2020 State of Computer Science Education

Illuminating Disparities

Advocacy Coalition

CSTA

ECEP Expanding Computing Education Pathways

Thank You for Helping to Build a Movement

The **Code.org Advocacy Coalition**, **Computer Science Teachers Association**, and the **Expanding Computing Education Pathways Alliance** wish to thank the hundreds of thousands of teachers, community members, researchers, local champions and stakeholders, nonprofits, universities, corporations, and government institutions who have supported the vision that every student in every school deserves the opportunity to learn computer science. Thank you for your support of this movement:

Microsoft · ExcelinEd · facebook · Infosys Foundation USA · amazon · Google · CollegeBoard

And to all the members of the Code.org Advocacy Coalition:

AccessCSforAll
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Alliance for California Computing Education for Students and Schools
American Association for University Women
Anita Borg Institute
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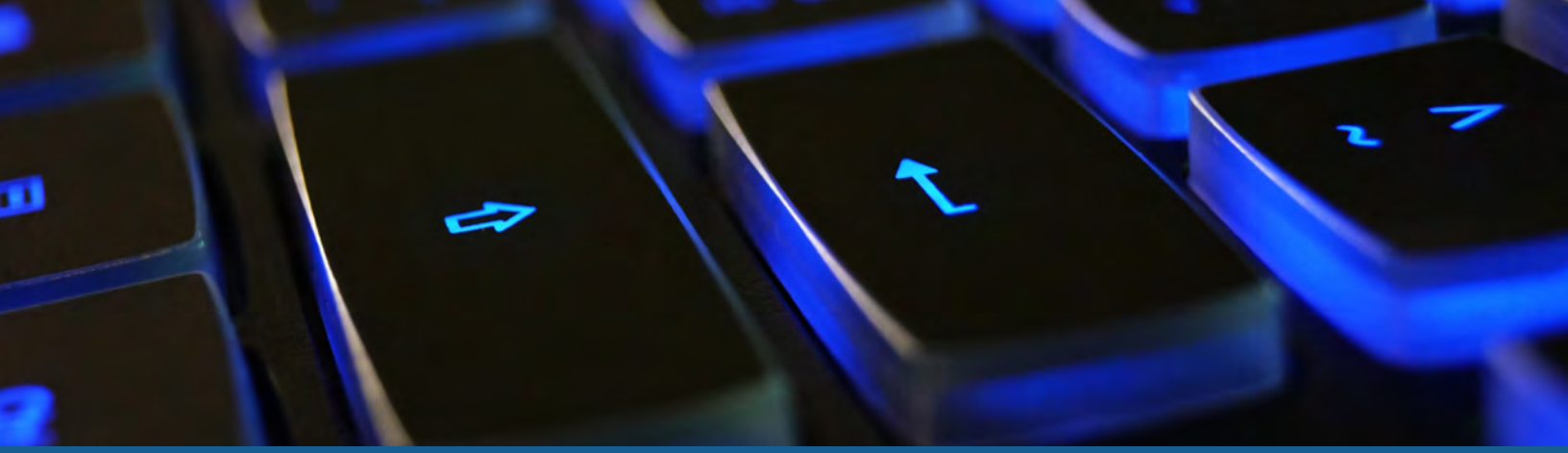

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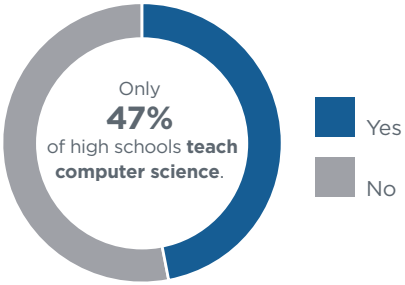
Executive Summary

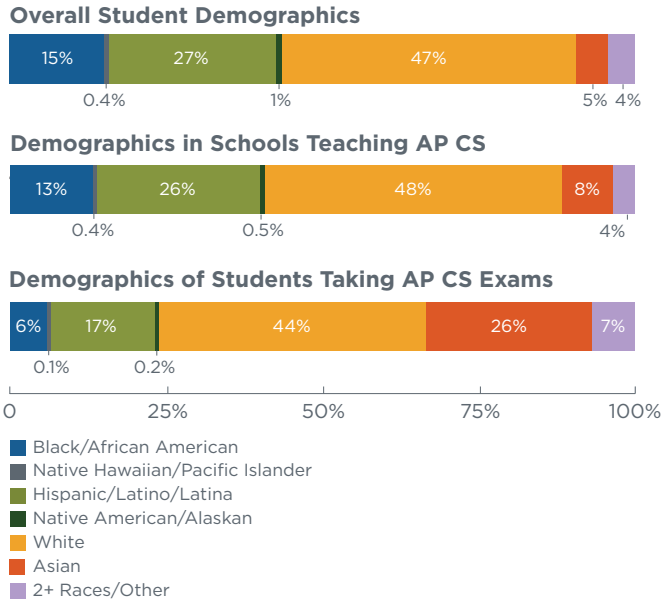
Computer science education is more important than ever. The COVID-19 pandemic has highlighted our society's reliance on computing and its power to help businesses innovate and adapt, yet at the same time has surfaced greater disparities for students studying computer science. Access to computer science is key to addressing the equity issues in society, yet only 47% of our nation's high schools teach foundational computer science.

Percent of High Schools Teaching Computer Science



Computer science is far from immune to the effects of societal inequities and systemic racism: Black/African American students, Hispanic/Latino/Latina students, and Native American/Alaskan students are less likely to attend a school that teaches a foundational computer science course. Students in rural areas, students with disabilities, English language learners, Native Hawaiian/Pacific Islander students, and economically disadvantaged students are also underrepresented in computer science courses.

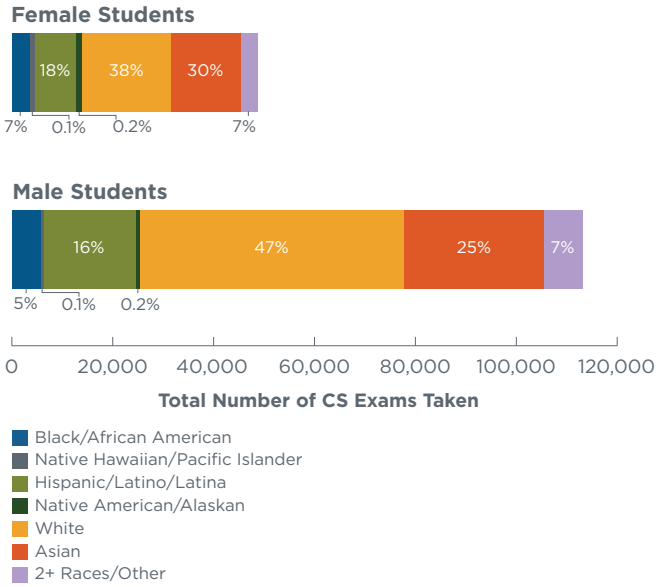
National AP CS Access and Participation by Race/Ethnicity



* Includes only public schools

Progress over the last several years highlights the work we **all** need to do to reach parity. While participation in AP computer science courses continues to skyrocket (the number of female students taking AP computer science exams has quadrupled since 2014), the percentage of female students has increased only from 22% to 29% of exams. A deeper look at AP computer science exams by gender and each race and ethnicity further illuminates the disparities in participation by male and female students from underrepresented groups.

National AP CS Participation by Race/Ethnicity and Gender



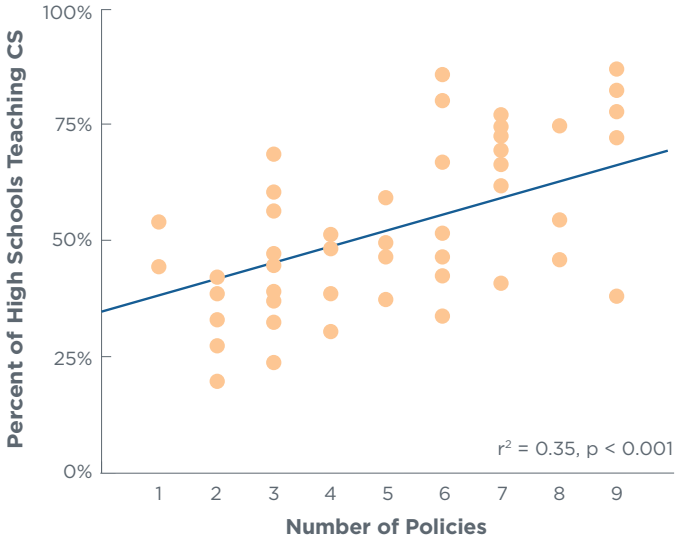
* Includes both public and private schools

Credit: University of Washington, DO-IT

States are working to broaden participation in computer science by passing policies to make computer science a fundamental part of the K–12 education system. Over the past year, 28 states passed 42 new laws and regulations promoting computer science. In addition to adopting more policies, state education leaders extend and innovate on previously adopted policies: continuing to fund computer science education, supporting teachers and students, and providing leadership and guidance.

The nine policies form a framework for state policy developed by the Code.org Advocacy Coalition. The coalition is a group of industry, nonprofit, and advocacy organizations working to make computer science a fundamental part of the K–12 education system. When the organizations in the coalition began their work in 2013, just 14 states plus DC had at least one of these nine policies in place; now all 50 states have adopted one or more of the nine policies, and most states have adopted five or more. State leaders continue to guide implementation of each policy while considering diversity, equity, and inclusion. Overall, there continues to be a strong connection between the adoption of the nine policies and the percentage of high schools teaching computer science in a state.

Policy Adoption and Access to Computer Science



9 Policies

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
- Equity and Diversity*

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

The 2020 State of Computer Science Education report includes descriptions of policy trends, an in-depth view of each state's policy and implementation, and data on disparities in access to and participation in computer science. For the first time, the K–12 Computer Science Access Report has data for all 50 states and DC.

Computer science education cannot progress unless disparities are illuminated. Many groups of students are still invisible or uncounted in computer science. Change is needed. We call on states and national groups to ask difficult questions, challenge assumptions and biases, and commit to collect broader data on which students have access, which students are recruited into computer science classrooms, and which students are retained in computer science pathways. In this time of significant change and focus on inequity, the computer science education movement must strive to be part of the solution.

Call to Action: Illuminate Disparities

1. Create opportunities for diverse participation and inclusive experiences in addition to increasing capacity and access.
2. Disaggregate student data by race and ethnicity and discontinue the use of terms such as "underrepresented minorities (URM)."
3. Explore the intersection of demographic data such as gender and race/ethnicity or disability status and race/ethnicity.
4. Include broader data on student participation, such as students with disabilities, English language learners, and economically disadvantaged students.

Credit: University of Washington, DO-IT

National Momentum

This fourth annual edition of the State of Computer Science Education, co-authored by Code.org, the Computer Science Teachers Association (CSTA), and the Expanding Computing Education Pathways (ECEP) Alliance, comes at a time of unprecedented upheaval in our society and our state education systems.

The nation's focus on confronting systemic racism has reinforced why principles such as equity, diversity, and inclusion must be central to expanding access to and participation in high-quality computer science education. At the same time, the transition to online learning during the COVID-19 pandemic has magnified inequities in broadband and device access, increasing the "digital divide" for students from groups underrepresented in computer science, including: Black/African American students, Hispanic/Latino/Latina students, Native American/Alaskan students, and Native Hawaiian/Pacific Islander students; students with disabilities;[1] English language learners; students from rural areas; and economically disadvantaged students.[2] The online platforms and businesses that people have relied upon during the pandemic reinforce the significance of computing in our society. In response to these issues, the *2020 State of Computer Science Education* report seeks to **illuminate disparities** in access and participation while providing an update on state progress in computer science education policy and implementation.

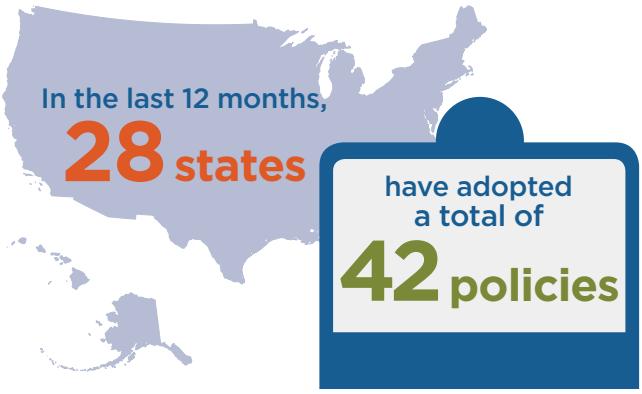
This report contains:

- updated data on who has access to and participates in computer science courses, including K–12 Computer Science Access Report data for all states;
- a summary of each recommended policy, including a map of states that have enacted each policy, examples of policy implementation, and related resources; and
- state-by-state summaries, including detailed information on state progress in the nine policy areas and data on school offerings and participation.

[1] Defined as students who receive services under Individuals with Disabilities Education Act (IDEA) or Section 504 of the Rehabilitation Act

[2] Defined as students who are eligible for free and reduced-price meals under the National School Lunch Program

In particular, this report illuminates disparities in access and participation in ways that have not been visible before. In some cases, it is still invisible, and we call on states and national organizations to collect data.



Since the *2019 State of Computer Science Education* report, 28 states have adopted a total of 42 policies to support computer science education. This chapter includes a discussion of the nine policies, momentum by state governors and the federal government, and challenges and opportunities for the future.

New This Year

Previous issues of this report failed to include participation and access data for students with disabilities, English language learners, and disaggregated data on female and male students from underrepresented racial and ethnic groups. In an effort to improve our understanding of diversity, equity, and inclusion in computer science, this year's report attempts to illuminate the opportunities and accessibility of computer science courses for more diverse students.

Notable changes in this year's report include:

- **The inclusion of data that was not available in previous years and is not currently available from any national sources.** A few states track and report enrollment in foundational computer science courses for students with disabilities, English language learners, and economically disadvantaged students. It is our goal to support all states in this level of data collection.
- **Demographic breakdowns by race and ethnicity and clear identification of students from underrepresented groups, including breakdowns for male and female students from each racial and ethnic group.** This data is also represented in charts and graphs with the intention of making disparities visual. The term "underrepresented minority" does not adequately capture demographics for marginalized racial and ethnic groups underrepresented in computer science or the obstacles they face. We are committing to disaggregate student data by race and ethnicity and call on others to do the same.
- **Specific examples of how each state policy promotes access to and equity within computer science courses.**

Although this report highlights the available data, the community's understanding of student access to, and experiences in, rigorous computer science courses remains limited. Most states do not collect or make available demographic data on student enrollment in computer science courses. Current national and state data sources have other limitations, such as delayed reporting or including only lagging indicators of student learning, such as Advanced Placement® (AP) courses. No national data source on computer science courses and enrollment includes data on students with disabilities (including students who receive services under Individuals with Disabilities Education Act (IDEA) or Section 504 of the Rehabilitation Act).[3] To accurately examine disparities in computer science education and make improvements, states and national organizations must begin to collect broader

[3] Blaser, B. & Ladner, R. E. (2020). Why is data on disability so hard to collect and understand? In Proceedings of Research on Equity and Sustained Participation in Engineering, Computing, and Technology (RESPECT 2020). 8 pages.

data that reflects all stages of K–12 computer science education, such as disaggregated enrollment data for computer science courses and experiences. The community must also examine how leading indicators—such as teacher capacity, equitable access to funding, biased early mathematics course tracking, and local or state policies that exclude students very early on from computer science experiences—affect long-term enrollment and success in computer science.

Nine Policies to Make Computer Science Fundamental

These nine recommendations are intended to help 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. All nine policies should promote access to and equity within rigorous and engaging computer science courses. Each policy is described in detail in Appendix 1.

Policy Principles

Clarity · Capacity · Leadership · Sustainability · Equity and Diversity*

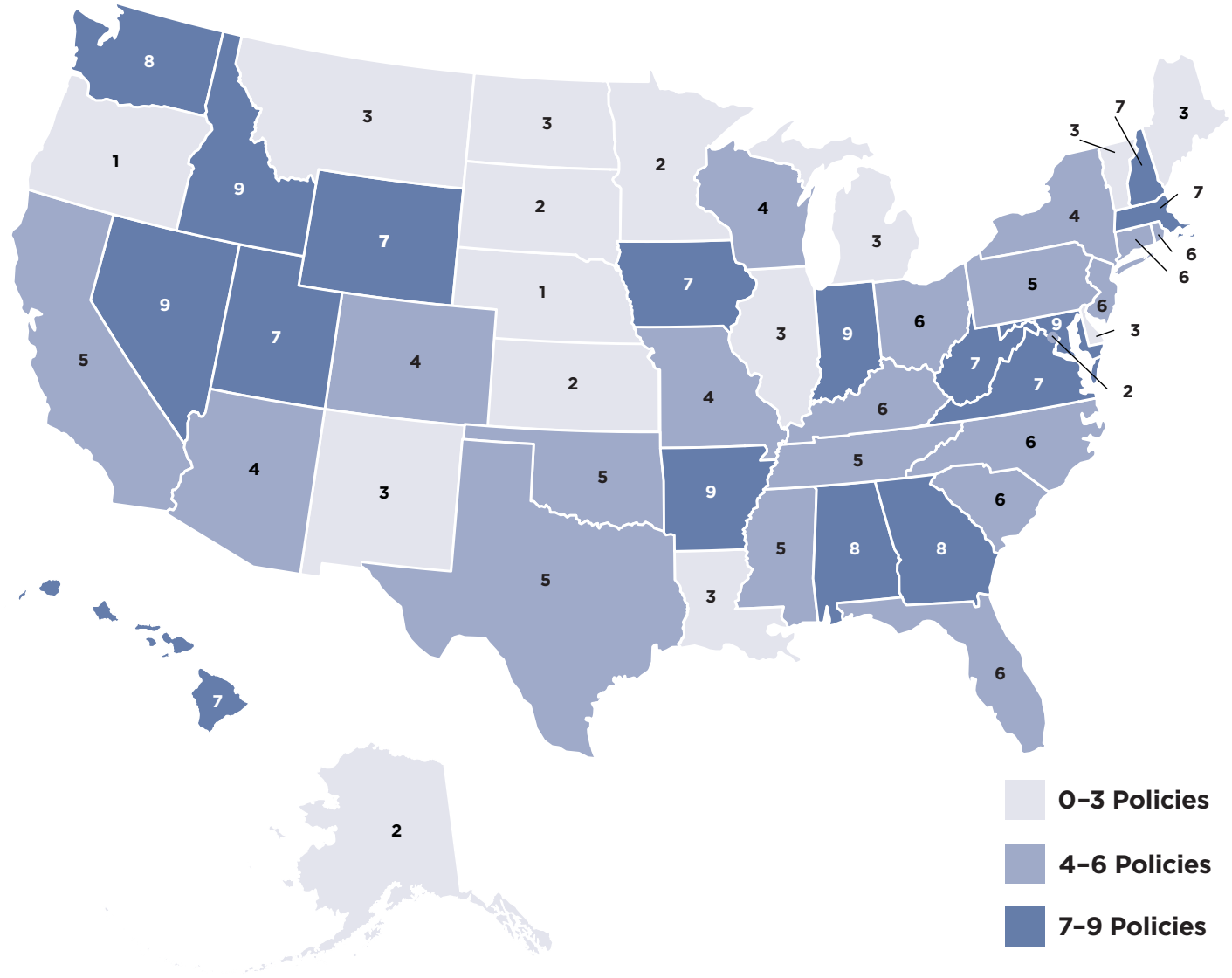
*Equity and Diversity is incorporated in each of the nine policies.

These nine policies are widely agreed upon as necessary in making computer science fundamental to a state's K–12 education system. At the same time, it is important to note that these policies are not a checklist to complete. It is not intended that every state will be able to adopt every policy, nor is it enough to adopt each policy in isolation without considering implementation of those policies. We encourage state policymakers, advocates, and education leaders to take a holistic approach with respect to adopting and implementing the nine policies, ensuring that all students have the opportunity to learn computer science.

Over the past year, many states have begun taking this holistic approach. As more states have adopted more policies, new adoption has slowed in favor of deeper implementation of existing policies, expanding participation in computer science courses, and increasing the quality of instruction. We have seen states focusing their attention on ensuring that the policies work well together and supporting teachers and schools in enacting the policies. States have innovated in reaching beyond the nine policies to further prioritize equity, access to courses, and support for students from groups underrepresented in computer science.

At the time of this report, Arkansas, Idaho, Indiana, Maryland, and Nevada have adopted all nine policies. Many other states have adopted seven or eight policies, including Alabama, Georgia, Iowa, Massachusetts, New Hampshire, Utah, Virginia, Washington, West Virginia, and Wyoming. Several states have made great strides over the past year, not only by adopting more policies, but also ensuring that policies are aligned with one another and implementing actions outlined in previously adopted policies. Maine, Tennessee, and West Virginia each adopted three policies since the last report. Maine adopted a state plan, established a computer science specialist position, and established a policy for students to count a computer science course towards graduation. Tennessee adopted a state plan, a comprehensive set of K–12 standards, and dedicated funding for computer science. West Virginia similarly structured the adoption of policies around the development of the state plan.

Number of Policies



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 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.

"Computer science has quickly moved from a narrow elective to a basic skill that every student needs."

— Governor Kim Reynolds (R), Iowa, during the Condition of the State 2020 Speech

The Governors' Partnership for K–12 Computer Science has 17 members, including nine Republicans and eight Democrats. Governors who are members of the partnership are noted on their respective state's page in this report. More information about the partnership can be found at **governorsforcs.org**.

"Knowing the basics of computer science can open doors to virtually any career in our fast-growing 21st-century economy. We are working to expand career-connected learning and integrate computer science into the curriculum at every grade level."

— Governor Ralph Northam (D), Virginia, during an announcement of grants for computer science

Federal Policy

National policy discussions and efforts within federal agencies and on Capitol Hill continue to include the need for more computer science education. Before the pandemic slowed education policy action, members of Congress introduced several proposals to expand computer science education. The Computer Science For All Act would invest in professional learning, instructional resources, and initiatives to broaden computer science participation. The Teacher Education For Computer Science Act, introduced in both the House and Senate, would encourage colleges to establish teacher preparation programs in computer science. The Rural STEM Education Act would address specific challenges faced by rural schools in offering computer science courses. Republicans and Democrats in Congress champion these and other computer science initiatives. In addition, advocates continue to push for investments from the Department of Defense via the JROTC Cyber Training Act and the PROMOTES Act. Facing uncertain times and the November elections, Congress is unlikely to turn to these proposals until 2021.

State education agencies are investing in computer science with funds from the Every Student Succeeds Act, and are including computer science in their Career and Technical Education plans they file with the U.S. Department of Education. In July 2020, the Department once again provided a competitive advantage to applicants that address computer science in early-phase Education Innovation and Research grant proposals. The National Science Foundation is investing $20 million in Computer Science for All (CSforAll: Research and RPPs) to support research-practitioner partnerships and other research to expand K–12 computer science and computational thinking for all students. The community's collective advocacy efforts continue to seek—and secure—federal funds and policy changes that support expanding access to K–12 computer science education.

Looking Forward: Challenges and Opportunities

The U.S. is in a very different place than it was a year ago, with many disparities in education not only persisting, but also widening. Over the next year, we anticipate the continuation of the following emerging trends in computer science education policy.

Student Access to Computer Science Learning at Home

In 2020, the COVID-19 pandemic and resulting school closures illuminated existing disparities between students who have access to broadband and devices and those who do not. In spring 2020, many schools turned to remote learning for all students, which enabled curriculum providers to see which students were able to continue learning computer science at home. For example, Code.org's platform saw a widening of the gap for students from rural communities, schools with higher percentages of students eligible for free and reduced-price meals, and schools with larger populations of students from marginalized racial and ethnic groups underrepresented in computer science. This is indicative of the barriers students face in access to broadband and devices for learning at home. Even when schools reopen for in-person instruction, the "homework gap" will persist.

Changes in State Funding

Due to the pandemic and the resulting decreased state revenue, states had to reduce their spending in the FY 2020 and 2021 budgets. Several states ultimately removed computer science from the FY 2021 budget, while others reallocated or froze existing computer science funding. Computer science education leaders will continue to advocate for state funding to expand computer science. Still, states may increasingly turn to federal funding opportunities to support these programs or incorporate computer science course funding into existing school funding.

Focus on Implementation of Existing Policies

In 2020, many states shortened their legislative sessions or limited hearings to bills and issues directly related to public health or budget. As a result, several promising computer science education bills did not pass. It is vital in the current climate that states value what computer science brings to all courses of study, as well as its impact on students as a standalone subject. Many policies do not depend on funding and can make a meaningful difference in course access.

States can sustain their momentum by examining existing state computer science policies and ensuring that the policies work as intended to expand access and increase participation. State leaders can collect and analyze data around who has access to and/or participates in computer science courses to develop strategies to reduce barriers for students from underrepresented populations.

No matter how many policies a state has adopted, efforts must be bolstered by an understanding of the inherent institutional biases that exist. Strategic efforts should include training on identifying institutional biases, as well as systems change strategies that reduce disparities. State computer science education leaders have a responsibility to drive change by illuminating the disparities in K–12 now in order to affect students' lives in the future.

Stories from the Field

Looking to re-engage stakeholders committed to advancing computer science education for all students in North Carolina, a group of leaders from K–12, higher education, and nonprofit organizations such as the Friday Institute launched plans for a fully virtual statewide computer science education summit. The 2020 summit will help CS4NC maintain computer science advocacy and policy momentum while addressing challenges brought on during the COVID-19 pandemic. With great uncertainty in the current situation, CS4NC hopes to provide stakeholders with a clear understanding of how they can continue to provide computer science education in their schools and implement the new NC K–12 Computer Science Standards.

Computer Science for California (CSforCA) is a state-wide coalition of educators, industry leaders, nonprofit organizations, and higher education institutions advocating for high-quality and equity-minded computer science teaching and learning opportunities in K–12 public schools. The coalition's advocacy has been instrumental to the progress of equitable, scalable, and sustainable computer science policy and programs in California, including the adoption of the state plan, K–12 computer science standards, funding proposals, computer science supplementary authorization for teachers, making computer science count, and informing other related legislation with research and practitioner expertise.

The Connecticut Computer Science Advisory Committee and their network of colleagues have demonstrated that lack of funding does not necessarily impede state change efforts. Without funding, Connecticut has adopted K–12 computer science standards, supported computer science teacher pathways (SB 957, 2019), and included computer science in the public school curriculum (SB 957). Each success has increased access to computer science for all students and provides evidence to support future funding requests to expand the work of the committee.

During the 2020 legislative session, C Spire, based in Mississippi, launched a campaign to support a bill requiring all schools to offer computer science by the 2022–2023 school year. The campaign website, ourmsfuture.com, featured a bill tracker, a form to email legislators, and a video dramatization of leaders in neighboring states "thanking" Mississippi for sending jobs to their economies. After passing one side of the legislature, HB 1165 was put aside to focus on issues immediately related to the COVID-19 pandemic.

Washington has a lot of ground to cover—literally! Although the CSTA chapters in Spokane and Puget Sound areas support teachers in their regions, a significant area of the state lacked coordinated efforts. Supported by an ECEP co-sponsorship, the CSforAll WA team facilitated meetings between CSTA chapter leaders and funded networking events that led to the formation of the Mid-Columbia CSTA chapter. At the same time, the team supported the Office of the Superintendent of Public Instruction to build a publicly accessible dashboard of computer science education data and develop a K–12 Computer Science Education guidance document.

