#### 111TH CONGRESS 2D SESSION

# S. 3883

To amend part B of title II of the Elementary and Secondary Education Act of 1965 to promote effective STEM teaching and learning.

## IN THE SENATE OF THE UNITED STATES

SEPTEMBER 29, 2010

Mr. Begich (for himself, Mr. Carper, Mrs. Gillibrand, and Mr. Lieberman) introduced the following bill; which was read twice and referred to the Committee on Health, Education, Labor, and Pensions

## A BILL

To amend part B of title II of the Elementary and Secondary Education Act of 1965 to promote effective STEM teaching and learning.

- 1 Be it enacted by the Senate and House of Representa-
- 2 tives of the United States of America in Congress assembled,
- 3 SECTION 1. SHORT TITLE.
- 4 This Act may be cited as the "Effective STEM
- 5 Teaching and Learning Act of 2010".
- 6 SEC. 2. EFFECTIVE STEM TEACHING AND LEARNING.
- 7 (a) In General.—Part B of title II of the Elemen-
- 8 tary and Secondary Education Act of 1965 (20 U.S.C.
- 9 6661 et seq.) is amended to read as follows:

## 1 "PART B—EFFECTIVE STEM TEACHING AND

2	LEARNING
3	"SEC. 2201. PROGRAM AUTHORIZED.
4	"(a) Program Authorization.—The Secretary
5	shall use funds made available to carry out this part for
6	a fiscal year to award grants, on a competitive basis, to
7	State educational agencies or to State educational agen-
8	cies in partnership with appropriate outside entities (such
9	as nonprofit organizations and institutions of higher edu-
10	cation) in States that have adopted and are implementing
11	high-quality mathematics standards (and additional
12	standards, such as science standards, at the discretion of
13	the Secretary) that build toward college and career readi-
14	ness, to carry out activities in order to improve the teach-
15	ing and learning in—
16	"(1) mathematics or science, or both, in pre-
17	school through grade 12; and
18	"(2) at the discretion of the State educational
19	agency, technology or engineering or both in pre-
20	school through grade 12.
21	"(b) Length of Grants.—
22	"(1) IN GENERAL.—Grants awarded under sub-
23	section (a) shall be for not more than 3 years.
24	"(2) Extension.—The Secretary may extend a
25	grant awarded under subsection (a) for an additional
26	2 years if the grantee—

1	"(A) is achieving the intended outcomes of
2	the grant; and
3	"(B) shows improvement against baseline
4	measures on performance indicators established
5	by the Secretary.
6	"(c) STATE CAPACITY-BUILDING GRANTS.—
7	"(1) In General.—The Secretary may reserve
8	not more than 5 percent of the amount appropriated
9	to carry out this part for any fiscal year to make ca-
10	pacity-building grants, on a competitive basis, to
11	State educational agencies that do not otherwise re-
12	ceive a grant under this part.
13	"(2) Activities.—A State educational agency
14	that receives a capacity-building grant under para-
15	graph (1) may use the grant funds to carry out 1
16	or more of the activities described in subsections (b)
17	and (c) of section 2203, which may include cooper-
18	ating with industry, museums, institutions of higher
19	education, philanthropic organizations, community-
20	based organizations, or other community partners
21	with STEM expertise, to become more competitive
22	for a grant under subsection (a) in future years.
23	"(d) Definition.—In this part, the term 'STEM'
24	means the subject or subjects in which the grantee chooses
25	to carry out activities consistent with subsection (a).

1	"SEC. 2202. APPLICATION.
2	"(a) In General.—Each State educational agency
3	that desires to receive a grant under section 2201(a), shall
4	submit an application at such time, in such manner, and
5	containing such information as the Secretary may reason-
6	ably require. At a minimum, each application shall include
7	or describe—
8	((1) for an applicant that proposes to carry out
9	mathematics activities, an assurance that the State
10	has adopted high-quality mathematics standards
11	that build toward college and career readiness, and
12	a description of the State's plan for implementing
13	those standards;
14	"(2) for an applicant that proposes to carry out

