2018
State of Computer Science Education
Policy and Implementation

CODE Advocacy Coalition

CSTA

About the Code.org Advocacy Coalition

Advocacy Coalition

Bringing together more than 50 industry, non-profit, and advocacy organizations, the Code.org Advocacy Coalition is growing the movement to make computer science a fundamental part of K-12 education.

About the CSTA

CSTA

The Computer Science Teachers Association (CSTA) is a membership organization that supports and promotes the teaching of computer science. CSTA provides opportunities for K–12 teachers and their students to better understand computer science and to more successfully prepare themselves to teach and learn.

Suggested citation: 2018 State of Computer Science Education. (2018). Retrieved from https://advocacy.code.org/

Table of Contents

Executive Summary

Computing is changing every part of our lives, from how we interact with each other to how we do our jobs. It is the number one source of all new wages in our economy and there are currently 500,000 open computing jobs across the United States. Yet the US education system does not provide widespread access to this critical subject. How can policymakers increase access to K-12 computer science for every student?

This report contains the status of computer science education policy across the nation and a first look at school-by-school data on the availability of computer science in high schools. Across 24 states, **only 35% percent of high schools** in the US teach computer science. In addition, Black and Hispanic students, students receiving free and reduced lunch, and students from rural areas are less likely to attend a school that provides access to this critical subject.

Underrepresented Minority Students and Access to Computer Science (CS)

High schools with higher percentages of under-represented minority (URM) students are less likely to teach computer science.

Bar chart — Percent of Schools Teaching CS (y-axis, 0%–60%) vs. Percent of URM Students in the School Population (x-axis):
- 0–25%: 41%
- 25%–50%: 39%
- 50%–75%: 35%
- 75%–100%: 27%
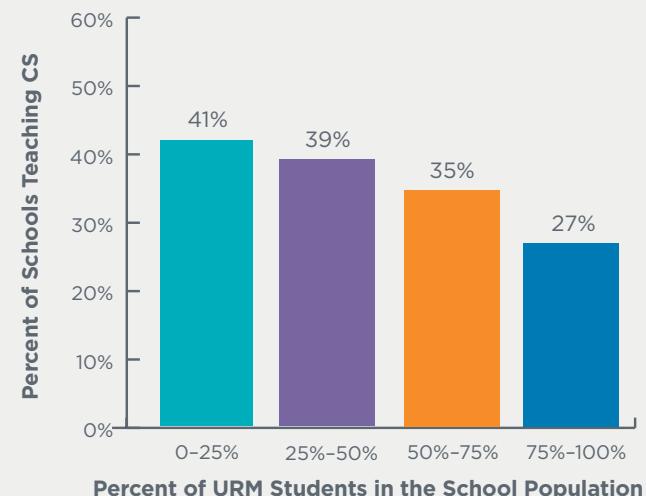
"Computer science has driven innovation in every field and is powering approaches to many of our world's toughest challenges."

—K–12 Computer Science Framework, 2016

Percent of High Schools Teaching Computer Science by Community Type

Students in rural communities have less access to computer science.

Computer science is one of the few policy issues that can address both foundational education needs and workforce development demands for a state's future workforce. Numerous states have begun to pursue nine specific policy ideas to expand access to K-12 computer science for all students.

Nine Policies to Make Computer Science Fundamental

1 Create a state plan for K-12 computer science

2 Define computer science and establish rigorous K-12 computer science standards

3 Allocate funding for rigorous computer science teacher professional learning and course support

4 Implement clear certification pathways for computer science teachers

5 Create programs at institutions of higher education to offer computer science to preservice teachers

6 Establish dedicated computer science positions in State and Local Education Agencies

7 Require that all secondary schools offer computer science with appropriate implementation timelines

8 Allow computer science to satisfy a core graduation requirement

9 Allow computer science to satisfy an admission requirement at institutions of higher education

Policy Principles

- Clarity
- Capacity
- Leadership
- Sustainability

The principle **Equity and Diversity** is incorporated in each of the nine policies.
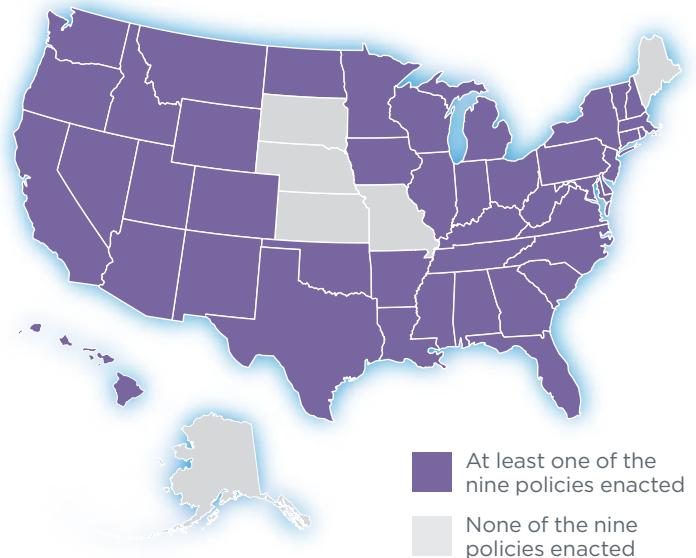
When the Code.org Advocacy Coalition began its work in 2013, just 14 states plus Washington, D.C. had at least one of these nine policies in place. Because of bipartisan support from state and national leaders over the last five years, 44 states have enacted one or more of these policies. The pace of reform is accelerating; since the last state of computer science report in 2017, 33 states have passed new laws and regulations promoting computer science.

2013: States with at least one policy
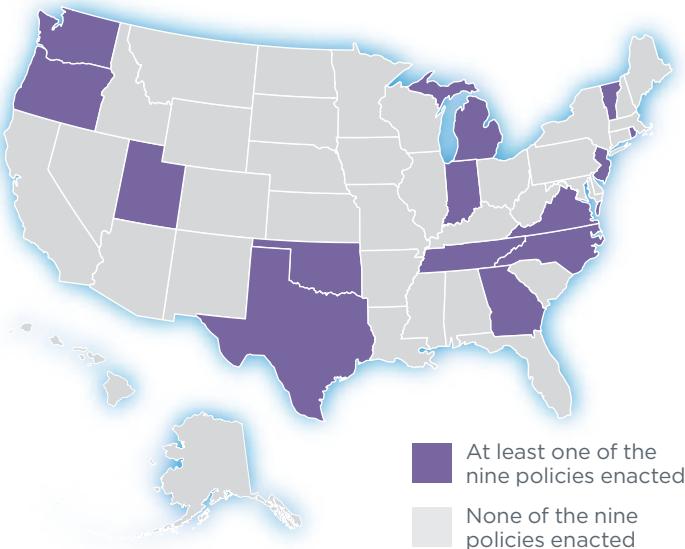
At least one of the nine policies enacted

None of the nine policies enacted

2018: States with at least one policy

At least one of the nine policies enacted

None of the nine policies enacted

Trend in Policy Adoption and Access to Computer Science

States that have adopted more of the nine policies have a greater percentage of high schools teaching computer science.
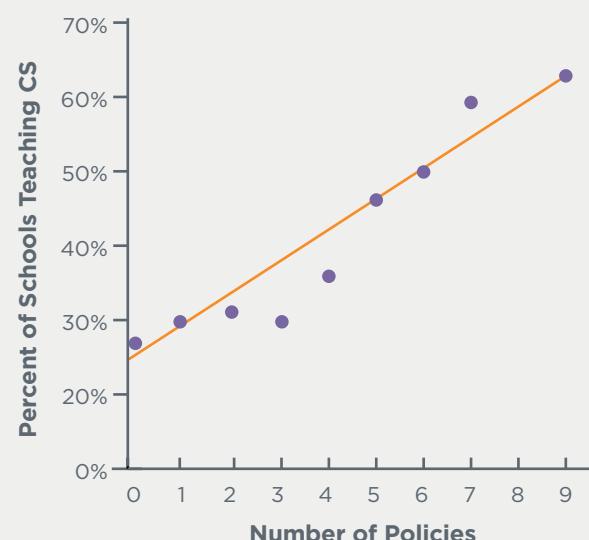
But do these policies mean that more students have access to K-12 computer science? This report analyzes implementation rates in states that have pursued these policies. The graph to the left clearly shows that in states that enact more of these nine policies, a greater percentage of schools provide students access to K-12 computer science.
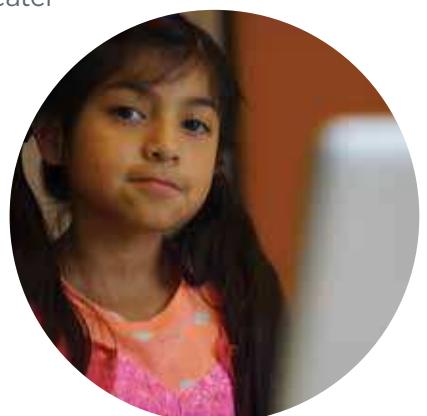
State funding for K-12 computer science professional learning is a key policy for expanding access. By focusing funding on high-quality professional learning to retrain part of the existing teaching workforce (rather than hiring new computer science teachers) states can keep costs low while quickly scaling. New data from this report shows that this approach is working. States that have funded K-12 computer science opportunities have 1.7 times the implementation rates of states that have not provided direct funding.

Funding and Access to Computer Science

States that have provided funding for teacher professional learning in computer science have more high schools that teach computer science.

States should enact or expand on all nine of these education policies in order to provide opportunities for all students regardless of where they live, their race/ethnicity, gender, or socioeconomic status. States that have enacted some or many of these ideas should continue to focus on implementation. They should continue to fund opportunities to prepare inservice teachers so students can have access in the short term, while funding preservice teacher preparation to sustain the growth of the teaching workforce in the long term.

We cannot let generations of students—particularly those from underrepresented backgrounds—leave the K-12 system without some exposure to computer science. Pursuing an access agenda to K-12 computer science provides policymakers a rare opportunity to address equity, workforce, and education issues on a bipartisan basis. We must continue the bipartisan support and momentum we have seen for this critical subject.

Introduction

The *State of the States Landscape Report*[1], published in March 2017, described each state's status toward meeting the nine policies developed by the Code.org Advocacy Coalition, plus state-level initiatives to address diversity in education.
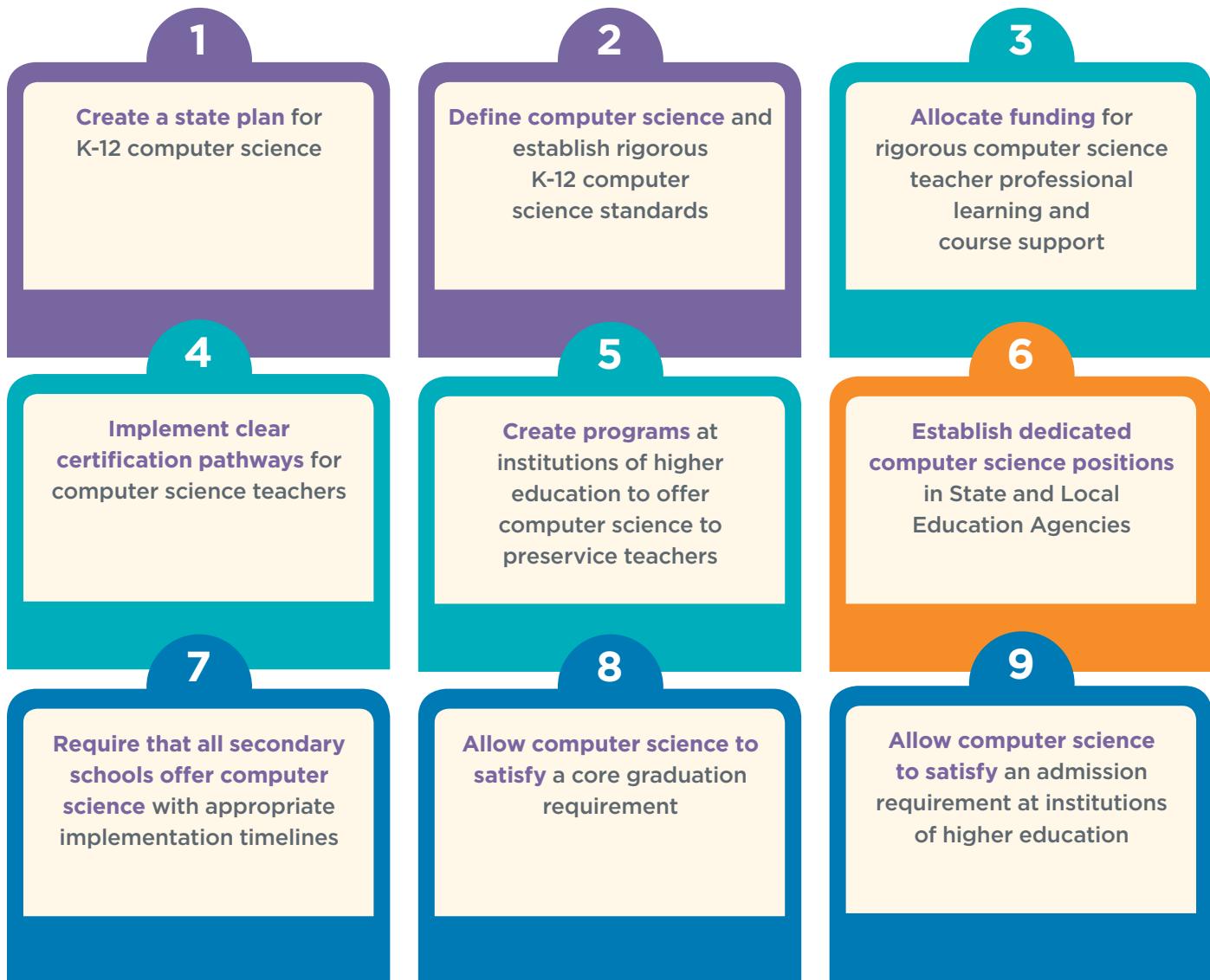
The *State of the States Landscape Report* included maps, detailed information about states that had enacted each policy, state levers for action, emerging best practices, recommendations, and issues to be addressed. Although the status of which states have met the policy priorities in the report have changed dramatically, much of what was written in the report still applies, particularly the emerging best practices, recommendations, and issues to be addressed. Rather than repeating the latter, this report intentionally focuses on providing an update on what has changed since the last report, including policy trends and national momentum over the last 18 months, updated maps showing states' progress in enacting the nine policies, and state-by-state summaries. This report also includes preliminary data collected for the K-12 Computer Science Access Report, an effort to identify, on a school-by-school basis, where computer science courses are taught.

This report contains:

- a policy summary for each of the nine policies displaying the states that have enacted the policy, including a highlighted state and related resources,

- state-by-state summaries including additional information on the state's progress toward meeting the nine policies and data on university graduates, school offerings, participation, and the supply of prepared teachers, and

- preliminary findings about high schools that teach computer science from 24 states.

[1] Authors represented Code.org, Education Commission of the States, Education Development Center, Inc. and the Massachusetts Computer Attainment Network, Expanding Computing Education Pathways, and SageFox Consulting Group. The report can be accessed at https://code.org/files/State_of_the_states.pdf.

Nine Policies to Make Computer Science Fundamental

1

Create a state plan for K-12 computer science

2

Define computer science and establish rigorous K-12 computer science standards

3

Allocate funding for rigorous computer science teacher professional learning and course support

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Implement clear certification pathways for computer science teachers

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Create programs at institutions of higher education to offer computer science to preservice teachers

6

Establish dedicated computer science positions in State and Local Education Agencies

7

Require that all secondary schools offer computer science with appropriate implementation timelines

8

Allow computer science to satisfy a core graduation requirement

9

Allow computer science to satisfy an admission requirement at institutions of higher education

Policy Principles

■ **Clarity**   ■ **Capacity**   ■ **Leadership**   ■ **Sustainability**

The principle Equity and Diversity is incorporated in each of the nine policies.

These nine recommendations are intended to be used to build and sustain a comprehensive state policy framework to broaden the teaching and learning of computer science. They support a vision built on five principles: **Equity and Diversity, Clarity, Capacity, Leadership, and Sustainability**.

Equity and Diversity

All nine policies should promote access to and equity within rigorous and engaging computer science courses.

Prioritizing equity and diversity requires policymakers to focus attention on underserved populations and underresourced schools. Data clearly show female students and underrepresented groups (including rural students) are less likely to have access to high-quality computer science content. If unaddressed, entire populations will be excluded from this fast-growing field.

Clarity

A lack of clarity around what computer science is and how to achieve goals around expanding computer science have hampered implementation in states. Clarity of goals, including a state plan and an agreed-upon definition of computer science and learning expectations, are critical components of implementation.

State Plan for K-12 Computer Science Education

Making computer science a fundamental part of a state's system of education means adding an entirely "new" subject to most states. States will need to create roadmaps to address a number of policy and implementation issues to integrate computer science as a new subject into its existing system. The plan should articulate the goals for computer science, strategies for accomplishing the goals, and timelines for carrying out the strategies. Equitable access to K-12 computer science must be at the foundation of a state's plan.

K-12 Computer Science Standards

High-quality, equitable standards create foundational expectations for all students, rather than just those interested in advanced study, and prepare students for success in a variety of postsecondary, college, and career options. States should develop discrete standards for computer science education guided by the concepts, practices, and recommendations in the K-12 Computer Science Framework. The Computer Science Teachers Association (CSTA) K-12 Computer Science Standards are one example of standards that have been informed by the K-12 Computer Science Framework.

Capacity

Capacity for offering computer science in schools often constitutes having an adequate number of teachers prepared to teach computer science. Thus, building teachers' capacity to teach computer science requires state funding, clear certification pathways, and preservice teacher preparation at institutions of higher education.

State-Level Funding for K-12 Computer Science Professional Learning

Because computer science courses are often electives, there is not enough school district funding for professional learning and staffing support for teachers. States should provide resources for professional learning to prepare inservice teachers from diverse backgrounds to teach K-12 computer science. Funding priority should be given to districts in which a demonstrable effort will be made to engage underrepresented groups. This will expand the capacity for schools to offer computer science by preparing inservice teachers and motivating preservice teachers to pursue teaching computer science.

State Computer Science Teacher Certification

The expansion of K-12 computer science education offerings is hampered by the lack of qualified computer science teachers, which disproportionately affects underrepresented minority students. Creating clear, navigable, and rewarding professional paths tied to content knowledge for computer science teachers can help to grow their ranks and increase equitable access to the subject.

