To amend the Elementary and Secondary Education Act of 1965 to provide for the development of State statistical literacy plans and to authorize the Secretary of Education to make grants for statistics-related teacher professional development and the improvement of statistics education.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.
This Act may be cited as the “Statistics Teaching, Aptitude, and Training Act of 2011” or the “STAT Act of 2011”.
SEC. 2. FINDINGS.

The Congress finds the following:

(1) Statistical literacy, the understanding and use of the language and tools of statistics, is vital for United States citizens in an era of intense global competition and growing reliance on data, because of a statistically literate individual’s ability to—

(A) ask and evaluate critical questions about the design of a study and the appropriateness of the conclusions drawn from a study;

(B) distinguish arguments based on data and evidence from arguments based on anecdotes;

(C) recognize and interpret different representations of data in context; and

(D) formulate questions that can be addressed with data, collect and organize relevant data, and draw appropriate statistical conclusions.

(2) Statistical literacy is essential for both effective citizenship and personal well-being because of the everyday need to—

(A) interpret and synthesize data displays and summaries, such as polls, surveys, and study outcomes; and
(B) critically evaluate claims based on data—

(i) as a consumer of the news media;
(ii) in making medical decisions; and
(iii) in making financial decisions, such as decisions related to a mortgage or a car repair.

(3) Statistics provides tools for describing variability and uncertainty to support making informed decisions, both large and small. A foundation in statistical thinking helps individuals to evaluate risks and weigh the likelihood of various outcomes.

(4) Statistical literacy provides tools for dealing with uncertainty. There is uncertainty in virtually every situation and number individuals face, but statistical literacy enables individuals to make rational decisions in the face of uncertainty.

(5) Statistical concepts are important for the study of mathematics, the natural sciences, and the social sciences. In mathematics, statistical literacy provides applications and real-life illustrations of the importance of mathematics, which motivates students for deeper learning. In the natural sciences and the social sciences, statistical problem-solving
teaches a framework for the scientific process and an understanding of data and their limitations.

(6) Effective statistical literacy education in elementary and secondary school would—

(A) produce graduates better equipped with the skills necessary to compete in the workforce of the 21st century, with its burgeoning growth of and dependence on data;

(B) enhance student learning and problem-solving skills across disciplines; and

(C) equip students with knowledge needed to be responsible and engaged citizens.

(7) Room exists for significant improvement in statistics education because of the following factors:

(A) While national mathematics standards and benchmarks from organizations such as Achieve, the College Board, and the National Council for Teachers of Mathematics support data analysis and probability as essential components of mathematics education, many elementary and secondary school teachers have not received the necessary training at the appropriate level to teach statistical literacy in their classrooms.
(B) Most State guidelines include statistics and probability, but the topic tends to be skipped because of the lack of teacher preparation and proper emphasis on the topic in State assessments.

(C) While some students do take a course in statistics, sound statistical reasoning skills take time for students to develop and cannot be honed in a single course. Foundational statistical concepts should be introduced and nurtured in the elementary grades and strengthened and expanded throughout the middle school and high school grades and in postsecondary courses.

(D) Teacher training programs at institutions of higher education for pre-service mathematics and science teachers and professional development programs designed to reach in-service mathematics and science teachers do not yet include statistical concepts and pedagogy at the appropriate level.

(E) Teachers do not yet have access to materials supported by statistics education research.
SEC. 3. STATISTICAL LITERACY EDUCATION.

(a) In General.—Part D of title V of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 7241 et seq.) is amended by adding at the end the following new subpart:

“Subpart 22—Statistical Literacy Education

“CHAPTER A—STATISTICAL LITERACY PLANS

“SEC. 5621. PLAN REQUIRED; DEVELOPMENT, SUBMISSION, AND APPROVAL.

“(a) Plan Required.—To be eligible to receive a grant under section 5632(a), a State educational agency shall submit a statistical literacy plan to the Secretary in accordance with this section.

“(b) Development.—

“(1) In General.—A State educational agency shall, in developing a statistical literacy plan—

“(A) consult with the Statistical Literacy Advisory Panel established by the State educational agency under paragraph (2)(A); and

“(B) seek input from the public.