Access and Participation

This section provides nationwide data on student access to and participation in computer science courses. The K–12 Computer Science Access Report provides the percent of schools that teach a foundational computer science course nationally and in each state, and disparities in access based on community type, income level, and student race and ethnicity. Demographic data collected from a few states identifies disparities in participation for students with disabilities, English language learners, and students eligible for free and reduced-price meals. This section also provides data on student access to and participation in AP computer science courses. Detailed methodology for data collection, including data sources, can be found in Appendix 3.

K–12 Computer Science Access Report

Based on data from 25,554 public high schools in the U.S., 47% of public high schools teach at least one foundational computer science course.

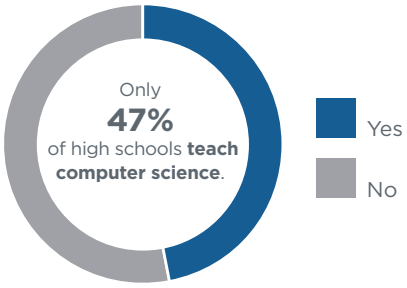
Defining a Foundational Computer Science Course

The Computer Science Teachers Association developed the following definition of computer science (Tucker, 2003) which was 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.*

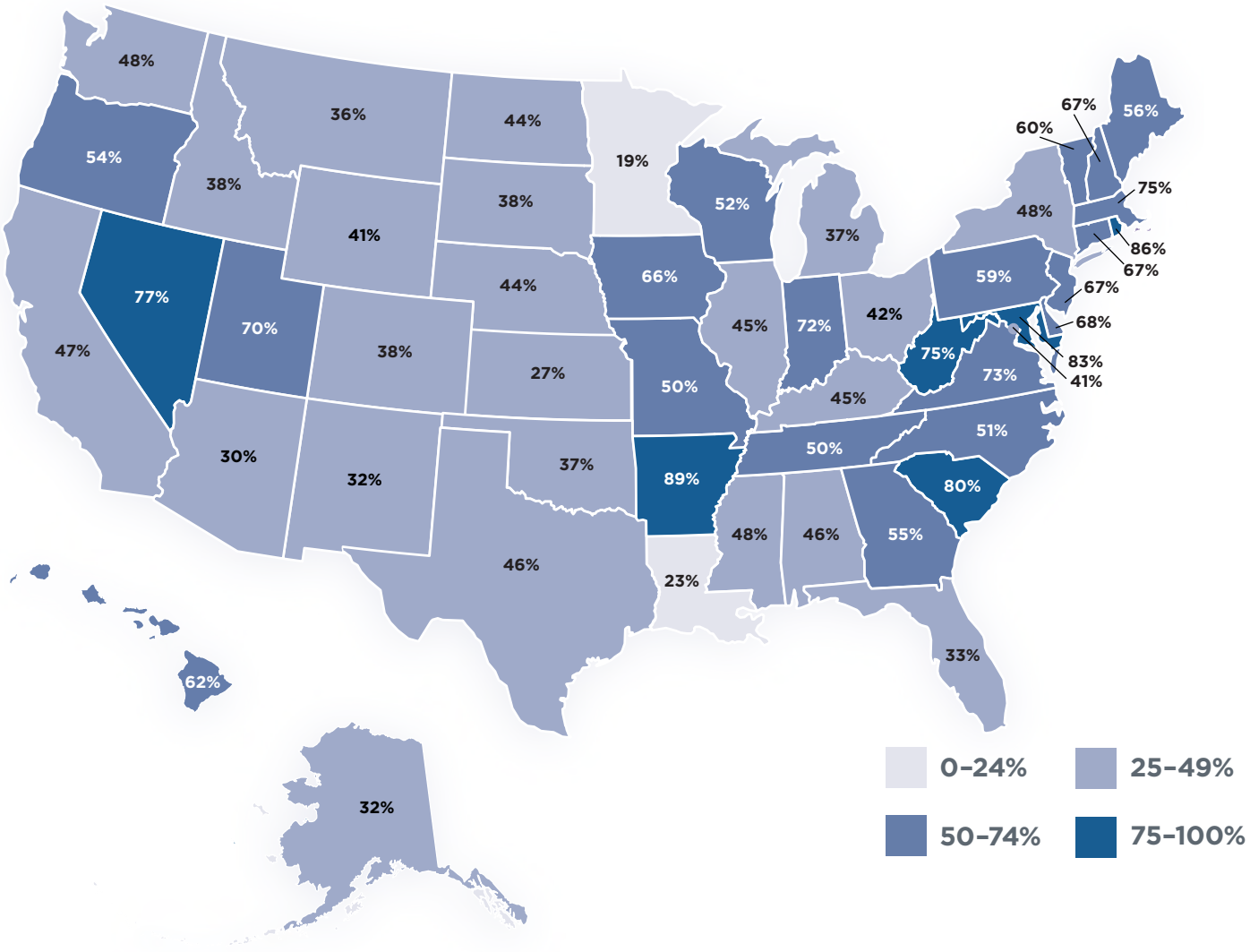
Learning computer science means learning how to create new technologies, rather than simply using them. Although many schools offer their students some exposure to computer science in a limited capacity such as an Hour of Code, this report focuses on schools that teach a foundational computer science course. These are schools where students learn computer science during the school day 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). Although computer science is broader than programming, some direct programming experience is integral to learning the fundamental concepts. It is also used as a defining characteristic to differentiate foundational computer science courses from other more advanced or non-foundational courses, or from general technology courses. Although some schools may integrate computer science and programming instruction in other courses, the Access Report only includes courses that are coded as computer science.

Percent of High Schools Teaching Computer Science



Across the U.S., about 47% of public high schools teach computer science.

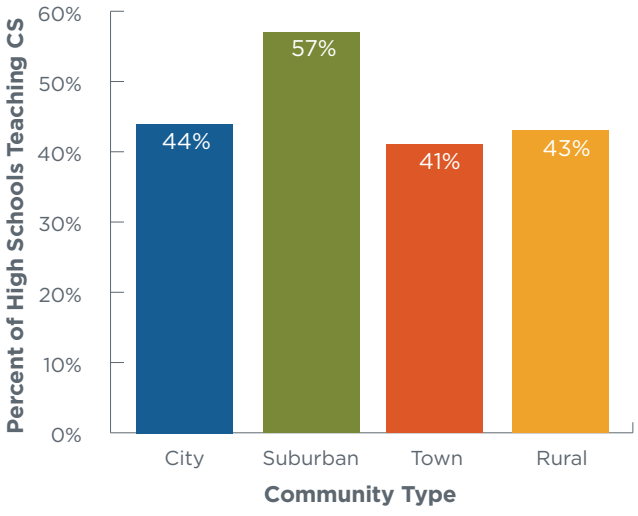
Percent of Public High Schools Teaching Computer Science



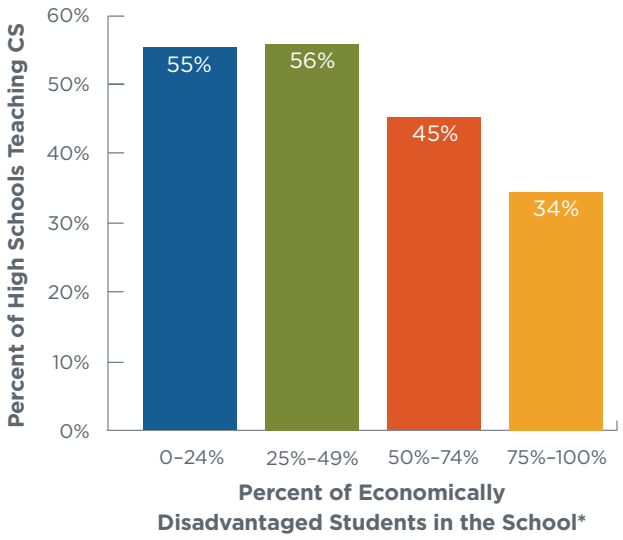
Disparities in Access

Geographic and socioeconomic factors represent two systems that require further consideration in computer science advocacy. Data shows that in the nation as a whole, schools in rural communities and schools with higher percentages of economically disadvantaged students are less likely to teach computer science. Further, students from underrepresented racial and ethnic groups are less likely to have the opportunity to attend a school that teaches it. Disparities by community type differ by state; details on this data by state are in Appendix 4.

Percent of High Schools Teaching Computer Science by Community Type



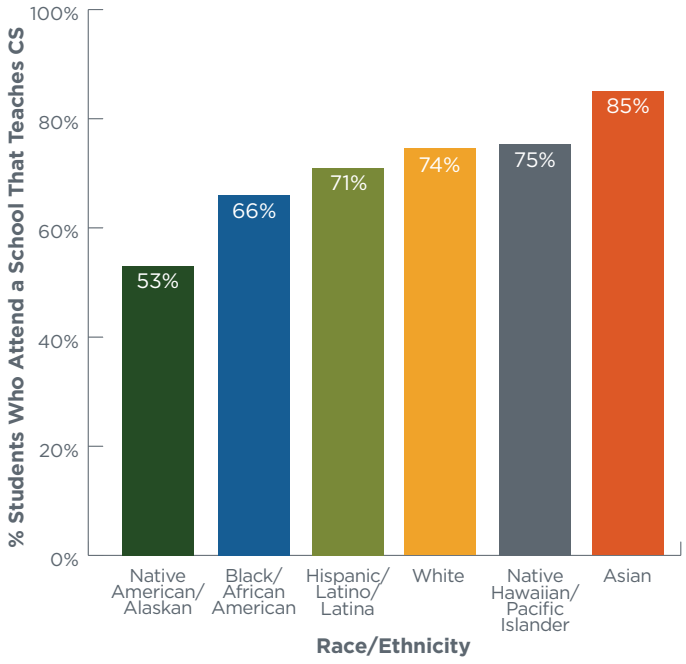
Income Level and Access to Computer Science



* Defined as students who are eligible for free and reduced-price meals under the National School Lunch Program; a proxy for the measure of poverty.

85% of Asian high school students in the U.S. and 74% of white students attend a school that teaches a foundational computer science course, compared to 53% Native American or Alaskan students, 66% of Black or African American students; 71% of Hispanic, Latino, or Latina students; and 75% of Native Hawaiian or Pacific Islander students.

Race/Ethnicity and Access to Computer Science



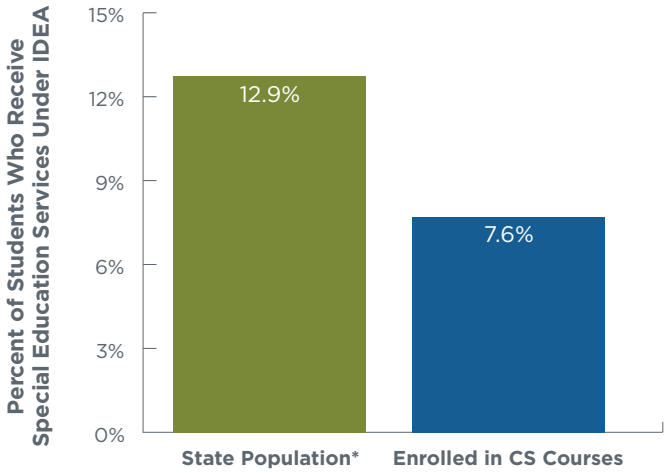
Credit: University of Washington, DO-IT

Disparities in Participation

Alabama, Arkansas, Connecticut, Florida, Hawaii, Indiana, Massachusetts, Mississippi, New Jersey, New Mexico, and Texas provided data on the demographics of students enrolled in computer science courses, including students with disabilities, English language learners, and economically disadvantaged students.[4] For state-by-state data, refer to Appendix 3.

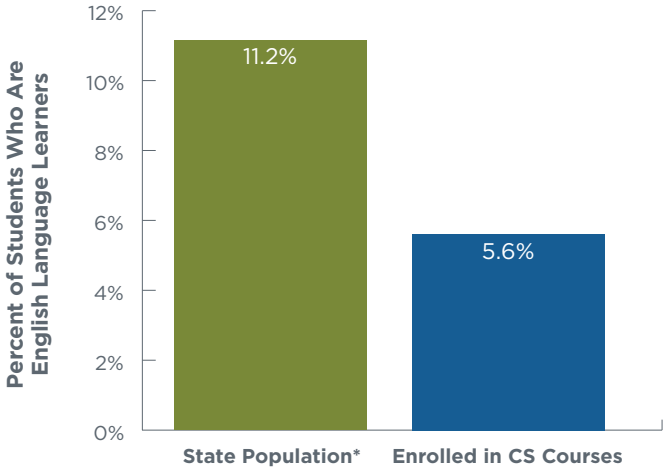
Across these 11 states, 7.6% of students enrolled in foundational computer science courses receive special education services under IDEA, 5.6% of students enrolled in foundational computer science courses are English language learners, and 41.3% of students are economically disadvantaged.

Students with Disabilities and Participation in Computer Science



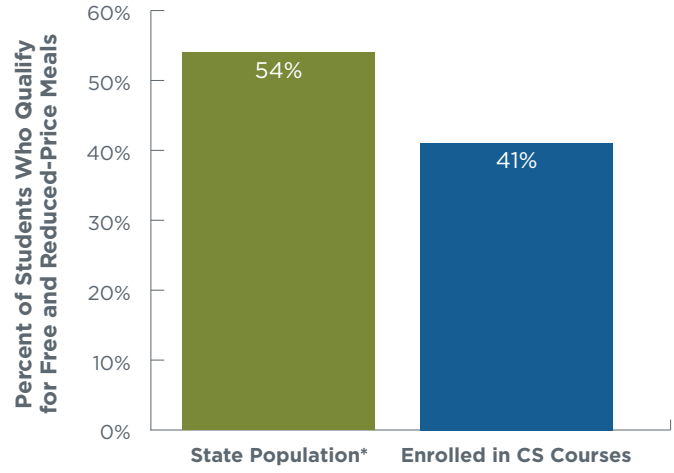
* Weighted average of state enrollment from AL, AR, CT, FL, HI, IN, MA, MS, NJ, NM, TX from the U.S. Department of Education, Digest of Education Statistics Table 204.70, 2017–2018

English Language Learners and Participation in Computer Science



* Weighted average of state enrollment from AL, AR, CT, FL, HI, IN, MA, MS, NJ, NM, TX from the U.S. Department of Education, Digest of Education Statistics Table 204.20, fall 2017

Economically Disadvantaged Students and Participation in Computer Science



* Weighted average of state enrollment from AL, AR, CT, FL, HI, IN, MA, MS, NJ, NM, TX from the U.S. Department of Education, Digest of Education Statistics Table 204.10, 2016–2017

As state advocates continue to increase access to computer science courses, we need to ensure all students are able to participate in foundational courses. We call on all states to follow the leads of these 11 states and collect comprehensive demographic data on student enrollment in computer science courses.

[4] Generally, the courses included here are the same as those included in the Access Report. Details on states that provided a different list of courses or masked data are in Appendix 3.

Stories from the Field

In the 2019–2020 school year, the Washington State School for the Blind (WSSB) offered both AP CS A and AP CS Principles, the latter integrating Code.org's curriculum and Quorum, a programming language designed for blind students. Students used physical manipulatives to replicate pixels on a screen when learning about images. Thanks to a general push to include computer science as a core class, 20% of WSSB's student population enrolled in computer science.

Students with language-based learning disabilities at Landmark High School in Beverly, MA, learn computer science using physical devices which make computing concepts more tangible, like Arduino and Raspberry Pi. Text is limited with block-based programming languages such as Scratch or AppInventor and languages designed to output graphics rather than text, such as Processing.

The Hispanic Heritage Foundation's (HHF) CSL (Code as a Second Language) program will teach 100,000 students from underrepresented racial and ethnic groups in 75 regions to code by the end of 2021. The program trains college students and young Latino/Latina professionals to teach coding using culturally- and age-relevant pedagogy. In Minneapolis, a Somalian CSL Fellow from the community introduced a group of Somali refugees to coding. CSL en Español is a K–12 in-school, Spanish-language coding class, where students reported that learning coding was much easier than learning English.

CSTA, the California Reading and Literature Project, UC San Diego, and the CSTA Chapters in Arizona, San Diego, and New Mexico are partnering on a 4-year grant from the U.S. Department of Education to increase the number of English learners (ELs) that participate and earn qualifying scores in AP Computer Science Principles. The program leverages a proven framework to:

CSforEL
CSTA

1. Contextualize computer science content around issues that engage ELs' funds of knowledge
2. Develop student computer science understanding
3. Foster productive and receptive forms of discourse around computer science
4. Elevate language and literacy development in computer science

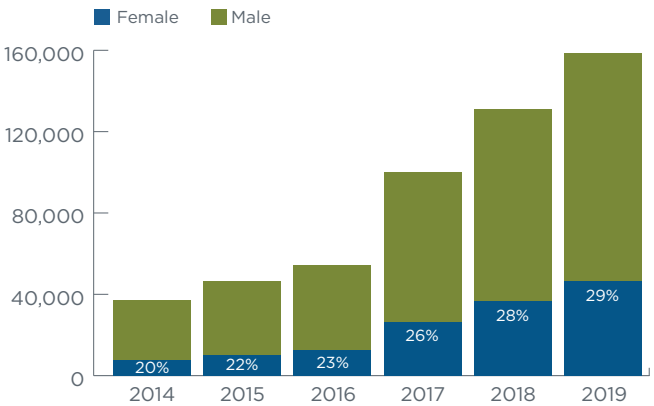
After development in the southwest, CSTA plans to expand the programming to its network of chapters across the U.S.

Student Participation in AP Computer Science

Over the past several years, the number of students taking AP computer science exams has skyrocketed. In the 2018–2019 school year, 6,388 schools taught AP computer science, and U.S. students took 158,577 AP computer science exams, up from 5,400 schools and 130,904 students in the 2017–2018 school year. The number of female students and students from each underrepresented racial and ethnic group taking AP computer science exams has increased every year since 2014, with a significant increase in participation after the 2016–2017 launch of AP Computer Science Principles.

The graphs in this section describe the nuances in AP computer science exam participation. Previously, this report did not describe participation by each race and ethnicity, or by gender and race and ethnicity. It is important to have a full picture of student participation across race, ethnicity, and gender because summaries obscure the trends and current participation rates for each group. Though the broader groups show positive trends, the trends are different for each racial and ethnic group and for each intersectional (gender and race and ethnicity) group.

AP Computer Science Exam Participation by Gender

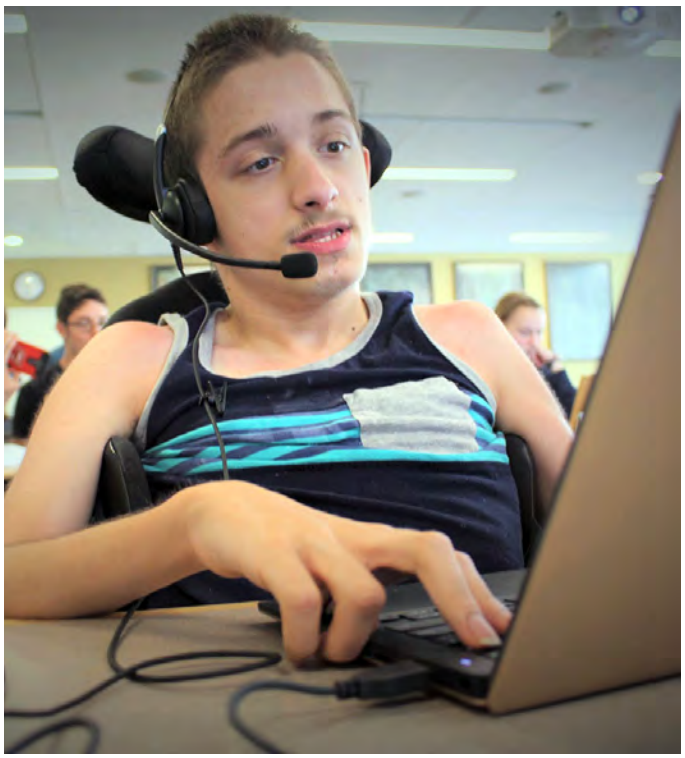


* Includes both public and private schools

AP Participation by Gender

Although the numbers of female students and male students have increased each year, the percent of all computer science exams taken by female students has also increased. This indicates that female student participation is growing faster than male participation and the overall exam participation is inching closer to parity. The largest growth of female student participation—in both numbers of students and percent—occurred in the 2016–2017 school year, when AP Computer Science Principles was introduced.

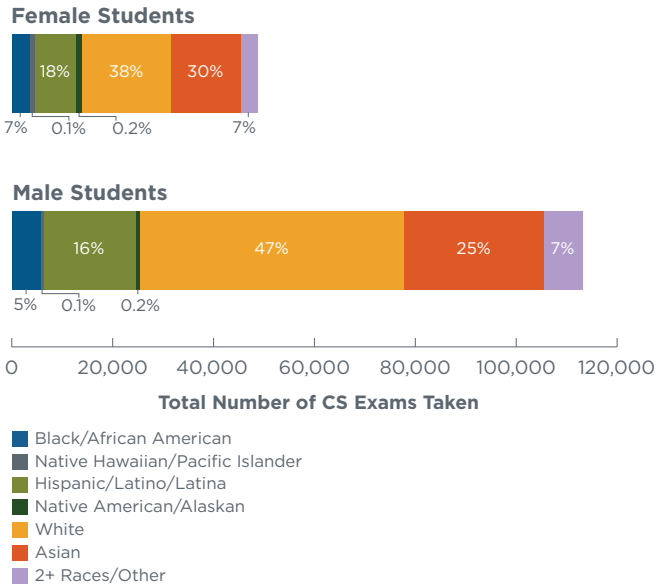
However, as highlighted by Barbara Ericson's research,[5] looking at participation by gender alone only tells a portion of the full story. Although female students' participation is increasing, these numbers do not capture the intersecting parts of identity. The following graph shows the rate of female students' participation by race and ethnicity. Breaking down gender categories provides a more complete view of disparities. At this time, there are no comprehensive data sources with non-binary participation.



Credit: University of Washington, DO-IT

[5] cs4all.home.blog

National AP CS Participation by Race/ Ethnicity and Gender



* Includes both public and private schools

AP Participation by Race/Ethnicity and Gender

Although female students took 29% of AP computer science exams overall in the 2018–2019 school year, female students from different races and ethnicities are represented differently.

- Black or African American female students took 7.5% of AP computer science exams taken by all female students (and only 2.2% of all AP CS exams), despite making up 15% of the female student population.
- Native Hawaiian or Pacific Islander female students took 0.11% of AP computer science exams taken by all female students (and only 0.03% of all AP CS exams), despite making up almost 0.4% of the female student population.
- Hispanic or Latina female students took 18% of AP computer science exams taken by all female students (and only 5.2% of all AP CS exams), despite making up 27% of the female student population.
- Native American or Alaskan female students took 0.17% of AP computer science exams taken by all female students (and only 0.05% of all AP CS exams), despite making up almost 1% of the female student population.
- White female students took 38% of AP computer science exams taken by all female students (and only 11% of all AP CS exams), despite making up 50% of the female student population.
- Asian female students took 30% of AP computer science exams taken by all female students (and only 8.8% of all AP CS exams), despite making up 5% of the female student population.

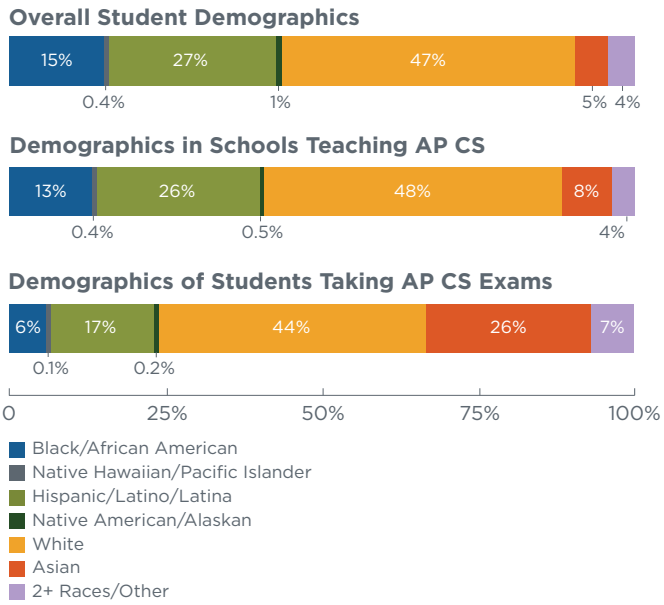
Male students from different races and ethnicities are also represented differently:

- African American or Black male students took 5% of AP computer science exams taken by male students (and only 3.5% of all AP CS exams), despite making up 15% of the male student population.
- Native Hawaiian or Pacific Islander male students took 0.15% of AP computer science exams taken by male students (and only 0.1% of all AP CS exams), despite making up almost 0.4% of the male student population.
- Hispanic or Latino male students took 16% of AP computer science exams taken by male students (and only 11.4% of all AP CS exams), despite making up 27% of the male student population.
- Native American or Alaskan male students took 0.25% of AP computer science exams taken by male students (and only 0.17% of all AP CS exams), despite making up almost 1% of the male student population.
- White male students took 47% of AP computer science exams taken by male students (and 33% of all AP CS exams), despite making up 50% of the male student population.
- Asian male students took 25% of AP computer science exams taken by male students (and 17% of all AP CS exams), despite making up 5% of the male student population.

AP Access and Participation by Race/ Ethnicity

This graph compares the percent of students from each race or ethnicity within the overall student population, the population of students in schools teaching AP computer science, and the population of students taking AP computer science exams.

National AP CS Access and Participation by Race/Ethnicity



* Includes only public schools

The first and second bars can be compared to see the overall access that students have to AP computer science courses. Nationally, students of most racial and ethnic groups have access to computer science in a percentage similar to their overall demographics, except for Native American or Alaskan students. This unequal access is highlighted by the disparity index. Native American or Alaskan students are 2 times less likely to attend a school that teaches AP Computer Science than their white and Asian peers. Black or African American students are 1.2 times less likely to attend a school that teaches it, Hispanic/Latino/Latina students are 1.1 times less likely, and Native Hawaiian or Pacific Islander students are just as likely.[6]

The second and third bars can be compared to see students' overall *participation* in AP computer science courses. Students from marginalized racial and ethnic groups are underrepresented in taking AP computer science exams, *even when they attend a school that teaches it*. They are also less likely to take an exam than their white and Asian peers:

- Native Hawaiian or Pacific Islander students are 3.5 times less likely to take an AP computer science exam compared to their white and Asian peers who attend a school that teaches it.
- Black or African American students are almost 3 times less likely.
- Native American or Alaskan students are almost 3 times less likely.
- Hispanic, Latino, or Latina students are almost 2 times less likely.[7]

Encouragingly, the numbers of students taking an AP computer science exam has increased for every race and ethnicity since the 2013–2014 school year:

- Native American or Alaskan students increased from 131 to 353.
- Black or African American students increased from 1,469 to 9,080.
- Hispanic, Latino, or Latina students increased from 3,270 to 26,329.
- Native Hawaiian or Pacific Islander students were not included as a demographic until the 2015–2016 school year, but similarly increased from 71 students to 215 in the 2018–2019 school year.
- White students increased from 19,520 to 69,897.
- Asian students increased from 11,060 to 41,505.

[6] See Appendix 3 for details on the disparity index calculations.
[7] ibid.