- "(2) for an applicant that proposes to carry out science activities, an assurance that the State has adopted high-quality science standards that build toward college and career readiness, and a description of the State's plan for implementing those standards;
- "(3) how the State's plan to implement standards in mathematics or science, or both, will help ensure comparability of content and access to highquality instruction in the content area of those standards among all local educational agencies and public schools in the State, particularly in high-poverty local educational agencies and schools;

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1	"(4) the State educational agency's goals for
2	improving student outcomes in STEM throughout
3	the State for all students, including students with
4	disabilities and English language learners, and in-
5	cluding a description of a clear and credible path
6	that the State educational agency will take to
7	achieve these goals with the support of the local edu-
8	cational agencies in the State;
9	"(5) the data that the State has considered or
10	will consider in developing or updating the com-
11	prehensive preschool through grade 12 STEM plan
12	that the State shall develop or update with the
13	State's grant under this section, which shall include
14	data from a needs assessment that the State has
15	conducted prior to applying for funds under this
16	part and that the State uses—
17	"(A) to determine its current approach to
18	STEM instruction;
19	"(B) to support its plan, consistent with
20	section 2201(a), to carry out activities to im-
21	prove teaching and learning; and
22	"(C) to support struggling schools;
23	"(6) how the State educational agency will

carry out the required State-level activities described

in section 2203(b), which may include cooperating

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1	with industry, museums, institutions of higher edu-
2	cation, philanthropic organizations, community-
3	based organizations, or other community partners
4	with STEM expertise, and how the State will align
5	those activities with the comprehensive preschool
6	through grade 12 STEM plan that the State will de-
7	velop (or update) and implement with the State's
8	grant;
9	"(7) how the State educational agency will use
10	evidence to inform and continuously improve the de-
11	sign and implementation of its activities and why the
12	State educational agency expects those activities to
13	improve student achievement, including the achieve-
14	ment of groups of students who are low-performing
15	or underrepresented in STEM fields;
16	"(8) how the State will run a rigorous, high-
17	quality subgrant competition, including how it will—
18	"(A) review and judge—
19	"(i) the evidence supporting the cur-
20	ricula and materials that local educational
21	agencies propose to use;
22	"(ii) the record of local educational
23	agencies in implementing and improving
24	student achievement through other STEM
25	initiatives; and

1	"(iii) the local educational agencies"
2	capacity to implement successfully their
3	proposals; and
4	"(B) give priority to local educational
5	agencies whose applications are supported by
6	the strongest available evidence;
7	"(9) how the State educational agency will en-
8	sure that subgrants that it awards under this part
9	will adequately address the needs of students with
10	disabilities and English language learners;
11	"(10) how the State educational agency will use
12	the grant to leverage other Federal and State funds
13	in order to maximize the impact of the grant, and
14	how it will support local educational agencies in inte-
15	grating these funds with other Federal, State, and
16	local funds to support high-quality STEM instruc-
17	tion, including how it will implement a coherent
18	strategy to coordinate activities with rigorous and
19	challenging instruction for STEM career and tech-
20	nical education through funds the applicant receives
21	under the Carl D. Perkins Career and Technical
22	Education Act of 2006;
23	"(11) how the State educational agency will le-
24	verage the use of technology to engage students in
25	STEM, strengthen teaching and learning of STEM,

1	and improve the learning opportunities in under-
2	served areas;
3	"(12) how the State educational agency will
4	evaluate the State's progress in improving achieve-
5	ment in the relevant STEM subject or subjects, for
6	students, schools, or local educational agencies, par-
7	ticularly those that are underperforming, such as
8	STEM-specific strategies for turning around persist-
9	ently low-performing schools;
10	"(13) how the State educational agency will dis-
11	seminate information on project outcomes in formats
12	that are easily understood by, and accessible to, the
13	public, and how the State educational agency will
14	make the information useful to parents, educators,
15	researchers, and other experts;
16	"(14) the role of any entities with which the
17	State educational agency proposes to partner in car-
18	rying out its proposed activities;
19	"(15) if the State educational agency plans to
20	make subgrants consistent with section 2203(d), the
21	rationale for doing so, including a description of—
22	"(A) how the State educational agency will
23	ensure the alignment of the activities under-
24	taken by subgrantees with State standards and,

1 as appropriate, with the components of high-2 quality STEM instruction; and

> "(B) the State educational agency's plan for conducting the subgrant competition, including a description of how the State educational agency will ensure either that the activities conducted by the subgrantee are evidence-based, or that the subgrantee has a plan to rigorously evaluate the effectiveness of those activities; and

"(16) if the State has received a Race to the Top grant (under the American Recovery and Reinvestment Act of 2009) and, in competing for that grant, received a competitive preference priority for STEM education, how the State educational agency will coordinate the activities it will carry out under this part with the STEM activities carried out under its Race to the Top grant.