“(2) Statistical Literacy Advisory Panel.—

“(A) In General.—A State educational agency developing a statistical literacy plan shall establish a Statistical Literacy Advisory
Panel to advise the State educational agency on the contents of the plan.

“(B) COMPOSITION OF PANEL.—A Statistical Literacy Advisory Panel of a State educational agency shall include the following members, to be appointed by the State educational agency:

“(i) One member from the State educational agency and 1 member from a local educational agency within the State.

“(ii) Two statisticians from institutions of higher education, at least 1 of whom has expertise in teaching statistics education.

“(iii) Two teachers from public elementary schools or public secondary schools, 1 of whom teaches a grade that is not higher than the 8th grade and 1 of whom teaches a grade that is not lower than the 9th grade and not higher than the 12th grade.

“(iv) One member from a teacher training department or professional development center of an institution of higher
education who has expertise in statistics or mathematics education.

“(v) One statistician with experience working in the private sector in a field that employs a significant number of statisticians, such as finance, computer science, or market and survey research.

“(3) Plan developed for other purposes.—In the case of a State educational agency that, prior to the date of the enactment of this subpart, developed a statistical literacy plan in cooperation with State statistical literacy and education experts for purposes other than meeting the requirement of subsection (a), the agency shall be deemed to meet the requirements of paragraphs (1) and (2).

“(c) Approval.—

“(1) In general.—Not later than 120 days after submission by a State educational agency of a statistical literacy plan, the Secretary shall, with input from the Peer Review Board established under paragraph (5)(A)—

“(A) if the plan meets the criteria described in paragraph (2), approve the plan; or

“(B) if the plan does not meet such criteria, inform the State educational agency of
any deficiencies in the plan and implement the
process described in paragraph (3).

“(2) CRITERIA FOR APPROVAL.—The criteria
described in this paragraph are the following:

“(A) The State educational agency certifies
to the Secretary that the plan was developed in
accordance with subsection (b).

“(B) The plan includes the contents de-
scribed in subsection (d).

“(C) Implementation of the plan will—

“(i) achieve the objectives described in
subsection (e); and

“(ii) ensure statistical literacy appro-
priate to the grade-level of all students in
elementary schools and secondary schools
served by the State educational agency.

“(3) PROCEDURE IF PLAN INADEQUATE.—

“(A) NOTICE AND OPPORTUNITY FOR RE-
VISION.—The Secretary may not deny approval
of a statistical literacy plan submitted by a
State educational agency under paragraph (1)
unless the Secretary has first—

“(i) informed the agency of any defi-
cencies in the plan;
“(ii) provided the agency with an opportunity for a hearing on such deficiencies;

“(iii) provided the agency with a period of at least 90 days in which to revise the plan; and

“(iv) offered the agency technical assistance in revising the plan.

“(B) Resubmission and Final Decision.—A State educational agency that has been given an opportunity to revise a statistical literacy plan under subparagraph (A)(iii) shall submit the revised plan to the Secretary not later than the end of the period described in such subparagraph. Not later than 120 days after receiving the revised plan, the Secretary shall approve or disapprove the plan.

“(4) State Academic Content Standards and Assessments.—The Secretary may not, as a condition of approval under this subsection of a statistical literacy plan of a State educational agency, require that the State educational agency—

“(A) include in or delete from the statistical literacy plan one or more specific elements
of the academic content standards adopted
under section 1111(b)(1)(A); or

“(B) use specific instruments or items for
academic assessment.

“(5) PEER REVIEW BOARD.—

“(A) Establishment.—The Secretary
shall establish a Peer Review Board to advise
the Secretary on whether a statistical literacy
plan submitted by a State educational agency
should be approved, revised, or (after the oppor-
tunity for revision required by paragraph
(3)(A)(iii)) disapproved.

“(B) Membership.—The Peer Review
Board shall be composed of a number of mem-
ers to be determined by the Secretary, to be
appointed by the Secretary. The Secretary shall
appoint members that—

“(i) are representative of parents,
teachers, State educational agencies, local
educational agencies, and nongovernmental
organizations; and

“(ii) are familiar with current issues
in the field of statistics and statistics edu-
cation and with the statistics education
needs of students.
“(C) Compensation.—

“(i) In general.—Except as provided in clause (ii), members of the Peer Review Board shall serve without compensation.