On the other hand, the proportion of students from each demographic has not had equivalent growth:

- Hispanic, Latino, or Latina students have seen the largest growth, from 8.8% of exams in 2014 to 16.6% in 2019, with the largest increase coinciding with the introduction of AP Computer Science Principles.
- Black or African American students made up 3.9% of AP computer science exams in 2014 and 5.7% in 2019—showing slight growth.
- Native Hawaiian or Pacific Islander students' representation remained relatively stable at 0.13% of AP computer science exams in 2016 (the first year that Native Hawaiian/Pacific Islander was included as a demographic category), and 0.14% in 2019.
- Worryingly, Native American or Alaskan students dropped from 0.35% of exams in 2014 to 0.22% of exams in 2019, with the largest drop around the introduction of Computer Science Principles.
- Asian and white students, who are overrepresented in AP CS exams, decreased from 30% to 26% of exams and 52% to 44%, respectively.

It is important to look into these changes on a state-by-state level to fully understand what is happening. State data can also help to identify the barriers students face and the opportunities students are provided.

Credit: University of Washington, DO-IT

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 nine policies, refer to Appendix 1. For the policy rubrics and lists of states, refer to Appendix 2.

Each policy page includes:

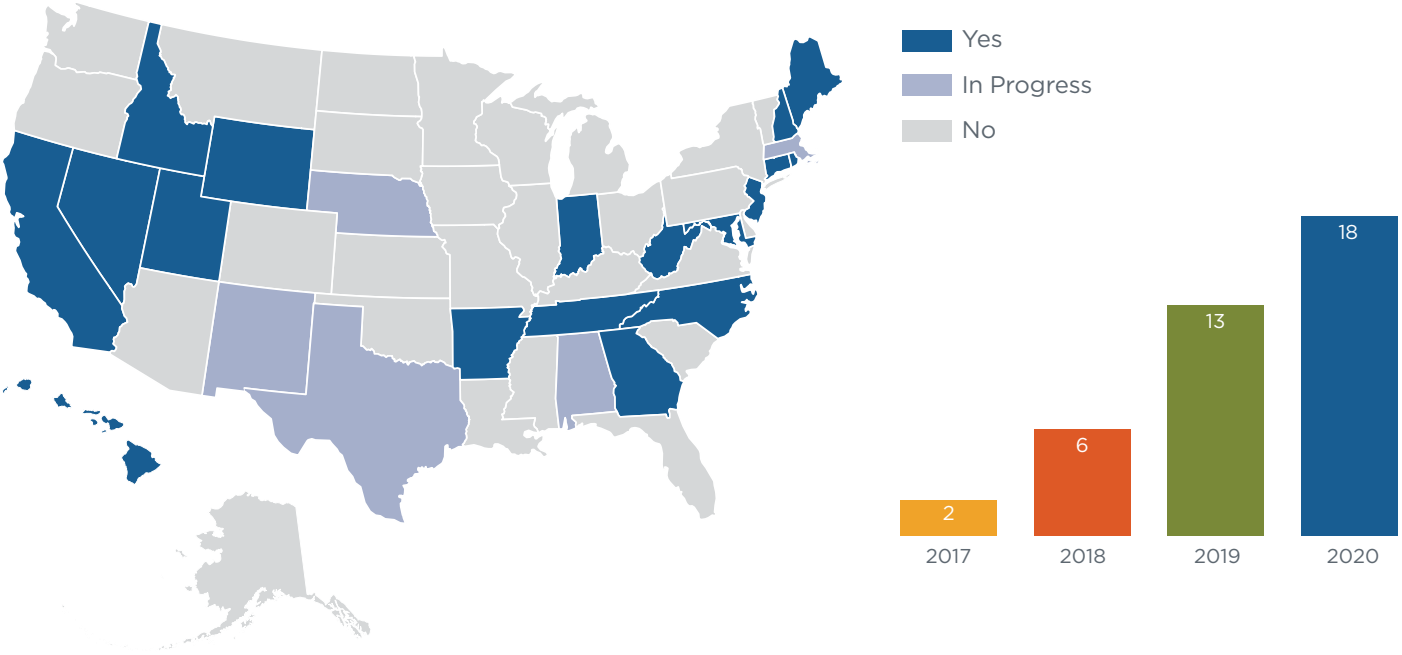
- a map depicting which states have enacted the policy,
- the number of states with the policy each year since 2017,
- highlights describing best practices related to the policy, and
- related resources to assist states in developing the policy.

Each page includes examples of the ways states have prioritized equity and diversity within the policy. All nine policies can promote access to and equity within rigorous and engaging computer science courses when stakeholders make equity an explicit focus of policy development and implementation monitoring.

Although a "no" indicates that a state has not met all of the criteria in the rubric, in some cases, a state may have met some of the criteria. Where possible, we note a state's progress toward meeting a policy.

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

1 State Plan for K–12 Computer Science Education



Highlights

Since the last report, **Connecticut, Maine, New Jersey, Tennessee,** and **West Virginia** have adopted state plans.

State plans have included timelines, goals, and strategies for providing equitable access for all students, professional learning for teachers, and awareness of the importance of computer science in the community. Many plans also address funding, standards, and certification. A wide range of stakeholders are involved in developing these plans, including teachers, parents, students, administrators, institutions of higher education, nonprofit organizations, and industry partners.

In May 2019, the California State Board of Education adopted the California Computer Science Strategic Implementation Plan. The goal of the plan is for all schools to offer rigorous and relevant computer science education equitably and sustainably, and to prepare all teachers to teach computer science aligned with the state's standards. The plan's sections are: Equity and Access, Supporting Educators to Teach Computer Science, and Expanding Computer Science Course Offerings. Each section includes a description of activities, immediate actions and those pending funding, and guidance for schools, districts, county offices of education, community and business partners, and other entities to consider as they work to improve computer science education.

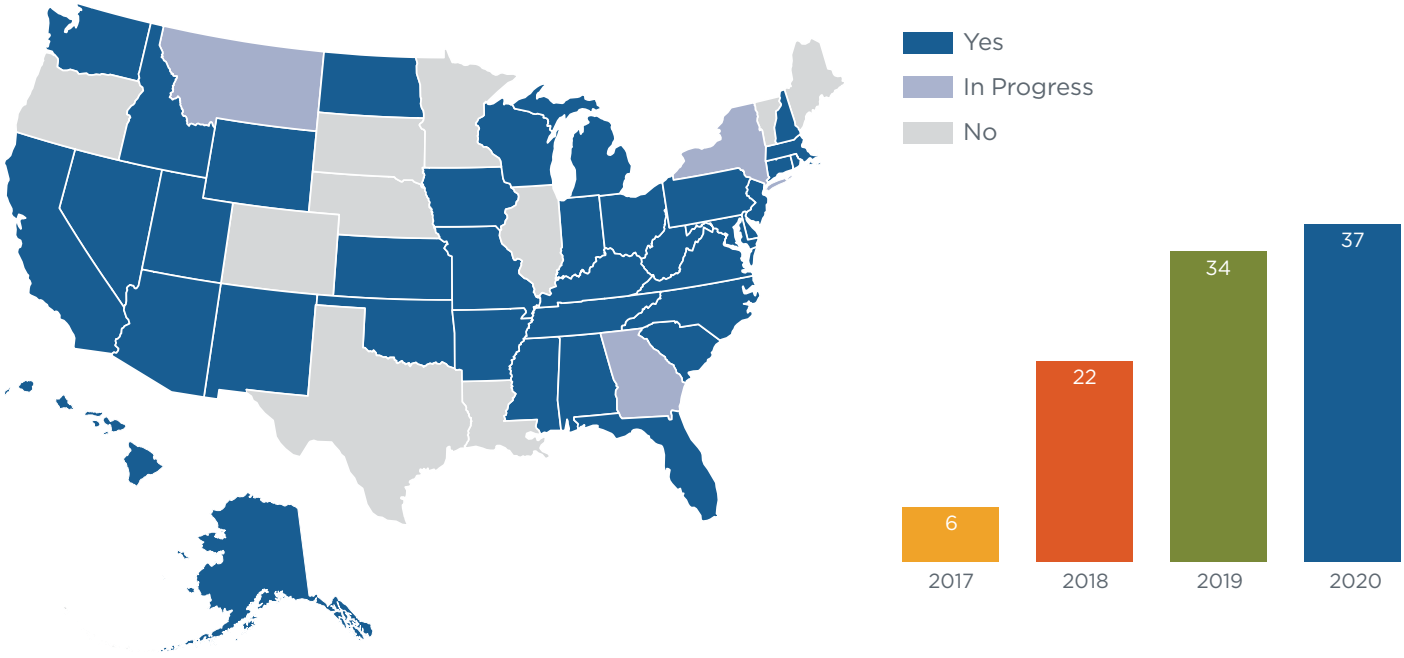
Resources

State Computer Science Planning Toolkit
bit.ly/statetoolkit

State Summit Toolkit
ncwit.org/organize

Stakeholders Involved with BPC
ecepalliance.org/resources/stakeholders-involved-bpc

2 K–12 Computer Science Standards



Highlights

Since the last report, **North Carolina, Tennessee,** and **Wyoming** have adopted K–12 computer science standards.

Most states developed their own comprehensive K–12 computer science standards informed by the K–12 Computer Science Framework and the CSTA K–12 Standards[8]—resources recognized for their inclusive vision of computer science and attention to concepts of equity, including bias, accessible technology, and inclusivity. States have also issued guidance on how to teach standards to all students, especially those underrepresented in computer science. Examples include using culturally relevant pedagogy, universal design for learning, and accessible technology for students with disabilities.

State-specific adaptations include emphasizing aspects of the standards to reflect local economic priorities, such as cybersecurity, or implementation scenarios, such as integration with other subjects. The structure of state standards differ, but many employ a mix of grade-level standards and grade bands, such as K, 1, 2, 3, 4, 5 at the elementary school level and grade bands at the middle and high school levels. Some states, including the eight states that officially adopted the grade-banded CSTA K–12 Standards,[9] use grade bands such as K–2, 3–5, 6–8, and 9–12.

The Ohio Learning Standards for Computer Science consist of expectations for individual grades K, 1, 2, 3, 4, 5, 6, 7, and 8, and the 9–12 grade band, which include foundational and advanced levels. Ohio's Computer Science Model Curriculum provides in-depth guidance for implementing the standards, such as learning progressions and key concepts and practices associated with each standard. The model curriculum is not a complete curriculum, nor is it mandatory; it is intended to help educators plan and develop their local curricula.

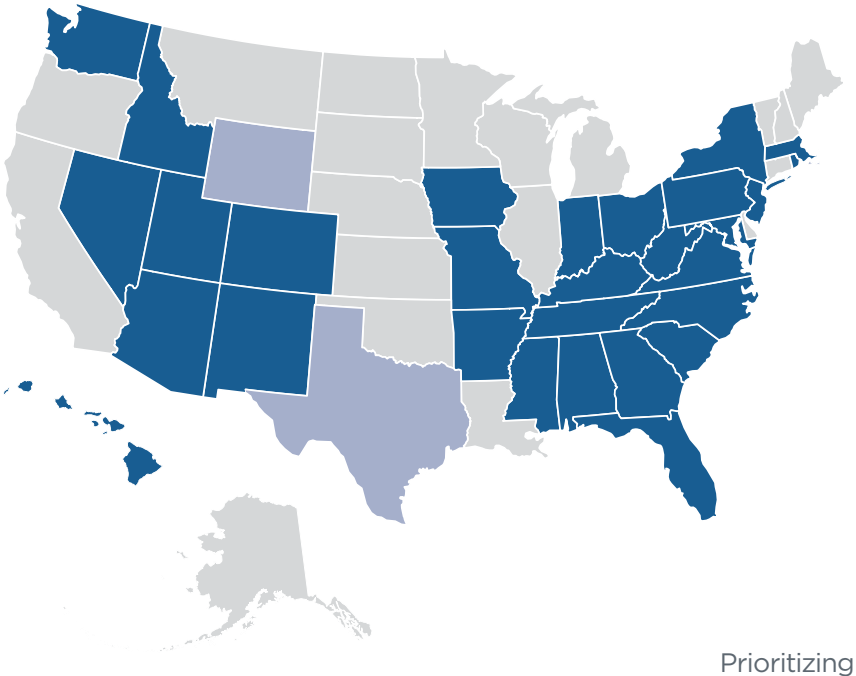
Resources

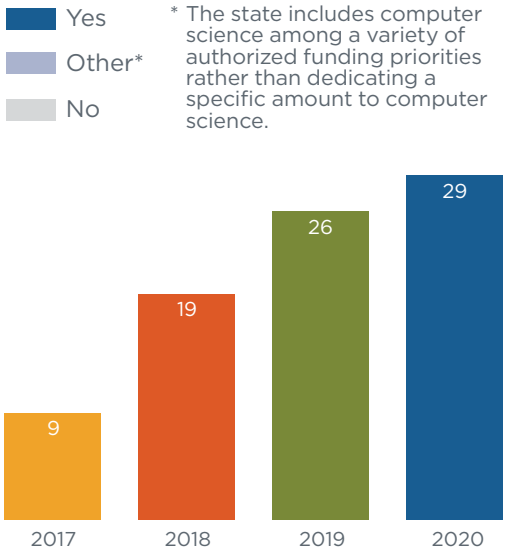
K–12 Computer Science Framework
k12cs.org

CSTA K–12 Computer Science Standards
csteachers.org/standards

[8] 28 states referenced the CSTA standards in their state standards documents.
[9] CT, DE, HI, IA, MI, NM, PA, and WA

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





Highlights

Since the last report, **Kentucky, Tennessee,** and **West Virginia** have allocated state-level funding for K–12 computer science professional learning.

States have directed funding towards computer science education for a variety of purposes, such as standards development, state plans, and teacher retention, but all state funding recognized in this report emphasizes teachers' professional learning. For FY 2021, states allocated over $55 million for computer science professional learning.

In FY 2020, Florida allocated $10 million to train, recruit, and retain computer science teachers by preparing teachers for computer science certification and providing bonuses for teachers earning their certification. In FY 2019, Pennsylvania allocated $20 million for STEM and computer science education for the expansion of existing large-scale programs and for schools or districts with little to no computer science.

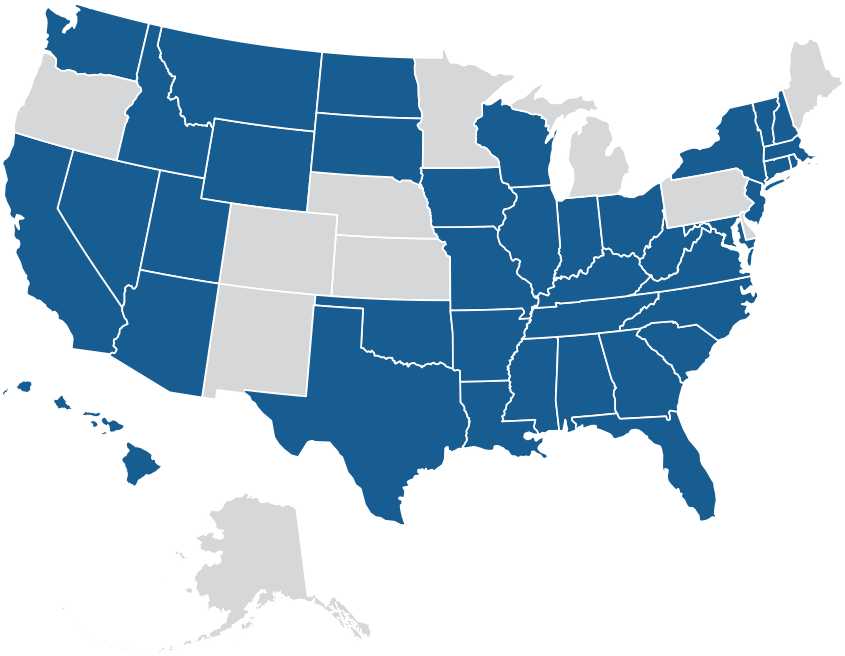
Prioritizing students from underrepresented groups in grant programs ensures the equitable distribution of funding. Maryland established a computer science grant program (HB 281, 2018) that prioritizes applications that serve underrepresented populations including students with disabilities. HB 2303 (2019) in Arizona amended the computer science professional development program to prioritize rural schools and schools with at least 60% of the students eligible for free and reduced-price lunches.

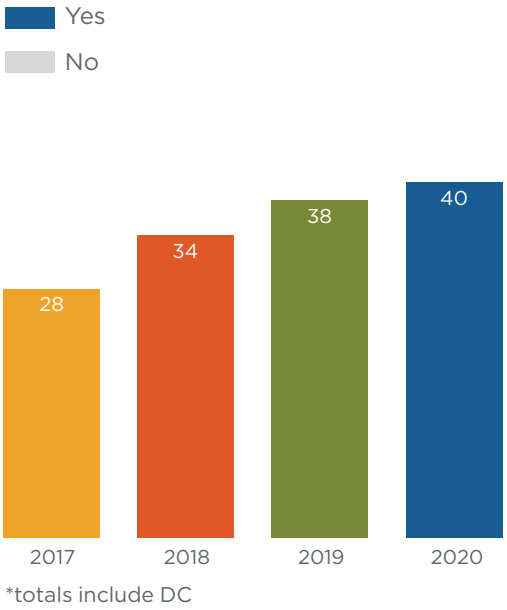
Although the COVID-19 pandemic coincided with state budget adoption, Alabama and Virginia increased funding for computer science, while several other states, including Arkansas, Iowa, Mississippi, and New York, sustained ongoing funds. Unfortunately, budget actions in a few other states reduced or re-allocated previous computer science funding, including funds dedicated to professional learning and the hiring of state supervisor positions.

Resources

Models for Funding Professional Learning
bit.ly/modelsforfundingcs

4 State Computer Science Teacher Certification





*totals include DC

Highlights

Since the last report, **Rhode Island** and **South Dakota** have adopted computer science teacher certifications.

States often have multiple pathways to certification. Approaches include initial computer science licensure for preservice teachers and add-on computer science endorsements for inservice teachers. Recently, several states amended existing requirements in order to reduce barriers for teachers and increase the number of certified teachers. Arizona's previous computer science endorsement spanned preK–12 and required 30 semester hours in computer science, proving a burden to many teachers. Arizona now has two new endorsements, preK–8 and 6–12, that require nine and twelve semester hours respectively, and include topics such as inclusive pedagogy. These requirements can be met through an accredited institution or through a program approved by the local education agency. The endorsements also allow 15 clock hours of professional learning or an analogous micro-credential to count towards coursework requirements.

Arkansas has a unique approach to certification with an initial full licensure, an add-on endorsement, and a temporary approval code. Until the 2021–2022 school year, any teacher with a grade-appropriate license can apply for the approval code with documentation of approved professional development, prior computer science teaching, coursework in computer science, or meeting other department requirements. After the 2020–2021 school year, all computer science teachers will be required to hold the Computer Science Endorsement (obtained as either an initial full license or an add-on endorsement). Arkansas provides financial incentives for teachers to obtain the endorsement.

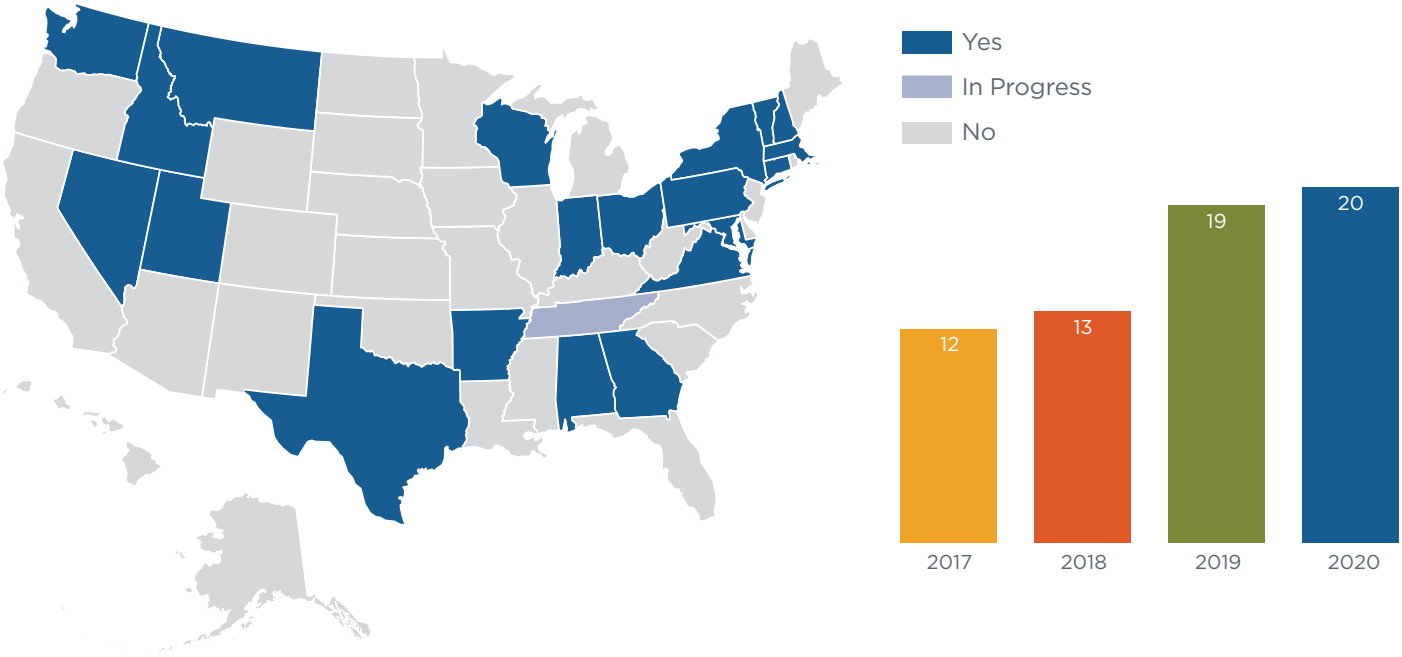
Resources

Teacher Pathways Recommendations
bit.ly/csteacherpathway

CSTA Standards for Computer Science Teachers
csteachers.org/page/standards-for-cs-teachers

Micro-credentials in Computer Science
advocacy.code.org/micro-credentials.pdf

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



Highlights

Since the last report, **Alabama, New Hampshire,** and **New York** have approved preservice teacher preparation programs or created standards for the approval of programs.[10]

In addition to approving, funding, or creating preservice programs at institutions of higher education, some states require that preservice teachers across all subject areas and grade levels receive exposure to computer science to ensure that they have the knowledge and skills to integrate computer science into their classroom practice. In 2018, only 62 preservice teacher candidates nationwide graduated prepared to teach computer science.[11]

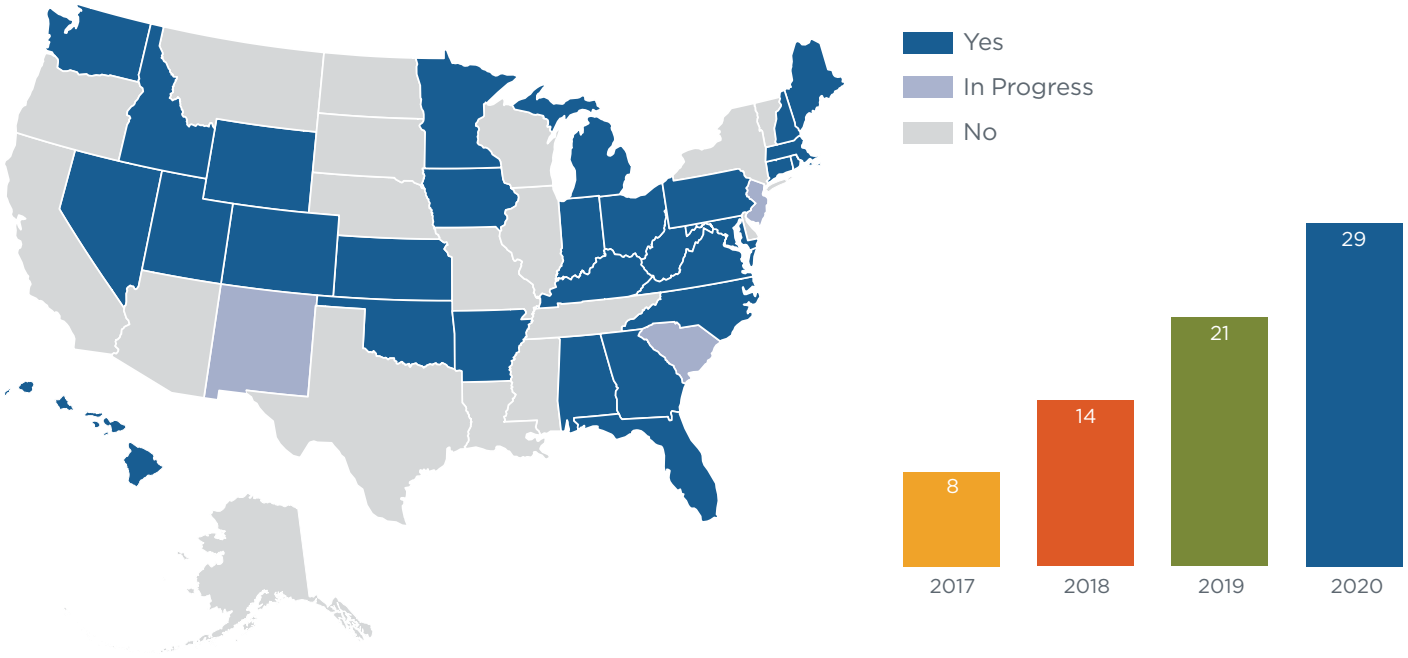
Nevada requires all teacher candidates in the Nevada System of Higher Education to receive appropriate education and training in computer science and allows the Board of Regents to apply for funds from the Account for Computer Education and Technology to develop the curriculum and standards for computer science teaching. Connecticut requires that all teacher preparation programs include instruction in computer science that is grade-level and subject-area appropriate. Arkansas and Indiana require all elementary education preservice teachers to have an understanding of fundamental concepts and processes in science and engineering, including computer science. Additionally, Arkansas provides funding to support preservice teachers who agree to teach computer science in underserved communities.

Resources

Priming the Computer Science Teacher Pump
computingteacher.org

[10] In the 2019 report, Iowa and Michigan were listed as having preservice teacher preparation. As a result of eliminating the requirements for computer science teacher certification, Michigan no longer has the related preservice programs. Iowa has programs only for existing teachers, and are working to address preservice.
[11] Title II Reports (2019), title2.ed.gov

6 State-Level Computer Science Supervisor



Highlights

Since the last report, **Alabama, Kansas, Kentucky, Maine, Michigan, Minnesota, Rhode Island,** and **West Virginia** have established state-level computer science supervisor positions.

State computer science supervisors recommend and guide the development of state regulations and legislation, professional learning, standards development, and teacher certification. States can ensure that the computer science supervisor position supports local education agencies in improving equitable access to computer science through a job description that emphasizes this role or a specific section in the state plan for computer science that the employee is responsible for implementing.

