] The phrase "out-of-school programs" refers to before- and after-school programs and summer learning opportunities.

2. Support educators' knowledge and expertise in STEM disciplines through recruitment, preparation, support, and retention strategies; and
3. Increase student access to materials and equipment needed to support inquiry-based pedagogy and active learning.[5]

Enhancing the impact of STEM education programs and maximizing the impact of available Federal resources necessitate leveraging various sources of support. For example, an SEA or LEA might use title I funds to purchase STEM materials, devices, or STEM-focused digital learning resources[6]; title II funds to train educators on new STEM concepts and approaches; title III funds to provide access to STEM resources specifically developed for English learners; and Perkins funds to develop a comprehensive STEM pathway program. In addition, under title IV, part B, an SEA may continue to provide students at 21st Century Community Learning Centers program sites with the opportunity to engage in authentic STEM content that aligns to their school day and to focus on hands-on, STEM-rich experiences. An SEA or LEA could also apply for discretionary competitions to support STEM, such as the Department's CTE Makeover Challenge designed to support the enhancement of learning spaces. All uses of Federal resources must comply with applicable laws and requirements for each funding source.

We hope the examples and other information provided in this letter will be helpful in your efforts to provide access to high-quality STEM programs and resources as well as improve learning and achievement for all students.

Sincerely,

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[5] Active learning is a process whereby students engage in activities such as reading, writing, discussion, prototyping, or problem-solving that promote analysis, synthesis, and evaluation of course content.

[6] Schools operating a title I schoolwide program under ESEA may use title I, part A funds to acquire devices, including tablets, laptops, and other devices, as part of a comprehensive plan to upgrade the educational program of a school, consistent with the school's comprehensive needs assessment.

Examples of Leveraging ESEA, IDEA, and Perkins Funds for STEM Education for School Year 2016–2017

The pace of technological and scientific change continues to accelerate, and students beginning elementary school will graduate into an innovation economy with new technologies, scientific advances, and job opportunities that did not exist a decade ago. To best prepare for this future, all students will benefit from a solid foundation in the STEM fields. The Department encourages educators at every level to pursue innovative strategies and active teaching methods in STEM, while working to ensure equitable educational opportunities across STEM disciplines. To help catalyze such innovation, this letter provides examples that illustrate how grantees may use funds made available under the ESEA, as amended by NCLB, IDEA, and Perkins.

The use of funds under any grant program must be an allowable use of funds that is consistent with the intent and purpose of the program. The examples below highlight ways in which a grantee might be able to use Federal funds for STEM education in the 2016–2017 school year to:

1. Increase students' equitable access to STEM courses and experiences, including out-of-school programs, STEM-themed schools, and career pathways;
2. Support educators' knowledge and expertise in STEM disciplines through recruitment, preparation, support, and retention strategies; and
3. Increase student access to materials and equipment needed to support inquiry-based pedagogy and active learning.

Except as otherwise noted, statutory references in the examples below are to the ESEA, as amended by NCLB.

Increase students' equitable access to STEM courses and experiences, including out-of-school programs, STEM-themed schools, and career pathways: STEM learning occurs across a variety of places and times. In 2014, the National Research Council convened experts from the formal, informal, and out-of-school learning communities to explore how these three contexts could improve STEM learning for all students. [7] A 2013 report found that by the time a student from a low-income family reaches 6th grade, he or she will typically have had 6,000 fewer hours of out-of-school or summer enrichment activities than a more economically advantaged peer. [8]

[7] National Research Council. (2014). *STEM Learning Is Everywhere: Summary of a Convocation on Building Learning Systems.* S. Olson and J. Labov, Rapporteurs. Planning Committee on STEM Learning Is Everywhere: Engaging Schools and Empowering Teachers to Integrate Formal, Informal, and Afterschool Education to Enhance Teaching and Learning in Grades K-8, Teacher Advisory Council, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press. National Research Council. (2015). *Identifying and Supporting Productive STEM Programs in Out-of-School Settings.* Committee on Successful Out-of-School STEM Learning. Board on Science Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

[8] The 6,000 Hour Learning Gap Infographic by ExpandED Schools www.expandedschools.org/sites/default/files/tasc_6000-hours-infographic.pdf

To help address this critical gap, schools, SEAs, and LEAs may use Federal funds to support increased access to STEM opportunities both during the school day and out-of-school-time.