State-Approved Preservice Teacher Preparation at Institutions of Higher Education

The computer science teacher shortage should be addressed by exposing more preservice teachers to computer science during their required coursework and by creating specific pathways for computer science teachers. Students preparing to become

mathematics, science, or broader technology teachers could become computer science teachers in many states if they were exposed to relatively minimal computer science coursework within teacher preparation programs. To address equity concerns, states should fund partnership opportunities between local school districts and schools of education to create direct pathways for teachers into high-need school districts.

Leadership

Implementing policy reforms requires centralized leadership at the state to oversee statewide initiatives.

State-Level Computer Science Supervisor

In order to ensure rapid scaling and statewide support, it is essential that states provide support to—and facilitate the sharing of best practices with—school districts. Creating a statewide computer science leadership position within the State Education Agency will send a signal to schools that computer science is an important core offering needed for all levels of education. This position would monitor the scaling process for issues of equitable access and diversity of students reached.

Sustainability

The long-term sustainability of new computer science initiatives depends on making computer science a fundamental part of the K-12 education system. Key policies must be in place to promote and maintain momentum for computer science with districts and students, including requirements to offer computer science and allowing computer science to satisfy high school graduation and higher education admissions requirements.

A Requirement for All High Schools to Offer Computer Science

Most high schools don't offer computer science courses because states or local school districts have not prioritized this discipline. Underrepresented minority students are less likely to attend a school that offers computer science. Given the important role computer science plays in our economy and the world around us, ensuring that all students have access to computer science in K-12 is critical. This should start early by embedding computer science in the K-5 curriculum, which could inspire students to elect to take computer science courses in middle and high school. At the high school level, states should adopt policies that require schools to offer at least one computer science course based on rigorous standards.
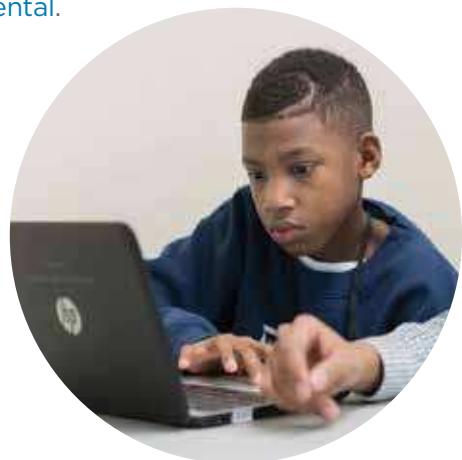
Computer Science Can Satisfy a Core High School Graduation Requirement

Currently, the majority of states have clear, publicly accessible policies allowing rigorous computer science courses to satisfy existing core high school graduation requirements. But many states still do not include computer science as a core course for graduation. Computer science should be recognized as a distinct computer science credit that can satisfy a graduation requirement, in a core subject such as mathematics or science, or, increasingly, in computer science. States that count computer science towards a core graduation requirement see 50% more enrollment in their AP Computer Science courses and increased participation from underrepresented minority students.[2]
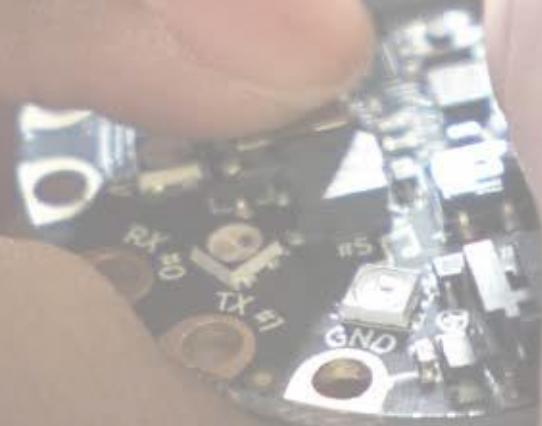
Computer Science Can Satisfy a Core Admission Requirement at Institutions of Higher Education

Admission policies for most colleges and universities do not allow rigorous computer science courses to meet the mathematics or science entrance requirements, which discourages students from taking such courses in secondary education— even if they count towards a high school graduation requirement. Aligning these policies would incentivize students to explore computer science earlier, which is an important step to increasing diversity in the field.

Based on five key principles, these nine policy ideas are intended as a menu of choices that states have to ensure that computer science is a central part of K-12 education. Not all states will be in a position to adopt every policy and many will require years of careful implementation. Some of these policy ideas may require resources, such as funding or time. States should adopt the policies for which they are best positioned and work to ensure that computer science is at the core of their education system. Read more about these policies at bit.ly/makecsfundamental.

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[2] Sources: http://blog.code.org/post/121123281798/md and http://blog.code.org/post/143007230537/computer-science-the-impact-of-k-12-on-university.

Policy Trends and National Momentum

Since the *State of the States Landscape Report* was published in March 2017, 33 states have adopted a total of 68 policies to support computer science education. This chapter discusses trends related to the nine state policies and describes momentum by state governors and the federal government. For more information about state legislation to promote computer science, refer to bit.ly/modelcslegislation.

Policy Trends

Developing a State Plan for K-12 Computer Science Education

Since the last report, the number of states with statewide plans has increased from two to six. These state plans typically address the areas described in the *State Planning Toolkit*: diversity, professional learning, certification, standards, outreach, and funding. The toolkit includes resources, considerations and recommendations, and a table for listing goals and strategies. Learn more about the *State Planning Toolkit* at bit.ly/statetoolkit.

Developing K-12 Computer Science Standards Informed by Nationally-Recognized Resources

Since the last report, the number of states that have K-12 computer science standards has increased from 6 to 22, with an additional 11 states actively developing standards. Standards development has seen the largest growth of the nine policies discussed in this chapter.

Most states have developed their own state-specific K-12 computer science standards informed by the K-12 Computer Science Framework and the CSTA K-12 Computer Science Standards. State-specific adaptations include rewriting grade-band standards as grade-level standards or emphasizing aspects of the standards to reflect the local economic priorities or implementation scenarios. For example, Virginia's standards emphasize cybersecurity to address state workforce demands. Nevada's standards include interdisciplinary

connections to support the state requirement to teach computer science to all elementary school students. In Rhode Island, Tennessee, and Alabama, computer science standards are combined with digital literacy standards to reflect these states' visions of a holistic computing education.

Although most states have created their own state computer science standards, several states, such as Connecticut, Delaware, Hawaii, Iowa, and Pennsylvania, have chosen to endorse or adopt the existing CSTA K-12 Standards.

Equitably Funding K-12 Computer Science Professional Learning

Since the last report, the number of states funding K-12 computer science professional learning has increased from 9 to 19. These 19 states have allocated over $62M for computer science between fiscal years 2016 and 2021. States have taken steps to ensure that funding is distributed equitably. For example, Maryland's funding requires the prioritization of grant applications "that focus on serving areas of high poverty, rural areas, and areas with large minority or diverse student populations including female students, students with disabilities, and students of ethnic, racial, or other demographic groups that are underrepresented in the field of computer science" (HB 281, 2018). Recent policies in Arizona have directed funding of professional learning in computer science to schools that serve Native American populations and school districts that do not currently offer high school computer science instruction.

Allowing Teachers with Prior Computer Science Teaching Experience to Apply for New State Certifications

Since the last report, the number of states with teacher certifications in computer science has increased from 27 to 33. In New York, the Board of Regents created a new computer science teacher certification that will be in effect by September 2022. Current teachers in New York will be "grandfathered" in, and new computer science teachers will have four pathways to certification. In New Jersey, a new computer science endorsement allows a teacher to apply if they have taught computer science within the three years prior to a requirement to hold the endorsement. These trends are consistent with Code.org's teacher pathways recommendations. Learn more about these recommendations at bit.ly/csteacherpathway.

Incentivizing Preservice Teacher Preparation at Institutions of Higher Education

Since the last report, the number of states supporting preservice teacher preparation has increased from 12 to 13, with the addition of Washington. Although Washington has had a computer science teacher endorsement since 2015, the number of teachers receiving the endorsement has been hampered by a lack of preservice computer science education programs at the higher education level. The Washington State Opportunity Scholarship, a public-private partnership to support low- and middle-income undergraduates pursuing high-demand science, technology, engineering, and mathematics (STEM) degrees, recently provided funding via the Opportunity Expansion Fund for Central Washington University and Western Washington University to develop programs leading preservice teachers to fulfill the requirements for the computer science teaching endorsement.

Dedicating a State-Level Computer Science Position to Lead New Policy Initiatives

Since the last report, the number of states with computer science supervisors has increased from 8 to 14. The creation of these new positions has reflected states' commitments to implementing recently adopted policy initiatives. For example, Colorado's state computer science supervisor moved from a part-time to full-time position in part to support the implementation of high school standards that were adopted in April 2018. And in Connecticut, after the state board of education adopted a computer science position statement, the state department of education created a Mathematics and Computer Science position to organize the statewide advisory committee and develop a state strategic plan. As a result, Connecticut recently endorsed K-12 computer science standards. Indiana, Hawaii, Maryland, and Virginia designated new computer science supervisors in conjunction with state policies that require all high schools, or all K-12 schools, to offer computer science. Although state supervisors for other school subjects have national associations and annual gatherings, the number of state computer science supervisors has only recently become large enough to result in their first dedicated national workshop in May 2018.

A second trend that has gained traction since the last report is the development of local computer science education supervisors across a state. In Arkansas, computer science specialists at Education Service Cooperatives throughout the state support schools and teachers in offering computer science. Other states, like Washington, have begun pilot programs placing a computer science coordinator at a few of the nine Educational Service Districts in the state.

Requiring All Schools to Offer Computer Science, Including Elementary, Middle, and High Schools

Since the last report, the number of states requiring all high schools to offer computer science has increased from 4 to 15.

Several of these states have also recognized the need to engage younger students in computer science, including female and underrepresented minority students, before they are influenced by negative cultural stereotypes. Recently, several states have required schools to offer computer science before high school. Florida requires all high schools and middle schools to offer it, Nevada requires all high schools and elementary schools, and Indiana, New Hampshire, and Wyoming require all K-12 schools to offer computer science instruction. An appropriate timeline, funding, and teacher professional learning are all necessary to support schools and districts as they implement these requirements.

Creating a Core Graduation Requirement in Computer Science

Since the last report, the number of states allowing computer science to satisfy a core high school graduation credit has increased from 28 to 39. This policy change has been bolstered by the evidence of a corresponding increase in diversity and enrollment in computer science courses. In the year following a policy change to allow computer science to satisfy a core graduation requirement, states see the average number of Advanced Placement (AP) computer science exams per school increase by 10%, exams

taken by female students increase by 24%, and exams taken by underrepresented minority students increase by 26%. And computer science participation is 19% higher in states that allow it to count, 48% higher among female students, and 64% higher among underrepresented minority students[1].

Although states such as Massachusetts and California have recently adopted policies allowing computer science to count towards an existing mathematics or science graduation requirement, other states have adopted a dedicated computer science graduation require-ment. Mississippi recently amended their state high school diploma requirements for students entering their freshman year of high school in school year 2018-2019 to require one credit in either technology or com-puter science. Although students in Mississippi are not required to take computer science and can satisfy the requirement with a technology course, the change recognizes computer science as a dis-tinct core discipline. Nevada has renamed the state's half credit "use of computers" credit to "computer education and technology". To meet the credit's requirements, a course must dedicate half of the instructional time to computer science and computational thinking. A student that takes a computer education and technology course in middle school is not required to fulfill the half credit in high school. South Carolina has had a graduation requirement in computer science for years, but allowed the majority of students to fulfill the requirement with a keyboarding course. Recent revisions to the list of courses that satisfy the requirement include the deletion of keyboarding

and a focus on computer science courses, effectively requiring all students to take at least one credit of computer science to graduate. The success of a policy such as this relies on thoughtful implementation, including adequate funding and professional learning for teachers; the computer science education community remains cautiously optimistic.

A graduation requirement in computer science is an extension of the Code.org Advocacy Coalition's recommendation that a computer science course be recognized as a distinct discipline even when it can flexibly apply towards a different core graduation requirement (e.g., mathematics or science). That is, in states or districts that allow computer science to count as a core graduation credit in mathematics or science, the coalition supports having computer science courses designated as computer science on student transcripts, coded with computer science course codes, and linked to computer science teacher certification. Learn more about this policy position at bit.ly/csflexcredit.

Aligning High School Graduation and Higher Education Admissions Policies

Since the last report, the number of states allowing computer science to count as a core admissions requirement for higher education, rather than an elective, has increased from 13 to 17 with the addition of Indiana, Nevada, South Carolina, and Wyoming. These four states have worked to align higher education admission requirements with high school graduation requirements. In many states, computer science may count towards a core high school graduation requirement such as mathematics or science, but not towards higher education admissions for the same subject. This misalignment detracts from the goal of allowing computer science to count as a core high school graduation credit because many student schedules are directed by higher education admissions requirements.

[1] medium.com/@codeorg/does-making-cs-count-make-a-difference-7ab5ca6b8407

National Momentum

Reaching Rural Areas

As access to computer science courses spreads across states, rural areas face implementation challenges related to teacher capacity, access to high-quality professional learning, technical infrastructure, and funding. State implementation plans should prioritize equitable access to best meet the needs of students, teachers, and their communities. The Wyoming Department of Education, for example, plans to meet with every school district in the state to learn their challenges and potential solutions to scale to other communities. Other strategies include directing or prioritizing funding for professional development to underserved communities (e.g., Colorado) and creating regional support structures to assist with implementation hurdles (e.g., Arkansas).

### Governors' Partnership for K-12 Computer Science

The Governors' Partnership for K-12 Computer Science is a group of bipartisan state leaders committed to advancing policy and funding to expand access to, and increase equity in, K-12 computer science education. As part of the partnership, governors commit to working towards

"The need for high-tech talent in the workplace is nationwide, in every field and industry— Can you think of any business that doesn't involve computer technology in some way?"

—Asa Hutchinson, Governor (R), Arkansas
Co-chair of the Governors' Partnership
for K-12 Computer Science

"To remain at the forefront of the innovation economy, we must prepare our kids for today's jobs and the jobs of the future. Computer programming is one example of just such an opportunity."

—Jay Inslee, Governor (D), Washington
Co-chair of the Governors' Partnership
for K-12 Computer Science
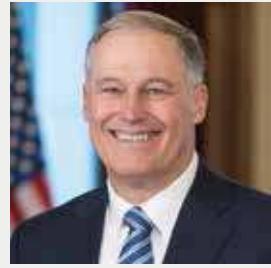
ensuring all high schools offer computer science, funding professional learning opportunities for teachers, and developing a set of high-quality academic K-12 computer science standards.

Since the last report, the number of members in the Governors' Partnership for K-12 Computer Science has increased from 8 to 17 (10 Republicans and 7 Democrats). Governors who are members of the partnership are noted in their respective state's summary later in this report. More information about the partnership can be found at governorsforcs.org.

Federal Policy

Although federal K-12 computer science education policy has trailed the pace of state and local policy reforms, significant progress has been made. The STEM Education Act of 2015 amended the federal definition of STEM to explicitly include computer science, ensuring that computer science is included in federal STEM programs such as grant solicitations. Later in 2015, the US

Congress reauthorized the Elementary and Secondary Education Act, moving the country from the 2002 No Child Left Behind Act to the Every Student Succeeds Act. The new law explicitly included computer science among the subjects that should be taught as part of a "well-rounded education," and specifically named computer science education professional development eligible for federal funding support.

Building on that success and federal lawmakers' support for computer science, additional policy changes followed. In 2016, President Barack Obama proposed Computer Science For All, an unprecedented federal investment of over $4 billion in computer science education. The newly-formed Computer Science Education Coalition (CSEC) communicated the importance of federal funds to catalyze state and local efforts to Congress and found allies on both sides of the aisle. Although Congress chose not to fund that concept, the momentum it created has resulted in many like-minded efforts, and the CSEC continues to ask Congress for targeted federal funds for computer science.

The universal appeal of computer science was apparent in 2017, when President Donald Trump and White House Advisor Ivanka Trump embraced the importance of STEM and computer science education to the 21st century workforce. In September of that year, the president signed a Presidential Memorandum directing the US Education Department to invest at least $200 million annually in STEM education, "with a particular focus on computer science." Simultaneously, Congress was in the middle of updating the Carl D Perkins Career and Technical Education Act, which sends states over $1.2 billion annually to invest in high schools and career and technical education (CTE). A revised Perkins Act was enacted in 2018 and contained changes that recognized computer science as a subject essential to industry and a modern workforce.

Looking ahead, the computer science education community and the CSEC continue to pursue changes to federal policies to increase access to the subject. At the top of the community's priorities are federal laws and programs that address diversity in STEM fields and subjects, changes to education laws that would support the growth of the computer science teaching workforce, and support for important research on the teaching, learning, and assessment of computer science education.
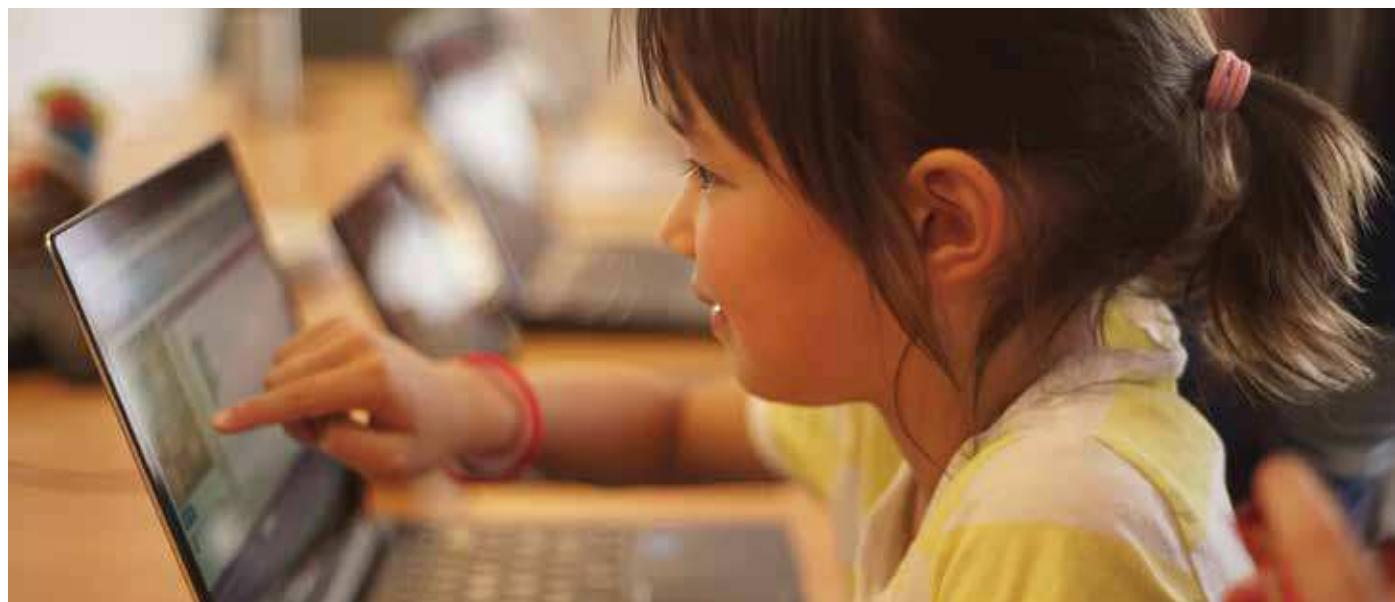
The State of Computer Science Policy

This section presents the most reliable data currently available on the nine model state policies developed by the Code.org Advocacy Coalition for expanding computer science education. For more information regarding the policies, please refer to Nine Policy Ideas to Make Computer Science Fundamental to K-12 Education (bit.ly/makecsfundamental).