“(ii) Travel expenses.—Each member of the Peer Review Board shall receive travel expenses, including per diem in lieu of subsistence, in accordance with applicable provisions under subchapter I of chapter 57 of title 5, United States Code.

“(d) Contents.—The contents described in this subsection are the following:

“(1) A description of how the State educational agency will measure the statistical literacy of students, including—

“(A) challenging State academic content standards and student academic achievement standards in statistics education, and how statistics education instruction will be integrated throughout the curriculum used in elementary schools and secondary schools; and

“(B) a description of the relationship of the plan to the secondary school graduation requirements of the State.
“(2) A description of programs for professional development for teachers to improve—

“(A) statistical subject-matter knowledge;

and

“(B) pedagogical skills in teaching statistical concepts, including the use of—

“(i) interdisciplinary and research-based learning; and

“(ii) innovative technology in the classroom.

“(3) A description of how the State educational agency will implement the plan, including securing funding and other necessary support.

“(e) OBJECTIVES.—The objectives described in this subsection are the following:

“(1) To prepare students to make informed decisions in the face of uncertainty, including decisions related to personal finance, using statistical reasoning necessary to interpret data and critically evaluate claims based on data.

“(2) To provide experiences that incorporate statistics into the regular school curriculum and to create programs that teach statistical problem-solving as an investigative process, including experiences and programs that—
“(A) promote statistical thinking through hands-on problem-solving and concept activities;

“(B) emphasize concepts over formulas, using real-world data;

“(C) stress the importance of context in problem-solving;

“(D) recognize the omnipresence of variability; and

“(E) use appropriate technology to emphasize concepts and support learning.

“(3) To create opportunities for enhanced and ongoing professional development for teachers that improves—

“(A) statistical subject-matter knowledge;

“(B) pedagogical skills in teaching statistical concepts, including the use of—

“(i) interdisciplinary and research-based learning; and

“(ii) innovative technology in the classroom; and

“(C) the ability of teachers to collect, organize, analyze, and interpret classroom data to inform instruction and evaluate student progress in statistical literacy.
“(f) **Updates of Plan.**—A State educational agency that has a statistical literacy plan approved under subsection (c) and wishes to remain eligible for grant funds under section 5632(a) shall submit to the Secretary for approval under such subsection an updated plan—

“(1) not later than 4 years after the date of the approval of the plan and every 4 years thereafter; and

“(2) at any other time the agency considers modification of the plan to be necessary to ensure that the plan continues to achieve the objectives described in subsection (e).

“(g) **Report on Implementation of Plan.**—

“(1) **In General.**—A State educational agency shall submit to the Secretary, not later than 2 years after receiving a grant under section 5632(a), and biennially thereafter for each 2-year period during any part of which the agency received grant funds under such section, a report on the implementation of the statistical literacy plan of the agency for which an approval under subsection (c) is in effect during such period.

“(2) **Reporting Requirements.**—A report required by paragraph (1) shall—
“(A) be in a form and include such contents as the Secretary may require; and

“(B) be based on evaluation activities conducted by the State educational agency on a regular basis throughout implementation of the plan.

“(3) PUBLIC AVAILABILITY.—The Secretary shall make each report required by paragraph (1) available to the public on an appropriate website.

“SEC. 5622. GRANTS FOR DEVELOPMENT OF PLAN.

“(a) AUTHORIZATION.—The Secretary may make grants on a competitive basis to State educational agencies for the development of statistical literacy plans required by section 5621(a).

“(b) ELIGIBILITY.—The Secretary may only make a grant under subsection (a) to a State educational agency that—

“(1) the Secretary determines lacks the resources to develop an adequate statistical literacy plan; and

“(2) submits to the Secretary an application at such time, in such form, and containing such information and assurances as the Secretary may require.

“(c) REQUIRED ACTIVITIES.—A State educational agency receiving a grant under subsection (a) shall—
“(1) not later than 1 year after receiving the grant, submit to the Secretary a statistical literacy plan in accordance with section 5621;

“(2) if the Secretary finds any deficiencies in the plan, submit a revised plan in accordance with the procedures described in subsection (c)(3) of such section; and

“(3) not later than 30 days after the Secretary approves the plan, apply for a grant under section 5632(a).