## "(b) Priorities.—

"(1) Required priority.—In awarding grants under this section, the Secretary shall give a competitive priority to any State educational agency that demonstrates, in its application, that the State has adopted and is implementing a set of high-quality mathematics standards (and additional standards,

such as science standards, at the discretion of the Secretary) for kindergarten through grade 12 that build toward college and career readiness, and are common to a significant number of States.

"(2) OPTIONAL PRIORITY.—The Secretary may give a competitive priority to any State educational agency that has a robust, statewide partnership or network that brings together industry, museums, institutions of higher education, philanthropic organizations, community-based organizations, or other community partners with STEM expertise, to increase student learning, engagement, and achievement in STEM.

14 "(c) SELECTION CRITERIA.—In reviewing an applica-15 tion under this part, the Secretary shall take into consid-16 eration—

> "(1) the quality of the application, including the State educational agency's plan for making publicly available findings, results (including interim results), and outcomes of the project in a timely manner and in formats that are easily understood and accessible;

> "(2) the extent to which the State educational agency has demonstrated a process for giving priority to applicants that have plans that are evidence-

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1	based or that have a plan in place to evaluate rigor-
2	ously the effectiveness of their projects;
3	"(3) the quality of the applicant's plan to co-
4	operate with industry experts, museums, institutions
5	of higher education, research centers, or other com-
6	munity partners with STEM expertise, in—
7	"(A) preparing and assisting teachers in
8	effectively integrating STEM content across
9	grades and disciplines;
10	"(B) providing effective and relevant in-
11	struction; and
12	"(C) offering applied learning opportuni-
13	ties for all students; and
14	"(4) the quality of the applicant's plan for pre-
15	paring more students for advanced study and ca-
16	reers in STEM, including by addressing the needs
17	of, and barriers faced by, student groups that are
18	underrepresented in STEM, including women and
19	girls, underrepresented minorities, students with dis-
20	abilities, and English language learners.
21	"SEC. 2203. STATE USE OF FUNDS.
22	"(a) State-Level Activities.—A State edu-
23	cational agency that receives a grant under section
24	2201(a) shall reserve not more than 20 percent of the

1	funds it receives under this part for State level activities
2	as described in subsections (b) and (c).
3	"(b) Required Activities.—A State educational
4	agency that receives a grant under section 2201(a) shall—
5	"(1) develop or update, implement, and con-
6	tinuously improve a comprehensive State STEM
7	plan (which may be a component or modification of
8	the consolidated plan submitted by the State under
9	section 9302) for preschool through grade 12 that—
10	"(A) aligns policies, resources, and prac-
11	tices;
12	"(B) contains clear instructional goals; and
13	"(C) sets high expectations for all students
14	and student subgroups;
15	"(2) align the use of Federal and State funds
16	and programs within the State educational agency
17	and in local educational agencies in the State, in-
18	cluding funds under title I, part A of title II, title
19	III, and title VII, and, as appropriate, under the In-
20	dividuals with Disabilities Education Act, the Carl
21	D. Perkins Career and Technical Education Act of
22	2006, and the McKinney-Vento Homeless Assistance
23	Act, to support a coherent approach to funding and
24	implementing high-quality STEM instruction in

high-need local educational agencies and high-need
 schools;

"(3) develop or update a process, or use an existing process, to review and judge the evidence base for the curricula and materials that local educational agencies propose to use in implementing their subgrants and in determining whether the curricula and materials are aligned with State standards, and make the process and results of any such review publicly available;

"(4) administer a rigorous competition for subgrants that is informed by the review process described in paragraph (3), and using the results of that process to inform the competition;