This data builds on the March 2017 State of the States Landscape Report and was vetted by state computer science leaders across the nation. Each policy summary includes:

- a list of states that have met the policy and the total number of states,
- a map designating the status of states in meeting a policy,
- a rubric describing the criteria necessary to meet the policy,
- a highlight describing a recent state action related to the policy, and
- one or two related resources to assist a state in developing the policy.

Although a "No" indicates that a state has not met all of the criteria in a rubric, in some cases, a state may have met some of the criteria. Where possible, states that are in progress of meeting a policy are noted as such.

For the most up-to-date policy status and additional information, please refer to code.org/promote and bit.ly/9policies.

Yes

In Progress

No
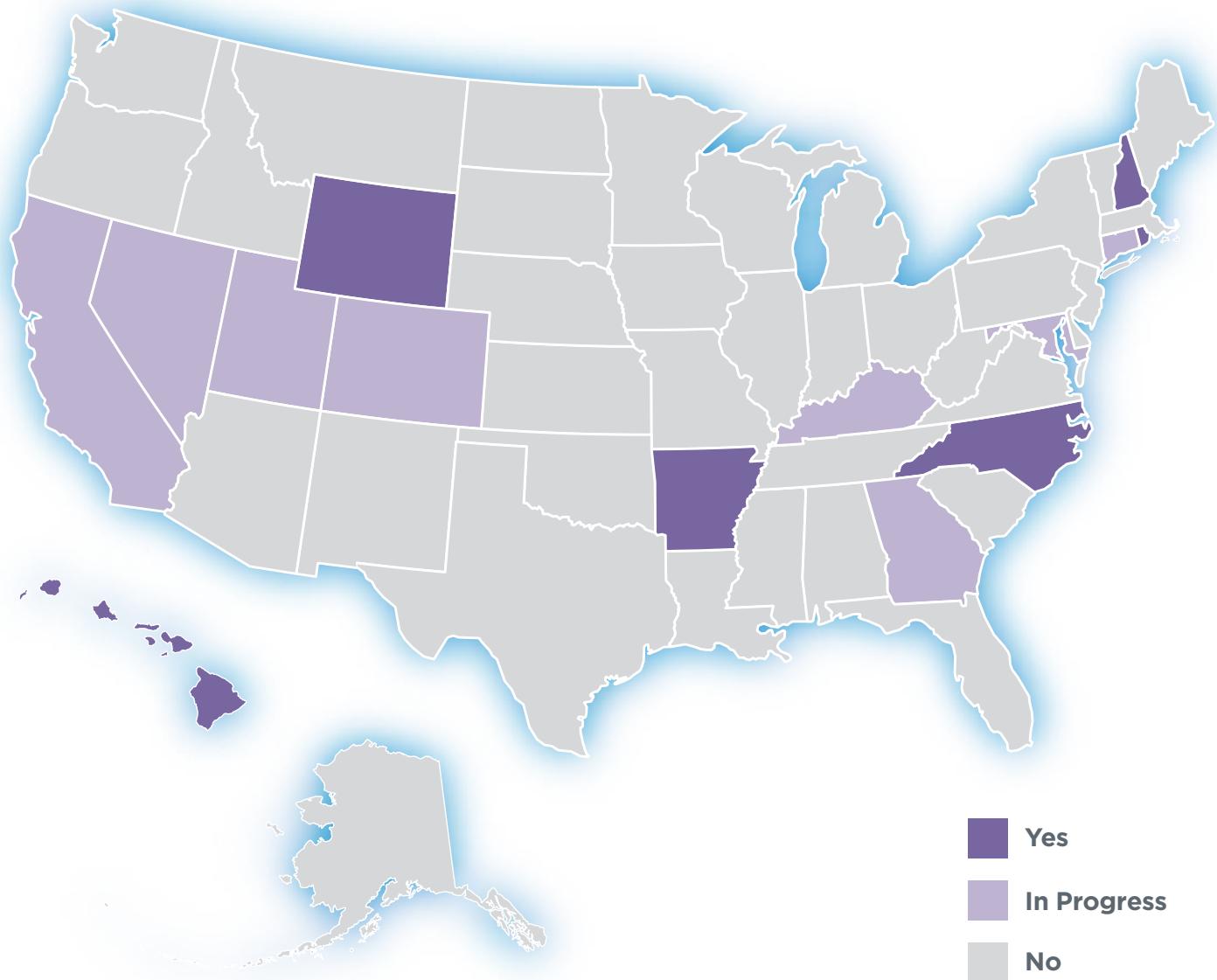
Only six states have strategic plans for K-12 computer science.

Rubric

A state is considered to have a plan for K-12 computer science education if the plan meets all four of the following criteria:

- developed by the state education agency,
- specific to computer science education,
- includes a timeline, goals, and strategies for achieving the goals, and
- the plan is publicly accessible.

States

The following states have state plans:

- Arkansas
- Hawaii
- New Hampshire
- North Carolina
- Rhode Island
- Wyoming

Recent Activity

HB 281 (May 2018) tasks the Maryland Center for Computing Education to develop a state implementation plan by placing priority on reaching school districts with high poverty, large rural areas, and student populations that are underrepresented in computer science fields. The plan shall identify specific actions, resources, metrics and benchmarks to create a sustainable pipeline of computer science teachers and activities to obtain and sustain public and private partnerships for funding, mentoring, and internships for teachers. The plan shall be published on the center's website.

Related Resources

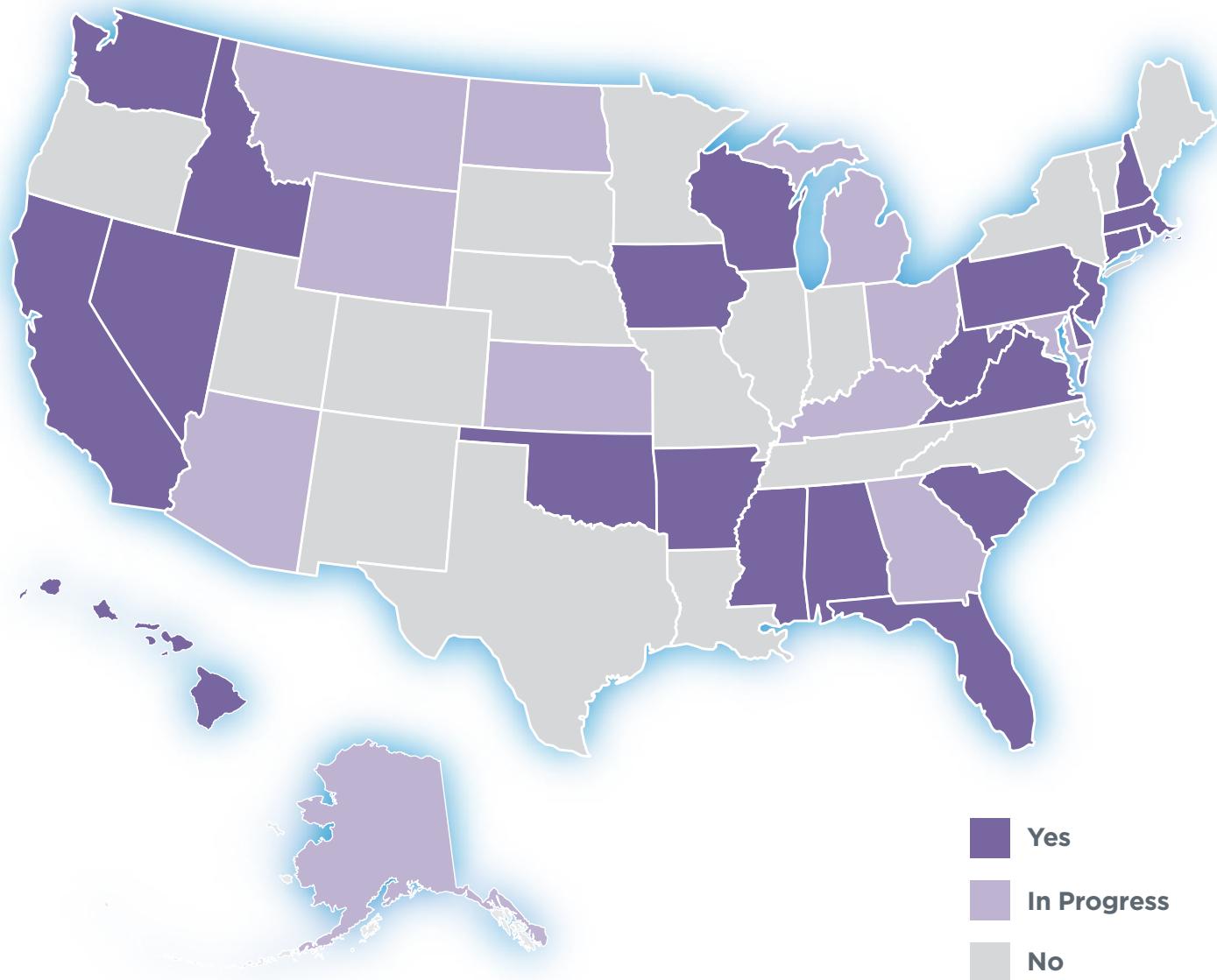### State Computer Science Planning Toolkit

This toolkit helps state and local education agencies establish plans to address the key policy and implementation issues reflected in this report. The toolkit includes resources, considerations and recommendations, and a table for listing goals and strategies.

bit.ly/statetoolkit

Yes

In Progress

No

Only 22 states have K-12 computer science standards.

Rubric

A state is considered to have K-12 computer science standards if the standards meet both of the following criteria:

- form a coherent progression that aligns elementary, middle, and high school expectations, and

- are publicly accessible on the state's website.

States

The following states have K-12 computer science standards:

- Alabama
- Arkansas
- California
- Connecticut
- Delaware
- Florida
- Hawaii
- Idaho
- Iowa
- Massachusetts
- Mississippi
- Nevada
- New Hampshire
- New Jersey
- Oklahoma
- Pennsylvania
- Rhode Island
- South Carolina
- Virginia
- Washington
- West Virginia
- Wisconsin

Recent Activity

In January 2018, Nevada approved K-12 computer science standards based on the K-12 Computer Science Framework and 2017 CSTA K-12 Standards. The Nevada standards consist of expectations for a combination of individual grades and grade bands: K, 1, 2, 3, 4, 5, 6-8, and 9-12; and the 9-12 standards include basic and advanced expectations. They also provide connections to standards in science, mathematics, English language arts, and social studies.

Related Resources

K-12 Computer Science Framework

The K-12 Computer Science Framework provides high-level guidance describing the computer science concepts and practices that are essential to the success of all students. It provides an organizing structure for states to create their own standards.

k12cs.org

2017 CSTA K-12 Computer Science Standards

The CSTA K-12 Computer Science Standards delineate a core set of learning objectives designed to provide the foundation for a complete computer science curriculum. The K-12 Computer Science Framework was considered as a primary input for the CSTA standards.

csteachers.org/standards

Yes

No
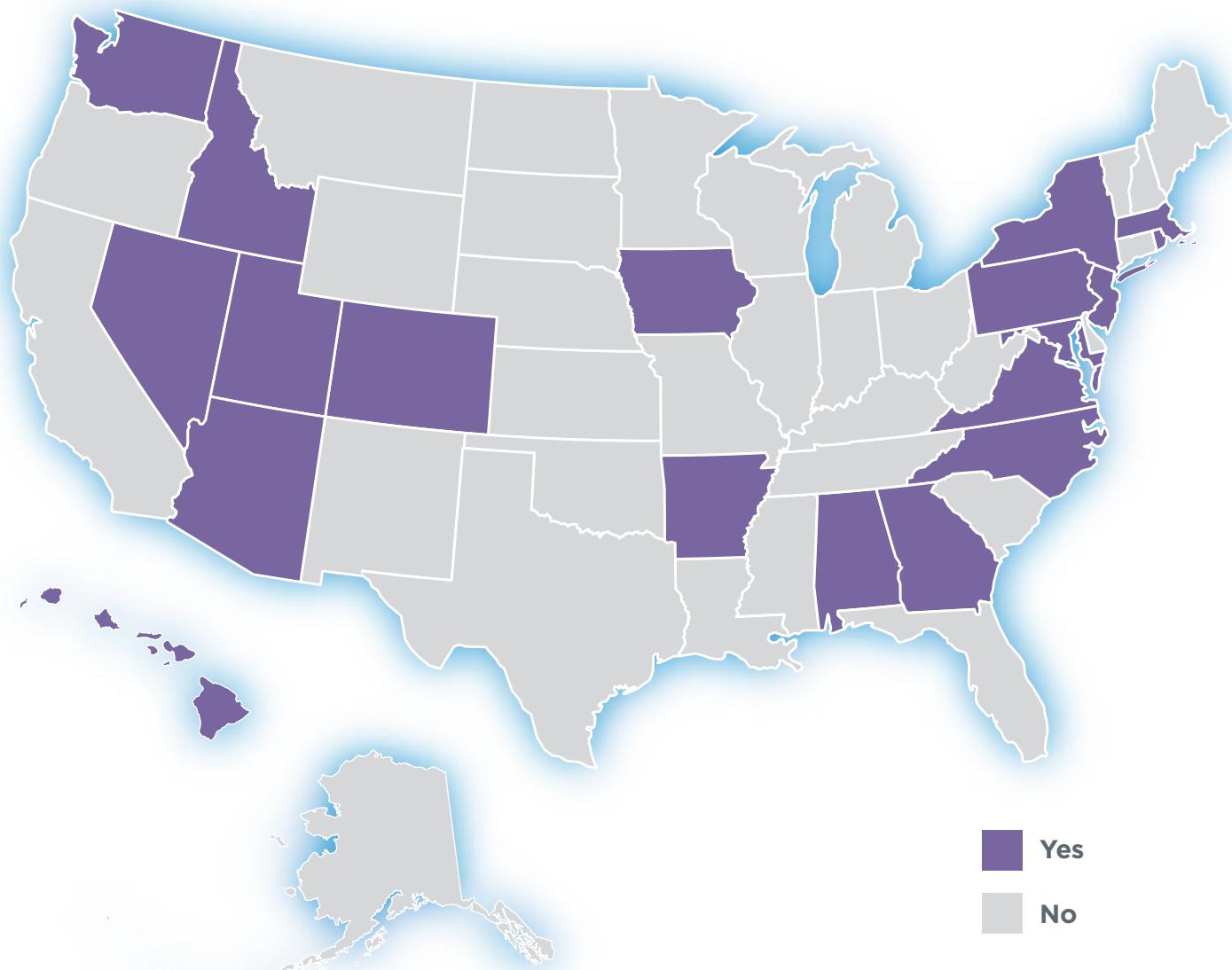
Only 19 states have dedicated funding to K-12 computer science professional learning.

Rubric

A state is considered to have dedicated state-level funding to K-12 computer science professional learning if the funding meets all three of the following criteria:

- the funds are allocated via the approved state budget or state legislation,
- a description of the funds is publicly accessible, and
- the funds were allocated in fiscal years (FY) 2016, 2017, 2018, and/or 2019.

States

The following states have dedicated state-level funding to K-12 computer science professional learning:

- Alabama
- Arizona
- Arkansas
- Colorado
- Georgia
- Hawaii
- Idaho
- Iowa
- Massachusetts
- Maryland
- Nevada
- New Jersey
- New York
- North Carolina
- Pennsylvania
- Rhode Island
- Utah
- Virginia
- Washington

Recent Activity

Utah allocated $400K for computer science through the State Office of Education in FY 2017. SB 190 in 2017 created a continuing stream of funding through the Computing Pathways Grants program, including $1.2M for FY 2018 and for FY 2019.

Related Resources

Models for Funding Professional Learning

This document describes key elements of legislative initiatives to fund computer science and provides detailed guidance for state authorities implementing grant programs.

bit.ly/modelsforfundingcs

Yes

No
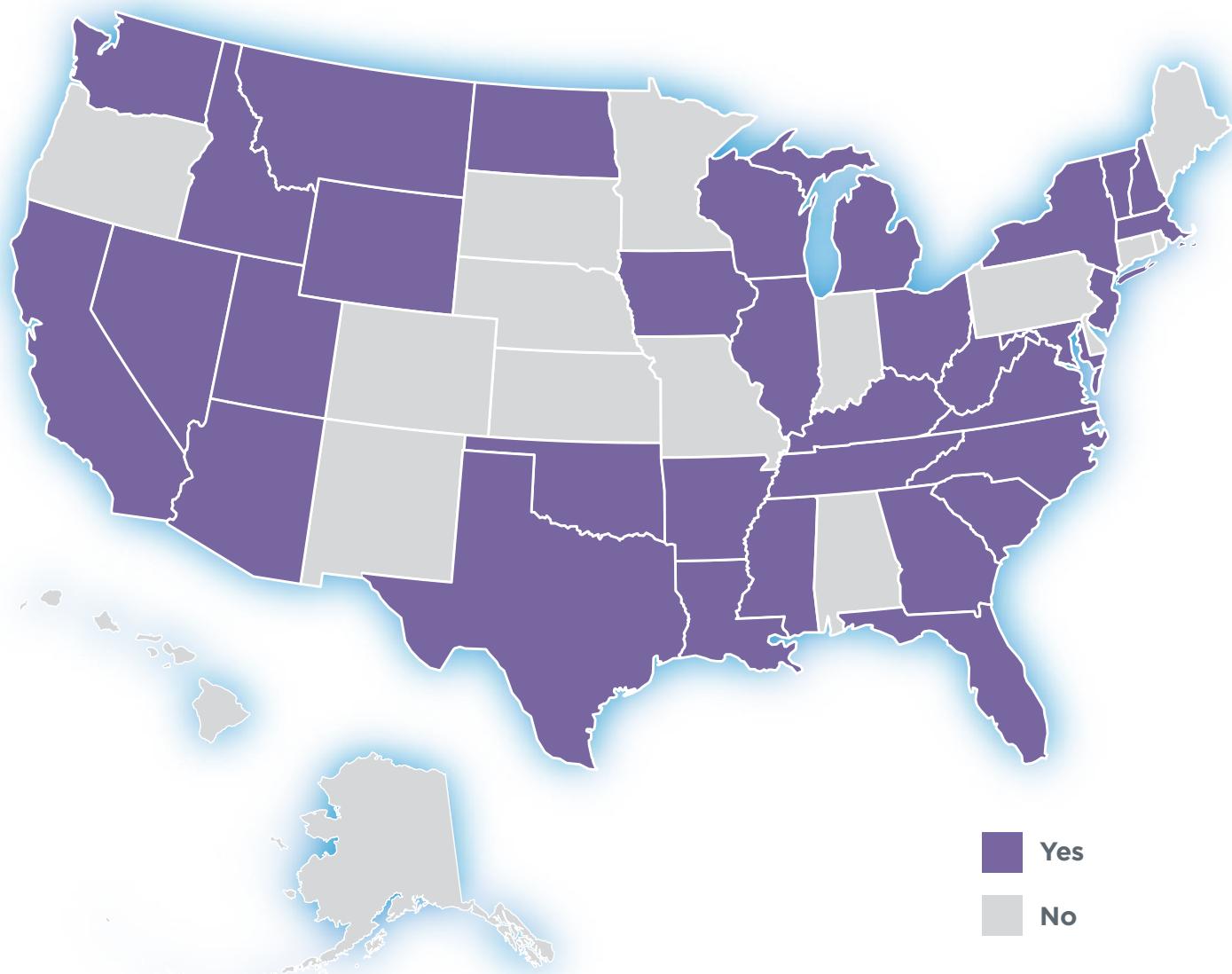
Only 33 states, plus D.C., have computer science teacher certification.