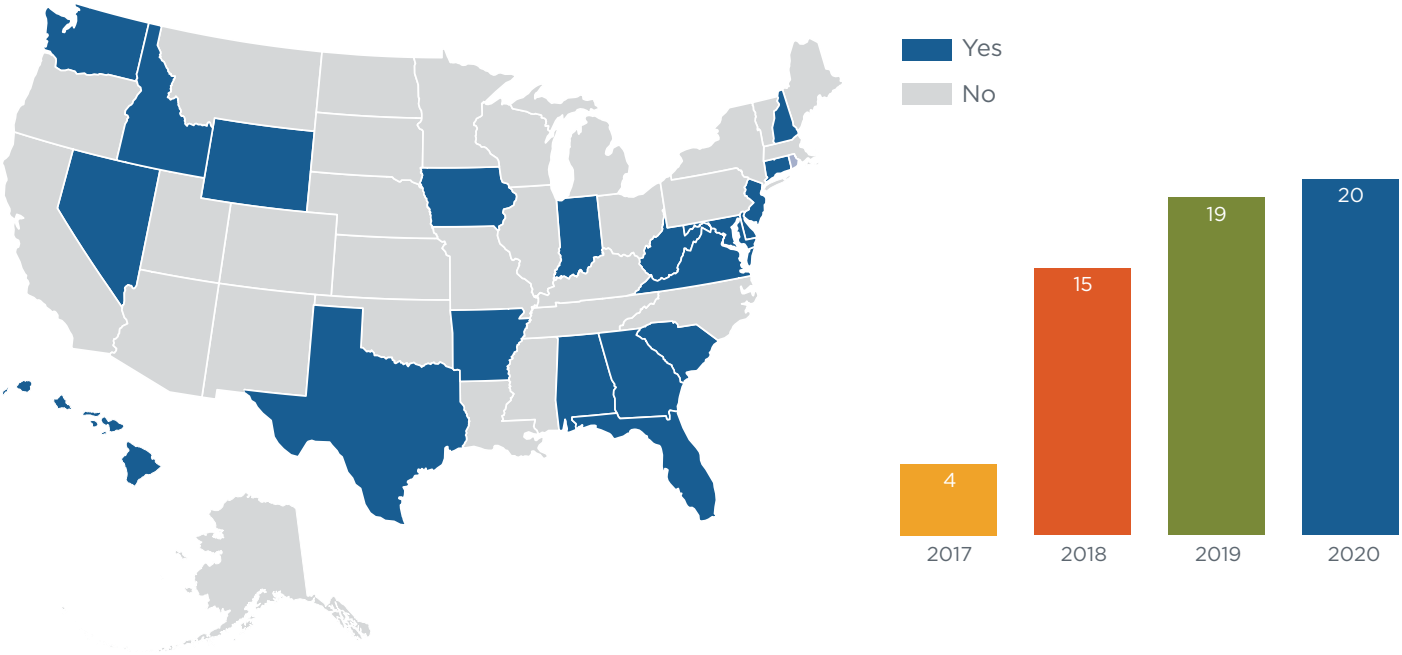
Multiple state-level positions dedicated to computer science allow for a focused and coordinated effort reflecting different aspects of a state's computer science initiative, whether within a state education agency or across different state entities. Maryland has positions at the Maryland State Department of Education and at the Maryland Center for Computing Education (MCCE) based at the University System of Maryland. The responsibilities of the MCCE include implementing the state plan, managing state grant funds, and developing preservice programs. The Maryland State Department of Education employs two computer science specialists: a Career Programs Coordinator with oversight of STEM and computer science pathways, and a specialist responsible for computer science resources and courses. The latter position provides technical assistance to educators, collects data on computer science programs, and collaborates with other content specialists to integrate computer science across other content areas. Other states employing multiple dedicated computer science positions include Alabama, Arkansas, and Rhode Island.

Resources

Model Computer Science State Supervisor Job Description

bit.ly/csjobdescription

7 A Requirement for All High Schools to Offer Computer Science



Highlights

Since the last report, **Iowa** has established a requirement for all high schools to offer computer science.

States have adopted policies requiring all high schools to offer computer science within an appropriate timeline. Many states have extended the goal to elementary and middle schools, and require annual reporting for transparency and accountability.

Georgia is currently phasing in a requirement that all middle and high schools offer computer science. By the 2022–2023 school year, at least one high school in each local school system must offer a computer science course and all middle schools must offer exploratory computer science. By the 2023–2024 school year, at least 50 percent of the high schools in each local school system must offer a computer science course, and by the 2024–2025 school year, all high schools must offer a course. The department reports annually the number of teachers trained and the number and demographics of students served. A few states, such as Indiana and Washington, require a public report of computer science enrollment disaggregated by factors such as gender, race, ethnicity, eligibility for free and reduced-price meals, and eligibility for disability services. Nevada requires that schools make efforts to increase enrollment of students with disabilities in computer science.

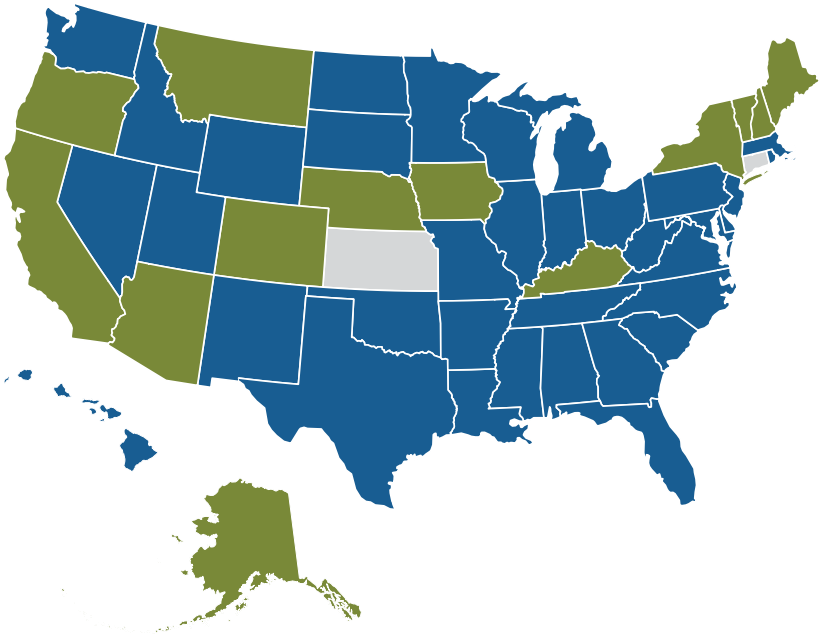
Resources

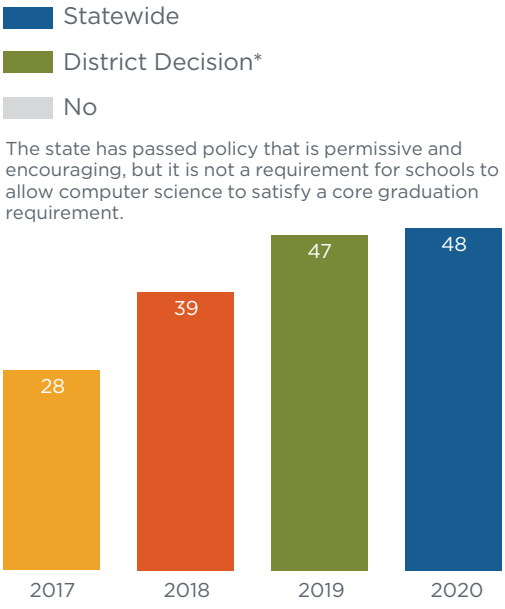
All High Schools Offer Computer Science
bit.ly/allhsofferexamples

2014-15	2015-16	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2024-25
Texas	Arkansas	Virginia	Florida New Jersey South Carolina	Connecticut Idaho	Alabama Delaware New Hampshire West Virginia	Hawaii Indiana Maryland	Iowa Nevada Washington Wyoming	Georgia

This timeline shows states' target school years for all high schools to offer computer science.

8 Computer Science Can Satisfy a Core High School Graduation Requirement





Highlights

Since the last report, **Maine** has allowed computer science to satisfy a core high school graduation requirement.

States are allowing computer science to count towards a core graduation requirement, regardless of their high school pathway, and are providing guidance to districts on policy implementation. For example, Missouri allows students to fulfill one unit of any mathematics, science, or practical arts unit required for graduation with a district-approved computer science course. The state developed the policy alongside new K–12 computer science standards and teacher certification requirements, and posted a guidance document that defines computer science, explains course code reporting, and outlines teaching qualifications for the course to count.

Some states have reduced restrictions within existing policies to increase flexibility. Multiple computer science courses can be approved by districts (e.g., AP, non-AP, CTE) to count towards graduation requirements. Washington removed a restriction that required students to take certain courses before computer science could count as a mathematics credit. Florida no longer requires students to earn an industry certification for a course to count towards a mathematics or science credit.

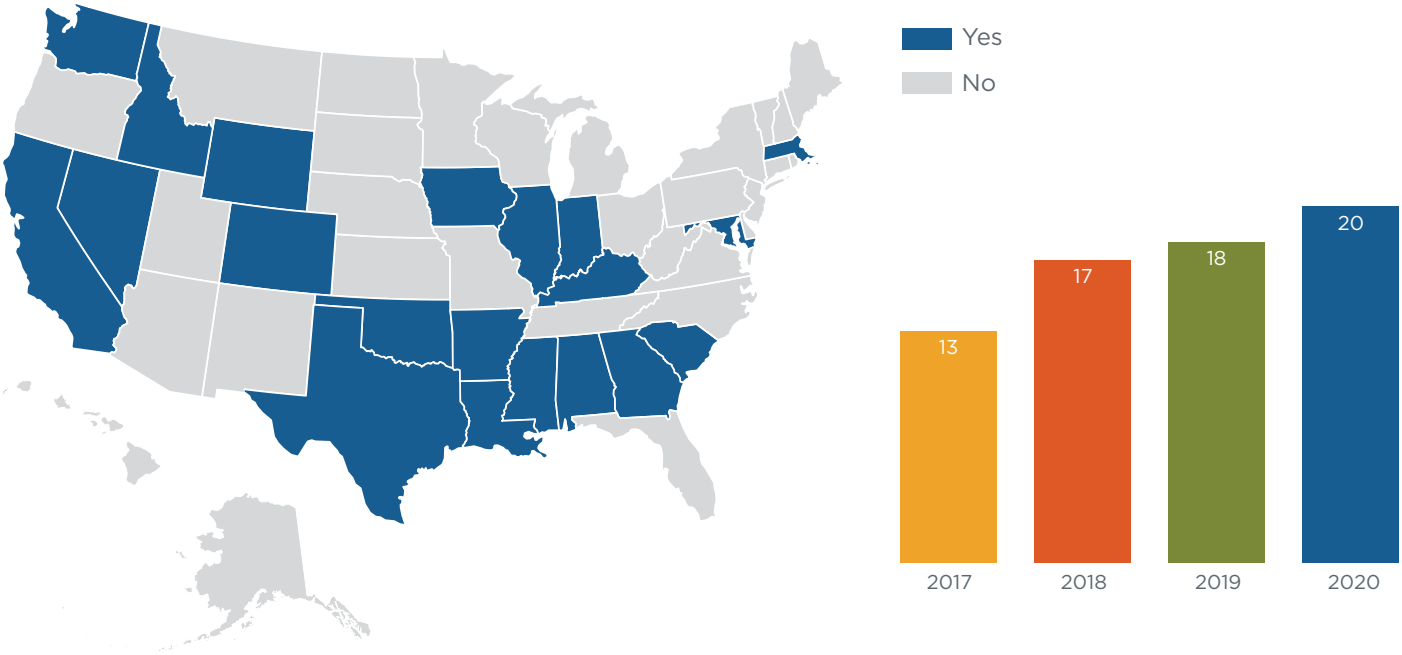
Nevada and South Carolina are the only two states to have computer science graduation requirements; both states revised existing graduation requirements in technology to focus on computer science. Mississippi also has a technology graduation requirement that can be fulfilled with computer science courses. These states continue to fund and coordinate statewide professional learning to re-train general technology or computer literacy teachers in computer science.

Resources

Outcomes of K–12 Computer Science Policy in States
bit.ly/cspolicyoutcomes

Computer Science Flex Credit
bit.ly/csflexcredit

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



Highlights

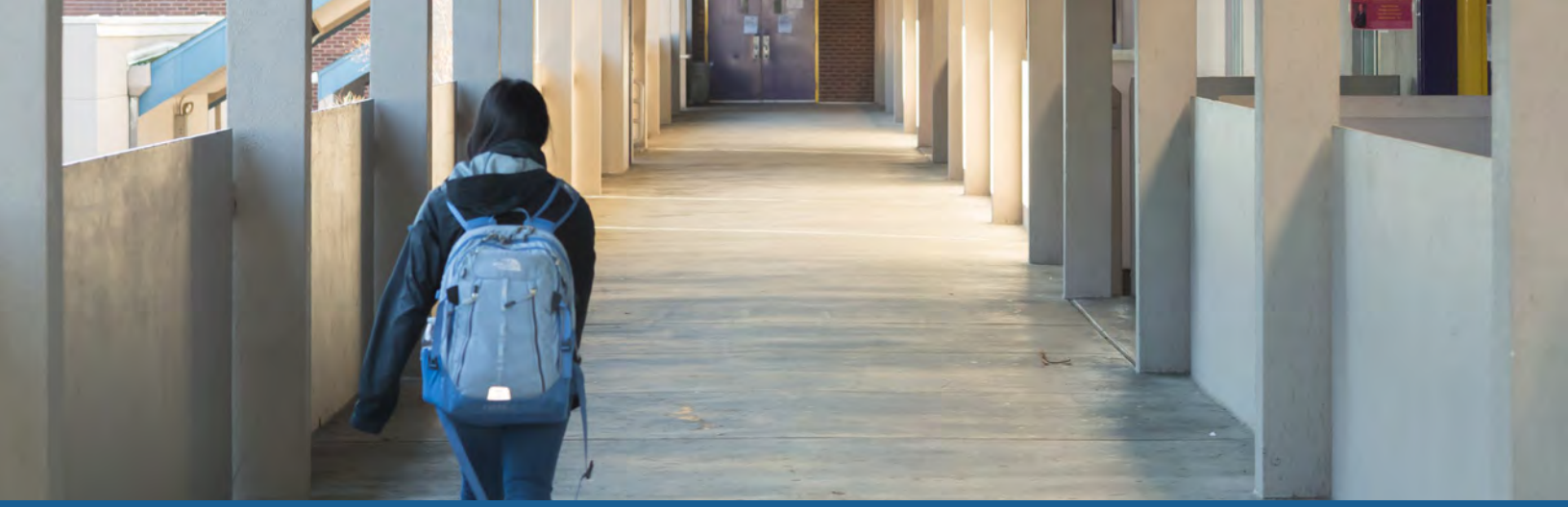
Since the last report, **Iowa** and **Oklahoma** have allowed computer science to satisfy a core admission requirement at institutions of higher education.

In many states, computer science may count towards a specific core graduation requirement (e.g., math or science), but not count towards the same subject requirement for admission to an institution of higher education. This misalignment may disadvantage students who choose to apply a computer science credit towards one of their graduation requirements. By aligning high school graduation requirements and higher education admission requirements, states clarify the use of computer science credits for students. For example, beginning in fall 2022, students applying to Mississippi State Institutions of Higher Learning must have one credit in computer science or technology, which aligns with the state's computer science or technology requirement for high school graduation.

Resources

University of California Data Confirms Computer Science is Foundational

bit.ly/ucdataconfirmscs



State Summaries

This section provides information for each state in the nation, including:

- **the state's status on each of the nine policies,**
- **data on school offerings and participation,**
- **membership in the Governors' Partnership for K–12 Computer Science,**
- **membership in the Expanding Computing Education Pathways (ECEP) Alliance, a National Science Foundation-funded Broadening Participation in Computing Alliance, and**
- **the existence of state CSTA chapters.**

Further Information

Refer to ecepalliance.org for more information about connecting with a state team and to learn more about how your state can increase the number and diversity of K–16 students in computing and computing-related degrees. Refer to csteachers.org/chapters to find your CSTA chapter.

Data Sources

The data included in the state summaries represents the most current information that is publicly accessible. Refer to advocacy.code.org for up-to-date state policy information and data. Graphs portraying less than 1% are enlarged for visibility.

The percent of schools in the state teaching a computer science course each year and by school characteristic comes from the Access Report and includes only public high schools. See Appendix 3 for full methodology and Appendix 4 for more details on student access by state.

The data about AP computer science exam participation comes from the College Board State Summary Reports (research.collegeboard.org/programs/ap/data) and combines AP Computer Science Principles and AP Computer Science A. Participation by gender includes public and private school data; participation by race/ethnicity includes public schools only.

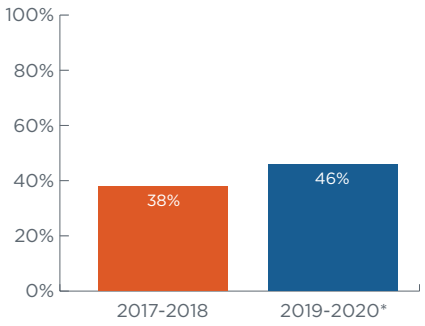
Data sources for access and participation are the National Center for Education Statistics and the College Board. AP data is used because it provides a national data set on participation and diversity in computer science courses, although it only tells part of the story of computer science access and participation. See Appendix 3 for details about how access and participation descriptions are calculated.

Alabama

State Plan In Progress	The Governor's Computer Science Advisory Council made a series of policy recommendations in 2019, including goals and strategies, but these recommendations did not include timelines.
Standards Yes	The state adopted K–12 computer science and digital literacy standards in 2018. The "Equitable Access" Position Statement in the standards document includes examples of ways to broaden participation in computer science education, and the standards address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	HB 187 (FY 2021) and SB 199 (FY 2020) appropriated $3.771M and $2.771M for CS education: $614K for the Middle School Programming Initiative, $300K for CS educator training, $1 and $2M for CS4AL, and $857K for the Technology in Motion Program to train K–12 teachers in computer science. HB 175 (FY 2019) appropriated $613K for the Middle School Programming Initiative, and an additional $300K was allocated for professional development. SB 129 (FY 2018) allocated $675K for the Middle School Programming Initiative.
Certification Yes	Teachers with existing licensure can add 6–12 computer science as an additional teaching field by passing the Praxis CS exam. Teachers can also obtain a course-specific permit by completing an approved training or college credit for the specific course. State funding for computer science can support credentialing for teachers.
Preservice Yes	In September 2019, the State Board of Education passed Teacher Educator Standards for Computer Science, which are used to approve programs at institutions of higher education.
CS Supervisor Yes	The State Department of Education has an Education Specialist and an Educator Administrator for Digital Literacy and Computer Science.
All HS Offer Yes	Act 389 requires all high schools, middle schools, and elementary schools to offer CS by the 2020–2021 school year. There is public reporting of CS enrollment demographics at the state level.
Grad Credit Yes	Courses including AP Computer Science A or AP Computer Science Principles can count as a mathematics or science credit for graduation.
IHE Admission Yes	AP CS A or AP CS Principles count towards mathematics or science admission requirements, as determined by each public institution of higher education.

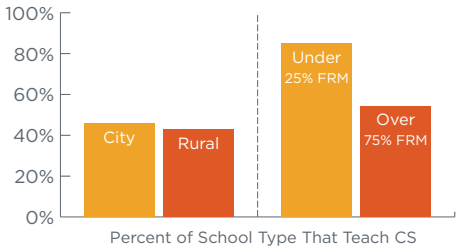
Alabama is a member of the ECEP Alliance, has a CSTA chapter, and Governor Kay Ivey is a member of the Governors' Partnership for K–12 Computer Science.

High Schools Teaching CS

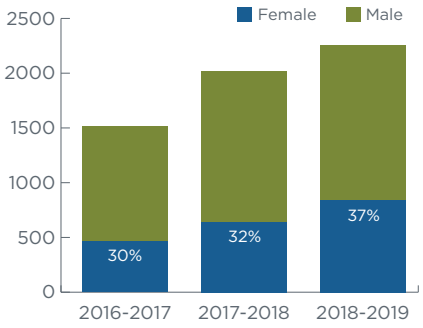


*Data was not collected for the 2018–2019 school year

High Schools Teaching CS by School Type

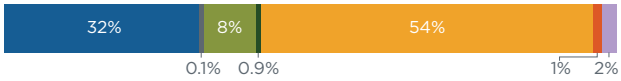


AP CS Student Participation



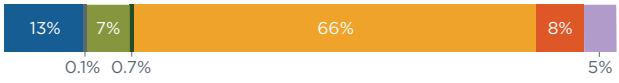
Access and Participation by Race/Ethnicity

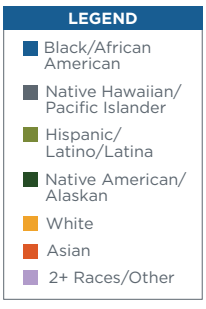
Overall Student Demographics



Demographics in Schools Teaching AP CS

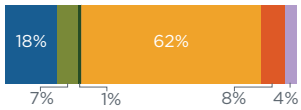
Demographics of Students Taking AP CS Exams



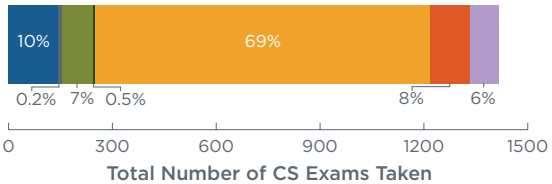


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



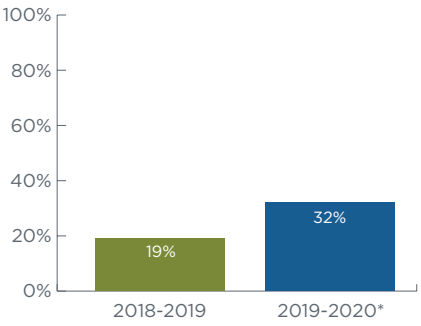
Hispanic/Latinx students are 1.5 times less likely than their white and Asian peers to attend a school that offers AP CS. Black students are 2.6 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Alaska

State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted K–12 computer science standards based on the CSTA standards in 2019. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification No	The state does not yet have a computer science teacher certification.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Dist. Decision	The state passed a permissive and encouraging policy to allow computer science to count as a mathematics, science, or local CTE/ technology credit for graduation, but it is a district decision.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

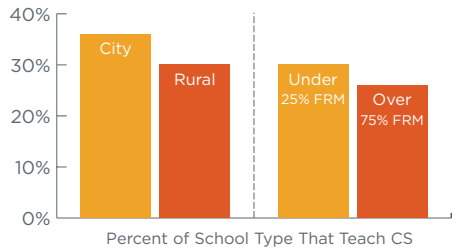
Alaska has a CSTA chapter.

High Schools Teaching CS

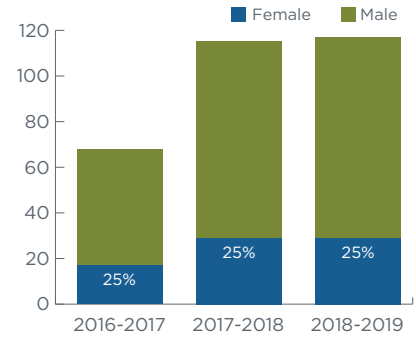


*2019 data combines historic data from 2018 with new 2019 AP and survey data

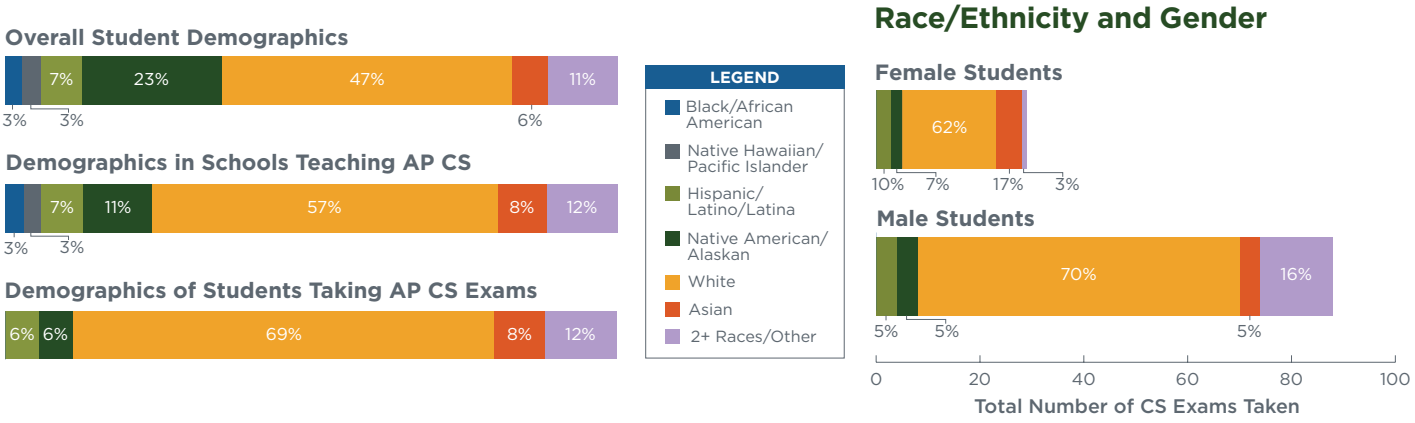
High Schools Teaching CS by School Type



AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender

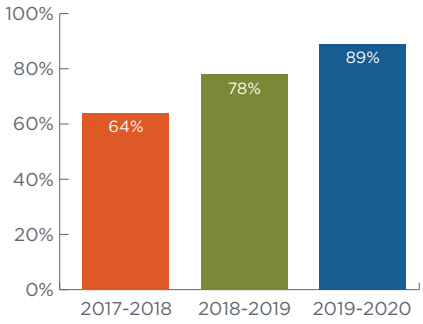
Native American/Alaskan students are 2.5 times less likely than their white and Asian peers to attend a school that offers AP CS, and 2.5 times less likely to take an AP CS exam when they attend a school that offers it.

Arkansas

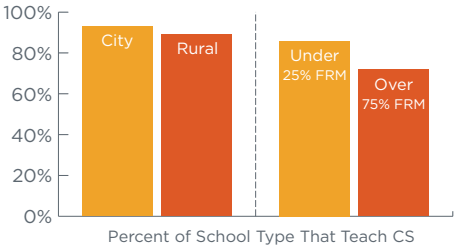
State Plan Yes	The Arkansas Department of Education developed a state plan in 2016. In 2020, the Computer Science and Cybersecurity Task Force will release a new set of recommendations for the Department.
Standards Yes	The state adopted K–8 computer science standards in 2015 and 9–12 standards in 2016. All students learn the K–6 standards and take a coding block in 7th or 8th grade.
Funding Yes	Act 154 (FY 2021), Act 877 (FY 2020), Act 243 (FY 2019), Act 1044 (FY 2018), and Act 189 (FY 2016 and 2017) allocated $2.5M annually for the Computer Science Initiative. One grant program for schools prioritizes programs that broaden participation in computer science courses.
Certification Yes	Teachers with existing licensure can add a 4–12 endorsement by passing the Praxis CS exam; teachers can also earn an initial license in computer science. Until the 2021–2022 school year, any teacher with a grade-appropriate license can obtain an approval code. State funding for computer science can support credentialing for teachers.
Preservice Yes	The state has approved secondary computer science preparation programs and requires all preservice elementary teachers to receive instruction in computer science education. ForwARd Arkansas scholarships are available for students studying to become licensed computer science instructors and commit to teaching in a ForwARd Community school district.
CS Supervisor Yes	The Department of Education has an office of computer science with four staff members focusing on computer science, including the State Director of Computer Science Education. There are also multiple statewide computer science specialists.
All HS Offer Yes	Act 187 (2015) required all high schools to offer computer science by the 2015–2016 school year. Each school reports computer science enrollment by grade and race.
Grad Credit Yes	Any computer science course can count as a mathematics or science credit for high school graduation.
IHE Admission Yes	Any computer science course can count as a mathematics or science credit required for admission at institutions of higher education, which aligns with the high school graduation policy.