"(5) collect and report, in formats that are easily understood and accessible to the public, data on the implementation and outcomes of the program, including student course enrollment and student achievement outcomes disaggregated in accordance with section 1111(b)(2)(C)(v) for use by parents, teachers, schools, local educational agencies, researchers, and State leaders for program improvement and to evaluate program effectiveness;

"(6) promote and support the implementation of effective subgrant activities in local educational

agencies and schools that do not receive, or are not
served by, subgrants;

"(7) provide technical assistance and support, such as through the development or sharing of information, models, technology-based tools, or training to subgrantees (and, at the State educational agency's discretion, to other local educational agencies) to enable the subgrantees and other agencies to implement a high-quality STEM program, as described in section 2204(e), and improve student achievement in core academic subjects; and

"(8) coordinate, as needed, with other relevant State agencies (including the State agency for higher education and the State entity responsible for professional standards and licensure of teachers and principals) to—

"(A) carry out activities to improve the State's teacher licensure and certification requirements and preservice teacher preparation, by focusing on subject matter competency and reducing unnecessary barriers to entering the teaching profession while ensuring that teachers have the knowledge and skills appropriate for the grade levels the teachers teach; and

1	"(B) improve the State's principal licen-
2	sure and certification requirements and
3	preservice principal preparation by developing
4	principals who are prepared to lead schools and
5	ensure effective instruction across subject areas
6	for a well-rounded education, including in math-
7	ematics and science.
8	"(c) Authorized Activities.—A State educational
9	agency may, either on its own or in a consortium with
10	other State educational agencies, use any funds reserved
11	under subsection (a) but not used for activities under sub-
12	section (b), to—
13	"(1) recruit and prepare individuals with
14	STEM expertise to teach in high-need schools, in-
15	cluding through the use of—
16	"(A) alternative pathways to licensure or
17	certification programs;
18	"(B) recruiting STEM majors within an
19	institution of higher education;
20	"(C) funding undergraduate or graduate
21	STEM internships in preschool through grade
22	12 classrooms; and
23	"(D) funding online STEM courses and
24	learning opportunities that provide STEM ex-

1	pertise across multiple locations, including
2	areas of STEM teacher shortages;
3	"(2) develop instructional systems that pro-
4	vide—
5	"(A) a systematic and coherent combina-
6	tion of instructional materials;
7	"(B) embedded formative and interim as-
8	sessments;
9	"(C) professional development;
10	"(D) information on student learning; and
11	"(E) academic interventions that are based
12	on cognitive science and content area knowledge
13	and that are aligned with college- and career-
14	ready standards;
15	"(3) develop and implement innovative uses of
16	technology that show promise for improving out-
17	comes in classroom instruction, teacher and leader
18	effectiveness, and student achievement; and
19	"(4) carry out activities related to any of the
20	other subjects in section 2201(a) that the State,
21	consistent with section 2202(a)(6), is not already
22	carrying out under this section.
23	"(d) Exception.—
24	"(1) In General.—The Secretary may permit
25	a State that receives a grant under section 2201(a).

- at the State's request, to use not more than 20 percent of the grant funds amount not reserved under subsection (a) to make subgrants to eligible entities (as defined under section 2204(a)(2)) under this subsection.
  - "(2) Not subject to section 2204.—Subgrants awarded under this subsection shall not be subject to the requirements of section 2204, with the exception of the requirements of paragraphs (1) and (2) of section 2204(b).
  - "(3) APPLICATION.—In order to receive a subgrant under this subsection, an eligible entity shall submit an application to the State educational agency at such time, in such form, and including such information as the State educational agency may prescribe. At a minimum, the application shall include—
    - "(A) a description of the applicant's district-wide plan for developing and implementing a high-quality plan or strategy to improve STEM education and for using subgrant funds to support the implementation of that plan or strategy;
  - "(B) a description of the activities the entity proposes to carry out, including an expla-