Rubric

A state is considered to have computer science teacher certification if the certification (or endorsement, licensure, or authorization) meets both of the following criteria:

- explicitly names "computer science" or has a related name (e.g., computer programming), and

- enables a teacher to teach computer science courses.

States

The following states have computer science teacher certification:

- Arizona
- Arkansas
- California
- District of Columbia
- Florida
- Georgia
- Idaho
- Illinois
- Iowa
- Kentucky
- Louisiana
- Maryland
- Massachusetts
- Michigan
- Mississippi
- Montana
- Nevada
- New Hampshire
- New Jersey
- New York
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- South Carolina
- Tennessee
- Texas
- Utah
- Vermont
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming

Recent Activity

In March 2018, New York approved a new computer science teacher certification requirement that will take effect in September 2022. Teachers who have taught computer science for at least five years preceding September 2022 may receive a statement of continued eligibility that will allow them to teach computer science for an additional ten years. After September 2022, teachers will have a variety of pathways to earn certification, including industry experience plus specific pedagogical coursework, or in the case of existing teachers, by taking appropriate computer science coursework.

Related Resources

Recommendations for States Developing Computer Science Teacher Pathways

This document provides recommendations and examples for computer science teacher preparation and certification that include steps toward short-term goals while working toward long-term goals.

bit.ly/csteacherpathway

5 State-Approved Preservice Teacher Preparation at Institutions of Higher Education

Yes

No
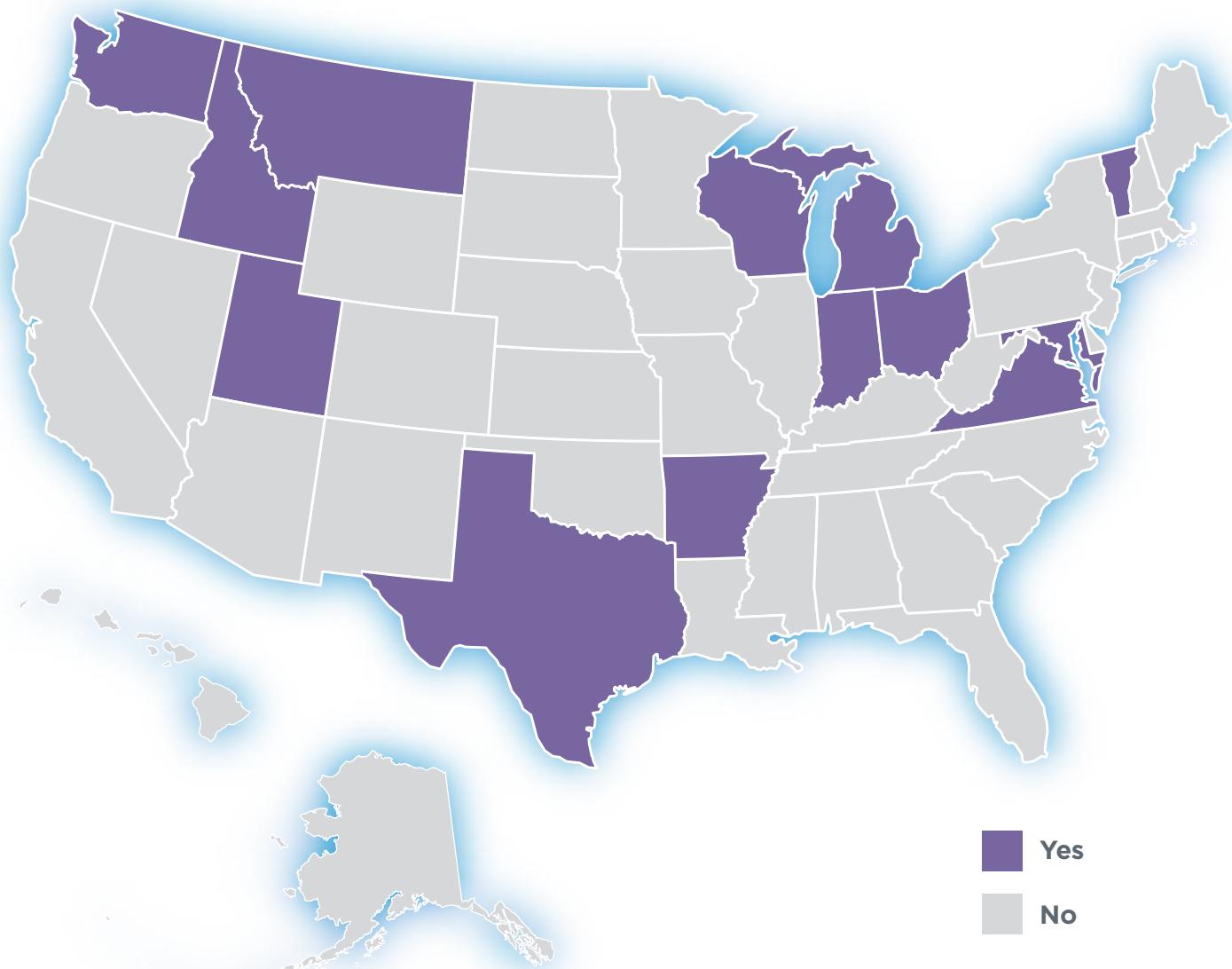
Only 13 states have state-approved preservice teacher preparation at institutions of higher education.

Rubric

A state is considered to have approved preservice teacher preparation in computer science at institutions of higher education if both of the following criteria are met:

- the state approves programs at institutions of higher education that prepare preservice teachers to teach computer science, and

- the list of approved programs is publicly accessible.

Additionally, a state may satisfy this policy if any of the following criteria are met:

- the state provides scholarships for preservice teachers to take computer science, and/or

- the state provides funds to teacher preparation institutions to establish computer science education programs.

States

The following states have state-approved preservice teacher preparation at institutions of higher education:

- Arkansas
- Idaho
- Indiana
- Maryland
- Michigan
- Montana
- Ohio
- Texas
- Utah
- Vermont
- Virginia
- Washington
- Wisconsin

Recent Activity

The Washington State Opportunity Scholarship, a public-private partnership to support low- and middle-income undergraduates pursuing high-demand STEM degrees, has provided funding via the Opportunity Expansion Fund for Central Washington University and Western Washington University to develop programs leading preservice teachers to fulfill the requirements for the computer science teaching endorsement..

Related Resources

Priming the Computer Science Teacher Pump

This report offers a set of recommendations that schools of education, together with other departments and school districts, can take to develop computer science education within their teacher education programs.

computingteacher.org

6 State-Level Computer Science Supervisor

Yes

No
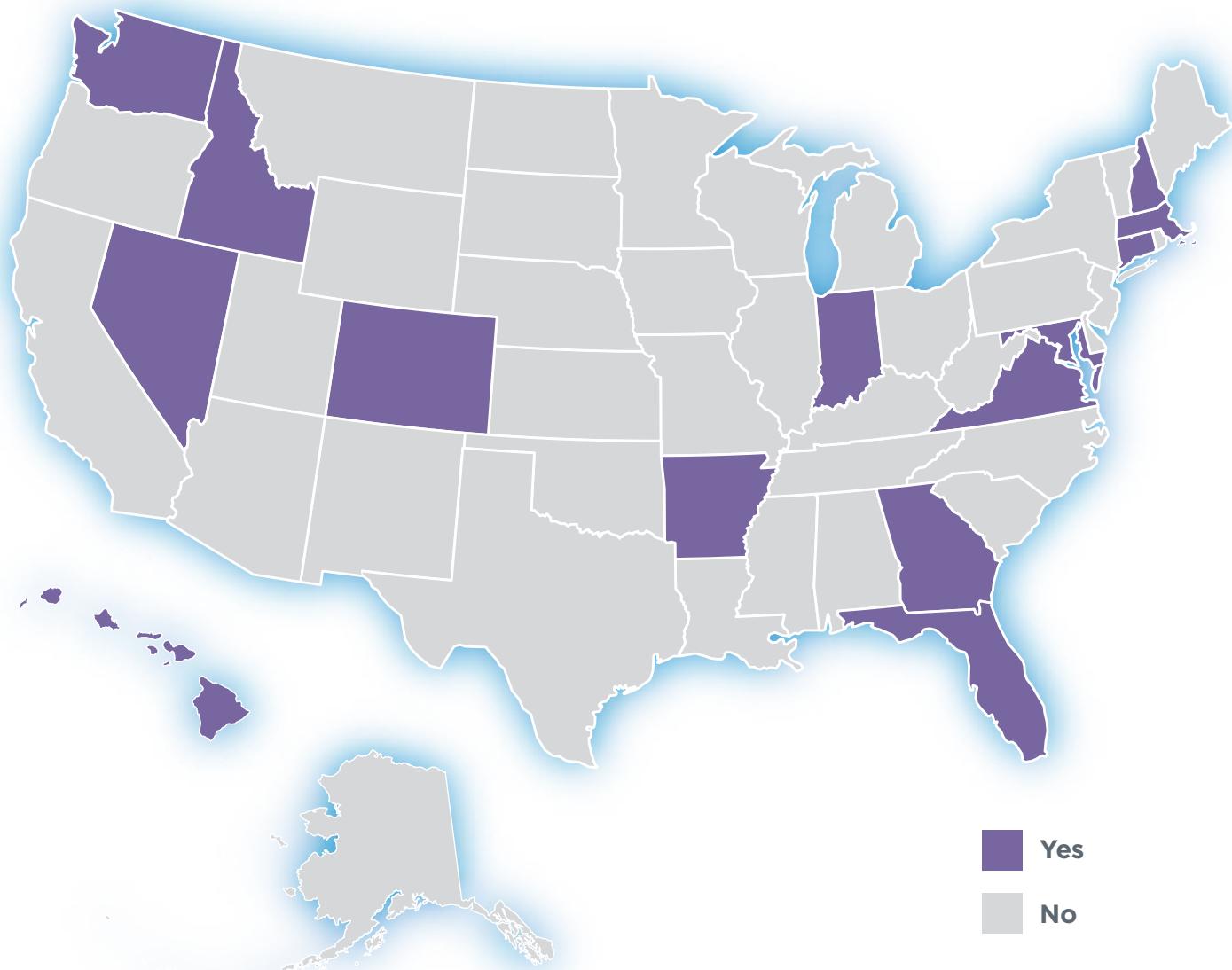
Only 14 states have a state-level computer science supervisor.

Rubric

A state is considered to have a state-level computer science supervisor if the position meets all three of the following criteria:

- located in a state agency,

- with a title reflecting a focus on K-12 computer science, and

- is clearly able to develop state policy/regulations and create programs around computer science.

States

The following states have a state-level computer science supervisor:

- Arkansas
- Colorado
- Connecticut
- Florida
- Georgia
- Hawaii
- Idaho
- Indiana
- Maryland
- Massachusetts
- Nevada
- New Hampshire
- Virginia
- Washington

Recent Activity

Indiana hired a Computer Science Specialist in June 2018 to provide statewide coordination for initiatives across the state. The specialist's responsibilities include developing regulations related to state policy, updating and supporting Indiana's standards, and developing programs and resources focused on the improvement of computer science education.

Related Resources

Model Computer Science State Supervisor Job Description

This resource provides a sample job description with responsibilities and qualifications based on existing state positions.

bit.ly/csjobdescription

A Requirement for All High Schools to Offer Computer Science

Yes

No
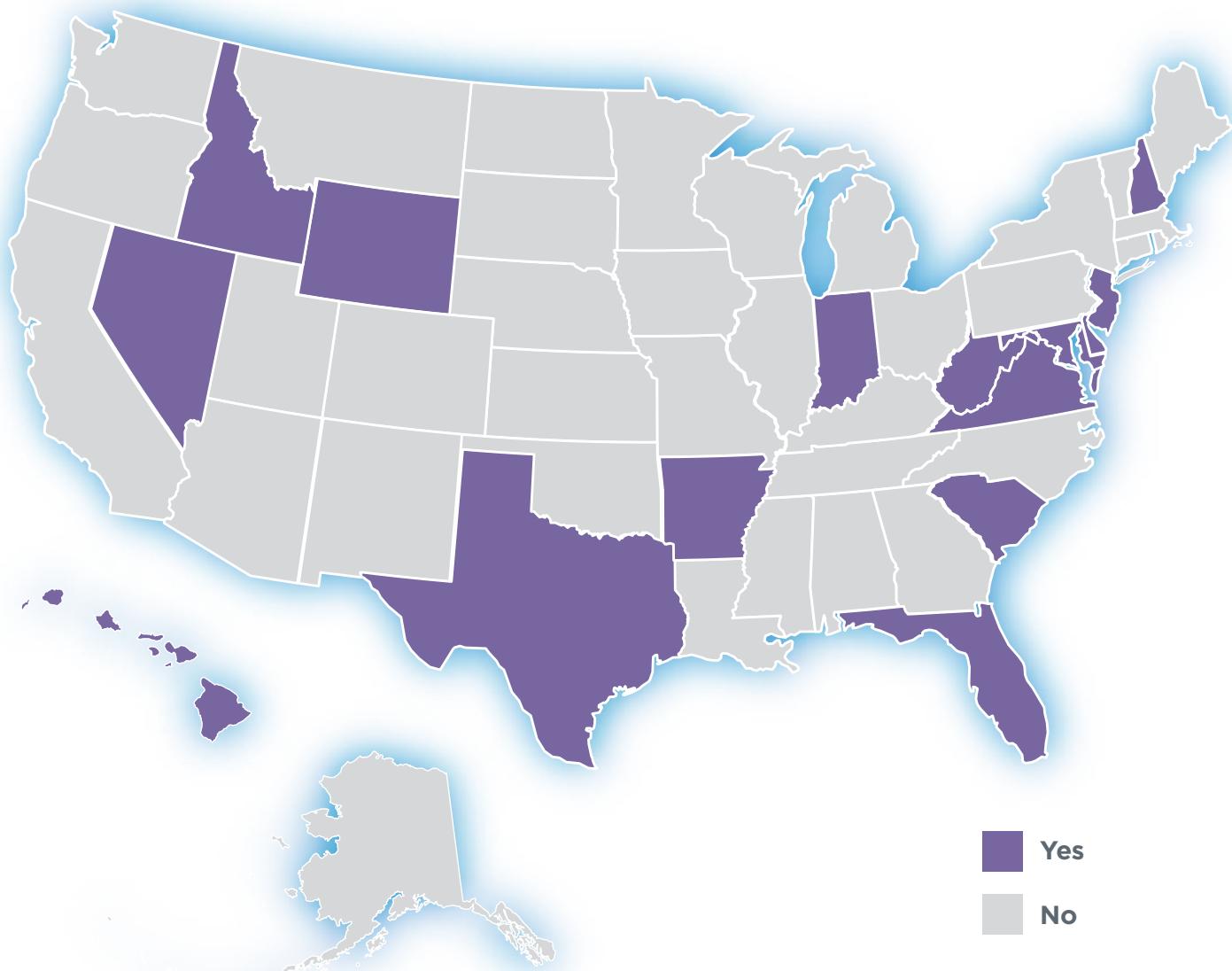
Only 15 states require all high schools to offer computer science.

Rubric

A state is considered to require all high schools to offer computer science if the policy meets both of the following criteria:

- requires all public high schools in the state to offer one or more computer science courses, and

- a description of the requirement is publicly accessible.

States

The following states require all high schools to offer computer science:

- Arkansas
- Delaware
- Florida
- Hawaii
- Idaho
- Indiana
- Maryland
- Nevada
- New Hampshire
- New Jersey
- South Carolina
- Texas
- Virginia
- West Virginia
- Wyoming

Recent Activity

In March 2018, Wyoming added computer science to the core areas of knowledge and skills taught by all schools, effectively requiring all elementary, middle, and high schools to offer computer science by 2022. The Wyoming Department of Education launched Boot Up Wyoming to support the initiative; early activities include developing a needs analysis, implementing teacher training, and developing standards.

