

Your Question: You asked if additional states have integrated computer science into high school graduation requirements since the April 2015 publication of ECS' report on the topic.

Our Response: Yes. Since the April 2015 release of ECS' report [Computer Science in High School Graduation Requirements](#), legislative or regulatory changes related to computer science in high school graduation requirements have been approved in seven states:

- Three states – Arkansas, New Jersey, and Minnesota – have adopted policies requiring districts to allow computer science coursework to be applied toward math (New Jersey and Minnesota) or math or science high school graduation requirements (Arkansas).
- One state – Colorado – has passed legislation that would permit, but not require, districts to award math or science credit for computer science coursework.
- One state – Tennessee – has passed legislation directing the state board to approve computer science courses that may satisfy the elective focus requirement for graduation.
- One state – West Virginia – has charged the state board with developing a computer science plan that includes learning standards that may fulfill a computer science, math, or science graduation credit.
- One state – Utah – that already permitted students to earn science credit via computer science has revised this regulation to provide greater specificity on the types of computer science courses that may fulfill the science credit requirement.

The sections that follow provide updated information on:

- Policies mandating awarding of math, science or foreign language credit for computer science coursework
- Policies permitting awarding of math or science credit for computer science coursework
- Policies awarding credit in other subject areas for computer science coursework
- One state in which mandatory versus voluntary awarding of math or science credit for computer science coursework is yet to be determined.

Policies mandating awarding of math, science or foreign language credit

Currently, 17 states require that students be allowed to apply specified computer science courses toward completion of mathematics, science or foreign language graduation requirements for the standard diploma. This is an increase from 14 states with such a requirement as of April 1, 2015.

Arkansas: Students choose to complete the rigorous “Smart Core” curriculum or the less rigorous “Core” curriculum. For each of these two curricular options, students select between Option 1 and Option 2 to complete math and science requirements. Smart Core students may use computer math to fulfill the 4th math credit OR may take 3 math credits from option 1 plus a unit of computer science. Math Option 2 for Arkansas Core students includes 1 unit computer science plus 3 units selected from Option 1.

Similarly, Smart Core students may fulfill the science requirement by taking one unit computer science and two units of lab science identified in option 1. Arkansas Core students may fulfill the science requirement by completing one unit computer science plus 2 units selected from Option 1. (Ark. Admin. Code 005.15.2-14.02)

Arkansas Smart Core and Core Option 1 and 2 for Mathematics

	Option 1	Option 2
Arkansas Smart Core (4 units)	Algebra I or Algebra A & B	1 unit computer science + 3 units chosen from Option 1
	Geometry or Investigating Geometry or Geometry A & B	
	Algebra II	
	4 th unit chosen from: Transitions to College Math, Pre-Calculus, Calculus, Trigonometry, Statistics, Computer Math, Algebra III, or an AP math	
Arkansas Core (4 units)	Algebra I or equivalent	1 unit computer science + 3 units chosen from Option 1
	Geometry or equivalent	
	2 additional units building on algebra and geometry knowledge and skills	

Arkansas Smart Core and Core Option 1 and 2 for Science

	Option 1	Option 2
Arkansas Smart Core (3 units)	Lab sciences chosen from Physical Science, Biology or Applied Biology/Chemistry, Chemistry, Physics or Principles of Technology I & II or PIC Physics	1 unit computer science + 2 units chosen from Option 1
Arkansas Core (3 units)	Biology or its equivalent	1 unit computer science + 2 units chosen from Option 1
	A physical science	
	One additional unit science	

Florida: One math or science unit may be completed by one unit in computer science and the earning of related industry certifications. Computer science may not fulfill Algebra I or higher-level math, or Biology I or higher-level science credit requirements. (West’s F.S.A. § 1007.2616(3)(a))

Georgia: Fourth science unit may be completed by Advanced Placement (AP) computer science. (Ga. Comp. R. & Regs. 160-4-2-.20)

Idaho: One math unit may be completed by an AP or dual credit computer science or dual credit engineering course if the student has completed Algebra II. One science unit may be completed by one of these courses. Students taking these courses may not count such courses as both a math and science credit. (IDAPA 08.02.03.105.01(d), (e))