1	nation of how those activities align with the
2	State's STEM standards and of how they would
3	incorporate the components of high-quality
4	STEM instruction;
5	"(C) the rationale underlying the proposed
6	model practice, strategy, or program in improv-
7	ing teaching practice as well as student achieve-
8	ment, especially with high-need student popu-
9	lations, which shall include either—
10	"(i) a description of how the proposed
11	practice, strategy, or program is evidence
12	based; or
13	"(ii) a rationale based on research
14	findings that the proposed practice, strat-
15	egy, or program will improve student
16	achievement; and
17	"(D) the plan for evaluating the impact of
18	the model practice, strategy, or program and
19	disseminating information from that evaluation.
20	"(4) Activities.—Subgrants awarded under
21	this subsection may carry out activities that are not
22	required of the State under subsection (b), but
23	that—
24	"(A) align with the State's STEM stand-
25	ards;

1	"(B) incorporate 1 or more of the compo-
2	nents of high-quality STEM instruction; and
3	"(C) are evidence-based or for which the
4	subgrantee has a plan in place to rigorously
5	evaluate their effectiveness.
6	"SEC. 2204. STEM EDUCATION SUBGRANTS.
7	"(a) Subgrant Authorization.—
8	"(1) In general.—A State educational agency
9	that receives a grant under section 2201(a) shall,
10	from funds the State receives under this part that
11	are not reserved under section 2203(a) or used pur-
12	suant to section 2203(d), make STEM education
13	subgrants, on a competitive basis, to eligible entities.
14	"(2) ELIGIBLE ENTITIES.—In this section, the
15	term 'eligible entity' means—
16	"(A) a high-need local educational agency;
17	"(B) a consortium of high-need local edu-
18	cational agencies;
19	"(C) a partnership of 1 or more high-need
20	local educational agencies with 1 or more insti-
21	tutions of higher education or 1 or more non-
22	profit organizations, or both; or
23	"(D) an educational service agency pro-
24	posing to serve high-need local educational
25	agencies.

1	"(b) Criteria.—Subgrants under this section shall
2	be—
3	"(1) used to carry out projects in high-need
4	schools;
5	"(2) of sufficient size to support projects that
6	can influence classroom instruction in a significant
7	number or percentage of classrooms in the high-need
8	schools that the subgrantee would serve; and
9	"(3) used to carry out the activities listed under
10	subsection (e), unless the Secretary has permitted
11	the State to do otherwise.
12	"(c) Application Requirements.—In order to re-
13	ceive a subgrant under this section, an eligible entity shall
14	submit an application to the State educational agency at
15	such time, in such form, and including such information
16	as the State educational agency may prescribe. At a min-
17	imum, the application shall include—
18	"(1) a description of the applicant's district-
19	wide plan for developing and implementing a com-
20	prehensive high-quality STEM program for all
21	schools and students in the participating local edu-
22	cational agencies and for using subgrant funds to
23	support the implementation of that plan;
24	"(2) a description of how the applicant's dis-
25	trict-wide plan aligns with the State's STEM plan

- for preschool through grade 12 and the State's goals
   for improving student outcomes;
- "(3) a description of the applicant's record in implementing and improving student achievement for all subgroups of students served through other STEM initiatives;
- "(4) a description of how the proposed activities
  are informed by a needs assessment described in the
  application and designed to support effective teaching and to improve student achievement for the lowest-performing subgroups;
  - "(5) a description of the evidence base for the proposed activities;
    - "(6) a description of how the activities will include and be accessible to all students, including students with disabilities and English language learners; and
- "(7) a description of how the applicant's selection of schools and the grade spans it plans to serve with funds under this part would support successful achievement of the objectives described in the application and the STEM plan required under paragraph (1).
- "(d) PRIORITIES.—In awarding subgrants under this
  section, a State educational agency shall give priority to—

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1	"(1) entities that propose a coherent strategy to
2	improve STEM instruction that aligns activities
3	under the subgrant with literacy instruction sup-
4	ported with other Federal funds under title I, part
5	A of title II, title III, and title VII, and, as appro-
6	priate, the Individuals with Disabilities Education
7	Act and the Carl D. Perkins Career and Technical
8	Education Act of 2006 and State and local funds;
9	"(2) entities that propose to develop 1 or more
10	robust partnerships with at least 1 entity, such as
11	a locally situated business, college or university, or
12	nonprofit organization, that has expertise, or a
13	workforce with knowledge, in STEM fields or in edu-
14	cation in STEM subjects;
15	"(3) entities that propose to implement activi-
16	ties in schools with the highest levels of need and ca-
17	pacity for improvement;
18	"(4) entities that have a plan for sustaining the
19	strategy described in paragraph (1) after the end of
20	the subgrant; and
21	"(5) entities whose proposals are supported by
22	the strongest available evidence.
23	"(e) Local Activities.—
24	"(1) REQUIRED ACTIVITIES.—Each recipient of
25	a subgrant under this section shall implement a