Related Resources

All High Schools Offer CS - State Examples

This resource provides examples of states that have set a public goal, passed a legislative mandate, or used other policy levers to ensure that all high schools offer computer science. The resource also includes best practices for implementing this policy.

bit.ly/allhsofferexamples

Computer Science Can Satisfy a Core High School Graduation Requirement

Statewide

District Decision*

No
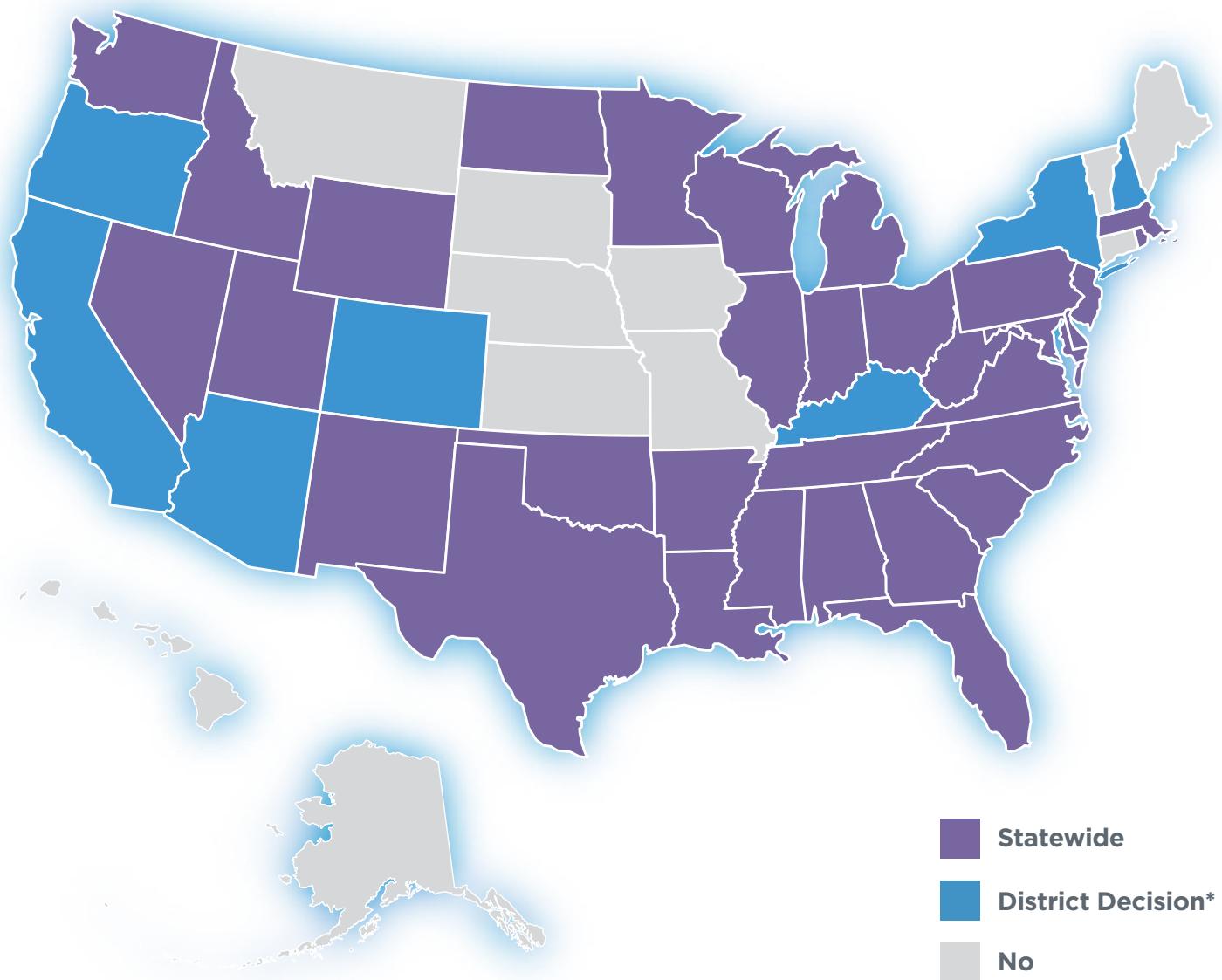
Only 39 states, plus D.C., allow computer science to count towards a core graduation requirement.

Rubric

A state is considered to allow computer science to count towards a core graduation requirement if the policy meets both criteria:

- allows computer science to satisfy a core graduation requirement (not an elective) for a subject such as mathematics, science, technology, or language other than English, and

- a description of the policy is publicly accessible.

States

The following states allow computer science to count towards a core graduation requirement:

- Alabama
- Arizona*
- Arkansas
- California*
- Colorado*
- Delaware
- District of Columbia
- Florida
- Georgia
- Idaho
- Illinois
- Indiana
- Kentucky*
- Louisiana
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Nevada
- New Hampshire*
- New Jersey
- New Mexico
- New York*
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- Oregon*
- Pennsylvania
- Rhode Island
- South Carolina
- Tennessee
- Texas
- Utah
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming

Recent Activity

In June 2018, the Massachusetts Board of Elementary and Secondary Education approved a recommendation to allow a computer science course to substitute for either a laboratory science course or mathematics course, if the course includes rigorous mathematical or scientific concepts and aligns with the state computer science standards. The Commissioner of Higher Education will work with the Commissioner of Elementary and Secondary Education to ensure alignment with admissions requirements for the state's public colleges and universities.

Related Resources

Outcomes of K-12 Computer Science Policy in States

This resource presents outcomes associated with policies allowing computer science to count towards a core graduation requirement, including increased enrollment and diversity in computer science courses.

bit.ly/cspolicyoutcomes

Computer Science Flex Credit

This issue brief describes best practices for how a computer science course should be considered a computer science credit on student transcripts and allowed to "flex" to satisfy a core requirement for high school graduation.

bit.ly/csflexcredit

*The state has passed policy that is permissive and encouraging, but it is not a requirement for schools to allow computer science to satisfy a core graduation requirement. Each district may set policy that allows computer science to count or not.

9 Computer Science Can Satisfy a Core Admission Requirement at Institutions of Higher Education

Yes

No
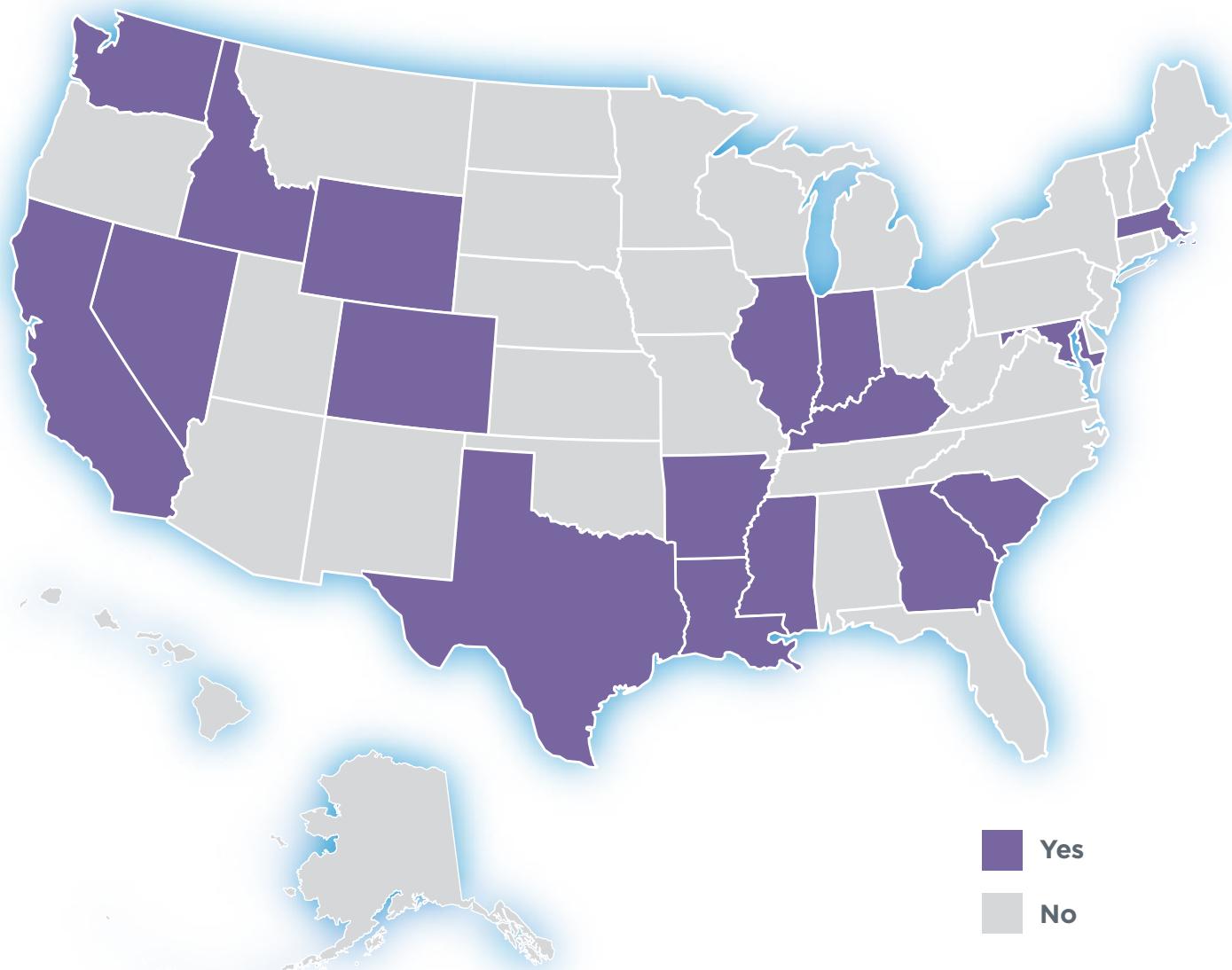
Only 17 states allow computer science to count towards a core admission requirement at institutions of higher education.

Rubric

A state is considered to allow computer science to count towards a core admission requirement if the policy meets both criteria:

- allows computer science to satisfy one of the core credits for entry (not an elective), and
- a description of the policy is publicly accessible.

States

The following states allow computer science to count towards a core admission requirement for institutions of higher education:

- Arkansas
- California
- Colorado
- Georgia
- Idaho
- Illinois
- Indiana
- Kentucky
- Louisiana
- Maryland
- Massachusetts
- Mississippi
- Nevada
- South Carolina
- Texas
- Washington
- Wyoming

Recent Activity

In February 2018, the University of California (UC) approved a recommendation to allow computer science to count as a science eligibility requirement for admissions. As a result, students who take a computer science course in high school and apply it to their science graduation requirements can also count this computer science course towards UC admissions requirements.

Related Resources

University of California Data Confirms Computer Science is Foundational

Computer science can satisfy a core university graduation requirement in 95% of B.S. degrees across the UC system, confirming that computer science is a foundational subject for all students. Universities that allow computer science to count towards their own degree requirements should also allow it to count towards admission requirements, as these policies influence high school graduation requirements and course-taking patterns.

bit.ly/ucdataconfirmscs

State Summaries

This section provides information for each state in the nation, plus D.C., including:

- the state's status toward meeting each of the nine policies,
- additional information about the policy actions taken in the state, and
- data on university graduates, school offerings, participation, and the supply of prepared teachers.

Data Sources

The data included in the state summaries represents the most current information that is publicly accessible. New data from the AP program and university graduates is expected in fall 2018. Refer to code.org/promote for up-to-date state policy information and data.

The number of computer science graduates in a given state and the percent female comes from the National Center for Education Statistics (NCES) IPEDS Completions Survey, obtained using the National Science Foundation (NSF) WebCASPAR tool. The data includes only bachelor's degrees from public or nonprofit private institutions.

The data about AP computer science exams compared to other subjects and participation by female and underrepresented minority students

(Black, Hispanic/Latino, Native American/Alaska Native, and Native Hawaiian/Other Pacific Islander students) comes from the College Board National and State Summary Reports: research.collegeboard.org/programs/ap/data. The number of high schools offering the exam comes from data provided to Code.org directly from the College Board. AP data is included because it provides a national, standardized data set on participation and diversity in computer science courses. AP numbers reported here aggregate both AP Computer Science A and AP Computer Science Principles courses.

The number of teachers in a state that graduated in 2016 and are prepared to teach computer science comes from the most recent Title II national teacher preparation data which contains data for academic year 2015-2016.

Alabama

1 State Plan	2 Standards	3 Funding
No	Yes	Yes

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards are combined with digital literacy and were adopted in March 2018.
- $675K and $613K were allocated for the Middle School Computer Programming Initiative in FY 2018 (SB 129) and 2019 (HB 175), respectively; and $300K was allocated for Computer Science Professional Development in FY 2019 (HB 175).
- AP Computer Science A or AP Computer Science Principles can count as a mathematics credit for graduation.
- The Governor's Advisory Council for Computer Science Education will develop recommendations for the expansion of computer science.
- Governor Kay Ivey is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 503 computer science graduates in 2015; only 21% were female students.
- Only 86 schools (25% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 58 more schools than the previous year.
  - Only 30% of exams were taken by female students in 2017.
  - Only 16% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Alaska

1 State Plan	2 Standards	3 Funding
No	In Progress	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	No	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards development began in March 2018.

Data

- There were 25 computer science graduates in 2015; only 16% were female students.
- Only 6 schools (8% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 3 more schools than the previous year.
  - Only 25% of exams were taken by female students in 2017.
  - Only 7% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Arizona

1	2	3
State Plan	Standards	Funding
No	In Progress	Yes

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
Yes	No	No

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
No	Math	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards development began in January 2018.
- SB 1538 (2016) allocated $500K for K-12 computer science implementation, with a focus on Native American students. $200K more was allocated in the FY 2018 budget (HB 2537) to support standards and PD opportunities. HB 2663 (2018) allocated $1M for FY 2019, prioritizing schools that currently do not provide high school computer science instruction. The bill requires the second 50% of state funding to be matched with private monies or in-kind donations.
- The state has passed a permissive and encouraging policy to allow computer science to count as a mathematics credit for graduation, but it is a district decision.
- Governor Doug Ducey is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 546 computer science graduates in 2015; only 15% were female students.
- Only 50 schools (16% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 23 more schools than the previous year.
  - Only 22% of exams were taken by female students in 2017.
  - Only 21% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Arkansas

1	2	3
State Plan	Standards	Funding
Yes	Yes	Yes

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
Yes	Yes	Yes

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
ES, MS, HS	Math & Science	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-8 computer science standards were adopted in 2015 and 9-12 standards were adopted in 2016. All students learn the K-6 standards and take a coding block in 7th or 8th grade.
- Arkansas provided $15 million over the FY 2016-21 budgets to expand computer science education to all schools.
- Act 187 (2015) required all high schools to offer computer science by the following school year.
- Teachers can obtain a computer science approval code as a temporary measure to meet short-term demands for courses and have access to pathways to later meet traditional certification requirements.
- Act 187 created the Computer Science and Technology in Public School Task Force.
- Governor Asa Hutchinson is the co-chair of the Governors' Partnership for K-12 Computer Science.

Data

- There were 328 computer science graduates in 2015; only 12% were female students.
- Only 50 schools (16% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 23 more schools than the previous year.
  - Only 26% of exams were taken by female students in 2017.
  - Only 25% of exams were taken by underrepresented minorities in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

California

1	2	3
State Plan	Standards	Funding
In Progress	Yes	No

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
Yes	No	No

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
No	Math & Science	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards were adopted in September 2018.
- The University of California allows computer science to count as a mathematics and science eligibility requirement for admissions rather than an elective, but it is ultimately a district decision whether computer science can count towards graduation.
- A state board member is currently designated as the computer science liaison, although the state department does not have a computer science supervisor.
- The draft Computer Science Strategic Implementation Plan, as legislated by AB 2329 (2016), was recommended for a 30-day public review period beginning in October 2018.

Data

- There were 4029 computer science graduates in 2015; only 16% were female students.
- Only 580 schools (25% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 210 more schools than the previous year.
  - Only 29% of exams were taken by female students in 2017.
  - Only 24% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Colorado

1	2	3
State Plan	Standards	Funding
In Progress	No	Yes

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
No	No	Yes

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
No	Math & Science	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- New high school computer science standards were adopted in April 2018. There is no comprehensive set of K-12 computer science standards.
- HB 16-1289 (2016) created a $1,000 per student incentive program for schools to offer AP Computer Science. SB 17-296 (2017) allocates up to $500K for teachers pursuing postsecondary education in computer science education for FY 2018, and another $500K for FY 2019. An additional $500K was allocated in HB 18-1322 (2018) for K-5 teacher professional development.
- The state has passed a permissive and encouraging policy to allow computer science to count as either a mathematics or science credit for graduation, but it is a district decision.

Data

- There were 785 computer science graduates in 2015; only 15% were female students.
- Only 96 schools (26% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 43 more schools than the previous year.
  - Only 19% of exams were taken by female students in 2017.
  - Only 18% of exams were taken by underrepresented minority students in 2017.
- Universities in the state only graduated one new teacher prepared to teach computer science in 2016.

Connecticut

1 State Plan	2 Standards	3 Funding
In Progress	Yes	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	Yes

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	No	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- The CSTA K-12 Computer Science Standards were adopted in June 2018.
- The State Board of Education adopted the *Position Statement on Computer Science Education for All K-12 Students* in 2016.

Data

- There were 404 computer science graduates in 2015; only 15% were female students.
- Only 96 schools (37% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 27 more schools than the previous year.
  - Only 27% of exams were taken by female students in 2017.
  - Only 12% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Delaware

1 State Plan	2 Standards	3 Funding
No	Yes	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
HS	Math	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- The CSTA K-12 Computer Science Standards were adopted in January 2018.
- HB 15 (2017) requires all high schools to offer computer science by school year 2020-2021.
- HB 15 also allows an Advanced Placement, Honors, College Prep, or Integrated computer science course meeting the computer science and mathematics standards can satisfy the fourth mathematics graduation credit.

Data

- There were 192 computer science graduates in 2015; only 23% were female students.
- Only 20% of schools with AP programs offered any AP Computer Science course in 2016-2017, which is 3 more schools than the previous year.
  - Only 23% of exams were taken by female students in 2017.
  - Only 10% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

District of Columbia

1	2	3
State Plan	Standards	Funding
No	No	No

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
Yes	No	No

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
No	Math	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- A computer science working group established in 2016 was tasked with creating a vision for computer science in the District, but no recommendations were put forth.
- An AP computer science course can satisfy the fourth year upper level mathematics credit for graduation.

Data

- There were 133 computer science graduates in 2015; only 41% were female students.
- Only 15 schools (29% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 4 more schools than the previous year.
  - Only 31% of exams were taken by female students in 2017.
  - Only 41% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Florida

1	2	3
State Plan	Standards	Funding
No	Yes	No

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
Yes	No	Yes

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
HS, MS	Math & Science	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards were adopted in May 2016 and are currently embedded as a strand within the state science standards.
- HB 495 (2018) requires all middle and high schools to offer computer science or provide students access via the Florida Virtual School if a district is unable to provide access.
- HB 5101 (2014) allows a high school computer science course and the earning of related industry certifications to count towards one mathematics graduation credit (with the exception of Algebra I or higher-level mathematics) or one science graduation credit (with the exception of Biology I or higher-level science).