Arkansas is a member of the ECEP Alliance, has a CSTA chapter, and Governor Asa Hutchinson is a member of the Governors' Partnership for K–12 Computer Science.

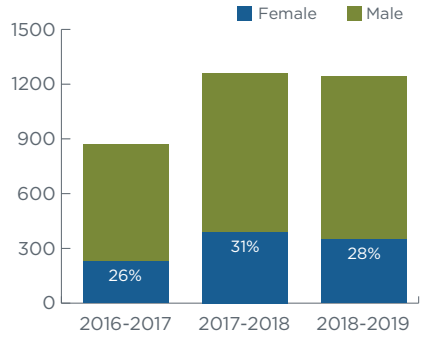
High Schools Teaching CS



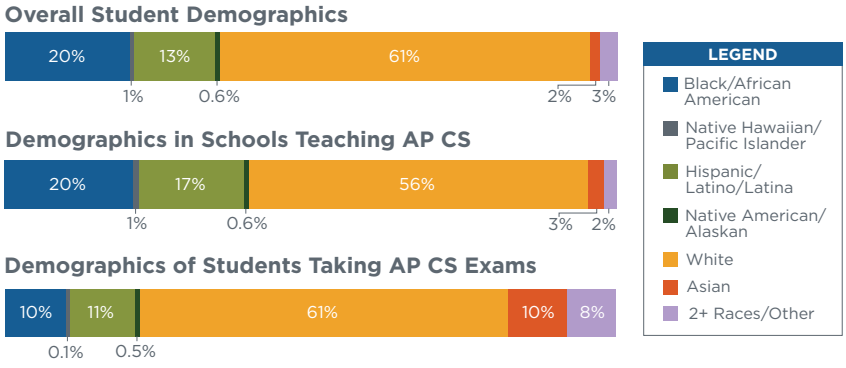
High Schools Teaching CS by School Type



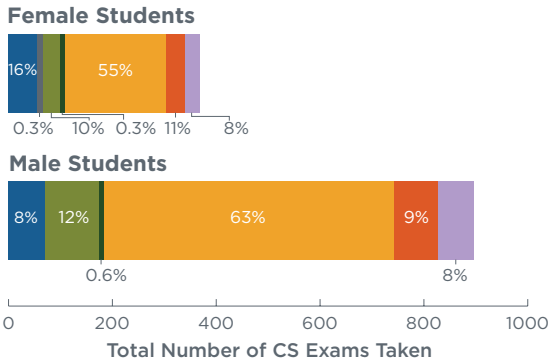
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



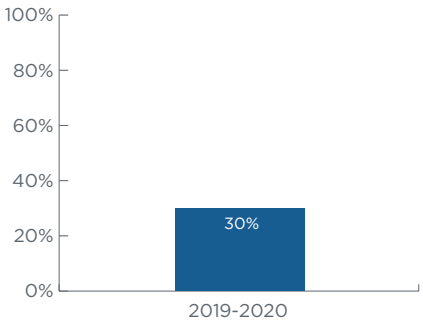
Students of all racial and ethnic groups have access to AP CS on par with their state population, but Native American students are 1.5 times less likely, Hispanic/Latinx students are 2 times less likely, and Black students are 2.5 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Arizona

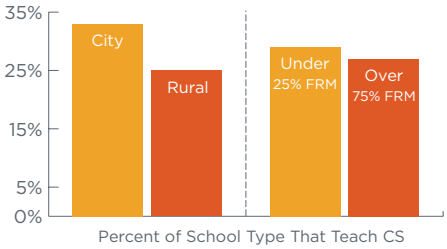
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted K–12 computer science standards with a focus on equity in 2018. The state intends to close the access gap for underserved populations, and standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	State budgets (FY 2019–2021) included $1M annually for professional development, prioritizing schools that currently do not provide computer science instruction. The program requires a 50% match of state funding with private monies or in-kind donations. In addition, HB 2303 (FY 2019) prioritized rural schools and schools with at least 60% of the students eligible for free and reduced-price lunches. HB 2537 (FY 2018) allocated $200K to support standards and professional development. SB 1568 (FY 2017) allocated $500K, with a focus on Native American students.
Certification Yes	Teachers with existing licensure can obtain the PreK–8 or 6–12 endorsement by completing a district-approved program or academic coursework. The PreK–12 special subject endorsement requires completing academic coursework.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Dist. Decision	The state passed a permissive and encouraging policy to allow computer science to count as a mathematics credit for graduation, but it is a district decision.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

Arizona has a CSTA chapter and Governor Doug Ducey is a member of the Governors' Partnership for K–12 Computer Science.

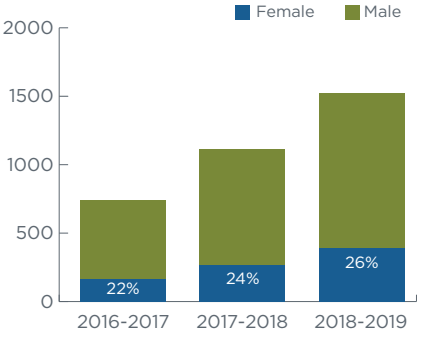
High Schools Teaching CS



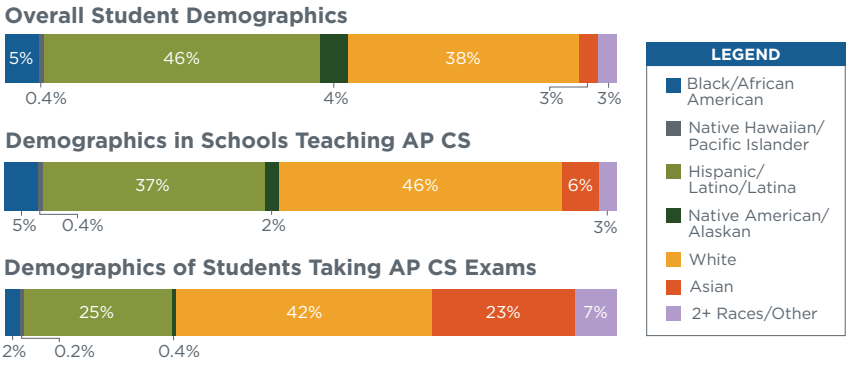
High Schools Teaching CS by School Type



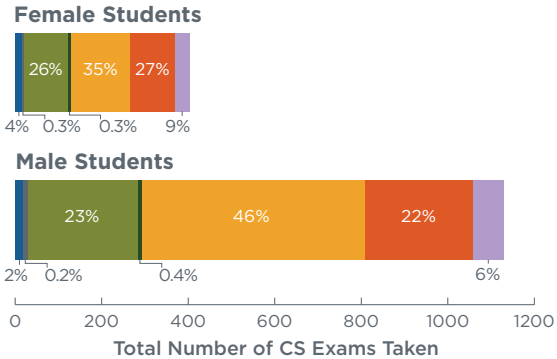
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



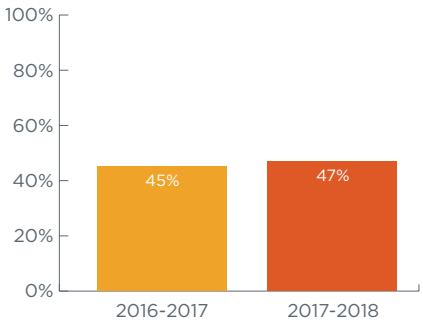
Native American students are 2.5 times less likely than their white and Asian peers to attend a school that offers AP CS, and 7 times less likely to take an AP CS exam when they attend a school that offers it. Black students are 3 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

California

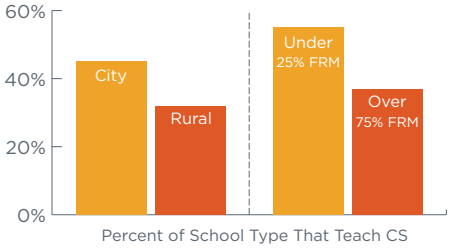
State Plan Yes	The State Board of Education adopted the Computer Science Strategic Implementation Plan in 2019. The plan includes practices and recommendations for equitable outcomes, such as providing culturally responsive training materials to support educators.
Standards Yes	The state adopted K–12 computer science standards in 2018. The introduction includes "Issues of Equity," describing equity, access, and representation. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity. The California NGSS Curriculum Framework also includes major sections on computational thinking and computer science for educators.
Funding No	The state has not provided dedicated state funding for computer science. Although SB 75 (FY 2019) appropriated $22.1M to the Educator Workforce Investment Grant Program, including $5M to support professional learning for computer science teachers, the state reallocated this funding for COVID-19 relief in April 2020.
Certification Yes	Teachers with existing licensure can obtain a supplementary authorization for PreK–12 through academic coursework.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	SB 75 (2019) created the Computer Science Coordinator position, but cut the position in May 2020 due to COVID-19 budget reallocations.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Dist. Decision	The state passed a permissive and encouraging policy to allow computer science to count as a science or mathematics credit for graduation, but it is a district decision.
IHE Admission Yes	Approved computer science courses can count as the recommended third-year science course (area D) or as a mathematics credit (area C) required under the University of California system admissions criteria, which aligns with the high school graduation policy.

California is a member of the ECEP Alliance and has CSTA chapters.

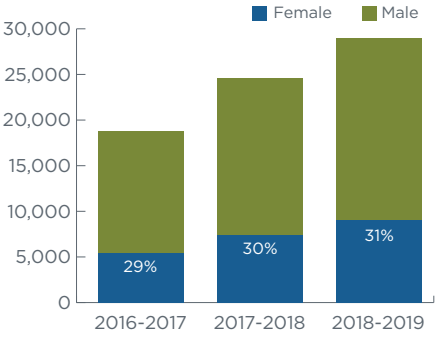
High Schools Teaching CS



High Schools Teaching CS by School Type



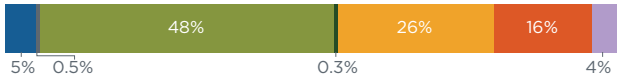
AP CS Student Participation



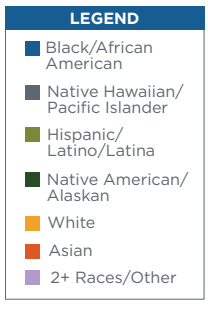
Access and Participation by Race/Ethnicity

Overall Student Demographics

Demographics in Schools Teaching AP CS

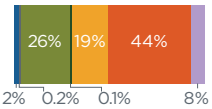


Demographics of Students Taking AP CS Exams

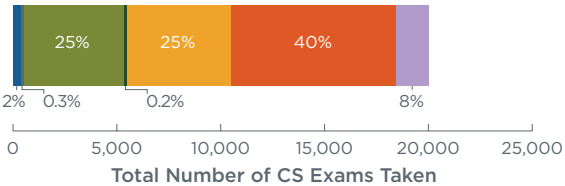


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



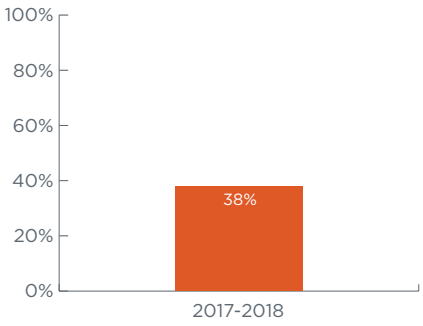
Native American, Hispanic/Latinx, and Pacific Islander students are each 3 times less likely and Black students are 4 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Colorado

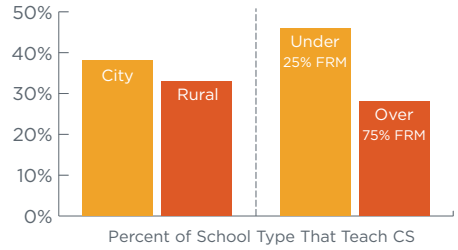
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines. However, HB 17-1184 (2017) directed the department to create a resource bank for CS materials.
Standards No	Although the state does not yet have a discrete set of rigorous computer science standards across K–12, the state adopted high school computer science standards in 2018.
Funding Yes	HB 20-1360 (FY 2021) and SB 19-207 (FY 2020) appropriated $801,657 and $1,048,600 for Computer Science Education Grants for Teachers, which give priority to applications serving rural areas, areas with high numbers of students eligible for free and reduced-price meals, or areas with high numbers of students from underrepresented racial and ethnic groups. HB 18-1322 (FY 2019) allocated $500K for K–5 teacher professional development. SB 17-296 (FY 2018 and 2019) allocated up to $500K annually for teachers pursuing postsecondary computer science education. HB 16-1289 (FY 2017) offered schools $1K for each student enrolled in AP computer science.
Certification No	The state does not yet have a computer science teacher certification.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The Department of Education has a Computer Science Content Specialist.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Dist. Decision	The state 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.
IHE Admission Yes	A computer science course with a mathematics prerequisite can count as a mathematics credit required for admission at institutions of higher education.

Colorado has a CSTA chapter.

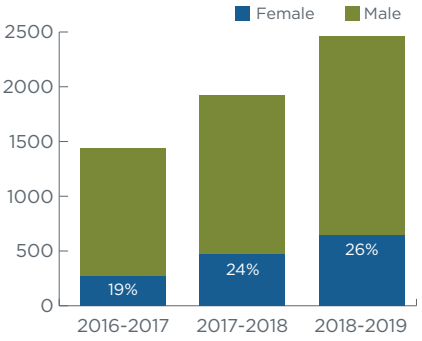
High Schools Teaching CS



High Schools Teaching CS by School Type



AP CS Student Participation

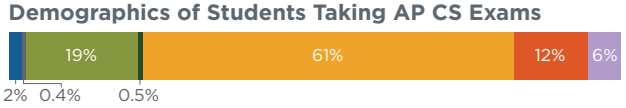


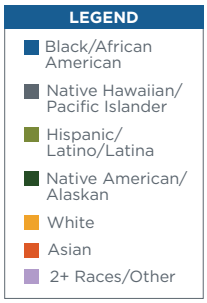
Access and Participation by Race/Ethnicity

Overall Student Demographics

Demographics in Schools Teaching AP CS

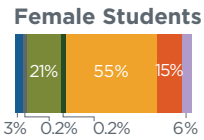
Demographics of Students Taking AP CS Exams



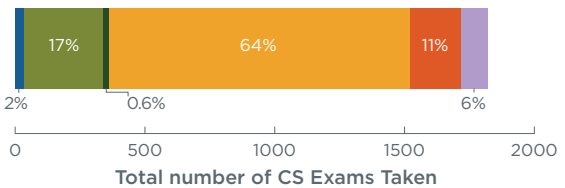


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



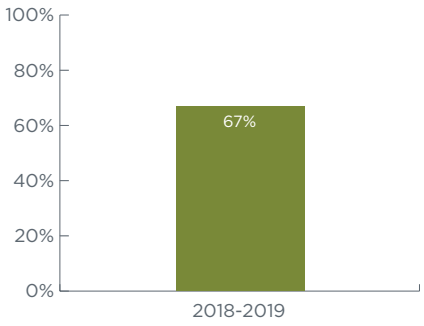
Hispanic/Latinx students are 1.5 times less likely than their white and Asian peers to attend a school that offers AP CS, and 1.5 times less likely to take an AP CS exam when they attend a school that offers it. Black students are 2.3 times less likely and Native American students are 1.7 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Connecticut

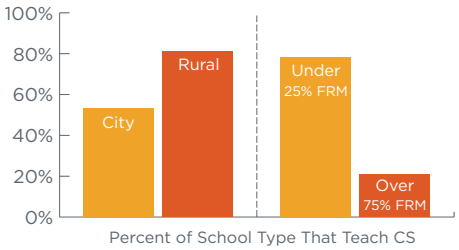
State Plan Yes	The State Board of Education adopted a computer science plan in 2020. The plan includes recommendations to reduce gaps in access to computer science courses for female students, students with high needs, and students from marginalized racial and ethnic groups underrepresented in computer science. The plan also targets diverse representation in computer science teachers.
Standards Yes	The state adopted the CSTA K–12 Computer Science Standards in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding No	Although SB 957 (2019) created a fund for computer science, no funding has been dedicated yet.
Certification Yes	Teachers with existing licensure can obtain the K–6 or 7–12 endorsement through academic coursework or passing the Praxis CS exam (approved in December 2019).
Preservice Yes	SB 957 (2019) required teacher preparation programs to include, as part of the curriculum for all preservice candidates, instruction in computer science that is grade-level and subject-area appropriate.
CS Supervisor Yes	The Department of Education has a Computer Science Education Consultant.
All HS Offer Yes	SB 957 (2019) added computer science to the list of subjects that public schools must teach, with implementation by the 2019–2020 school year.
Grad Credit No	The state does not yet allow computer science to count for a core graduation requirement.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

Connecticut is a member of the ECEP Alliance and has a CSTA chapter.

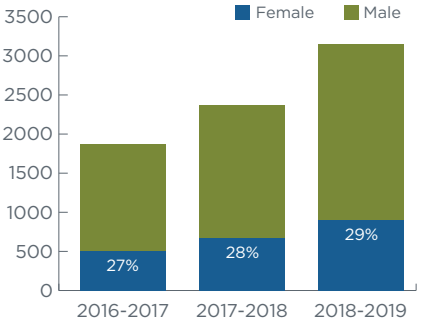
High Schools Teaching CS



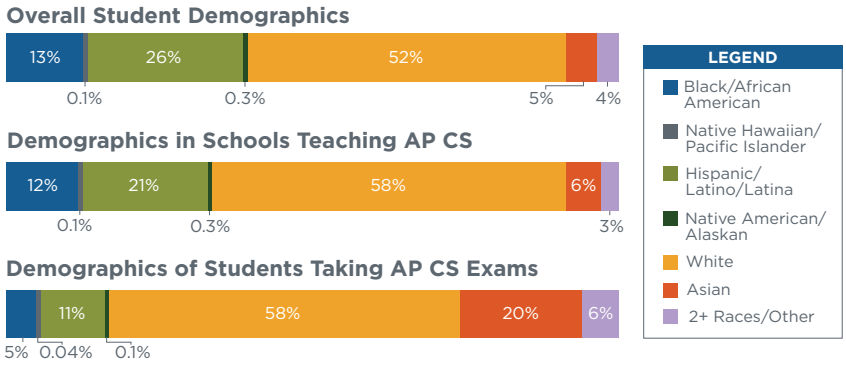
High Schools Teaching CS by School Type



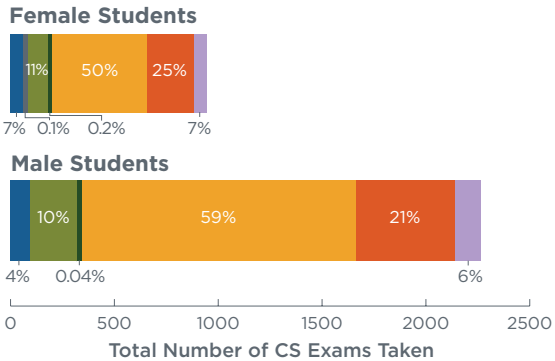
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



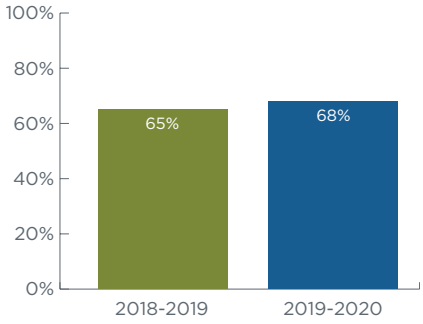
Black students are 2.7 times less likely and Hispanic/Latinx students are 2.4 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Delaware

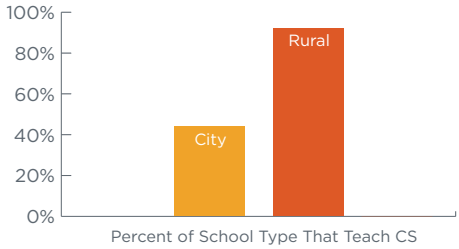
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted the CSTA K–12 Computer Science Standards in 2018. The "Equity" section in the Implementation Guidelines includes examples of ways to broaden participation in computer science education, and standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification No	The state does not yet have a computer science teacher certification.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer Yes	HB 15 (2017) required all high schools to offer computer science by the 2020–2021 school year.
Grad Credit Yes	An Advanced Placement, honors, college prep, or integrated computer science course meeting the computer science and mathematics standards can count as the fourth mathematics credit for graduation.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

Delaware has a CSTA chapter.

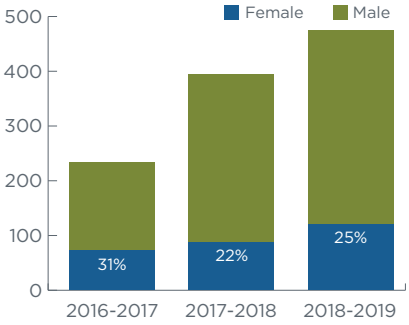
High Schools Teaching CS



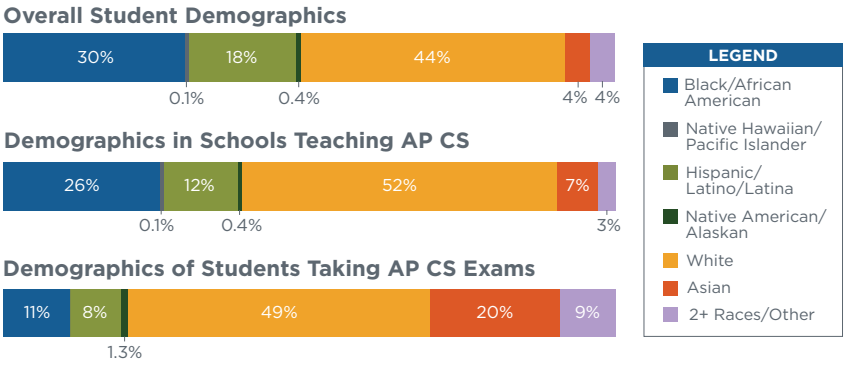
High Schools Teaching CS by School Type



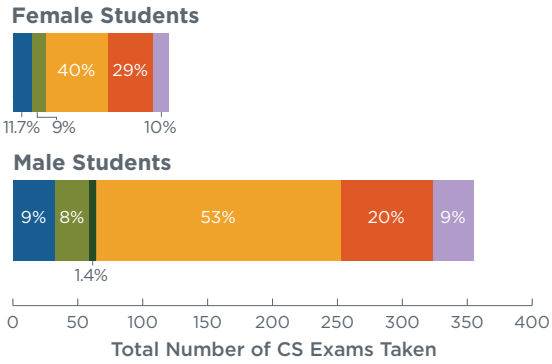
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender

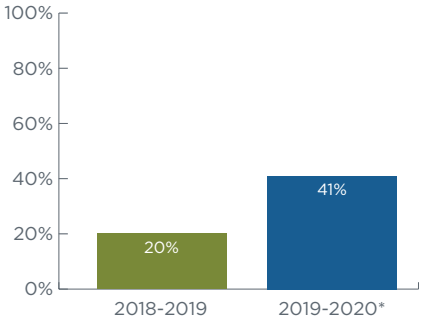


Hispanic/Latinx students are 2 times less likely than their white and Asian peers to attend a school that offers AP CS, and 2 times less likely to take an AP CS exam when they attend a school that offers it. Black students are 3 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

District of Columbia

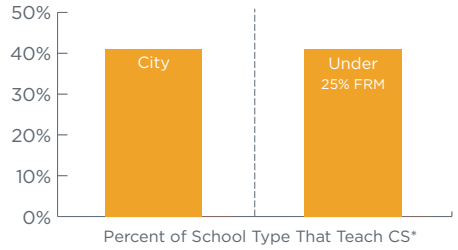
State Plan No	DC has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines. Although a computer science working group established in 2016 was tasked with creating a vision for computer science in the District, no recommendations were put forth.
Standards No	DC does not yet have a discrete set of rigorous computer science standards across K–12.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification Yes	Teachers with existing licensure can obtain a 7–12 certification by passing the Praxis CS exam. An initial license in computer science requires academic course work and passing the exam.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	An AP computer science course can count as the fourth-year upper-level mathematics credit for graduation.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

High Schools Teaching CS



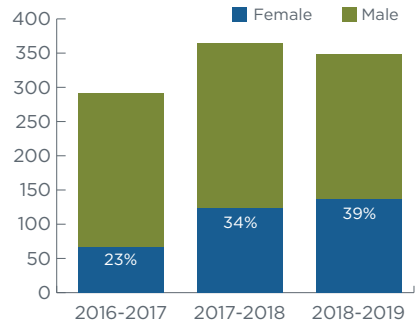
*2019 data includes CTE courses that were not included in 2018

High Schools Teaching CS by School Type



*All schools are located in the city locale and have less than 25% students eligible for FRM.

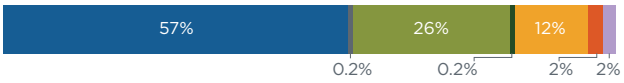
AP CS Student Participation



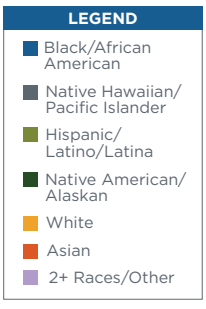
Access and Participation by Race/Ethnicity

Overall Student Demographics

Demographics in Schools Teaching AP CS

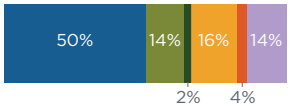


Demographics of Students Taking AP CS Exams

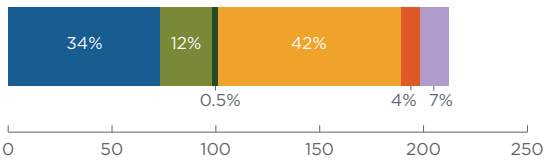


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



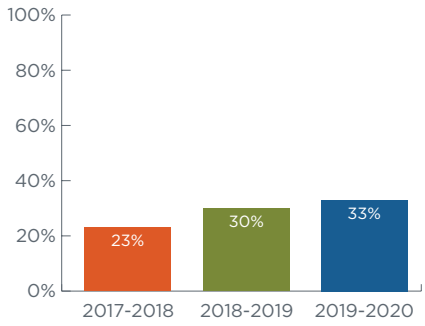
Hispanic/Latinx students are 2.3 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it. Black students are 1.3 times less likely than their white and Asian peers to attend a school offers AP CS and 1.3 times less likely to take an AP CS exam when they attend a school that offers it.

Florida

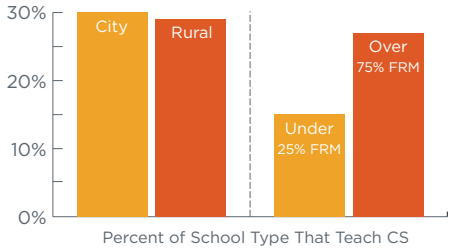
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted K–12 computer science standards as a strand within the state science standards in 2016. Benchmarks within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	HB 5001 (FY 2021) and SB 2500 (FY 2020) allocated $10M annually for computer science teacher certification and professional development. SB 7070 (FY 2019) established recruitment awards for newly hired teachers who are content experts in computer science.
Certification Yes	Teachers can obtain the K–12 certification as an initial license or an add-on endorsement through academic coursework. State funding for computer science can be used to support credentialing for teachers.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The Department of Education has a Computer Science Program Specialist.
All HS Offer Yes	HB 495 (2018) required 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.
Grad Credit Yes	Computer science can count as a math or science credit for graduation (HB 7071 in 2019 removed the industry certification requirement).
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

Florida has CSTA chapters.