“(d) Duration.—A grant under subsection (a) shall be for a period of not more than 1 year.

“(e) Nonrenewability.—The Secretary may not award more than 1 grant under subsection (a) to the same State educational agency.

“CHAPTER B—STATISTICS EDUCATION PROFESSIONAL DEVELOPMENT GRANTS

“SEC. 5631. PURPOSE.

“The purpose of this chapter is to ensure the academic achievement of students in statistical literacy through the professional development of teachers and other education professionals.

“SEC. 5632. FORMULA GRANTS TO STATES.

“(a) Authorization.—Using the allocation formula developed under subsection (b), the Secretary shall make
one or more grants to each State educational agency that
has a statistical literacy plan approved under section
5621(c) and submits an application for a grant under this
subsection to enable each such agency to award subgrants
to eligible partnerships under section 5633(a).

“(b) REGULATIONS.—The Secretary shall promul-
gate regulations to implement this chapter. Such regula-
tions shall include the formula by which the Secretary will
allocate grants to State educational agencies under sub-
section (a).

“(c) ADMINISTRATIVE EXPENSES.—A State edu-
cational agency receiving a grant under subsection (a) may
not use more than 2.5 percent of the grant funds for ad-
ministrative expenses.

“SEC. 5633. COMPETITIVE SUBGRANTS TO ELIGIBLE PART-
NERSHIPS.

“(a) AUTHORIZATION.—From funds received under
section 5632(a), a State educational agency shall make
grants, on a competitive basis, to eligible partnerships to
enable the eligible partnerships to carry out the activities
described in subsection (c), consistent with the statistical
literacy plan of the State educational agency.

“(b) ELIGIBILITY.—

“(1) IN GENERAL.—A State educational agency
may not award a grant under subsection (a) to an
eligible partnership unless the eligible partnership submits to the State educational agency an application at such time, in such form, and containing such information and assurances as the State educational agency may require, including the contents described in paragraph (2).

“(2) CONTENTS OF APPLICATION.—The contents described in this paragraph are the following:

“(A) The results of a comprehensive assessment of the teacher quality and professional development needs, with respect to the teaching and learning of statistical content, of the entities served by the eligible partnership.

“(B) An explanation of how the activities to be carried out by the eligible partnership are expected to improve student academic achievement and strengthen the quality of statistical instruction at schools served by the eligible partnership.

“(C) A description of how the activities to be carried out by the eligible partnership—

“(i) will be aligned with challenging State academic content standards and student academic achievement standards in statistics education and with the statistical
literacy plan of the State educational agency approved under section 5621(c); and

“(ii) will advance the teaching of interdisciplinary courses that integrate statistics into the study of natural, social, and economic systems.

“(D) A description of how the eligible partnership will carry out the activities described in subsection (c).

“(E) An evaluation and accountability plan that establishes rigorous objectives to measure the impact of the activities carried out with grant funds, including objectives to measure the increase in the number of teachers served by the eligible partnership who participate in statistics education content-based professional development activities.

“(F) A description of how the eligible partnership will continue the activities carried out with grant funds after the grant period has expired.

“(c) REQUIRED ACTIVITIES.—An eligible partnership receiving a grant under subsection (a) shall use the grant funds to carry out the following activities:
“(1) Creating opportunities for enhanced and ongoing professional development of teachers that improves the statistical subject-matter knowledge of such teachers.

“(2) Creating opportunities for enhanced and ongoing professional development of teachers that improves pedagogical skills in teaching statistical concepts, including in the use of—

“(A) interdisciplinary and research-based learning; and

“(B) innovative classroom technology.

“(3) Establishing and operating statistics education summer workshops or institutes, including follow-up training, for elementary school and secondary school teachers to improve pedagogical skills and subject-matter knowledge with respect to the teaching of statistics concepts.

“(4) Developing or redesigning more rigorous statistics education curricula that—

“(A) are aligned with challenging State academic content standards and student academic achievement standards in statistics education and with the statistical literacy plan of the State educational agency; and
“(B) advance the teaching of interdisciplinary courses that integrate statistics in the teaching of mathematics, science, economics, finance and financial literacy, and social studies.