Data

- There were 2486 computer science graduates in 2015; only 19% were female students.
- Only 241 schools (22% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 95 more schools than the previous year.
  - Only 25% of exams were taken by female students in 2017.
  - Only 39% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Georgia

1	2	3
State Plan	Standards	Funding
In Progress	In Progress	Yes

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
Yes	No	Yes

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
No	Math & Science	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards development began in September 2017.
- In 2018, the state budget (Act 286) included $500K in grants for middle school coding and teacher professional development. In 2016, the Governor's Office of Student Achievement Innovation Funds allocated $250K for the expansion of computer science throughout the state.
- Of the approved computing courses in the state, nine count towards graduation for the fourth mathematics credit or the fourth science credit; the same courses also count as a science for admission to the University System of Georgia. Two units of computer science emphasizing coding and programming can also satisfy the foreign language admission requirement to the University System.

Data

- There were 1747 computer science graduates in 2015; only 19% were female students.
- Only 154 schools (25% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 27 more schools than the previous year.
  - Only 24% of exams were taken by female students in 2017.
  - Only 18% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Hawaii

1	2	3
State Plan	Standards	Funding
Yes	Yes	Yes

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
No	No	Yes

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
HS	No	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- The CSTA K-12 Computer Science Standards were adopted in May 2018.
- HB 2607 (2018) dedicated $500K to computer science teacher professional development in FY 2019.
- HB 2607 requires all high schools to offer at least one computer science course by the 2021-2022 school year.
- Governor David Ige is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 155 computer science graduates in 2015; only 17% were female students.
- Only 16 schools (19% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 4 more schools than the previous year.
  - Only 32% of exams were taken by female students in 2017.
  - Only 19% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Idaho

1	2	3
State Plan	Standards	Funding
No	Yes	Yes

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
Yes	Yes	Yes

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
HS	Math & Science	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards were adopted in February 2017.
- Idaho provided a total of $6M for FY 2017-2019 for the expansion of computer science throughout the state, including funds for professional development (H0379 in 2016, H0298 in 2017, and H0669 in 2018).
- H648 (2018) requires each school district to make one or more computer science courses available to all high school students by 2020.
- AP Computer Science or dual-credit computer science can count as one mathematics (after completion of Algebra II) or up to two science credits for graduation.
- The Computer Science in K-12 working group made recommendations in 2016 for the expansion of computer science.
- Governor Butch Otter is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 333 computer science graduates in 2015; only 13% were female students.
- Only 19 schools (19% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 12 more schools than the previous year.
  - Only 29% of exams were taken by female students in 2017.
  - Only 12% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Illinois

1	2	3
State Plan	Standards	Funding
No	No	No

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
Yes	No	No

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
No	Math	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- HR0853 (2018) encourages districts to teach computer science.
- A task force on computer science education created by HB5720 (2016) developed and presented recommendations to the Illinois General Assembly in 2017.

Data

- There were 1768 computer science graduates in 2015; only 13% were female students.
- Only 157 schools (22% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 34 more schools than the previous year.
  - Only 23% of exams were taken by female students in 2017.
  - Only 17% of exams were taken by underrepresented minority students in 2017.
- Universities in the state only graduated one new teacher prepared to teach computer science in 2016.

Indiana

1 State Plan	2 Standards	3 Funding
No	No	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	Yes	Yes

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
ES, MS, HS	Math & Quant. Reasoning	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-8 computer science standards were adopted in April 2016 and are embedded in the state science standards. There is no comprehensive set of K-12 computer science standards.
- SB 172 (2018) requires all elementary, middle, and high schools to offer computer science by 2021-2022.
- The Department of Education has approved specific computer science courses that can count towards CORE 40 graduation requirements such as mathematics or quantitative reasoning.
- Governor Eric Holcomb is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 1578 computer science graduates in 2015; only 17% were female students.
- Only 77 schools (18% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 29 more schools than the previous year.
  - Only 20% of exams were taken by female students in 2017.
  - Only 11% of exams were taken by underrepresented minority students in 2017.
- Universities in the state only graduated one new teacher prepared to teach computer science in 2016.

Iowa

1 State Plan	2 Standards	3 Funding
No	Yes	Yes

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	No	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- The CSTA K-12 Computer Science Standards were adopted in June 2018.
- HF 642 (2018) allocated $500K for computer science professional development for FY 2019; another $500K was added to the fund.
- SF 274 (2017) sets a goal, but not a requirement, for each high school, middle school, and elementary school to offer computer science by July 2019.
- Certification pathways for 5-12 and K-8 computer science teachers were adopted in 2018.
- The IA Computer Science Task Force made recommendations (2015) to the STEM Advisory Council. SF 274 (2017) required the development of a CS Education Workgroup, which made recommendations to the legislature.
- Governor Kim Reynolds is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 364 computer science graduates in 2015; only 14% were female students.
- Only 31 schools (15% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 14 more schools than the previous year.
  - Only 17% of exams were taken by female students in 2017.
  - Only 9% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Kansas

1 State Plan	2 Standards	3 Funding
No	In Progress	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	No	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards development began in June 2018.

Data

- There were 338 computer science graduates in 2015; only 14% were female students.
- Only 13 schools (10% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 1 more school than the previous year.
  - Only 16% of exams were taken by female students in 2017.
  - Only 3% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Kentucky

1 State Plan	2 Standards	3 Funding
In Progress	In Progress	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math & Science	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards development began in July 2017.
- The state has passed a permissive and encouraging policy to allow computer science to count as an elective science credit or a fourth year mathematics credit for graduation, but it is a district decision. The course must involve computational thinking, problem solving, computer programming, and a significant emphasis on the science and engineering practices.

Data

- There were 434 computer science graduates in 2015; only 18% were female students.
- Only 61 schools (23% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 22 more schools than the previous year.
  - Only 28% of exams were taken by female students in 2017.
  - Only 9% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Louisiana

1 State Plan	2 Standards	3 Funding
No	No	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- The State Board of Education has adopted a policy to allow AP Computer Science A to count towards an advanced mathematics credit.

Data

- There were 365 computer science graduates in 2015; only 18% were female students.
- Only 37 schools (13% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 21 more schools than the previous year.
  - Only 31% of exams were taken by female students in 2017.
  - Only 33% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Maine

1 State Plan	2 Standards	3 Funding
No	No	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	No	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- A task force established by LD 398 (2017) presented recommendations to recognize computer science in the path to proficiency.
- High school computer science is recommended but not required for admission to the University of Maine.

Data

- There were 112 computer science graduates in 2015; only 16% were female students.
- Only 23 schools (16% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is the same as the previous year.
  - Only 20% of exams were taken by female students in 2017.
  - Only 5% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Maryland

1 State Plan	2 Standards	3 Funding
In Progress	In Progress	Yes

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	Yes	Yes

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
HS	Math & Technology	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards development began in January 2018.
- SB 185 (2018) allocated $5M for computer science for FY 2019, and HB 281 (2018) allocates $1M per year for FY 2020 and 2021.
- HB 281 requires all high schools to offer at least one computer science course by school year 2021-2022, and asks each school board to make efforts to incorporate computer science in each elementary and middle school and to increase the enrollment of female students, students with disabilities, and students of underrepresented ethnic or racial groups.
- HB 281 requires the Maryland Center for Computing Education to develop and publish a state plan by July 2019.
- Governor Larry Hogan is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 2923 computer science graduates in 2015; only 20% were female students.
- Only 150 schools (42% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 35 more schools than the previous year.
  - Only 31% of exams were taken by female students in 2017.
  - Only 21% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Massachusetts

1 State Plan	2 Standards	3 Funding
No	Yes	Yes

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	Yes

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math & Science	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards are combined with digital literacy and were adopted in June 2016.
- $1.5M was allocated for FY 2016 (H3650, 2015) for professional development and implementation support and required a one-to-one private match. $850K was allocated for FY 2018 in H3800 (2017) and an additional $850K was allocated for FY 2019 in H4800 (2018); both amounts require a one-to-one private match.
- The Massachusetts Board of Elementary and Secondary Education has approved a recommendation to allow a computer science course to substitute for either a laboratory science course or a mathematics course, if the course includes rigorous mathematical or scientific concepts and aligns with the state computer science standards.

Data

- There were 1953 computer science graduates in 2015; only 23% were female students.
- Only 168 schools (37% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 17 more schools than the previous year.
  - Only 24% of exams were taken by female students in 2017.
  - Only 16% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Michigan

1 State Plan	2 Standards	3 Funding
No	In Progress	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	Yes	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math & Science	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards development began in May 2018.
- Although the state has not created a dedicated funding source for computer science, HB 4313 (2017) allocates $1M for FY 2018 for a competitive grant to provide information technology education opportunities to students, including coding curriculum for high school and computational thinking for K-8. The Marshall Plan for Talent, stemming from SB 941 (2018), includes almost $30M for educational uses such as computer science and professional learning.
- A computer science course can count as the fourth mathematics credit for graduation or it can replace the Algebra II requirement as a department-approved formal career and technical education program or curriculum.

Data

- There were 1793 computer science graduates in 2015; only 16% were female students.
- Only 85 schools (13% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 14 more schools than the previous year.
  - Only 24% of exams were taken by female students in 2017.
  - Only 5% of exams were taken by underrepresented minority students in 2017.
- Universities in the state only graduated 6 new teachers prepared to teach computer science in 2016.

Minnesota

1 State Plan	2 Standards	3 Funding
No	No	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- HF 844 (2015) allows computer science to count as a mathematics credit if the course meets state academic standards in mathematics.

Data

- There were 895 computer science graduates in 2015; only 15% were female students.
- Only 59 schools (18% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 20 more schools than the previous year.
  - Only 20% of exams were taken by female students in 2017.
  - Only 7% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Mississippi

1 State Plan	2 Standards	3 Funding
No	Yes	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Computer Science	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards were adopted in April 2018.
- Beginning with incoming freshmen of 2018-2019, all students must earn one credit in technology or computer science.
- Beginning with students entering in Fall 2022, Mississippi State Institutions of Higher Learning require one credit in technology or computer science for admissions.

Data

- There were 155 computer science graduates in 2015; only 12% were female students.
- Only 13 schools (7% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 10 more schools than the previous year.
  - Only 23% of exams were taken by female students in 2017.
  - Only 22% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Missouri

1 State Plan	2 Standards	3 Funding
No	No	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	No	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- SB 894, passed by the legislature but vetoed by the governor in July 2018, called for the development of K-12 computer science standards, the creation of a computer science endorsement, and a policy to allow computer science to count as a mathematics, science, or practical arts credit. At the time of this report's publication, the governor had called the legislature into special session in September to reconsider the issue.

Data

- There were 1138 computer science graduates in 2015; only 17% were female students.
- Only 69 schools (21% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 22 more schools than the previous year.
  - Only 20% of exams were taken by female students in 2017.
  - Only 10% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Montana

1 State Plan	2 Standards	3 Funding
No	In Progress	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	Yes	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	No	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards development began in July 2018.
- Governor Steve Bullock is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 75 computer science graduates in 2015; only 11% were female students.
- Only 2 schools (2% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 2 more schools than the previous year.
  - Only 15% of exams were taken by female students in 2017.
  - Only 15% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Nebraska

1 State Plan	2 Standards	3 Funding
No	No	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	No	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- The state computer science effort is currently directed out of Business, Marketing, and Management and Information Technology in Nebraska Career Education within the Nebraska Department of Education.

Data

- There were 438 computer science graduates in 2015; only 15% were female students.
- Only 19 schools (21% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 4 more schools than the previous year.
  - Only 10% of exams were taken by female students in 2017.
  - Only 8% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Nevada

1 State Plan	2 Standards	3 Funding
No	Yes	Yes

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	Yes

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
ES, HS	Math, Science, & Computer Ed and Tech	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards were adopted in June 2018.
- $1M and $1.4M were allocated in FY 2018 and 2019, respectively, for carrying out SB 200 (2017) to expand computer science education.
- SB 200 requires a course in computer science to be made available in high schools, and requires all students to receive instruction in computer education before 6th grade. Schools must make efforts to increase enrollment of girls, students with disabilities, and underrepresented minority students.
- To meet the computer education and technology graduation credit, a course must dedicate half of the instructional time to computer science and computational thinking. A student that takes a computer education and technology course in middle school is not required to fulfill the half credit in high school.
- Governor Brian Sandoval is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 96 computer science graduates in 2015; only 23% were female students.
- Only 27 schools (24% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 18 more schools than the previous year.
  - Only 26% of exams were taken by female students in 2017.
  - Only 30% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

New Hampshire

1 State Plan	2 Standards	3 Funding
Yes	Yes	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	Yes

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
ES, MS, HS	Math & Technology	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards were adopted in August 2018.
- HB 1674 (2018) requires all schools to create and implement computer science programs.
- The state has passed a permissive and encouraging policy to allow computer science to count as a mathematics or technology credit for graduation, but it is a district decision.

Data

- There were 391 computer science graduates in 2015; only 20% were female students.
- Only 20 schools (17% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is the same as the previous year.
  - Only 18% of exams were taken by female students in 2017.
  - Only 3% of exams were taken by underrepresented minority students in 2017.
- Universities in the state only graduated two new teachers prepared to teach computer science in 2016.

New Jersey

1 State Plan	2 Standards	3 Funding
No	Yes	Yes

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
HS	Math & Science	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- Computer science standards are included as a strand in the state technology literacy standards revised in 2014.
- The Secondary School Computer Science Education Initiative (P.L. 2018, Chapter 53) allocates $2M for FY 2019.
- A2873 (2018) requires all high schools to offer a course in computer science by the 2018-2019 school year.
- A new computer science endorsement allows a teacher to apply if they have taught computer science within the three years prior to a requirement to hold the endorsement.

Data

- There were 1111 computer science graduates in 2015; only 15% were female students.
- Only 219 schools (39% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 29 more schools than the previous year.
  - Only 26% of exams were taken by female students in 2017.
  - Only 15% of exams were taken by underrepresented minority students in 2017.
- Universities in the state only graduated three new teachers prepared to teach computer science in 2016.

New Mexico

1 State Plan	2 Standards	3 Funding
No	No	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math & Science	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- SB 134 (2017) allows computer science to count towards a mathematics or science credit for graduation, provided that the student has demonstrated competence in mathematics or science.

Data

- There were 141 computer science graduates in 2015; only 18% were female students.
- Only 18 schools (14% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is eight more schools than the previous year.
  - Only 29% of exams were taken by female students in 2017.
  - Only 41% of exams were taken by underrepresented minority student in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

New York

1 State Plan	2 Standards	3 Funding
No	No	Yes

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math & Science	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- A 9506 (2018) requires the development of K-12 computer science standards by December 2019.
- The Smart Start program (funded in S 7504/A 9504, 2018) allocates $6M per year (for a total of $30M) starting in FY 2019 to expand computer science education.
- The Board of Regents created a new computer science teacher certification that will be in effect by September 2022. Current teachers will be exempt from needing to fulfill additional requirements to earn their computer science certification, and new computer science teachers will have four pathways to certification.
- The state has passed a permissive and encouraging policy to allow computer science to count as either a mathematics or science credit for graduation, but it is a district decision.

Data

- There were 3801 computer science graduates in 2015; only 18% were female students.
- Only 339 schools (23% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 139 more schools than the previous year.
  - Only 32% of exams were taken by female students in 2017.
  - Only 23% of exams were taken by underrepresented minority student in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

North Carolina

1 State Plan	2 Standards	3 Funding
Yes	No	Yes

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- SB 257 (2017) allocates $400K for FY 2018 for the "Coding and Mobile Application Grant Program" which can be used for teacher professional development in computer science. SB 99 (2018) allocated an additional $400K for the program in FY 2019, along with $500K to support the implementation of the Computer Science Education Plan and establish a position in the Department of Public Instruction to support the effort.
- HB 155 (2017) requires the development of a state plan and curriculum guidelines that are aligned with the K-12 Computer Science Framework.
- Computer science can count as the fourth mathematics credit for graduation in the Future-Ready Core track.
- Governor Roy Cooper is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 1284 computer science graduates in 2015; only 20% were female students.
- Only 95 schools (15% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is the same as the previous year.
  - Only 24% of exams were taken by female students in 2017.
  - Only 14% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

North Dakota

1 State Plan	2 Standards	3 Funding
No	No	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards development began in September 2018.
- North Dakota Century Code 15.1-21 allows computer science to count as a mathematics credit for graduation. Currently two courses have been approved: Mathematics for Computer Science/Information Technology and AP Computer Science A.
- Governor Doug Burgum is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 117 computer science graduates in 2015; only 7% were female students.
- Only 10 schools (19% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 7 more schools than the previous year.
  - Only 11% of exams were taken by female students in 2017.
  - Only 6% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Ohio

1 State Plan	2 Standards	3 Funding
No	In Progress	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	Yes	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math & Science	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards and a model curriculum are currently in development and must be completed by the end of 2018.
- HB 170 (2017) expanded how computer science can count towards a graduation credit in either science or mathematics. A computer science course can be taken in place of Algebra II if the school communicates to the student that institutions of higher education may require Algebra II for admission, and the parent or guardian signs a document acknowledging that not taking Algebra II may have an adverse effect on college admission decisions.

Data

- There were 1137 computer science graduates in 2015; only 18% were female students.
- Only 131 schools (18% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 49 more schools than the previous year.
  - Only 24% of exams were taken by female students in 2017.
  - Only 8% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Oklahoma

1 State Plan	2 Standards	3 Funding
No	Yes	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math & Foreign Language	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards were adopted in May 2018.
- A computer science course may satisfy a foreign language or mathematics credit in the Core Curriculum Standard Track.

Data

- There were 446 computer science graduates in 2015; only 15% were female students.
- Only 29 schools (10% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 6 more schools than the previous year.
  - Only 22% of exams were taken by female students in 2017.
  - Only 18% of exams were taken by underrepresented minority students in 2017.
- Universities in the state only graduated four new teachers prepared to teach computer science in 2016.

Oregon

1 State Plan	2 Standards	3 Funding
No	No	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Science	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- The state has passed a permissive and encouraging policy to allow computer science to count as a fourth science elective for graduation, but it is a district decision.