1. **Increasing access to rigorous STEM coursework for all students**: Depending on the student population served, program funds (see potential options below) may be used to support dual or concurrent enrollment programs, early college high school models, or other methods to increase access to rigorous STEM coursework to enhance career and college readiness. Schools and LEAs may utilize Federal funds to support STEM coursework for:
    a. Students attending a school operating a title I schoolwide program, consistent with the school's comprehensive needs assessment (ESEA section 1114);
    b. Supplemental English language acquisition activities in STEM courses (ESEA section 3115);
    c. Eligible students with disabilities under IDEA who require college coursework in order to receive a free appropriate public education, and making regular education STEM instruction more accessible to students with disabilities who may require additional supports (IDEA section 1411 and section 1414).
2. **Out-of-School Time:** SEAs and their subgrantees (e.g., LEAs, community-based organizations, and other public and private entities) may use funds from the Department's 21st Century Community Learning Center grants to provide high-quality STEM programs and activities to students in out-of-school learning settings (ESEA section 4201).
3. **Career-based experiential learning:** Perkins funds may be used to support collaborations with technology industries to offer voluntary internships, apprenticeships, and mentoring programs that improve the mathematics and science knowledge of students (Perkins section 135). Funds reserved for State leadership activities may also be used to support, develop, improve, or expand the use of technology through collaborations with technology industries to offer voluntary internships and mentoring programs (Perkins section 124).
4. **STEM-focused schools and pathways:**
    a. Eligible LEAs or consortia of LEAs could use STEM-focused instructional activities under the Magnet School Assistance Program (ESEA section 5301 and section 5307) to establish theme-based magnet schools that attract students of diverse backgrounds; and
    b. Public charter schools could support STEM initiatives using funds received under the Charter Schools Program (ESEA section 5202).
5. **Field trips:** Eligible title I schools[9] operating a schoolwide program may use title I funds to support activities such as field trips to increase access to real-world, hands-on STEM experiences, activities, and applications. Such uses must be consistent with applicable SEA or LEA policies, Federal requirements for uses of funds, and the school's comprehensive needs assessment (ESEA section 1114).

Support educators' knowledge and expertise in STEM disciplines through recruitment, preparation, support, and retention strategies: Educators have an incredible impact on student learning and engagement. To help envision ways Federal resources may be utilized to support the continuum of STEM educator development, the Department invites SEAs, LEAs, institutions of higher education (IHEs), and their partners to consider the following:

[9] For additional guidance on title I eligibility, please visit www2.ed.gov/programs/titleiparta/index.html.

1. **Recruiting and preparing novice STEM educators, including those from groups historically underrepresented in STEM.** Some examples include:
    a. Utilize title II funds to provide stipends to attract STEM educators to the profession (ESEA section 2113 and section 2123); and
    b. Utilize title II funds to recruit qualified individuals with STEM content knowledge from other fields to become teachers, including professionals from other occupations, former military personnel, and recent graduates with records of academic distinction (ESEA section 2113 and section 2123).
2. **Developing effective STEM pedagogy to improve teaching and learning.** Some examples include:
    a. Utilize title II funds to provide professional learning opportunities to teachers or principals. Examples include sustained relevant professional development opportunities offered by informal science institutions (such as science museums, Federal labs, or nonprofits) (ESEA section 2113 and section 2123);
    b. Utilize title II funds to support educators as they implement new courses, such as computer science and engineering (ESEA section 2113 and section 2123);
    c. Utilize title II funds to support educators to effectively teach students with disabilities in STEM subjects (ESEA section 2113 and section 2123);
    d. Utilize title II funds to provide supplemental support to educators to effectively teach English learners in STEM subjects (ESEA section 3115, section 2113 and section 2123);
    e. Utilize title II funds to support elementary STEM teachers, including preschool educators, to incorporate STEM experiences into their classrooms and to utilize effective STEM pedagogy in their teaching (ESEA section 2113 and section 2123);
    f. Utilize title II funds to train or provide professional development for educators to incorporate technology into effective STEM instruction through blended learning (ESEA section 2113 and section 2123); and
    g. Use funds reserved by the State for leadership activities to offer internships that provide valuable work experience, which may include internship programs that provide relevant business experience, for secondary and postsecondary teachers, faculty, administrators, and career guidance and academic counselors who are involved in integrated career and technical education programs (Perkins section 135 and 124).
3. **Supporting leadership pathways for STEM educators.** Some examples include:
    a. Hire STEM-coaches: LEAs may use title II funds to hire STEM coaches to help grantees tailor professional learning to the needs of individual educators. For example, coaches might help educators bolster their STEM content knowledge or expand STEM pedagogy to include problem- or project-based active learning or maker techniques (ESEA section 2113 and section 2123); and
    b. Provide differential or incentive pay for teachers, principals or school leaders in high-need subject areas, such as STEM, to serve in high-need schools, or to reward the work of teachers and leaders who have demonstrated effectiveness in improving student outcomes in STEM areas (ESEA section 2113 and section 2123).