“(5) Designing programs to prepare the teachers at a school to provide mentoring and professional development to other teachers at such school to improve teacher statistics education subject-matter and pedagogical skills.

“(6) Establishing and operating programs to bring teachers into contact with working professionals in statistical fields to expand the subject-matter knowledge of such teachers regarding statistical concepts and the research by such teachers on statistical issues.

“(7) Creating initiatives that seek to incorporate statistics education into teacher training programs or accreditation standards consistent with the statistical literacy plan of the State educational agency.

“(d) DURATION.—A grant under subsection (a) shall be for a period of not more than 4 years.

“(e) SUPPLEMENT, NOT SUPPLANT.—An eligible partnership receiving a grant under subsection (a) shall use such funds to supplement, not supplant, funds that
would otherwise be used for the activities described in subsection (e).

“(f) Evaluation and Accountability Report.—Not later than 90 days after the end of each year in which an eligible partnership receives a grant under subsection (a) from a State educational agency, the eligible partnership shall submit a report to the State educational agency on the progress of the eligible partnership in meeting the objectives established in the evaluation and accountability plan of the eligible partnership required by subsection (b)(2)(E).

“(g) Termination of Grant.—A State educational agency may terminate a grant to an eligible partnership at any time after the end of the 1st year of the grant based on the insufficiency of the progress of the eligible partnership in meeting the objectives established in the evaluation and accountability plan of the eligible partnership required by subsection (b)(2)(E).

“SEC. 5634. Eligible Partnership Defined.

“In this chapter, the term ‘eligible partnership’ means a partnership between a local educational agency and 1 or more of the following:

“(1) The teacher training department or professional development center of an institution of higher education.
“(2) The statistics department of an institution of higher education.

“(3) Another local educational agency, a public elementary school or a public secondary school (including a public charter school), or a consortium of such schools.

“(4) A Federal, State, regional, or local statistical agency that has demonstrated effectiveness in improving the quality of statistics education teachers.

“CHAPTER C—STATISTICS EDUCATION

GRANTS TO BUILD NATIONAL CAPACITY

“SEC. 5641. PURPOSE.

“The purpose of this chapter is to strengthen statistics education as an integral part of the curriculum of elementary schools and secondary schools in the United States.

“SEC. 5642. GRANT PROGRAM.

“(a) AUTHORIZATION.—From amounts reserved under section 5652(e), the Secretary may make grants, on a competitive basis, to eligible entities to enable the eligible entities to carry out activities described in subsection (e).

“(b) ELIGIBILITY.—The Secretary may only make a grant under subsection (a) to an eligible entity that sub-
mits to the Secretary an application at such time, in such form, and containing such information and assurances as the Secretary may require, including a description of how the entity will use grant funds to carry out 1 or more of the activities described in subsection (e).

“(c) USE OF FUNDS.—An eligible entity receiving a grant under subsection (a) shall use grant funds to carry out 1 or more of the following activities:

“(1) Developing model State standards and curriculum frameworks for statistics education that meet challenging academic content standards and student academic achievement standards for statistics education.

“(2) Replicating or disseminating information about proven and tested model statistics education programs that provide interdisciplinary instruction that integrates statistics in mathematics, science, economics, and social studies.

“(3) Developing and implementing new policy approaches to advancing statistics education at the State and national level.

“(4) Conducting studies of national significance that—
“(A) provide a comprehensive, systematic, and formal assessment of the state of statistics education in the United States;

“(B) evaluate the effectiveness of teaching statistics as a separate subject, and as an integrating concept or theme; and

“(C) evaluate the effectiveness of statistics education in improving student academic achievement in mathematics, science, and other core academic subjects.

“(5) Conducting projects that advance widespread adoption by State educational agencies and local educational agencies of statistics education content standards.

“(d) DURATION.—A grant under subsection (a) shall be for a period of not less than 1 year and not more than 5 years.

“(e) REPORTS.—

“(1) BY ELIGIBLE ENTITY TO SECRETARY.—Not later than 90 days after the end of each year in which an eligible entity receives a grant under subsection (a), the eligible entity shall submit to the Secretary a report that—
“(A) describes the activities carried out by the eligible entity using grant funds during the year covered by the report; and

“(B) assesses whether such activities have, directly or indirectly, helped State educational agencies, local educational agencies, and schools served by the eligible entity to make progress towards achieving the objectives described in section 5621(e).