Illinois: One math unit may be completed by an AP computer science course if the student completes Algebra II or an integrated math course with Algebra II content. If a school district offers an AP computer science course to high school students, the school board must designate that course as equivalent to a high school math course and note on the student’s transcript that the AP computer science course qualifies as a mathematics-based, quantitative course. (105 ILCS 5/27-22(e)(3), (f-5))

Maryland: AP computer science may fulfill a math credit towards graduation requirements. Another computer science course may fulfill a math credit requirement if the district determines the course meets the math standards required by regulation. (COMAR 13A.04.12.01(A)(2)(a))

Michigan: The Algebra II credit may be partially or fully fulfilled by completing a department-approved formal career and technical education (CTE) program or curriculum, including in computer science, and in that program successfully completing the same content as the Algebra II benchmarks assessed on the department-prescribed state high school assessment, as determined by the department. The third science unit requirement may be fulfilled by completing a department-approved computer science program or curriculum. (M.C.L.A. 380.1278a(1)(a)(i), M.C.L.A. 380.1278b(1)(b))

Minnesota: A computer science credit may fulfill a mathematics credit requirement if the credit meets state academic standards in mathematics. In addition, a Project Lead the Way credit [including Project Lead the Way Computer Science] may fulfill a science or mathematics credit requirement if the credit meets the state academic standards in science or mathematics. (M.S.A. § 120B.024, Subd. 2(e), (f))

New Jersey: Beginning with entering 9th graders in the 2016-17 school year (Class of 2020), the state board of education must require that local graduation requirements allow an AP Computer Science course to satisfy a part of the total credit requirement in mathematics. For an AP computer science course to satisfy a part of the mathematics credit requirement, the student must be concurrently enrolled in or have successfully completed algebra I and geometry or the content equivalent. (N.J.S.A. 18A:7C-2.1)

Ohio: Effective with students entering 9th grade in the 2014-15 school year (Class of 2018), one of the four math units must be chosen from computer programming, probability and statistics, applied mathematics or quantitative reasoning, or any other course approved by the department using standards established by the superintendent. (R.C. § 3313.603 (D)(5)(b))

Oklahoma: The state board is statutorily required to approve an AP computer science course to meet one of the math course requirements for the college preparatory/work ready curriculum if the course is taken in a student's senior year and the student is concurrently enrolled in or has successfully completed Algebra II. (70 Okl. St. Ann. § 11-103.6(G)(3))

In addition, computer science is one of the units or sets of competencies students opting out of the college preparatory/work ready curriculum may complete to fulfill a math credit. To earn math credit, the course must be taught by a teacher certified to teach mathematics. (70 Okl. St. Ann. § 11-103.6 (D)(2); Okla. Admin. Code 210:35-9-31 (e)(B)(ii))

South Carolina: One unit computer science, if approved by the Department of Education, may be counted toward math requirements. (§ 59-39-100(B))

Texas: The third math credit under the Foundation High School Program (default diploma option effective with entering 9th graders in 2014-15 and available to students in grades 10-12 in 2014-15) may be selected from one full credit or a combination of two half credits from two different courses, subject to prerequisite requirements, from a number of courses, including AP computer science and Discrete Mathematics for Computer Science. (19 TAC § 74.12(b)(2)(B))

Students under the existing Minimum, Recommended or Advanced high school programs (available to students in the Classes of 2016-2017) may earn one unit math credit for completing AP computer science or Discrete Mathematics for Computer Science. (19 TAC § 111.61(d), 19 TAC § 74.72(b)(2)(B), 19 TAC § 74.73(b)(2)(B), 19 TAC § 74.74(b)(2)(A))

In addition, students under the Foundation High School Program may fulfill two units of Languages Other Than English (LOTE) by completing two credits in computer programming languages selected from Computer Science, I, II and III. To apply to the LOTE requirement, these credits must be earned before September 2016. Effective both before and after September 2016, if a student, in completing the first credit of LOTE, demonstrates that s/he is unlikely to be able to complete the second credit, the student may substitute another appropriate course, including computer programming languages. (19 TAC § 74.12(b)(5)(A), (B))