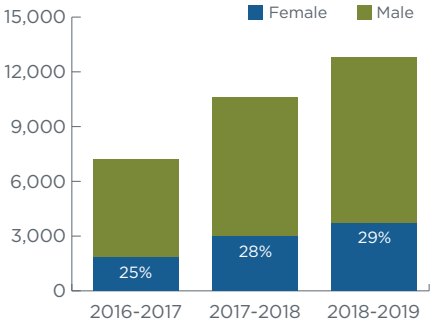
High Schools Teaching CS



High Schools Teaching CS by School Type



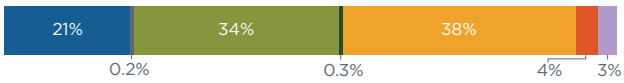
AP CS Student Participation



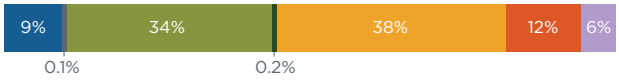
Access and Participation by Race/Ethnicity

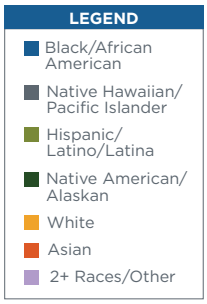
Overall Student Demographics

Demographics in Schools Teaching AP CS



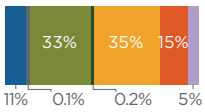
Demographics of Students Taking AP CS Exams



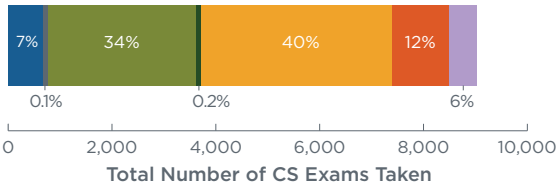


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



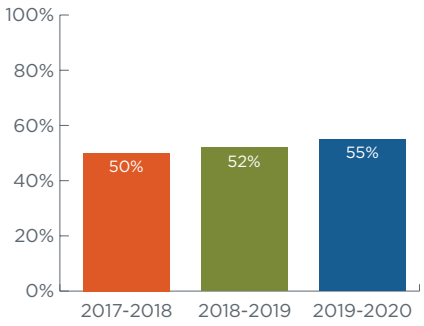
Students of all racial and ethnic groups have access to AP CS on par with their state population, but Black students are 2.7 times less likely and Native American students are 2 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Georgia

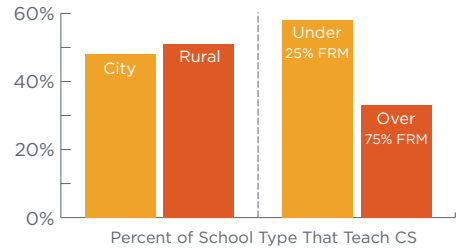
State Plan Yes	The Department of Education developed a state plan in 2018 with strategies to improve diversity in computer science, which includes rural and economically challenged communities.
Standards In Progress	Although the state does not yet have a discrete set of rigorous computer science standards across K–12, K–8 computer science standards were adopted in 2019.
Funding Yes	HB 793 (FY 2021) and HB 31 (FY 2020) appropriated $656.5K and $750K for the grant program established by SB 108 (FY 2019). HB 683 (FY 2018) appropriated $500K for middle school coding and teacher professional development. In FY 2016, the Governor's Office of Student Achievement Innovation Funds allocated $250K.
Certification Yes	Teachers with existing licensure can obtain a 6–12 academic endorsement by passing the Georgia GACE Computer Science Assessment. An initial license in computer science requires completing a state-approved program.
Preservice Yes	The Department of Education has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.
CS Supervisor Yes	The Department of Education has a Computer Science Education Program Specialist.
All HS Offer Yes	SB 108 (2019) required all high schools to offer computer science beginning in the 2024–2025 school year. The state set incremental requirements, requiring that at least one high school in each school system offers a course by the 2022–2023 school year, and half of all high schools offer a course by the 2023–2024 school year. All middle and elementary schools must offer computer science instruction by the 2022–2023 school year.
Grad Credit Yes	Of the approved computing courses in the state, nine can count as the fourth mathematics credit or the fourth science credit for graduation.
IHE Admission Yes	Computer science can count as a science or foreign language credit required for admission at institutions of higher education, which aligns with the high school graduation policy.

Georgia is a member of the ECEP Alliance and has a CSTA chapter.

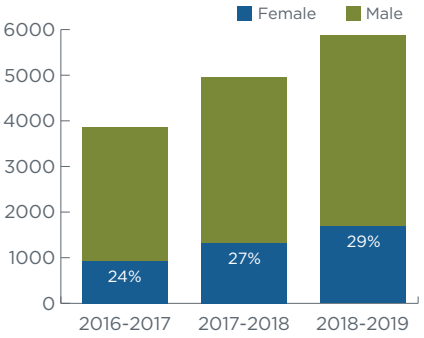
High Schools Teaching CS



High Schools Teaching CS by School Type

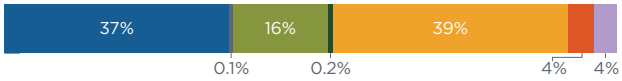


AP CS Student Participation

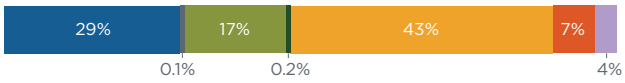


Access and Participation by Race/Ethnicity

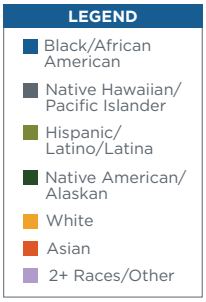
Overall Student Demographics



Demographics in Schools Teaching AP CS

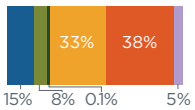


Demographics of Students Taking AP CS Exams

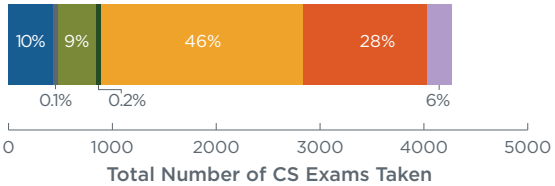


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



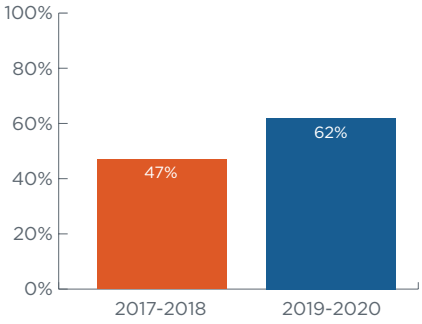
Black students are 1.5 times less likely than their white and Asian peers to attend a school that offers AP CS, and 3.6 times less likely to take an AP CS exam when they attend a school that offers it. Hispanic/Latinx students are 3 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Hawaii

State Plan Yes	The Hawaii State Department of Education developed a state plan for expanding computer science access in 2018. The plan includes a section focused on goals to increase diversity and equity in computer science.
Standards Yes	The state adopted the CSTA K–12 Computer Science Standards in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	HB 2607 (FY 2019) dedicated $500K to computer science teacher professional development and required grantees to address how they plan to instruct teachers to effectively teach students in computer science, including students from demographic groups that are historically underrepresented in computer science. In 2019, the state budget increased the weighted per-pupil funding to schools by $3M, recommending that schools use some of these funds to implement computer science curriculum.
Certification Yes	Teachers with existing licensure can obtain a K–6, 6–12, or K–12 certification by completing a state-approved teacher education program, passing the Praxis CS exam, coursework and experience, professional development and experience, or holding a certification from another state and experience. The state also has a limited license for individuals with CS industry experience.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The Department of Education has a Computer Science Specialist.
All HS Offer Yes	Act 51 (2018) required all high schools to offer at least one computer science course by the 2021–2022 school year.
Grad Credit Yes	AP computer science can count as the fourth mathematics credit required for the Academic or STEM Honors Recognition Certificate for graduation.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

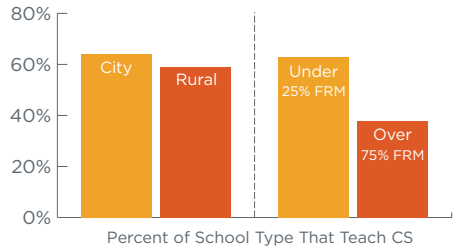
Hawaii is a member of the ECEP Alliance, has a CSTA chapter, and Governor David Ige is a member of the Governors' Partnership for K–12 Computer Science.

High Schools Teaching CS*

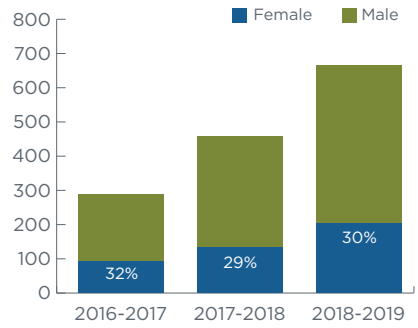


*Data includes public DOE and public charter schools; 68% of DOE high schools teach CS. Data was not collected for the 2018–2019 school year.

High Schools Teaching CS by School Type

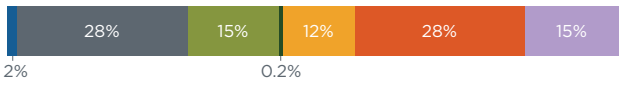


AP CS Student Participation

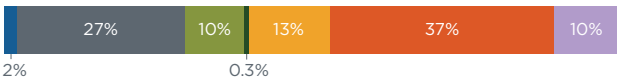


Access and Participation by Race/Ethnicity

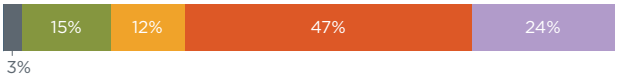
Overall Student Demographics

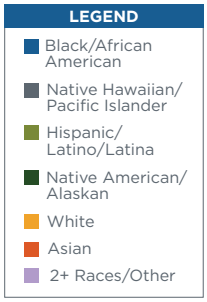


Demographics in Schools Teaching AP CS



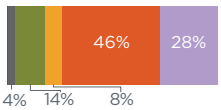
Demographics of Students Taking AP CS Exams



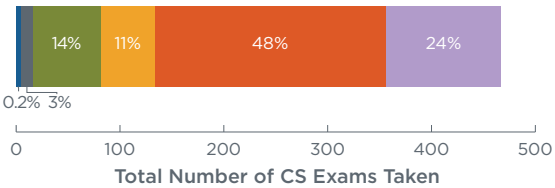


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



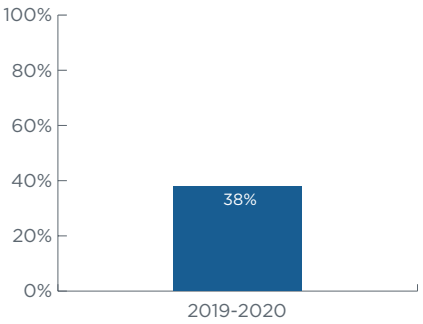
Native Hawaiian/Pacific Islander students are 11 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it. Hispanic/Latinx students are 2 times less likely than their white and Asian peers to attend a school that offers AP CS.

Idaho

State Plan Yes	The Idaho STEM Action Center and Idaho Digital Learning Academy developed a state plan in 2018. The plan includes goals and strategies to increase access for female, rural, and low-income students, and students from marginalized racial and ethnic groups underrepresented in computer science.
Standards Yes	The state adopted K–12 computer science standards based on the CSTA standards in 2017. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	H0331 (FY 2021) allocated $500K, H0215 (FY 2020) allocated $1M, and H0669 (FY 2019), H0298 (FY 2018), and H0379 (FY 2017) each allocated $2M annually for the expansion of computer science.
Certification Yes	Teachers with existing licensure can obtain a 6–12 or 5–9 endorsement by passing the Praxis CS exam. An initial license in computer science requires completing a state-approved program and passing the exam. A 6–12 CTE Occupational Specialist certification in computer science can be obtained with industry experience.
Preservice Yes	The State Department of Education has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.
CS Supervisor Yes	The Governor's STEM Action Center has a Computer Science Program Manager.
All HS Offer Yes	H648 (2018) required each school district to make one or more computer science courses available to all high school students by FY 2020. Students must have the option of taking the course as part of the normal instructional hours at the school where the student is enrolled. Courses may be offered online, in person, or through blended instruction.
Grad Credit Yes	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.
IHE Admission Yes	Under certain conditions, computer science can count as a mathematics or science credit required for admission at institutions of higher education.

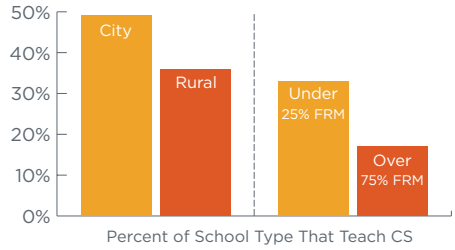
Idaho has a CSTA chapter.

High Schools Teaching CS*

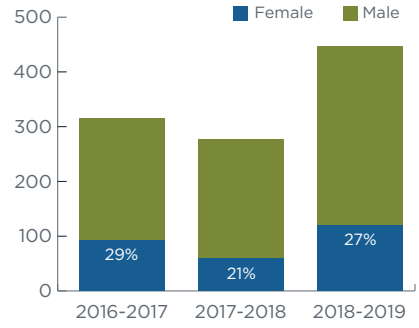


*May not reflect all courses the state defines as computer science

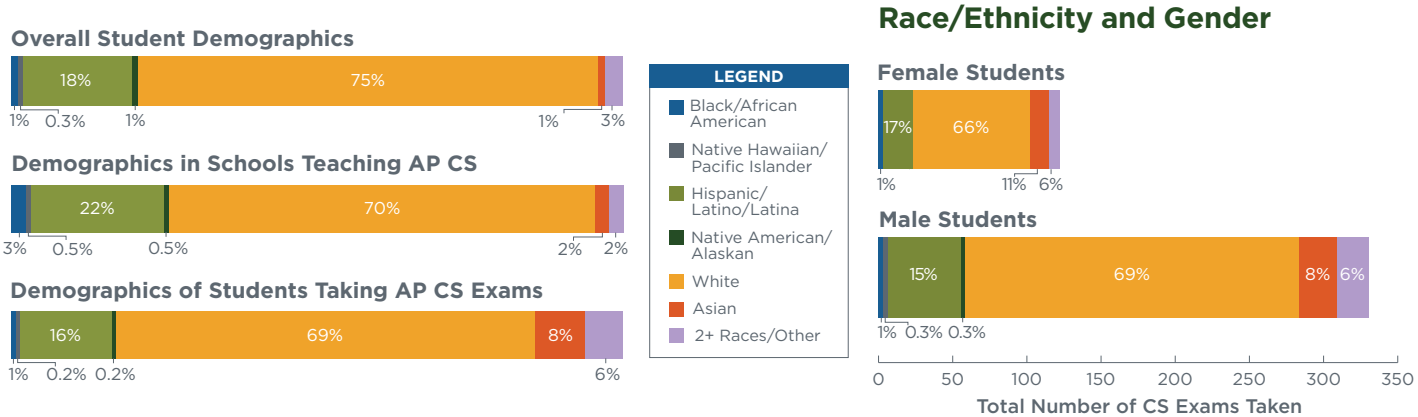
High Schools Teaching CS by School Type



AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender

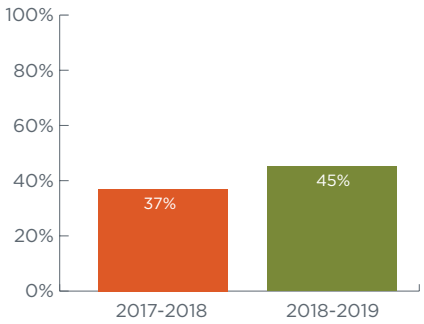
Native American students are 2 times less likely than their white and Asian peers to attend a school that offers AP CS, and 2.3 times less likely to take an AP CS exam when they attend a school that offers it. Hispanic/ Latinx students are 1.5 times less likely to take an AP CS exam when they attend a school that offers it.

Illinois

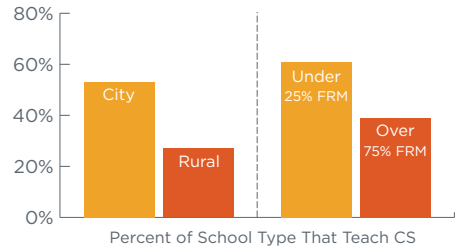
State Plan No	Although the state has not yet created a plan for K–12 computer science, a task force on computer science education created by HB 5720 (2016) developed and presented recommendations to the Illinois General Assembly in 2017.
Standards No	The state does not yet have a discrete set of rigorous computer science standards across K–12.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification Yes	Teachers with existing licensure can obtain a 5–8, 6–8, or 9–12 endorsement through academic coursework, including computer science teaching methods and passing the state content exam.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	Computer science can count as a mathematics credit for graduation.
IHE Admission Yes	Computer science can count as a mathematics credit required for admission at institutions of higher education, which aligns with the high school graduation policy.

Illinois has a CSTA chapter.

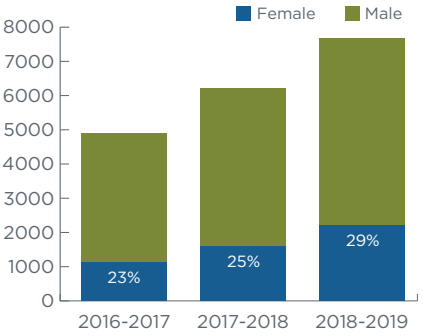
High Schools Teaching CS



High Schools Teaching CS by School Type

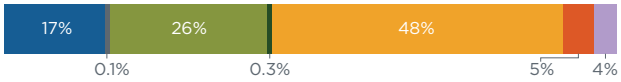


AP CS Student Participation



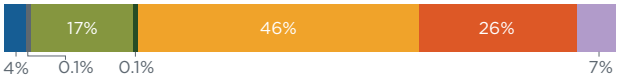
Access and Participation by Race/Ethnicity

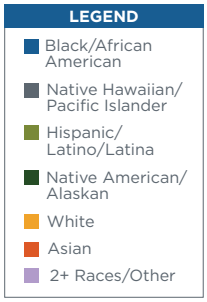
Overall Student Demographics



Demographics in Schools Teaching AP CS

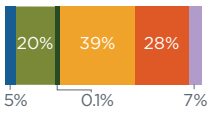
Demographics of Students Taking AP CS Exams



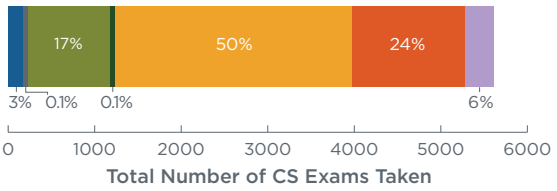


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



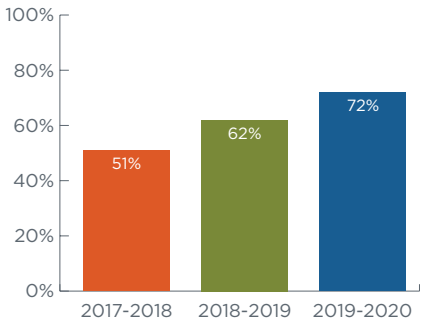
Native American students are 4 times less likely and Hispanic/Latinx students are 2 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it. Black students are 1.6 times less likely than their white and Asian peers to attend a school that offers AP CS, and 4 times less likely to take an AP CS exam when they attend a school that offers it.

Indiana

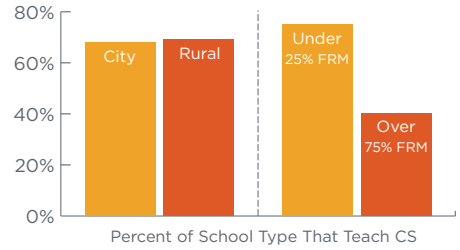
State Plan Yes	The Department of Education created a state plan in 2019. The plan includes a section focused on goals and strategies to increase participation for female students, students with disabilities, rural students, and students from marginalized racial and ethnic groups underrepresented in computer science.
Standards Yes	The state published a comprehensive set of K–12 computer science standards in 2018.
Funding Yes	HEA 1001 (FY 2020 and 2021) allocated $3M annually for teacher professional development. SEA 172 (FY 2019) required the Department of Education to contract with a provider to offer professional development.
Certification Yes	Teachers with existing licensure can obtain a 5–12 or preK–12 academic endorsement by passing the state-adopted content exam. An initial license in computer science requires completing a state-approved program and passing the exam. The state has a CTE Workplace Specialist license for individuals with occupational experience.
Preservice Yes	The Department of Education has approved computer science teacher preparation programs. In 2020, Indiana began requiring all preservice K–8 teachers to learn computer science.
CS Supervisor Yes	The Department of Education has a Computer Science Specialist.
All HS Offer Yes	SEA 172 (2018) required all elementary, middle, and high schools to offer computer science by the 2021–2022 school year. SEA 295 (2020) required the department to post an annual report on computer science course enrollment disaggregated by race, gender, grade, ethnicity, limited English proficiency, free and reduced lunch status, and eligibility for special education.
Grad Credit Yes	AP Computer Science, IB Computer Science, Cambridge International CS, Industrial Automation and Robotics, or CTE CS I or II can count as a mathematics or quantitative reasoning credit required for graduation. Computer science can also count as the third science requirement.
IHE Admission Yes	Computer science can count as a mathematics credit required for admission at institutions of higher education, which aligns with the high school graduation policy.

Indiana is a member of the ECEP Alliance, has a CSTA chapter, and Governor Eric Holcomb is a member of the Governors' Partnership for K–12 Computer Science.

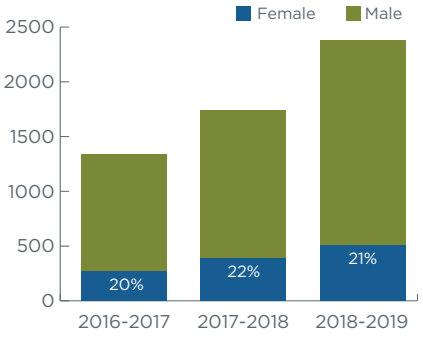
High Schools Teaching CS



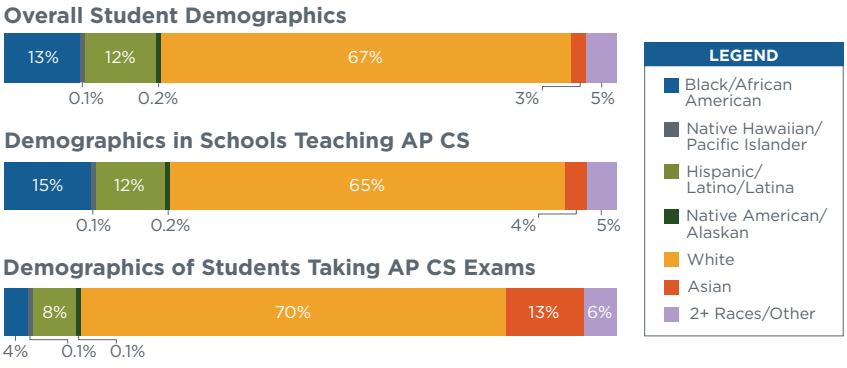
High Schools Teaching CS by School Type



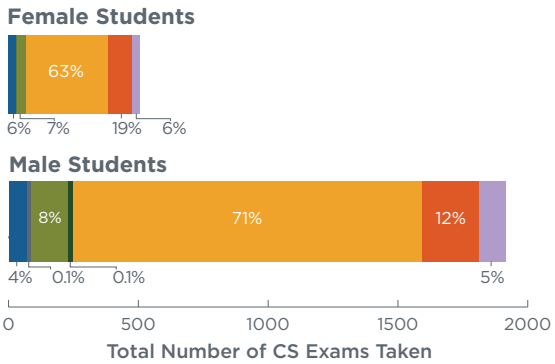
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



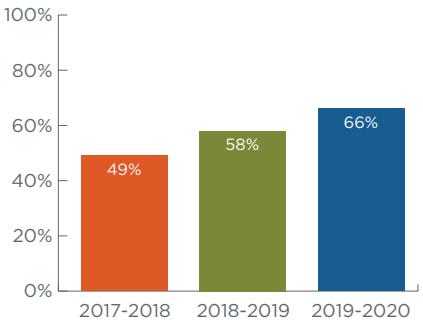
Hispanic/Latinx students are 2 times less likely, Black students are 4 times less likely, and Native American students are 5 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Iowa

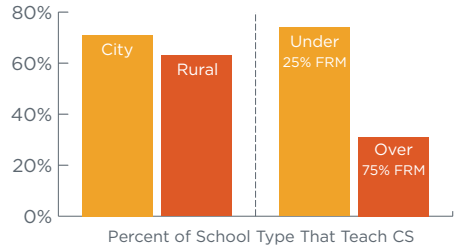
State Plan In Progress	HF 2629 (2020) required the development of a statewide K–12 computer science plan by July 1, 2022.
Standards Yes	The state adopted the CSTA K–12 Computer Science Standards in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	HF 2643 (FY 2021), HF 758 (FY 2020) and HF 642 (FY 2019) allocated $500K annually for computer science professional development. Another $500K was added to the fund in FY 2019. The grant rubric prioritizes targeted efforts to increase computer science participation by underrepresented groups (including female students, economically disadvantaged students, and students who are Black/African American, Hispanic/Latino/Latina, Native American/Alaskan, or Native Hawaiian/Pacific Islander).
Certification Yes	Teachers with existing licensure can obtain a 5–12 or K–8 endorsement by completing a state-approved program or academic coursework in both content and methods. The state waived these requirements in 2018 for teachers who could demonstrate content knowledge and successful teaching experience.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The Department of Education has a Computer Science Education Program.
All HS Offer Yes	HF 2629 (2020) required all high schools to offer computer science by July 1, 2022, and required all elementary and middle schools to offer computer science in at least one grade level by July 1, 2023.
Grad Credit Dist. Decision	The state passed a permissive and encouraging policy to allow computer science to count as a mathematics credit for graduation, but it is a district decision.
IHE Admission Yes	Computer science can count towards a core subject area credit required for admission at institutions of higher education.

Iowa has a CSTA chapter and Governor Kim Reynolds is a member of the Governors' Partnership for K–12 Computer Science.