“(2) BY SECRETARY TO CONGRESS.—Not later than 2 years after the date of the enactment of this subpart and annually thereafter for any year in which grants are made under subsection (a), the Secretary shall submit to Congress a report that—

“(A) describes the activities carried out by eligible entities using grants under subsection (a);

“(B) evaluates the success of such activities in improving national and State statistics education capacity; and

“(C) makes such recommendations as the Secretary considers appropriate to promote the continuation and improvement of such activities.
“(f) Termination of Grant.—The Secretary may terminate a grant made to an eligible entity under subsection (a) if—

“(1) the eligible entity fails to submit the report required by subsection (e)(1); or

“(2) the Secretary determines on the basis of such report that the performance of the eligible entity with respect to improving statistics education is inadequate.

“(g) Supplement, Not Supplant.—An eligible entity receiving a grant under subsection (a) shall use such funds to supplement, not supplant, funds that would otherwise be used for the activities carried out with grant funds.

“(h) Administrative Expenses.—The Secretary may not use more than 7.5 percent of the amounts reserved under section 5652(c) for administrative expenses.

“SEC. 5643. ELIGIBLE ENTITY DEFINED.

“In this chapter, the term ‘eligible entity’ means—

“(1) a teacher training department or professional development center of an institution of higher education;

“(2) the statistics or mathematical sciences department of an institution of higher education;
“(3) a Federal, State, regional, or local statistical agency that has demonstrated effectiveness, expertise, and experience in the development of the institutional, financial, intellectual, or policy resources needed to help the field of statistics education become more effective and widely practiced;

“(4) a nonprofit organization that has demonstrated effectiveness, expertise, and experience in the development of the institutional, financial, intellectual, or policy resources needed to help the field of statistics education become more effective and widely practiced; or

“(5) any of the entities listed in paragraphs (1) through (4) in partnership with a local educational agency, a public elementary school or a public secondary school (including a public charter school), or a consortium of such schools.

“CHAPTER D—GENERAL PROVISIONS

“SEC. 5651. STATISTICAL LITERACY DEFINED.

“In this subpart, the term ‘statistical literacy’ means the understanding of and ability to use the language and tools of statistics, including the ability to—

“(1) ask and evaluate critical questions about the design of a study and the appropriateness of the conclusions drawn from a study;
“(2) distinguish arguments based on data and evidence from arguments based on anecdotes;
“(3) recognize and interpret different representations of data in context; and
“(4) formulate questions that can be addressed with data, collect and organize relevant data, and draw appropriate statistical conclusions.

“SEC. 5652. AUTHORIZATION OF APPROPRIATIONS.
“(a) IN GENERAL.—There are authorized to be appropriated such sums as may be necessary to carry out this subpart.
“(b) AVAILABILITY.—Any amounts appropriated under subsection (a) are authorized to remain available until expended.
“(c) RESERVATION.—Of any amounts appropriated under subsection (a) for a fiscal year, the Secretary shall reserve not more than 10 percent to carry out chapter C.”.

(b) CONFORMING AMENDMENTS.—The table of contents of such Act is amended by inserting after the item relating to section 5618 the following:

Sec. 1. Short title.
Sec. 2. Findings.
Sec. 3. Statistical literacy education.

“SUBPART 22—STATISTICAL LITERACY EDUCATION

“CHAPTER A—STATISTICAL LITERACY PLANS

“Sec. 5621. Plan required; Development, submission, and approval.
“Sec. 5622. Grants for development of plan.
“Chapter B—Statistics Education Professional Development Grants

“Sec. 5631. Purpose.
“Sec. 5632. Formula grants to States.
“Sec. 5633. Competitive subgrants to eligible partnerships.
“Sec. 5634. Eligible partnership defined.

“Chapter C—Statistics Education Grants To Build National Capacity

“Sec. 5641. Purpose.
“Sec. 5642. Grant program.
“Sec. 5643. Eligible entity defined.

“Chapter D—General Provisions

“Sec. 5651. Statistical literacy defined.
“Sec. 5652. Authorization of appropriations.