Utah: The three science credits must be fulfilled, at a minimum, by two courses from any of the five science foundation areas, one of which is computer science. Students may complete .5 or 1.0 units of credit in AP Computer Science, Computer Science Principles, or Computer Programming II to meet that portion of the science requirement. (R277-700-6(C)(3)(a))

Virginia: 2014 legislation directs the state board to consider all computer science course credits to be math, science or CTE course credits, and to develop guidelines on how computer science credits can satisfy graduation requirements. (VA Code Ann. § 22.1-253.13:4(D)(8)) Under [those guidelines](#), adopted by the state board in January 2015, AP Computer Science A may fulfill:

- A standard graduation credit in math.
- A standard graduation credit in science when students successfully complete lab science courses from the different science discipline areas in accordance with the 2012 Regulations Establishing Standards for Accrediting Public Schools in Virginia (SOA). For AP Computer Science A to be applied as a standard credit for lab science, the course must include a significant experimental component, as defined in state board guidelines. International Baccalaureate (IB) computer science coursework may be applied as a lab science as part of the recognized IB diploma requirement, which is currently governed under the 2012 SOA regulations.
- A standard credit in CTE. (Virginia Board of Education Guidelines for the Use of Computer Science Courses to Satisfy Graduation Requirements, January 22, 2015)

In addition, Virginia permits a student to use a computer science exam as the student-selected end-of-course assessment to fulfill high school exit exam requirements, provided a student completes a CTE program sequence in programming or a related programming sequence and scores 3 or higher on the AP Computer Science A exam. (8 VAC 20-131-50(B)(2), (Virginia Board of Education Guidelines for the Use of Computer Science Courses to Satisfy Graduation Requirements, January 22, 2015))

Washington: Local boards must approve AP computer science as equivalent to high school mathematics or science and denote on a student's transcript that AP computer science qualifies as a math-based quantitative course for seniors taking the course. For a board to approve AP computer science as equivalent to high school math, the student must be concurrently enrolled in or have successfully completed Algebra II. (West's RCWA 28A.230.097(1))

Wisconsin: One math unit may be completed by a computer science course approved by the department of education. (118.33(1)(a)1)

Policies permitting awarding of math or science credit

The April 2015 document identifies two states, **Arizona** and **California**, that permit but do not require districts to recognize computer science courses as fulfilling math or science credit for high school graduation. 2016 legislation adds **Colorado** to these states. Specifically, Colorado [2016 H.B. 1198](#) directs the state board of education to adopt standards by July 2018 that identify the knowledge and skills that a secondary student should acquire related to computer science, including computer code writing, in one or more courses that qualify as a graduation requirement in either math or science. Local education providers may elect to implement the standards.

Policies mandating awarding of credit in other subject areas

One state has enacted policies in the last year permitting a computer science course to fulfill course credit requirements beyond math or science. Specifically, **Tennessee** [2016 Chapter 667](#) directs the state board, beginning with the 2016–2017 school year, to approve appropriate computer science courses that every candidate for a full high school diploma may enroll in and complete to satisfy the elective focus requirement for graduation. As used in this section, “computer science courses” includes, but is not limited to, software engineering, computer programming, computer graphics and design, and computer-aided design.

State in which mandatory vs. voluntary awarding of math or science credit is TBD

West Virginia 2016 H.B. 4730 directs the state board of education, prior to the 2017 regular legislative session, to submit a plan to the Legislative Oversight Commission on Education Accountability for the implementation of computer science instruction and learning standards in the public schools. The plan must include, among other components, recommendations for a core set of learning standards designed to provide the foundation for a complete computer science curriculum and its implementation at the K–12 level. The learning standards must present computer science at the secondary school level in a way that is both accessible and worthy of an academic curriculum credit and may fulfill a computer science, math, or science graduation credit. (W. Va. Code, § 18–2–12 (b)(1)(B))