Increase student access to materials and equipment needed to support inquiry-based pedagogy and active learning: Supporting students in STEM learning can require additional resources and technologies; the Department invites SEAs, LEAs, and other grantees to consider the following:

1. **Devices**: Federal funds may be used by grantees to purchase devices for students to access materials and general instruction and to collaborate with peers and educators and to support STEM learning.
    a. **Provide Students with Mobile Learning Devices to support STEM learning:** Schools operating a title I schoolwide program may use title I, part A funds to acquire devices, including tablets, laptops, and other devices, as part of a comprehensive plan to upgrade the educational program of a school, consistent with the school's comprehensive needs assessment (ESEA section 1114); and
    b. **Provide Students with Disabilities with Assistive Technology Devices:** SEAs may use IDEA Part B section 611 funds they retain for authorized State-level activities, other than administration, to improve the use of technology in the classroom for students with disabilities, in order to enhance their learning.[10] LEAs may use IDEA Part B funds to enable students with disabilities to participate in STEM courses (IDEA section 611).
2. **Labs and specialized learning spaces**: Title I funds may be used by title I schools operating schoolwide programs to update existing STEM-related labs and lab materials, or other specialized learning spaces, to support inquiry-based STEM or maker activities, as part of a comprehensive plan to upgrade the educational program of a school, consistent with the school's comprehensive needs assessment (ESEA section 1114).
3. **Supporting English Learners:** LEAs may use title III, part A funds to improve instruction for English learners by acquiring supplementary digital learning resources and software that will support English learners' acquisition of English proficiency and STEM content proficiency, including materials in languages other than English (ESEA section 3115).
4. **Use Technology to Connect Educators with STEM Professionals:** Consistent with their subgrant applications, IHE–LEA partnerships that receive SEA subgrants may use title II, part B Math Science Partnership funds to purchase software and devices that are an essential component of their plans to create and provide digital professional learning communities with practicing scientists or engineers. In addition, LEAs may use their title II, part A funds for this purpose. These activities may be especially helpful in rural schools and communities (ESEA section 2202 and section 2123).

These are just a few examples of allowable uses of Federal funds that might support the development, implementation, and expansion of STEM approaches to help improve student

[10] These improvements should include technology with universal design principles and assistive technology devices, to maximize accessibility to the general education curriculum for students with disabilities. Note that public schools must provide accessible technology to students with disabilities, as required by Section 504 of the Rehabilitation Act of 1973 and Title II of the Americans with Disabilities Act of 1990. Under these laws, public schools are also required to make STEM courses available to students with disabilities, if those courses are available to other students. These requirements apply regardless of whether IDEA funds are used to provide the accessible technology.

achievement in the 2016–2017 school year. To identify further opportunities, please review the statutes, regulations, and guidance for each Federal program or contact your Department program officer. Additional resources are available at https://innovation.ed.gov/stem.

Information about the ESSA

On December 10, 2015, President Obama signed into law the ESSA, which prioritizes excellence and equity and reauthorizes the ESEA, as amended by NCLB. For additional information, resources and guidance, please visit http://www.ed.gov/essa.

The ESSA explicitly mentions STEM. Sections from titles II and IV of ESSA that explicitly mention STEM are copied below for your reference:

STEM Master Teacher Corps (ESEA, as amended by ESSA, title II, section 2245): From funds reserved for title II national activities, grants may be awarded to: (1) SEAs to enable them to support the development of a statewide STEM master teacher corps or (2) SEAs or nonprofit organizations in partnership with SEAs to support the implementation, replication or expansion of effective STEM professional development programs in schools across the State through collaboration with school administrators, principals, and STEM educators.

Activities to Support Well-Rounded Educational Opportunities (ESEA, as amended by ESSA, title IV, section 4107): Each LEA or consortium of LEAs that receives an allocation under section 4105(a) shall use a portion of such funds to develop and implement programs and activities that support access to a well-rounded education and may include programming and activities that improve instruction and student engagement in science, technology, engineering, and mathematics, including computer science, such as:

a. Increasing access for students through grade 12 who are members of groups underrepresented in STEM fields;
b. Supporting the participation of low-income students in nonprofit competitions related to STEM subjects;
c. Providing hands-on learning and exposure to STEM subjects and supporting the use of field-based or service learning to enhance students' understanding of the STEM subjects;
d. Supporting the creation and enhancement of STEM-focused specialty schools;[11]
e. Facilitating collaboration among school, after-school program, and informal program personnel to improve the integration of programming and instruction in STEM subjects; and
f. Integrating other academic subjects including the arts, into STEM subject programs to increase participation in STEM subjects, improve attainment of skills related to STEM, and promote well-rounded education.

[11] ESEA, as amended by ESSA, title IV, section 4102 defines a STEM-focused specialty school to mean a school, or dedicated program within a school, that engages students in rigorous, relevant, and integrated learning experiences focused on science, technology, engineering, and mathematics, including computer science, which include authentic schoolwide research.

21st Century Community Learning Centers (ESEA, as amended by ESSA, title IV, section 4205): Each eligible entity that receives an award under section 4204 may use the award to carry out a broad array of expanded learning program activities that advance student academic achievement and support student success, including programs that build skills in STEM, including computer science, and that foster innovation in learning by supporting nontraditional STEM education teaching methods.