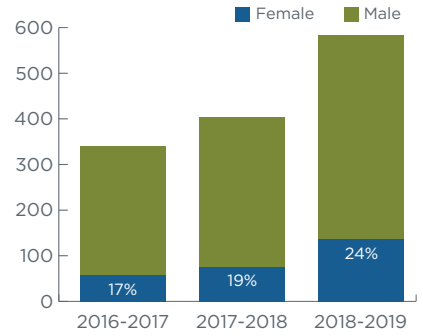
High Schools Teaching CS



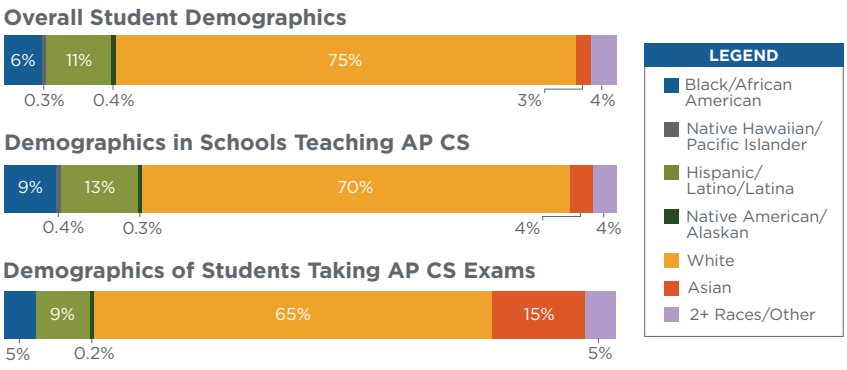
High Schools Teaching CS by School Type



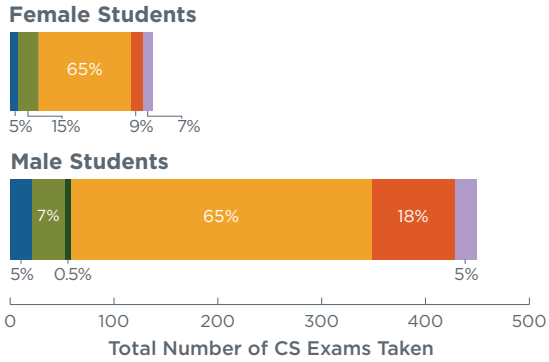
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



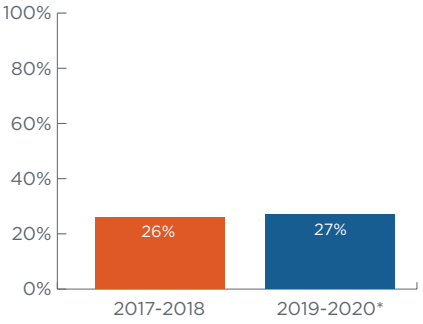
Hispanic/Latinx students are 1.5 times less likely and Black students are 2 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Kansas

State Plan No	Although the state has not yet created a plan for K–12 computer science, the State Board of Education adopted five policy recommendations from the Department of Education's Computer Science Education Task Force in 2020. The five recommendations include encouraging all schools to offer computer science, allowing computer science to satisfy a core graduation requirement, create a licensure endorsement, and arrange funding to carry out these goals.
Standards Yes	The state adopted preK–12 computer science standards in 2019. A primary goal of the standards is to increase the availability of rigorous computer science for all students, especially those who are members of underrepresented groups.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification No	The state does not yet have a computer science teacher certification.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The Department of Education has a Computer Science Education Program Consultant.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit No	The state does not yet allow computer science to count for a core graduation requirement.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

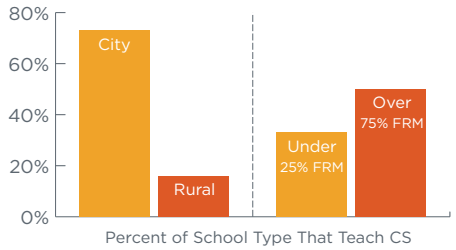
Kansas has a CSTA chapter.

High Schools Teaching CS

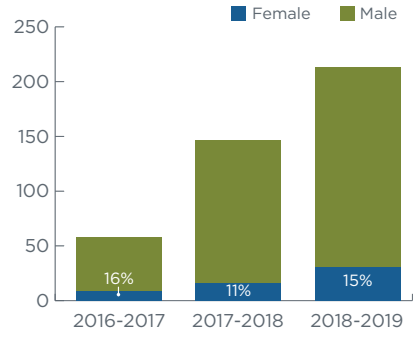


*Data was not collected for the 2018–2019 school year

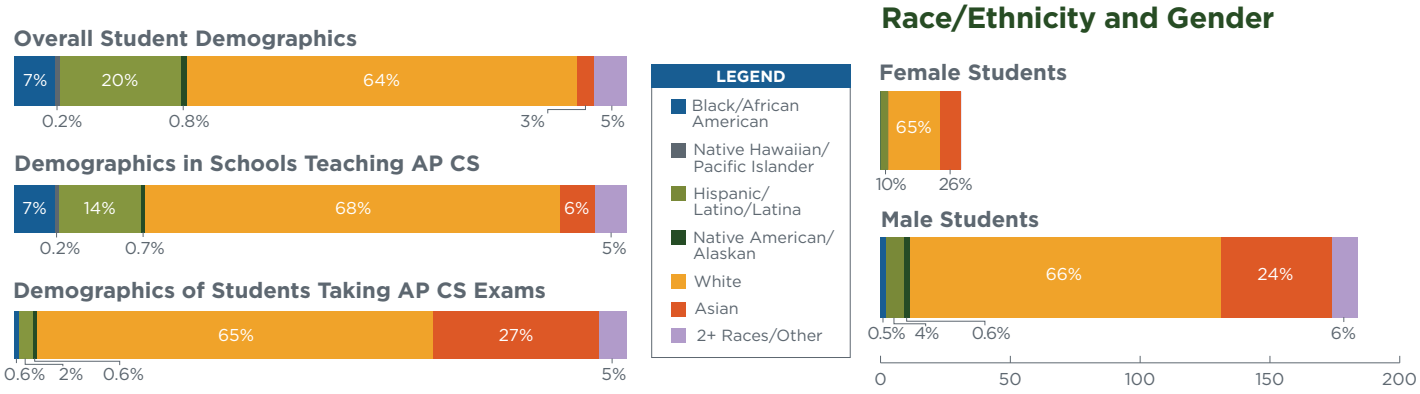
High Schools Teaching CS by School Type



AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender

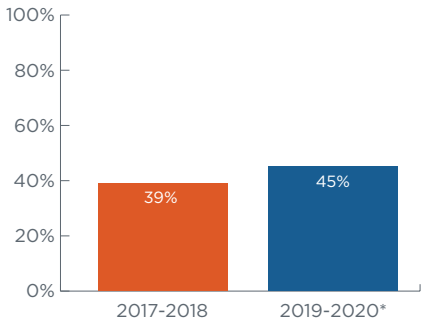
Although Hispanic/Latinx students make up 20% of the overall student population, only 4 Hispanic/Latinx students took an AP CS exam. Black students make up 7% of the overall student population, but only 1 Black student took an AP CS exam.

Kentucky

State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted K–12 computer science standards in 2019.
Funding Yes	HB 2000 (FY 2020) dedicated $800K to the CS and IT academy to address growth in computer science learning. The funding is dedicated to student exam vouchers, teacher K–12 computer science professional learning, and teacher industry certifications.
Certification Yes	Teachers with existing licensure can obtain an 8–12 endorsement in computer science.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The Department of Education has a dedicated K–12 Computer Science Lead.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Dist. Decision	The state 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.
IHE Admission Yes	Computer science can count as a mathematics credit required for admission at institutions of higher education if the K–12 district allows the student to fulfill a mathematics graduation credit via the computer science course.

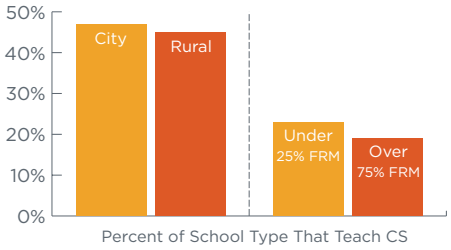
Kentucky has CSTA chapters.

High Schools Teaching CS

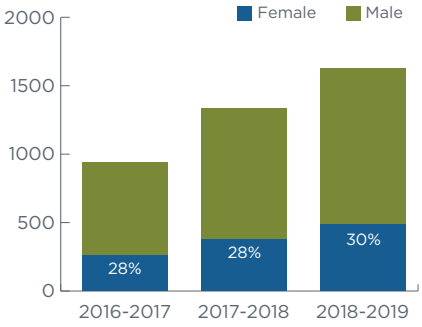


* Data was not collected for the 2018–2019 school year

High Schools Teaching CS by School Type

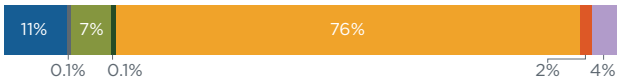


AP CS Student Participation

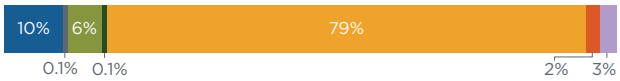


Access and Participation by Race/Ethnicity

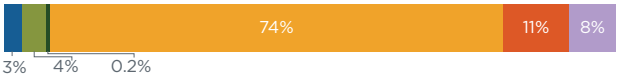
Overall Student Demographics

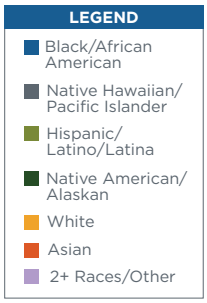


Demographics in Schools Teaching AP CS



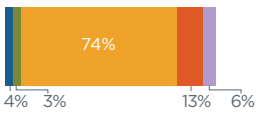
Demographics of Students Taking AP CS Exams



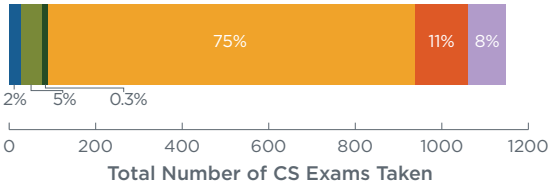


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



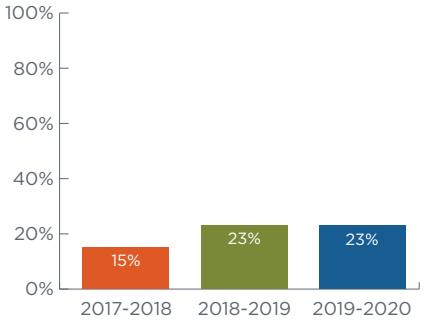
Hispanic/Latinx students are 1.5 times less likely and Black students are 4 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Louisiana

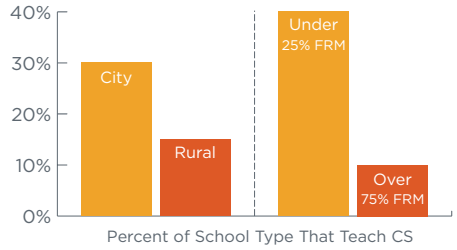
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards No	The state does not yet have a discrete set of rigorous computer science standards across K–12.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification Yes	Teachers with existing licensure can add a 6–12 specialty content area in computer science through academic coursework and/or passing the Praxis CS exam.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	AP Computer Science A can count as an advanced mathematics credit for graduation.
IHE Admission Yes	AP Computer Science A can count as a mathematics credit required for admission at institutions of higher education.

Louisiana has a CSTA chapter.

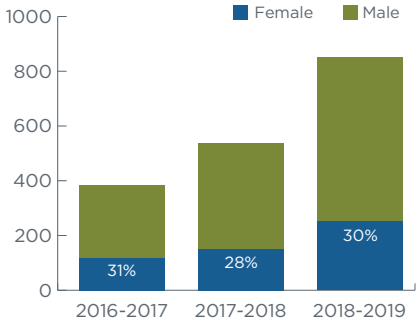
High Schools Teaching CS



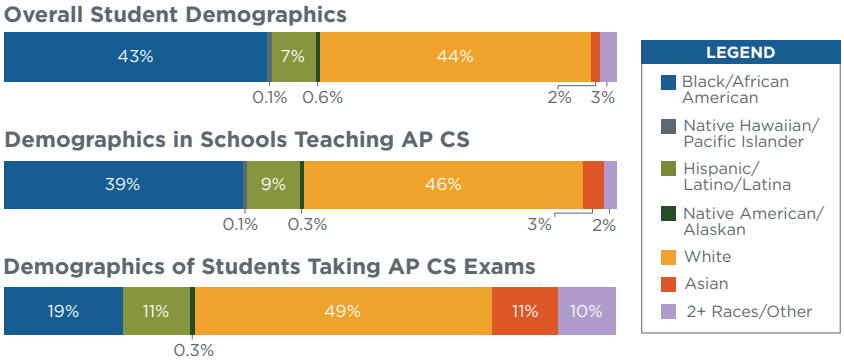
High Schools Teaching CS by School Type



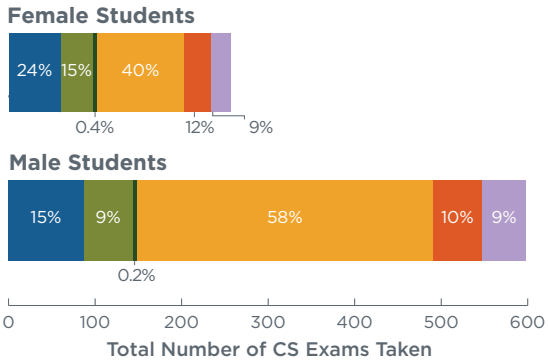
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender

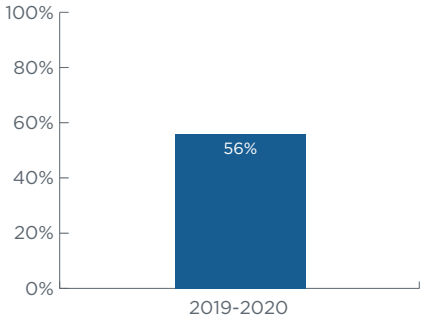


Native American/Alaskan students are 2.3 times less likely than their white and Asian peers to attend a school that offers AP CS. Black students are 2.5 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

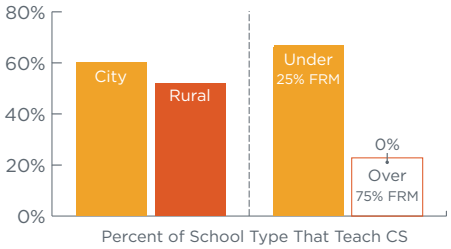
Maine

State Plan Yes	The Department of Education developed a state plan for computer science in January 2020 as required by LD 1382. Previously, a task force established by LD 398 (2017) presented recommendations to recognize computer science in the path to proficiency.
Standards No	The state does not yet have a discrete set of rigorous computer science standards across K–12.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification No	The state does not yet have a computer science teacher certification.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The Department of Education has a Secondary Digital Learning and Computer Science Specialist.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Dist. Decision	The state passed a policy in 2019 to allow computer science to count as a credit for graduation, but it is a district decision.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.
Maine has a CSTA chapter.	

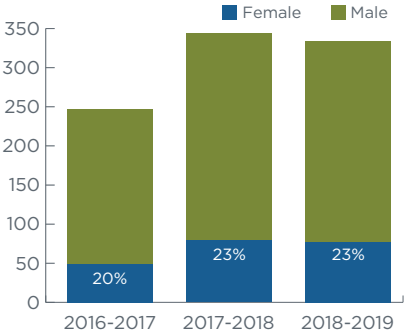
High Schools Teaching CS



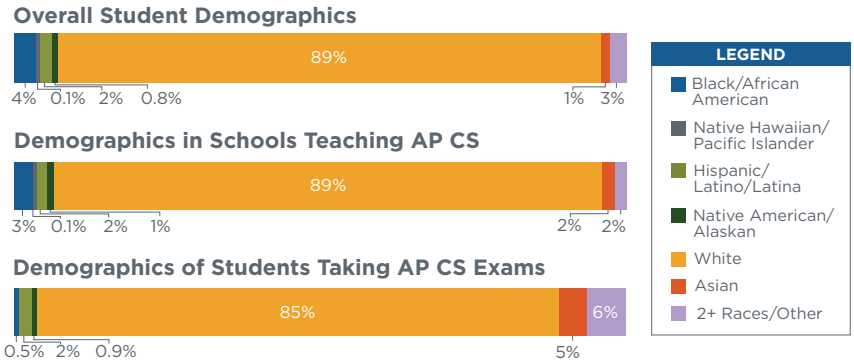
High Schools Teaching CS by School Type



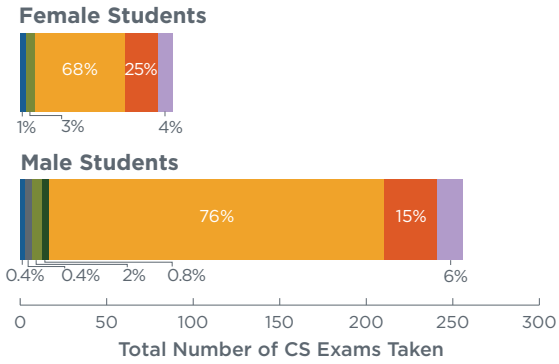
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



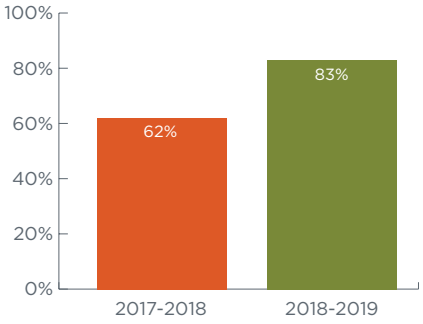
Although Black students make up 3.8% of the overall student population, only 1 Black student took an AP CS exam.

Maryland

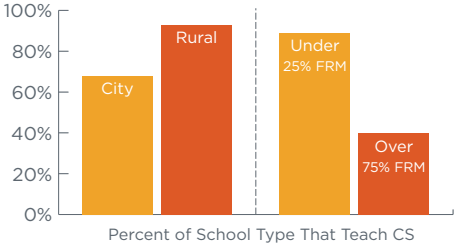
State Plan Yes	The Maryland Center for Computing Education (MCCE) developed a state plan in 2018. The plan addresses efforts to increase the enrollment of female students, students with disabilities, and students from underrepresented racial and ethnic groups.
Standards Yes	The state approved K–12 computer science standards aligned to the CSTA standards in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	HB 281 (FY 2020 and 2021) allocated $1M annually, and SB 185 (FY 2019) allocated $5M for computer science education. Grants focus on serving areas with high poverty, rural areas, students with disabilities, female students, or students from marginalized racial and ethnic groups.
Certification Yes	Teachers with existing licensure can obtain a 7–12 endorsement through academic coursework or passing the Praxis CS exam. An initial computer science licensure requires completing academic coursework and passing the exam. Pathways for CTE, alternative certification, and an accelerated certificate also exist. A stipend is available through the MCCE for teachers who pass the exam.
Preservice Yes	The Department of Education has approved teacher preparation programs leading to certification in computer science. The state provides funding for teacher preparation institutions to establish computer science education programs via HB 281 (2018).
CS Supervisor Yes	The Department of Education has a Computer Science Education Specialist as well as a Career Programs, STEM, and Computer Science Coordinator who collaborates with the Director of the MCCE.
All HS Offer Yes	HB 281 (2018) required all high schools to offer at least one computer science course by the 2021–2022 school year and asked each school board to incorporate computer science in elementary and middle schools and to increase the enrollment of female students, students with disabilities, and students of underrepresented ethnic and racial groups.
Grad Credit Yes	Foundations of Computer Science or Computer Science Principles can fulfill the technology credit requirement. AP Computer Science A can count as one of the four mathematics credits for graduation.
IHE Admission Yes	AP Computer Science can count as one of the four mathematics credits required for admission at institutions of higher education, as long as computer science is not the final year course, which aligns with the high school graduation policy.

Maryland is a member of the ECEP Alliance, has a CSTA chapter, and Governor Larry Hogan is a member of the Governors' Partnership for K–12 Computer Science.

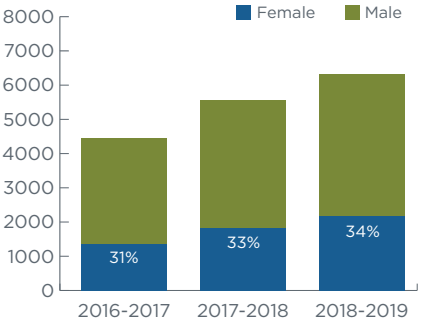
High Schools Teaching CS



High Schools Teaching CS by School Type

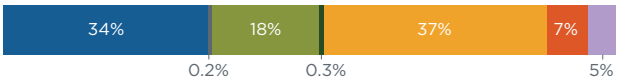


AP CS Student Participation

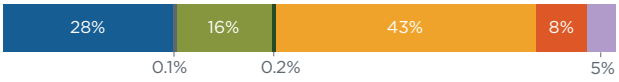


Access and Participation by Race/Ethnicity

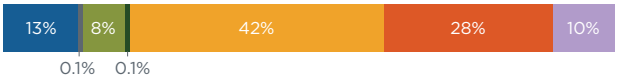
Overall Student Demographics

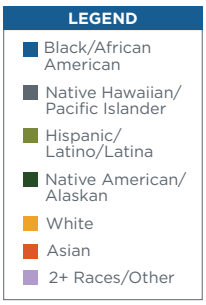


Demographics in Schools Teaching AP CS



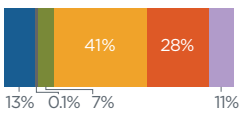
Demographics of Students Taking AP CS Exams



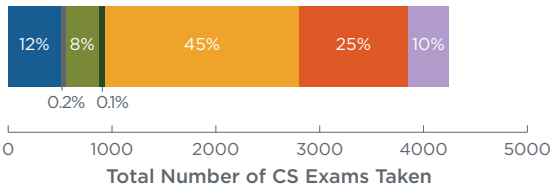


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



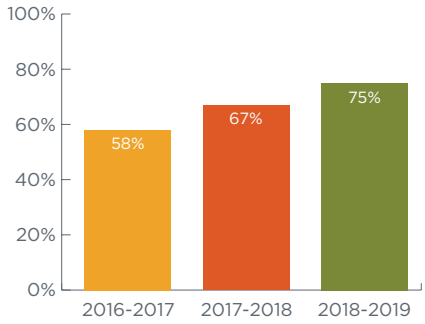
Hispanic/Latinx students and Black students are each 3 times less likely, and Native American students are 5 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Massachusetts

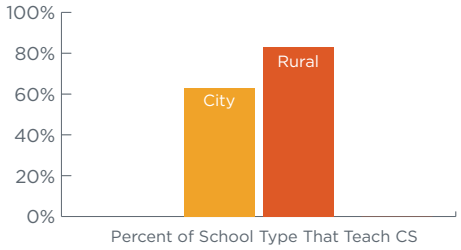
State Plan In Progress	The state is in the process of creating a plan for K–12 computer science, as required by the FY 2020 state budget.
Standards Yes	The state adopted K–12 digital literacy and computer science standards in 2016.
Funding Yes	H4000 (FY 2020) allocated $1M for computer science implementation; $590K went to the Digital Literacy Now grant program. The grant program prioritizes underserved students, including economically disadvantaged students, English language learners, students receiving special education services, students from marginalized racial and ethnic groups, and students in rural areas. H4800 (FY 2019) and H3650 (FY 2016) allocated $850K and $1.7M and required a one-to-one private match.
Certification Yes	Teachers can obtain a 5–12 certification through a combination of academic coursework, professional development, mentorship experience, teaching experience, passing the Pearson and/or Praxis CS exam, and/or by completing an approved teacher preparation program.
Preservice Yes	The Department of Elementary and Secondary Education has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.
CS Supervisor Yes	The Department of Elementary and Secondary Education has a Computer Science Content Coordinator.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	A computer science course can substitute for either a mathematics or laboratory science course if the course includes rigorous mathematical or scientific concepts and aligns with the state computer science standards. Students in technical and vocational programs may substitute a computer science course for a foreign language.
IHE Admission Yes	A computer science course can count as a mathematics, science, or foreign language credit required for admission at institutions of higher education if the course meets certain criteria.

Massachusetts is a member of the ECEP Alliance and has CSTA chapters.

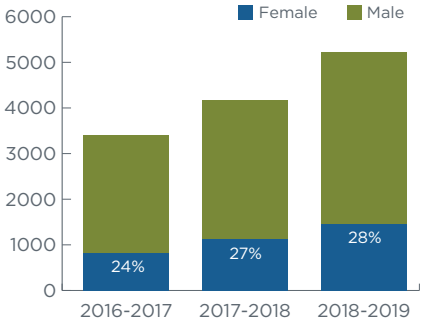
High Schools Teaching CS



High Schools Teaching CS by School Type



AP CS Student Participation

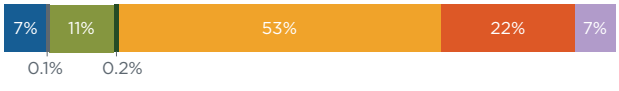


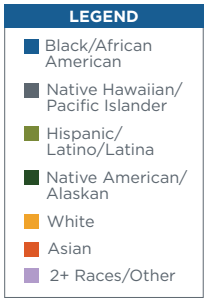
Access and Participation by Race/Ethnicity

Overall Student Demographics

Demographics in Schools Teaching AP CS

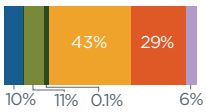
Demographics of Students Taking AP CS Exams



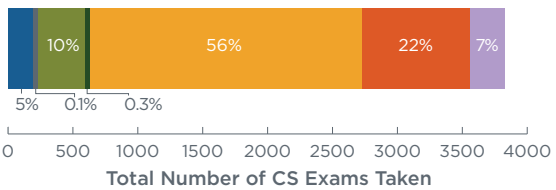


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



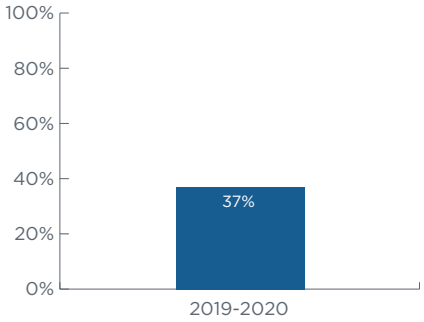
Hispanic/Latinx students are 1.7 times less likely and Black students are 1.5 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Michigan

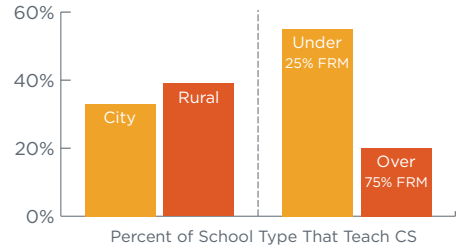
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines. However, as a prelude to a state plan, the Department of Education is collaborating with Michigan State University to create a landscape report.
Standards Yes	The state adopted the CSTA K–12 Computer Science Standards in 2019. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification No	The state phased out the computer science endorsement in 2017 so that any licensed teacher is eligible to teach computer science.
Preservice No	After the state phased out the computer science certification, teacher preparation programs in Michigan also phased out preservice programs in computer science education.
CS Supervisor Yes	The Department of Education has a Computer Science Consultant.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	Any department-approved computer science course can count as the fourth mathematics credit for graduation or replace the Algebra II requirement.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

Michigan has a CSTA chapter.