1	high-quality, evidence-based, comprehensive, and co-
2	herent STEM program that includes each of the fol-
3	lowing aligned components:
4	"(A) Effective professional development
5	(as defined in section 9101) in STEM for
6	teachers and school leaders, which may include
7	professional development focused on subject
8	matter competency and on ensuring that teach-
9	ers have the knowledge and skills appropriate
10	for the grade levels that they teach.
11	"(B) High-quality curriculum and instruc-
12	tional materials that are aligned with State
13	standards and that incorporate the components
14	of high-quality STEM instruction, and incor-
15	porate technology, as appropriate, and prin-
16	ciples of universal design for learning to sup-
17	port students with diverse learning needs, in-
18	cluding students with disabilities and English
19	language learners.
20	"(C) Coherent, high-quality assessment
21	systems that are aligned with State standards
22	and assessments and that include—
23	"(i) valid and reliable diagnostic and
24	progress-monitoring measures, to the ex-
25	tent available;

1	"(ii) the systematic use of the assess-
2	ment data to inform and modify instruc-
3	tion, interventions, and continuous pro-
4	gram improvement;
5	"(iii) appropriate accommodations
6	necessary to ensure that all students, in-
7	cluding students with disabilities and
8	English language learners, are reliably and
9	accurately assessed; and
10	"(iv) interventions to ensure that all
11	students, including both struggling stu-
12	dents and students who master the mate-
13	rial ahead of their peers, are served appro-
14	priately.
15	"(D) Monitoring of program implementa-
16	tion and outcomes, including the effectiveness
17	of professional development, and activities that
18	track implementation and outcomes at the local
19	educational agency, school, classroom, and stu-
20	dent levels, so as to inform continuous improve-
21	ment.
22	"(2) Additional authorized activities.—A
23	recipient of a subgrant under this section may carry
24	out additional activities, consistent with its plan
25	under subsection (c)(1), including—

1	"(A) providing technical assistance and
2	support to high-need schools to enable the
3	schools to implement a high-quality, comprehen-
4	sive STEM program;
5	"(B) developing partnerships with organi-
6	zations with STEM expertise to assist the local
7	educational agency in increasing student learn-
8	ing, engagement, and achievement in STEM;
9	"(C) creating mechanisms to promote the
10	adoption of effective practices and ensure that
11	those practices are sustained;
12	"(D) integrating evidence-based, effective
13	STEM programs and comprehensive STEM ini-
14	tiatives into the teaching of other core academic
15	subjects;
16	"(E) activities to support family engage-
17	ment in STEM education; and
18	"(F) developing and implementing innova-
19	tive uses of technology that show promise for
20	improving outcomes in classroom instruction
21	teacher and leader effectiveness, and student
22	achievement.
23	"(f) Length of Grants.—
24	"(1) In general.—Subgrants awarded under
25	this section shall be for not more than 3 years.

1	"(2) Extension.—The State educational agen-
2	cy may extend a subgrant under this section for an
3	additional 2 years if the subgrantee—
4	"(A) is achieving the intended outcomes of
5	the subgrant; and
6	"(B) shows improvement against baseline
7	measures on performance indicators established
8	by the Secretary.".
9	(b) Table of Contents.—The table of contents in
10	section 2 of the Elementary and Secondary Education Act
11	of 1965 is amended by striking the items relating to part
12	B of title II and inserting the following:

"PART B—EFFECTIVE STEM TEACHING AND LEARNING

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<sup>&</sup>quot;Sec. 2201. Program authorized.

<sup>&</sup>quot;Sec. 2202. Application.

<sup>&</sup>quot;Sec. 2203. State use of funds.

<sup>&</sup>quot;Sec. 2204. STEM education subgrants.".