Data

- There were 537 computer science graduates in 2015; only 15% were female students.
- Only 25 schools (11% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 10 more schools than the previous year.
  - Only 20% of exams were taken by female students in 2017.
  - Only 8% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Pennsylvania

1 State Plan	2 Standards	3 Funding
No	Yes	Yes

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math & Science	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- The CSTA K-12 Computer Science Standards were endorsed in January 2018.
- PAsmart (funded in HB 2121, 2018) dedicates $20M for FY 2019 to expanding STEM and computer science education, including teacher professional development.
- Governor Tom Wolf is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 2969 computer science graduates in 2015; only 20% were female students.
- Only 206 schools (26% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 37 more schools than the previous year.
  - Only 22% of exams were taken by female students in 2017.
  - Only 8% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Rhode Island

1 State Plan	2 Standards	3 Funding
Yes	Yes	Yes

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math & Science	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards that include digital literacy were adopted in May 2018.
- $260K was allocated for computer science professional development in the FY 2017 operating budget (HB 7454).
- Although it is not a requirement, the state implemented a plan to expand computer science to every K-12 school.
- Governor Gina Raimondo is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 348 computer science graduates in 2015; only 17% were female students.
- Only 29 schools (41% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 15 more schools than the previous year.
  - Only 23% of exams were taken by female students in 2017.
  - Only 9% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

South Carolina

1 State Plan	2 Standards	3 Funding
No	Yes	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
HS	Computer Science	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-8 computer science standards were adopted in May 2017. High school standards were adopted in August 2018.
- The Department of Education has revised the list of courses that satisfy the computer science graduation requirement, effectively requiring all high schools to offer at least one computer science course by 2019 and all students to take at least one credit of computer science to graduate.
- H 630 (2017) allocated $400K to the Computer Science Task Force.
- The Commission on Higher Education allows computer science to count as a mathematics course for admission, and also strongly recommends that students take a college preparatory course in computer science as an elective in high school.

Data

- There were 529 computer science graduates in 2015; only 25% were female students.
- Only 48 schools (16% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 16 more schools than the previous year.
  - Only 28.% of exams were taken by female students in 2017.
  - Only 17% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

South Dakota

1 State Plan	2 Standards	3 Funding
No	No	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
No	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	No	No

Refer to **code.org/promote** for additional up-to-date information.

Data

- There were 145 computer science graduates in 2015; only 18% were female students.
- Only 4 schools (5% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is the same as the previous year.
  - Only 9% of exams were taken by female students in 2017.
  - Only 3% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Tennessee

1	2	3
State Plan	Standards	Funding
No	No	No

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
Yes	No	No

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
No	Math	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-8 computer science standards are combined with digital literacy and were adopted in July 2018. There is no comprehensive set of K-12 computer science standards.

Data

- There were 625 computer science graduates in 2015; only 18% were female students.
- Only 50 schools (14% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 18 more schools than the previous year.
  - Only 29% of exams were taken by female students in 2017.
  - Only 20% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Texas

1	2	3
State Plan	Standards	Funding
No	No	No

4	5	6
Certification	Preservice Teacher Prep	State Supervisor
Yes	Yes	No

7	8	9
Require HS to Offer	Core Grad Credit	Higher Ed Admission
HS	Math, Science & Foreign Language	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- The Texas Essential Knowledge and Skills for Technology Applications at the high school level contain computer science standards and were implemented for the 2012-2013 school year. There is no comprehensive set of K-12 computer science standards.
- In 2014, the State Board of Education added computer science courses to the list of required curriculum offerings at high schools.
- AP Computer Science A or IB Computer Science Higher Level can satisfy a required mathematics or foreign language requirement. HB 728 (2017) allows a computer science course to count as an advanced science credit.

Data

- There were 2714 computer science graduates in 2015; only 18% were female students.
- Only 399 schools (22% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 63 more schools than the previous year.
  - Only 27% of exams were taken by female students in 2017.
  - Only 30% of exams were taken by underrepresented minority students in 2017.
- Universities in the state only graduated 15 new teachers prepared to teach computer science in 2016.

Utah

1	2	3
State Plan	**Standards**	**Funding**
In Progress	No	Yes

4	5	6
Certification	**Preservice Teacher Prep**	**State Supervisor**
Yes	Yes	No

7	8	9
Require HS to Offer	**Core Grad Credit**	**Higher Ed Admission**
No	Math & Science	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- SB 93 (2016) allocates $400K for computer science through the State Office of Education in FY 2017. SB 190 (2017) created a Computing Pathways Grants program, including $1.2M each year for FY 2018 and FY 2019.
- A computer programming course can replace the third mathematics credit (Secondary III) by request from the parent, or it can count as a science credit.
- There are three tiers for K-12 computer science endorsement allowing teachers to move towards a full certification while they begin to teach courses. The elementary STEM endorsement requires a computer science component.
- The State Board of Education created a Computer Science Task Force, which submitted recommendations in 2018.

Data

- There were 366 computer science graduates in 2015; only 10% were female students.
- Only 33 schools (17% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 19 more schools than the previous year.
  - Only 17% of exams were taken by female students in 2017.
  - Only 9% of exams were taken by underrepresented minority students in 2017.
- Universities in the state only graduated one new teacher prepared to teach computer science in 2016.

Vermont

1	2	3
State Plan	**Standards**	**Funding**
No	No	No

4	5	6
Certification	**Preservice Teacher Prep**	**State Supervisor**
Yes	Yes	No

7	8	9
Require HS to Offer	**Core Grad Credit**	**Higher Ed Admission**
No	No	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- Although the state digital learning plan (November 2017) is not specific to computer science, it includes building teacher capacity around computer science by working with higher education partners and providing computer science opportunities for all students.

Data

- There were 163 computer science graduates in 2015; only 18% were female students.
- Only 12 schools (16% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 3 more schools than the previous year.
  - Only 20% of exams were taken by female students in 2017.
  - Only 3% of exams were taken by underrepresented minority student in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Virginia

1 State Plan	2 Standards	3 Funding
No	Yes	Yes

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	Yes	Yes

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
ES, MS, HS	Math, Science & CTE	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- Mandatory K-12 computer science standards were added to the state Standards of Learning in November 2017, effectively requiring all K-12 schools to offer instruction in computer science.
- $1.1M was allocated in 2016 over FY 2017-2018 for K-12 computer science professional development.
- Computer science may satisfy a graduation credit in lab science, career and technical education, or mathematics at or above the level of Algebra II. The policy also allows students in English as a Second Language programs to add a computer science elective for graduation credit if they test out of their foreign language requirement.
- Governor Ralph Northam is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 1570 computer science graduates in 2015; only 18% were female students.
- Only 134 schools (29% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 3 more schools than the previous year.
  - Only 26% of exams were taken by female students in 2017.
  - Only 14% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Washington

1 State Plan	2 Standards	3 Funding
No	Yes	Yes

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	Yes	Yes

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math & Science	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards were adopted in December 2016 and updated in 2018.
- A $2M per biennium grant program with one-to-one private match for professional development and technology upgrades was included in the 2015-2017 (SB 6052) and 2017-2019 (SB 5883) budgets, for a total of $4M in state funds and $8M in overall funds.
- Previous legislation allowed computer science to count as a science or mathematics (as long as the student had previously taken or concurrently taking Algebra II) credit for graduation; SB 6136 (2018) allowed computer science to count as the third required mathematics credit without the Algebra II requirement.
- Governor Jay Inslee is the co-chair of the Governors' Partnership for K-12 Computer Science.

Data

- There were 1212 computer science graduates in 2015; only 21% were female students.
- Only 135 schools (31% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 37 more schools than the previous year.
  - Only 28% of exams were taken by female students in 2017.
  - Only 10% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

West Virginia

1 State Plan	2 Standards	3 Funding
No	Yes	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
HS	Math & Science	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards were adopted in April 2017.
- The State Board updated Policy 2510 to require all high schools to offer a computer science course beginning in the 2016-2017 school year, although no guidance has been issued around implementation of this requirement.
- An AP computer science course can count as the fourth mathematics credit for graduation. Policy 2520.14, updated in April 2017, allows a computer science course to count as a science credit.

Data

- There were 158 computer science graduates in 2015; only 11% were female students.
- Only 15 schools (12% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is the same as the previous year.
  - Only 36% of exams were taken by female students in 2017.
  - Only 4% of exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

Wisconsin

1 State Plan	2 Standards	3 Funding
No	Yes	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	Yes	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
No	Math	No

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards were adopted in June 2017.

Data

- There were 918 computer science graduates in 2015; only 15% were female students.
- Only 68 schools (13% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 8 more schools than the previous year.
  - Only 17% of exams were taken by female students in 2017.
  - Only 5% of exams were taken by underrepresented minority students in 2017.
- Universities in the state only graduated two new teachers prepared to teach computer science in 2016.

Wyoming

1 State Plan	2 Standards	3 Funding
Yes	In Progress	No

4 Certification	5 Preservice Teacher Prep	6 State Supervisor
Yes	No	No

7 Require HS to Offer	8 Core Grad Credit	9 Higher Ed Admission
ES, MS, HS	Math & Science	Yes

Refer to **code.org/promote** for additional up-to-date information.

Additional Information

- K-12 computer science standards development began in July 2018.
- The Wyoming Trust Fund for Innovative Education, although not a dedicated funding program for computer science, has prioritized computer science applications in 2018-2019.
- SF 29 (2018) requires each school to include computer science and computational thinking by school year 2022-2023.
- The Wyoming Department of Education created a task force in 2018 to develop and implement a long-term plan for expanding computer science.
- The University of Wyoming accepts a computer science course for admissions requirements in mathematics, science, or career, as needed.
- Governor Matt Mead is a member of the Governors' Partnership for K-12 Computer Science.

Data

- There were 25 computer science graduates in 2015; only 8% were female students.
- Only 5 schools (13% of schools with AP programs) offered any AP Computer Science course in 2016-2017, which is 1 more school than the previous year.
    - Only 24% of exams were taken by female students in 2017.
    - No exams were taken by underrepresented minority students in 2017.
- Universities in the state did not graduate a single new teacher prepared to teach computer science in 2016.

K-12 Computer Science Access Report

The K-12 Computer Science Access Report, launched in September 2017, is a partnership between the Computer Science Teachers Association and Code.org to identify, on a school-by-school basis, where computer science courses are taught.

So far, the K-12 Computer Science Access Report has collected data on 42% of all public K-12 schools and 67% of public high schools in the U.S. Based on this limited data, we know that at least 21,000 public schools in the US teach computer science (there are 104,881[1] public schools in the nation). As data continues to be collected, this report provides a point-in-time view of computer science implementation in the US. Refer to code.org/yourschool for an interactive map of the most up-to-date data.

The first part of this chapter describes the methodology for data collection, including data sources and the methodology for determining which courses are computer science courses. The second part is composed of graphics showing the percent of high schools in a state teaching computer science, the types of communities in which computer science is taught, student diversity and access, and income levels and access. The last part of this chapter describes the relationship between policy and implementation in the states showing the greatest percentage of schools teaching computer science.

The current data set includes elementary, middle, and high schools from every state, with the most data coming from public high schools. In order to provide an accurate portrayal of implementation,

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[1] 2015 NCES Public Elementary/Secondary School Universe Survey

this chapter only reflects public high school data from states where data has been collected from close to 100% of the state's public high schools. The data from these 24 states represent more than half of the total number of public high schools in the nation.

- Alabama
- Arkansas
- California
- Florida
- Georgia
- Indiana

- Iowa
- Kansas
- Kentucky
- Louisiana
- Massachusetts
- Mississippi

- Missouri
- Montana
- New York
- North Carolina
- North Dakota
- Oklahoma

- Oregon
- Rhode Island
- South Carolina
- Utah
- Virginia
- Wisconsin

Data Sources

Data Source	Description
National Center for Education Statistics (NCES)	Database of schools in the country, with demographic information, including information about enrollment in Free and Reduced Lunch programs, student demographics, and grades offered
State education agencies	School names, school IDs, course codes, course enrollment, and course descriptions
National organizations (e.g., the College Board, the International Baccalaureate)	School names, school IDs, course names, and course descriptions
School course catalogs	Course names and descriptions
Survey responses	Completed surveys on Code.org and Hourofcode.com from teachers, administrators, and parents

Data from state education agencies were collected through direct collaboration or via requests submitted through an online portal. State data included school codes, course codes, course descriptions, and course enrollment. School codes were cross-referenced with data from the National Center for Education Statistics (NCES) to determine schools' community type, underrepresented minority (URM) enrollment, and percent of students receiving free and reduced lunch (FRL). The NCES uses four main categories for community type (City, Suburban, Town, Rural) which can be reduced to two categories based on the US Census Bureau urban-rural classification: Urban (City, Suburban, and Town) and Rural. Race/Ethnicity categories from the NCES that we define as URM are Hispanic, American Indian/Alaska Native, Black of African American, and Native Hawaiian or Other Pacific Islander. State departments of education and organizations interested in providing statewide implementation data should contact accessreport@code.org.

Defining a Computer Science Course

The following definition of computer science was developed by the Computer Science Teachers Association (Tucker, 2003) and later reaffirmed in the K-12 Computer Science Framework:

Computer science is the study of computers and algorithms, including their principles, their hardware and software designs, their implementation, and their impact on society.

Learning computer science means learning how to create new technologies, rather than simply using them. Although many schools offer their students some exposure to computer science in a limited capacity such as an Hour of Code, this report focuses on **schools that teach a foundational computer science course**. These are schools where students learn computer science during the school day (not in after school clubs) and spend a minimum amount of time per semester applying learned concepts through programming (at least 20 hours of programming for grades 9-12 high schools and at least 10 hours of programming for K-8 elementary and middle schools). Although computer science is broader than programming, some direct programming experience is integral to learning the fundamental concepts and is used as a defining characteristic to differentiate a foundational computer science course from non-computer science courses.

State-by-State Data

Percent of Public High Schools Teaching Computer Science

A state is included in this map if data has been collected from almost all of the state's public high schools.
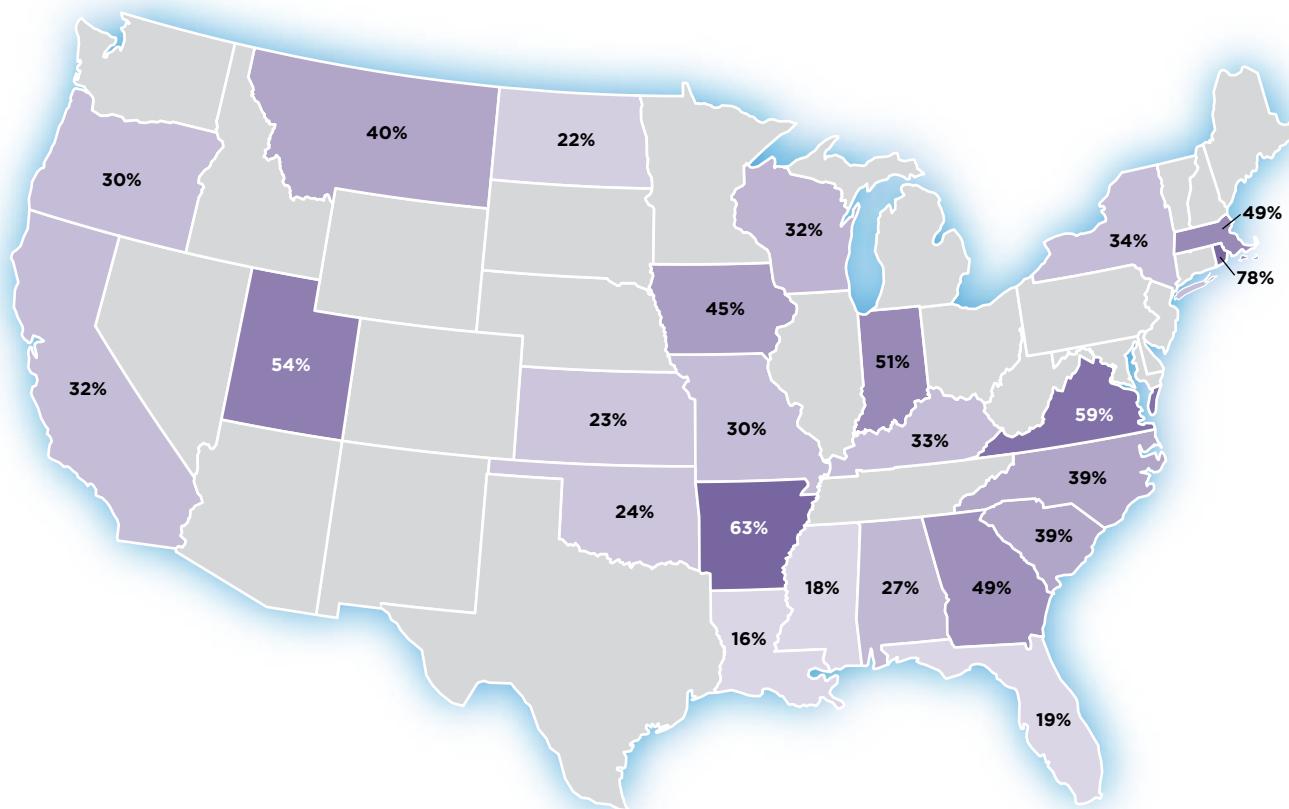
Public High Schools Teaching Computer Science (CS): Overall, By Community, By Underrepresented Minority, By Free and Reduced Lunch

A state is included in this table if data has been collected from almost all of the state's public high schools.

State	Overall Implementation	By Community Type		By Percent Underrepresented Minorities		By Percent Free and Reduced Lunch	
	Percent Teaching CS	Urban	Rural	Under 50% URM	Over 50% URM	Under 50% FRL	Over 50% FRL
Alabama	27%	49%	32%	38%	42%	57%	30%
Arkansas	63%	67%	68%	69%	61%	67%	68%
California	32%	35%	28%	44%	31%	48%	30%
Florida	19%	23%	15%	24%	21%	22%	23%
Georgia	49%	47%	45%	58%	42%	79%	39%
Indiana	51%	56%	50%	55%	49%	58%	46%
Iowa	45%	53%	42%	47%	56%	49%	38%
Kansas	23%	38%	14%	22%	38%	26%	18%
Kentucky	33%	34%	35%	35%	33%	46%	30%
Louisiana	16%	19%	9%	18%	14%	31%	10%
Massachusetts	49%	51%	41%	55%	36%	59%	35%
Mississippi	18%	24%	29%	34%	21%	39%	26%
Missouri	30%	37%	26%	33%	40%	41%	27%
Montana	40%	57%	37%	43%	22%	46%	27%
New York	34%	33%	29%	42%	26%	44%	27%
North Carolina	39%	40%	37%	42%	35%	48%	30%
North Dakota	22%	43%	18%	24%	8%	24%	14%
Oklahoma	24%	34%	18%	23%	29%	27%	23%
Oregon	30%	35%	20%	33%	22%	41%	26%
Rhode Island	78%	76%	88%	76%	81%	81%	76%
South Carolina	39%	47%	40%	51%	35%	56%	36%
Utah	54%	58%	39%	58%	35%	59%	45%
Virginia	59%	66%	53%	65%	51%	65%	52%
Wisconsin	32%	37%	30%	37%	21%	40%	23%

Percent of High Schools Teaching Computer Science

Across 24 states, about one-third (35%) of public high schools teach computer science.

Only
1/3
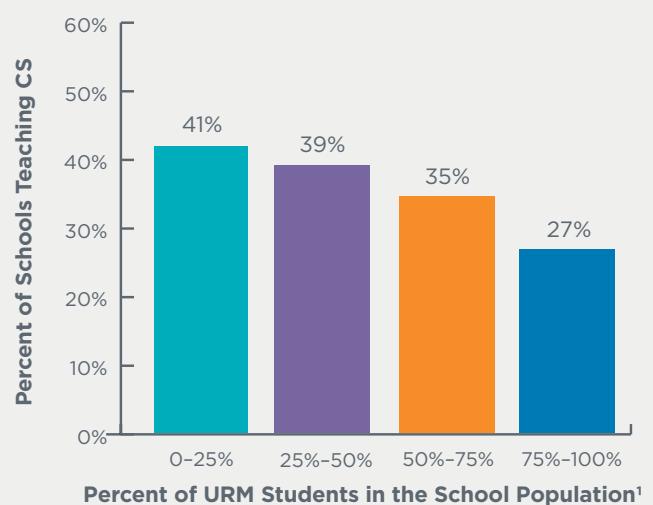of high schools **teach computer science**.

■ Yes
■ No
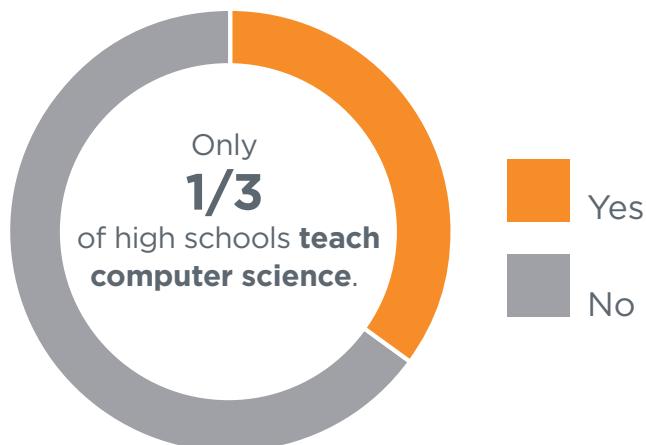
Community, Race/Ethnicity, and Socioeconomic Status and Access to Computer Science

Schools in rural communities, schools with higher percentages of underrepresented minority students, schools with higher percentages of students receiving free and reduced lunch, and schools that are Title 1 eligible are less likely to teach computer science.

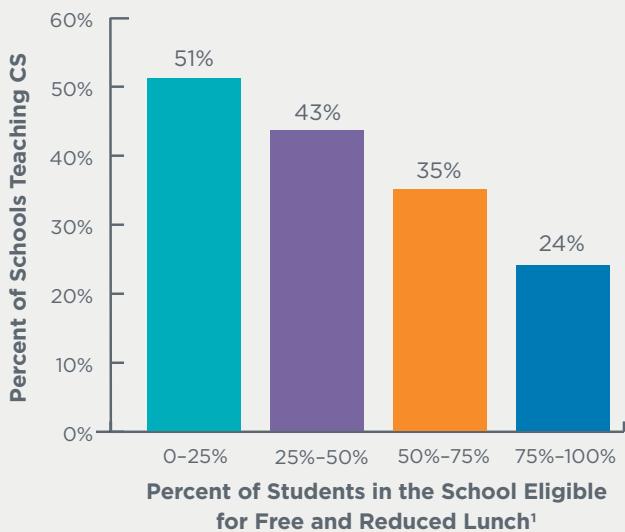## Percent of High Schools Teaching Computer Science by Community Type

Percent of Schools Teaching CS

- City: 34%
- Suburban: 45%
- Town: 29%
- Rural: 29%

Community Type

Underrepresented Minority Students and Access to Computer Science

Percent of Schools Teaching CS

- 0–25%: 41%
- 25%–50%: 39%
- 50%–75%: 35%
- 75%–100%: 27%

Percent of URM Students in the School Population[1]

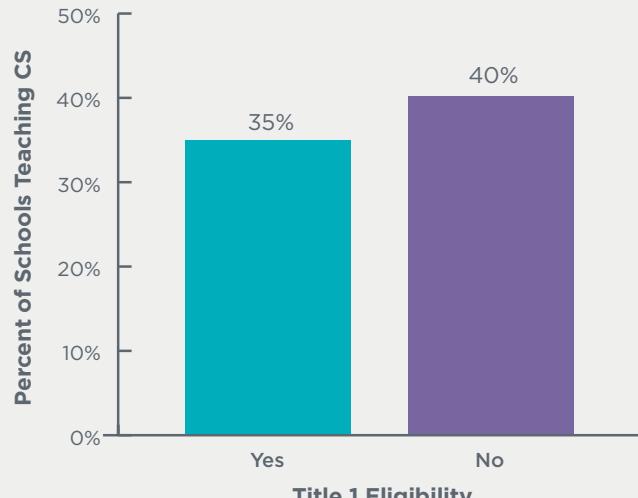[1] *This chart uses the following intervals:* 0 ≤ x < 25, 25 ≤ x < 50, 50 ≤ x < 75, 75 ≤ x ≤ 100
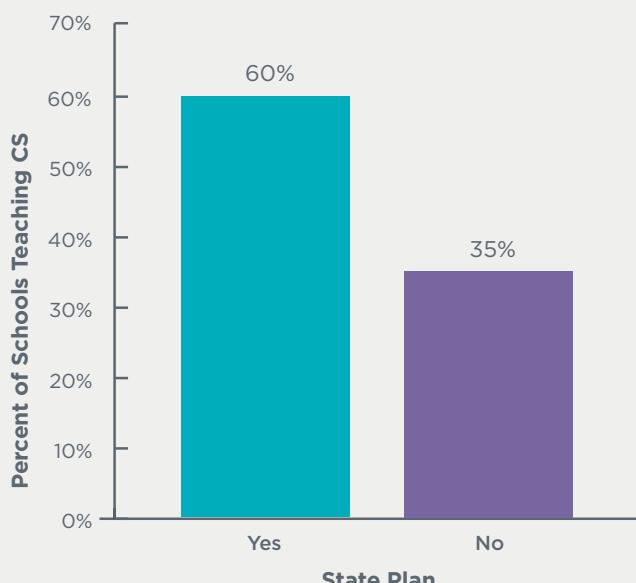
Income Level and Access to Computer Science

Percent of Schools Teaching CS

- 0–25%: 51%
- 25%–50%: 43%
- 50%–75%: 35%
- 75%–100%: 24%

Percent of Students in the School Eligible for Free and Reduced Lunch[1]

Title I Eligibility and Access to Computer Science

Percent of Schools Teaching CS

- Yes: 35%
- No: 40%

Title 1 Eligibility

Relationship Between State Policies and Access to Computer Science

Individually, many of the nine policies show a positive relationship with the percent of high schools that teach computer science. In addition, the total number of policies that a state has adopted has a positive relationship with the percent of high schools teaching computer science.

State Plan and Access to Computer Science

Percent of Schools Teaching CS

- Yes: 60%
- No: 35%

State Plan

K-12 Standards and Access to Computer Science

Percent of Schools Teaching CS

- Yes: 40%
- No: 35%

K-12 Computer Science Standards
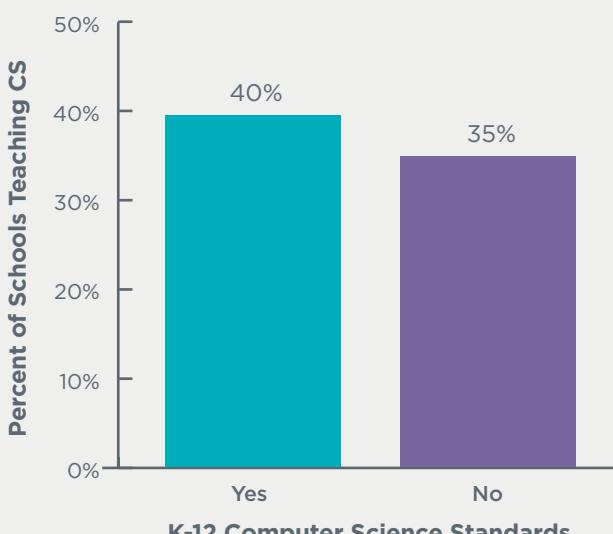
[1] *This chart uses the following intervals:* $0 \leq x < 25$, $25 \leq x < 50$, $50 \leq x < 75$, $75 \leq x \leq 100$
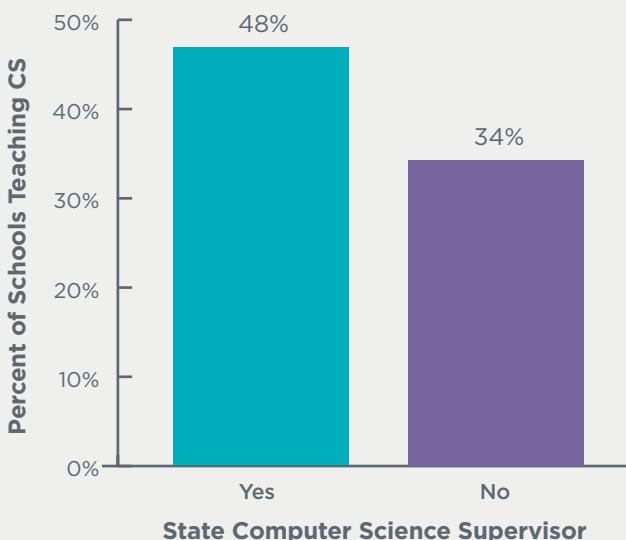
Funding and Access to Computer Science

Percent of Schools Teaching CS (y-axis)

- Yes — 50%
- No — 29%

Funding for Professional Learning

Preservice Teacher Preparation Programs and Access to Computer Science

Percent of Schools Teaching CS (y-axis)

- Yes — 50%
- No — 34%

Preservice Teacher Preparation Programs
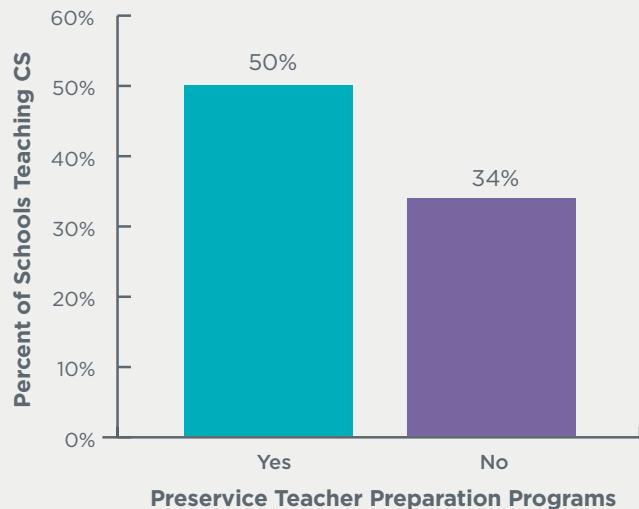
State Supervisor and Access to Computer Science

Percent of Schools Teaching CS (y-axis)

- Yes — 48%
- No — 34%

State Computer Science Supervisor

Requiring Schools to Teach Computer Science and Access to Computer Science

Percent of Schools Teaching CS (y-axis)

- Yes — 52%
- No — 33%

Requires Schools to Teach Computer Science
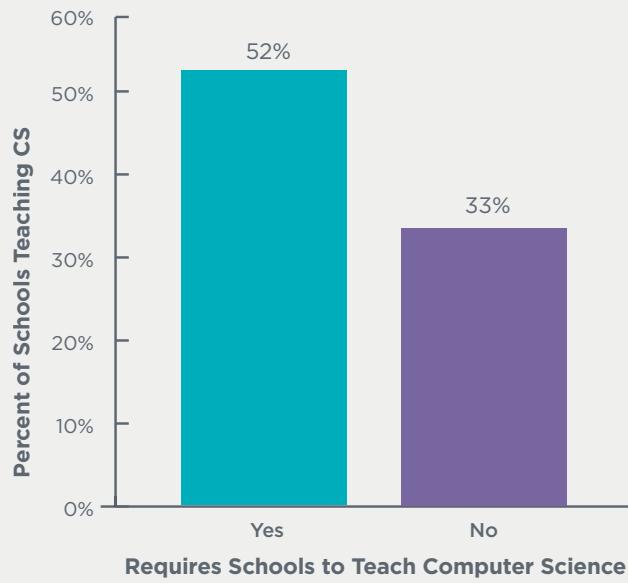
Computer Science Satisfying a Core Grad Requirement and Access to Computer Science

Percent of Schools Teaching CS

- Yes: 38%
- No: 35%

Computer Science Satisfies a Core Grad Requirement

Trend in Policy Adoption and Access to Computer Science

Percent of Schools Teaching CS

Number of Policies
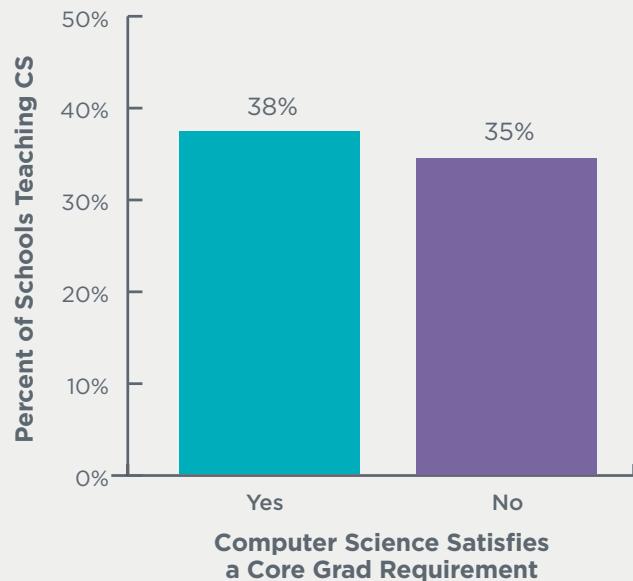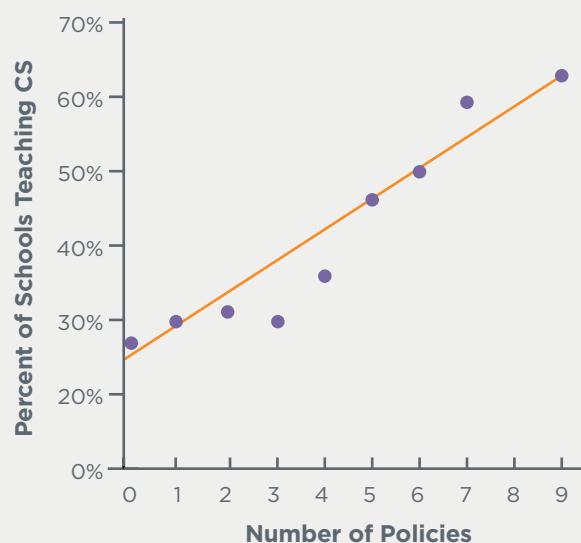
The three states in the data set that show the greatest percentage of high schools teaching computer science, Rhode Island, Arkansas, and Virginia, have also made significant policy decisions in recent years. These states are illustrative examples of the strong relationship between policy and implementation.

In Rhode Island, strong leadership, policy decisions, and statewide coordination have contributed to the highest percentage of public high schools teaching computer science (78%) in this data set. Rhode Island has created a state plan, developed K-12 computer science standards, funded professional learning, and allows computer science to count towards a mathematics or science graduation requirement. A state plan coupled with a statewide initiative has been one of the key factors in Rhode Island's success. The Computer Science for Rhode Island (cs4ri.org) initiative was launched in 2016 by the Office of Governor Gina Raimondo and is a partnership between the state government, the state department of education, K-12 schools, higher

education, private industry, and non-profits across Rhode Island. The initiative has a stated policy goal that all schools in the state should offer computer science. By directly partnering with curriculum and professional development providers to provide schools with a menu of funded options to select from, the initiative has bridged the gap between the policy goal and implementation.

Arkansas has put into place all nine model state policies developed by the Code.org Advocacy Coalition for expanding computer science education, and now sees one of the highest rates of computer science course access (63%) in the country. One innovative decision was to create a computer science approval code as a prelude to traditional certification in order to address short-term demand for computer science courses. Any teacher with a grade-appropriate license can obtain a computer science approval code to teach computer science through a variety of pathway options, including a combination of years teaching computer science and completion of an approved professional development program. The

approval code is a temporary measure that allows the state to collect data on a disparate computer science teaching population in order to help them meet traditional certification requirements later.

Arkansas has adopted other policies that may explain their high implementation rate in public high schools. Act 187 in 2015 created a requirement that all high schools must offer computer science, while also hiring a dedicated statewide computer science supervisor to support implementation and providing $15M in state funding to help schools meet the requirement. This funding has been used to cover instructional resources, professional learning (including attendance at state and national conferences), teacher mentoring, and incentive programs for students who have received passing scores on an AP Computer Science exam and for schools that increase the enrollment of female and underrepresented minority students.

Virginia has passed seven of the nine policies to increase access to computer science including requiring all schools to offer computer science, funding professional learning for teachers, adopting K-12 computer science standards, and allowing computer science to count towards core graduation requirements. For example, Virginia added computer science to the state Standards of Learning in November 2017, effectively requiring all K-12 schools to offer instruction in computer science. The high percentage of high schools that teach computer science (59%) is fueled by the combination of this requirement alongside state funding to build teacher capacity and the work of statewide organization CodeVA to provide professional learning.

In Rhode Island, Arkansas, and Virginia, we see the relationship between strong leadership, state policy decisions, and the number of schools teaching computer science. The governors of all three states are members of the Governors' Partnership for K-12 Computer Science and there is a high level of collaboration between the governors' offices and the respective state education agencies to support local implementation. Other states in the published data set have recently made significant policy decisions to increase the number of schools teaching computer science. Colorado, Georgia, Massachusetts, New York, North Carolina, and Utah have recently appropriated funds to support teacher professional learning. South Carolina has revised an existing computer science graduation requirement (traditionally implemented as a keyboarding course) so that the list of courses that may satisfy the requirement more accurately reflects computer science. Indiana not only requires high schools to offer computer science by the 2021-2022 school year, but all elementary and middle schools as well. The computer science education community looks forward to seeing the influence of these policy actions not only on the number of schools teaching computer science, but also on student enrollment and diversity.

For up-to-date policy data and advocacy resources, visit code.org/promote and advocacy.code.org

About the Code.org Advocacy Coalition

CODE Advocacy Coalition

Bringing together more than 50 industry, non-profit, and advocacy organizations, the Code.org Advocacy Coalition is growing the movement to make computer science a fundamental part of K-12 education.

About the CSTA

CSTA

The Computer Science Teachers Association (CSTA) is a membership organization that supports and promotes the teaching of computer science. CSTA provides opportunities for K–12 teachers and their students to better understand computer science and to more successfully prepare themselves to teach and learn.