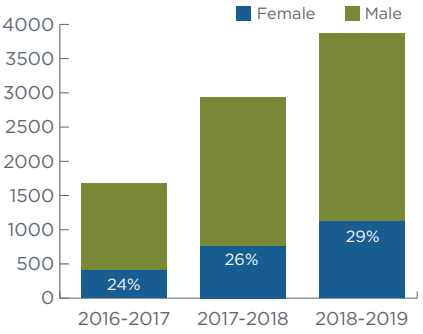
High Schools Teaching CS



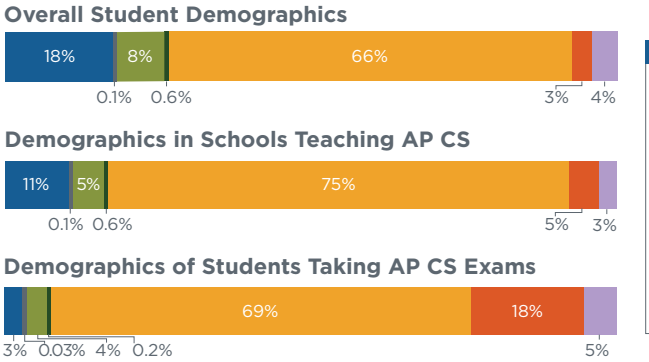
High Schools Teaching CS by School Type



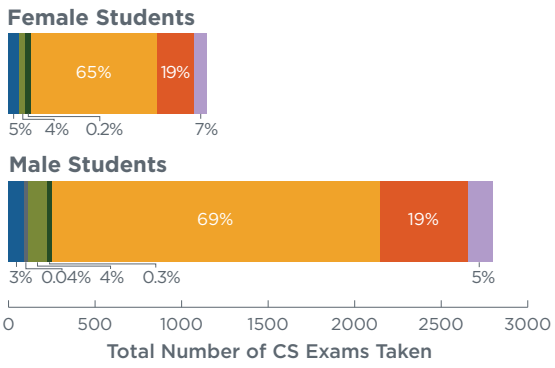
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



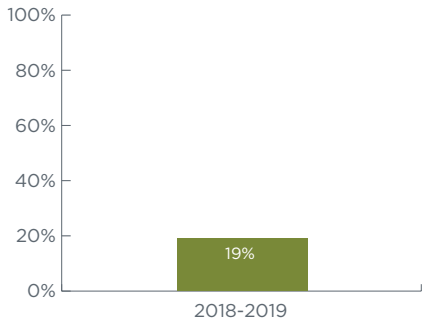
Hispanic/Latinx students and Black students are each 2 times less likely than their white and Asian peers to attend a school that offers AP CS. Black students and Native American students are 3.5 times less likely to take an AP CS exam when they attend a school that offers it.

Minnesota

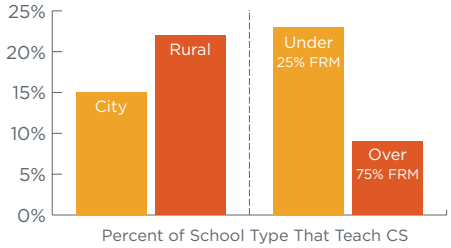
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards No	The state does not yet have a discrete set of rigorous computer science standards across K–12.
Funding No	Although the state does not provide dedicated state funding, MN was awarded a federal grant under the Jacob K. Javits Gifted and Talented Students Education Program to develop a screening process to identify students gifted in computer science, particularly from limited English or marginalized racial and ethnic groups. Schools that participate receive ongoing professional development, and all students receive computer science instruction.
Certification No	The state does not yet have a computer science teacher certification.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The Department of Education has a STEM and Computer Science Integration Specialist.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	Computer science can count as a mathematics credit for graduation if the course meets state academic standards in mathematics.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

Minnesota is a member of the ECEP Alliance and has a CSTA chapter.

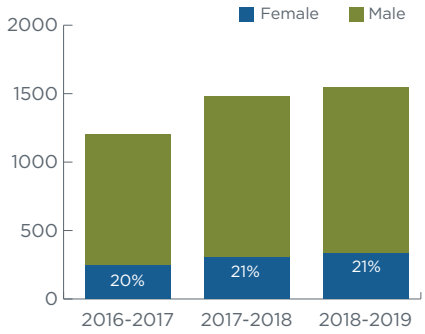
High Schools Teaching CS



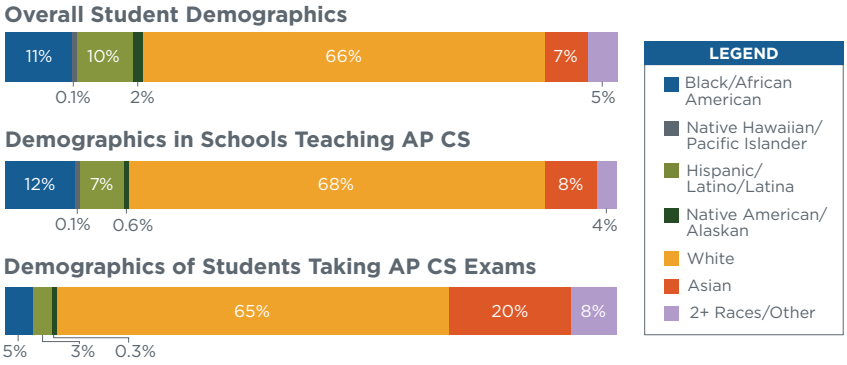
High Schools Teaching CS by School Type



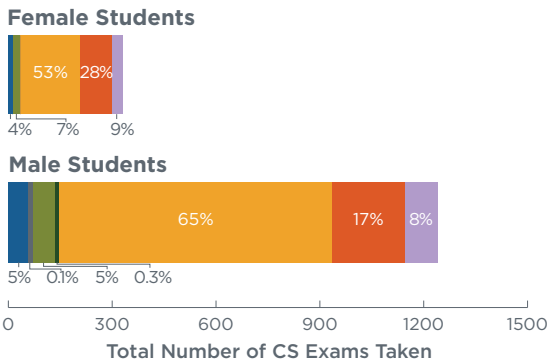
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



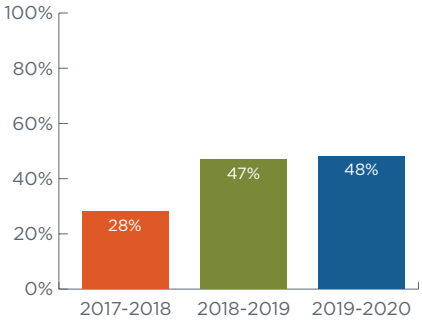
Native American students are 3 times less likely than their white and Asian peers to attend a school that offers AP CS, and 2 times less likely to take an AP CS exam when they attend a school that offers it. Hispanic/Latinx students are 2.6 times less likely and Black/African-American students are 3 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Mississippi

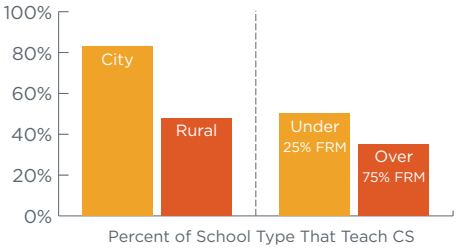
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted K–12 computer science standards based on the CSTA standards in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	HB 1700 (FY 2021) allocated $300K for computer science professional development. HB 1643 (FY 2020) allocated $300K to develop computer science courses and professional development.
Certification Yes	Teachers with existing licensure can obtain an AP Computer Science Principles Endorsement by completing an approved AP training. Teachers can also obtain a K–8 or 7–12 add-on endorsement by completing coursework or approved professional development for specific courses.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	Beginning with incoming freshmen of 2018–2019, all students must earn one credit in technology or computer science. Multiple computer science courses may satisfy the graduation credit.
IHE Admission Yes	All students applying to state institutions of higher learning for entrance in Fall 2022 must have earned one credit in computer science or technology, which aligns with the high school graduation policy.

Mississippi is a member of the ECEP Alliance and has a CSTA chapter.

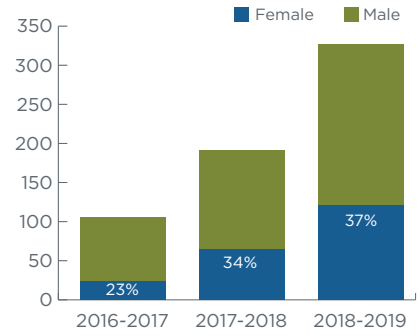
High Schools Teaching CS



High Schools Teaching CS by School Type

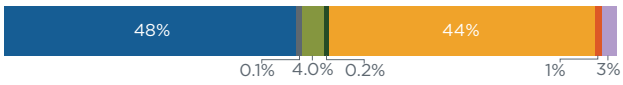


AP CS Student Participation

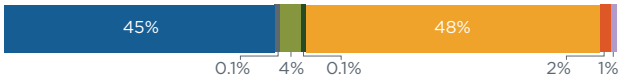


Access and Participation by Race/Ethnicity

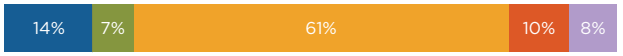
Overall Student Demographics

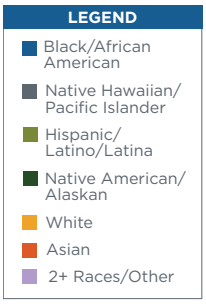


Demographics in Schools Teaching AP CS



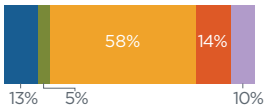
Demographics of Students Taking AP CS Exams



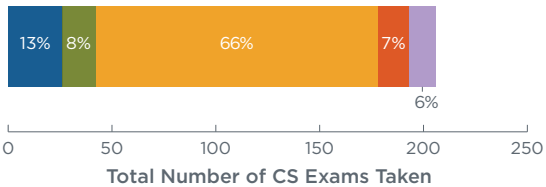


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



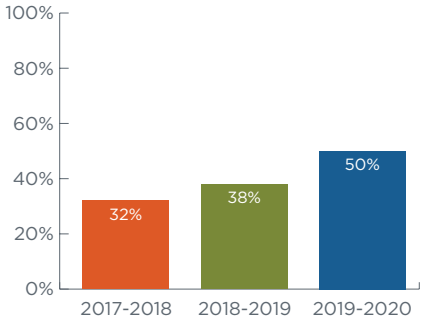
Black students are 4.4 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Missouri

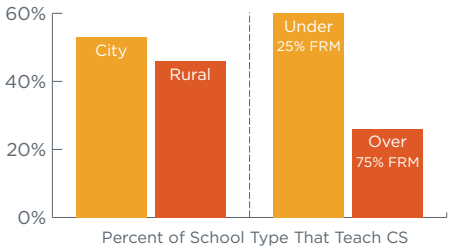
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted K–12 computer science standards in 2019. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	HB 3 (passed in special session in 2018) created a Computer Science Education Fund, and HB 2 (FY 2020) allocated $450K to the Computer Science Education fund created by HB 3 (2018 special session). Grant awardees must describe how they will reach and support students from marginalized racial and ethnic groups underrepresented in computer science.
Certification Yes	Teachers can obtain a 9–12 certification through academic coursework or by passing the state content exam. Teachers can be authorized to teach computer science after completion of department-approved professional development. State funding for computer science can be used to support credentialing for teachers.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	Any computer science course that aligns to the standards and has an appropriately qualified teacher can count as a mathematics, science, or practical arts credit for graduation.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

Missouri has CSTA chapters and Governor Michael Parson is a member of the Governors' Partnership for K–12 Computer Science.

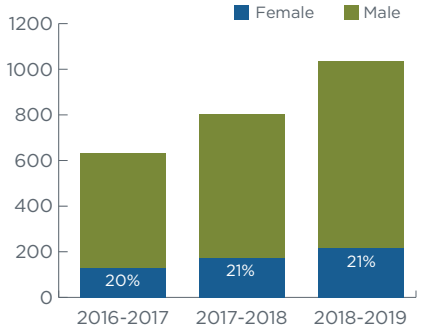
High Schools Teaching CS



High Schools Teaching CS by School Type



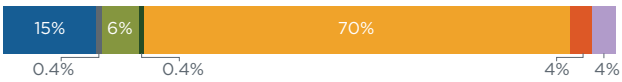
AP CS Student Participation



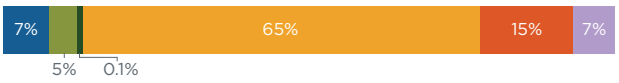
Access and Participation by Race/Ethnicity

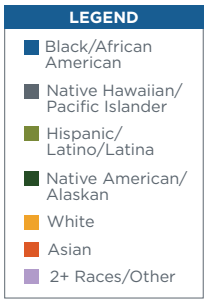
Overall Student Demographics

Demographics in Schools Teaching AP CS



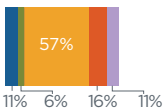
Demographics of Students Taking AP CS Exams



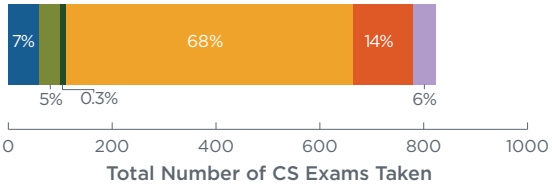


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



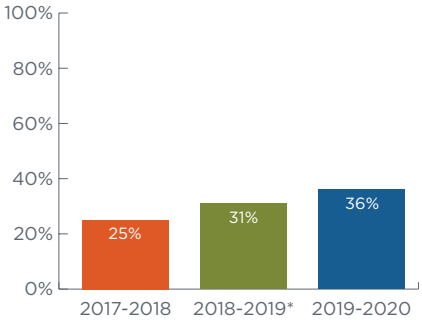
Black students are 2.3 times less likely and Native American students are 3 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Montana

State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards In Progress	The state is developing K–12 computer science standards; state board approval is anticipated in fall 2020.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification Yes	Teachers with existing licensure can obtain a K–12 endorsement through academic coursework. An initial license in computer science requires completing a teacher preparation program and passing the Praxis CS exam, or completing a non-traditional teaching program with five years of successful teaching experience.
Preservice Yes	The Office of Public Instruction has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Dist. Decision	The state passed a permissive and encouraging policy to allow computer science to count as a science, mathematics, elective, or CTE graduation requirement, but it is a district decision.
IHE Admission No	Although the state does not yet allow computer science to count as a core admission requirement at institutions of higher education, two years of computer science can count as electives.

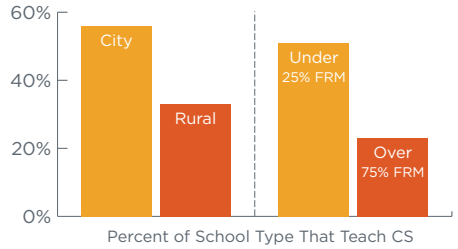
Governor Steve Bullock is a member of the Governors' Partnership for K–12 Computer Science.

High Schools Teaching CS

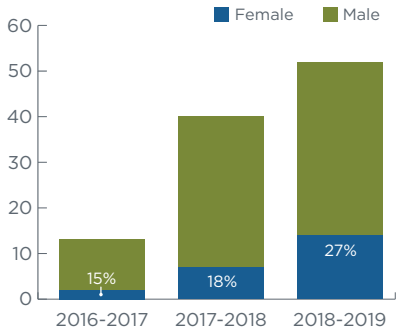


*2018 data reflects a correction of last year's published number

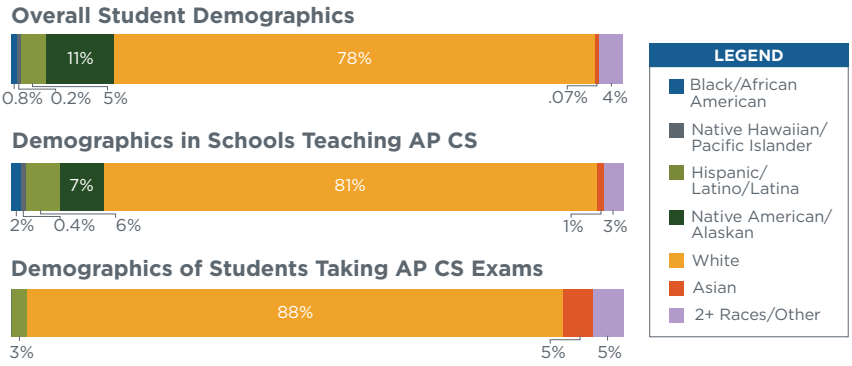
High Schools Teaching CS by School Type



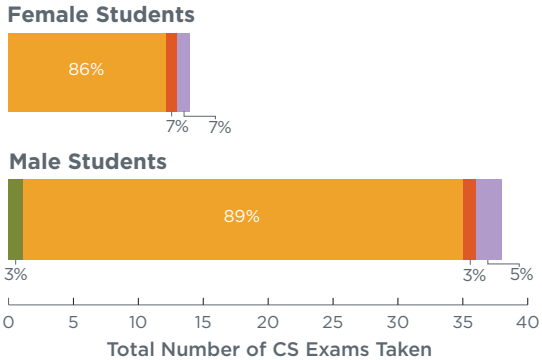
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender

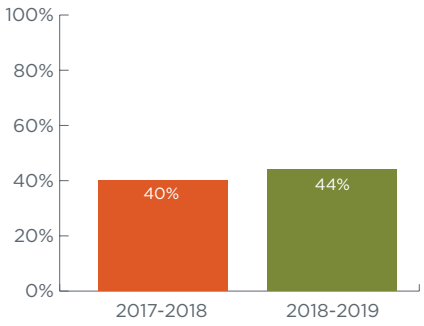


Although Native American students make up 11% of the overall student population, no Native American students took an AP CS exam. Hispanic/Latinx students make up 4.7% of the overall student population, but only 1 Hispanic/Latinx student took an AP CS exam.

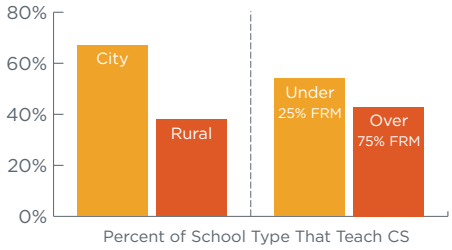
Nebraska

State Plan In Progress	The Department of Education is in the process of developing a state plan for K–12 computer science.
Standards No	The state does not yet have a discrete set of rigorous computer science standards across K–12.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification No	The state does not yet have a computer science teacher certification.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Dist. Decision	The state passed a permissive and encouraging policy to allow computer science to count towards CTE in the 80 core curriculum hours required for graduation, but it is a district decision.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.
Nebraska has CSTA chapters.	

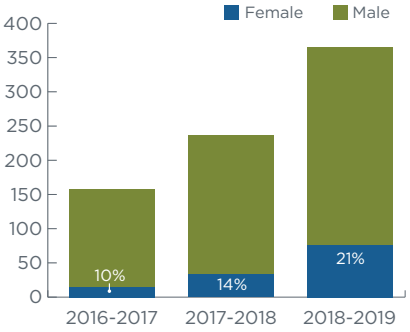
High Schools Teaching CS



High Schools Teaching CS by School Type



AP CS Student Participation

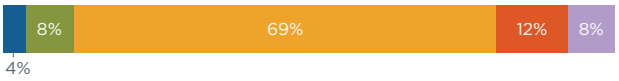


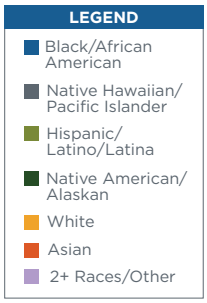
Access and Participation by Race/Ethnicity

Overall Student Demographics

Demographics in Schools Teaching AP CS

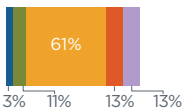
Demographics of Students Taking AP CS Exams



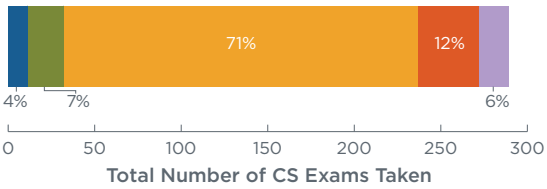


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



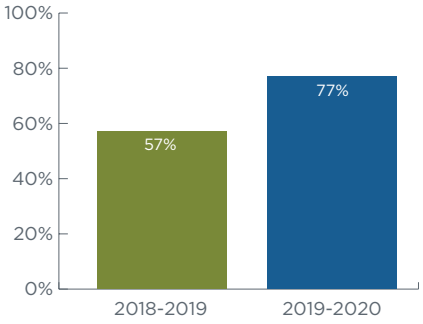
Native American students are 2 times less likely than their white and Asian peers to attend a school that offers AP CS. Hispanic/Latinx students are 3 times less likely and Black students are 2.7 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Nevada

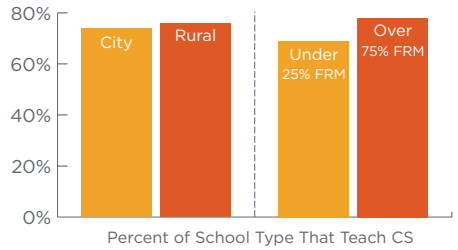
State Plan Yes	The Department of Education developed the Computer Science Strategic Plan in 2018. The plan includes a section dedicated to diversity and strategies to build toward more equitable outcomes.
Standards Yes	The state adopted K–12 computer science standards in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	SB 313 (FY 2020 and 2021) allocated $700K and $933K, and SB 200 (FY 2018 and 2019) allocated $1M and $1.4M to expand computer science education.
Certification Yes	Teachers can obtain a secondary endorsement in advanced computer science through coursework or by passing the Praxis CS exam. Teachers can obtain a secondary or middle school/junior high school endorsement in computer technology-based applications and computational thinking through coursework. Funding is available to offset the cost of certification.
Preservice Yes	SB 313 (2019) required training all preservice teachers in computer science and allowed the Board of Regents to apply for funding to develop curriculum and standards for preservice computer science educators.
CS Supervisor Yes	The Department of Education has a Computer Science Education Programs Professional.
All HS Offer Yes	SB 200 (2018) required all high schools to offer a computer science course by July 1, 2022, and all students to receive instruction in computer education before 6th grade. Schools must make efforts to increase enrollment of female students, students with disabilities, and students from underrepresented racial and ethnic groups. The state publishes a biennial report which includes enrollment demographics on gender, race, and students with disabilities.
Grad Credit Yes	All students must earn one-half credit in computer education and technology in a course with half of the instructional time dedicated to computer science and computational thinking either in high school or middle school.
IHE Admission Yes	A computer science course can count as a mathematics or science credit required for admission at institutions of higher education, which aligns with the high school graduation policy.

Nevada is a member of the ECEP Alliance and has a CSTA chapter.

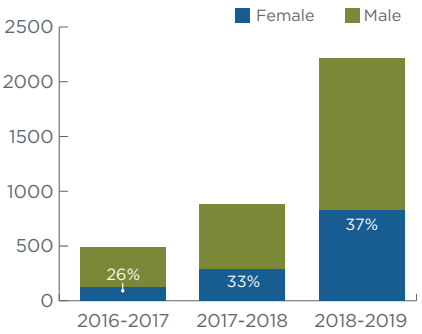
High Schools Teaching CS



High Schools Teaching CS by School Type

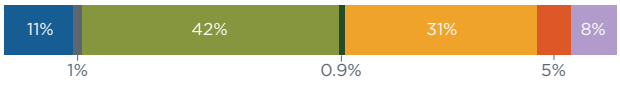


AP CS Student Participation



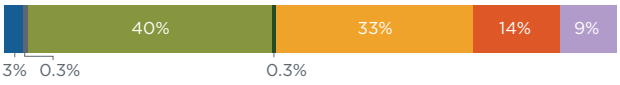
Access and Participation by Race/Ethnicity

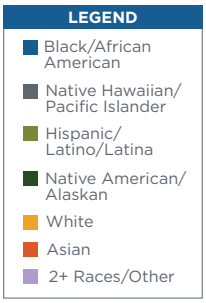
Overall Student Demographics



Demographics in Schools Teaching AP CS

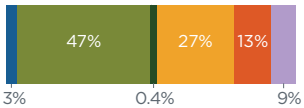
Demographics of Students Taking AP CS Exams



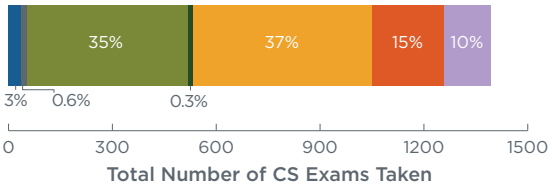


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



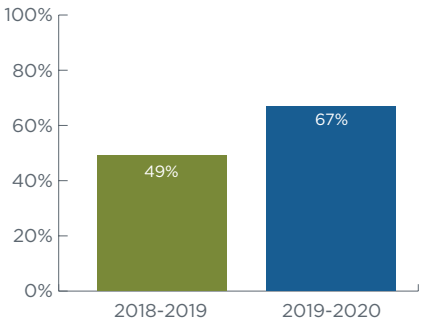
Black students are 4 times less likely, Pacific Islander students are 6 times less likely, and Native American students are 2.7 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

New Hampshire

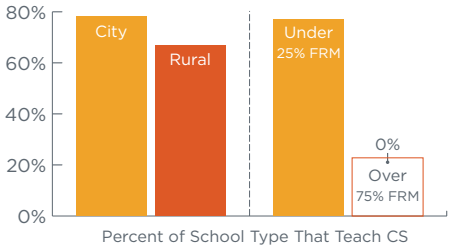
State Plan Yes	The state is in the process of updating the state plan for K–12 computer science.
Standards Yes	The state adopted K–12 computer science standards based on the CSTA standards in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification Yes	Teachers with or without existing licensure can obtain certification by passing a national exam, holding a computer science teaching assignment prior to June 2019, or submitting evidence of skills, knowledge, and competencies in computer science content. Evidence could include coursework, professional experience, letters of recommendation, professional development, or other artifacts.
Preservice Yes	The Department of Education has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.
CS Supervisor Yes	The Department of Education has a STEM Integration and Computer Science Administrator.
All HS Offer Yes	HB 1674 (2018) required all schools to create and implement computer science programs with a target goal of 2020 for full implementation.
Grad Credit Dist. Decision	The state 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.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

New Hampshire is a member of the ECEP Alliance and has a CSTA chapter.

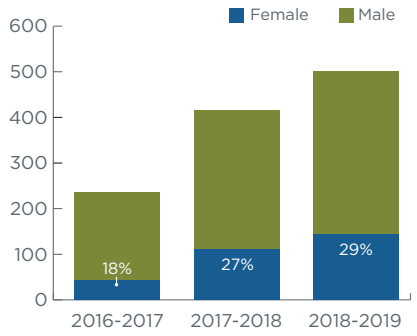
High Schools Teaching CS



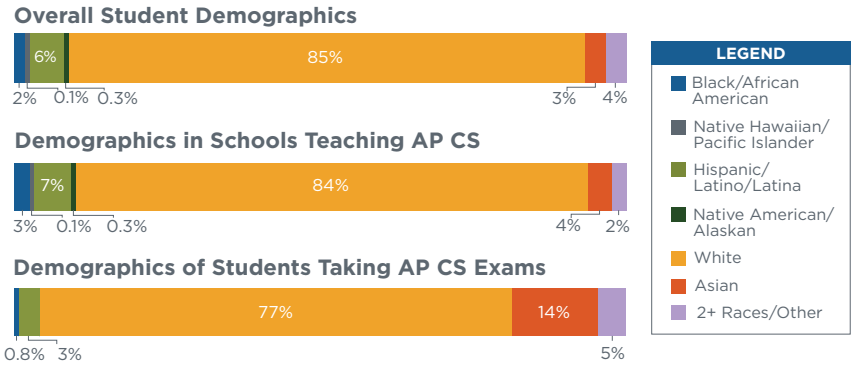
High Schools Teaching CS by School Type



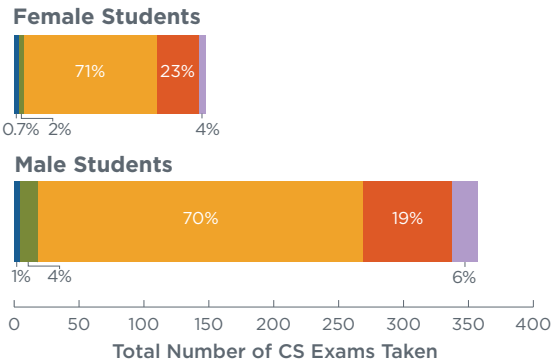
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



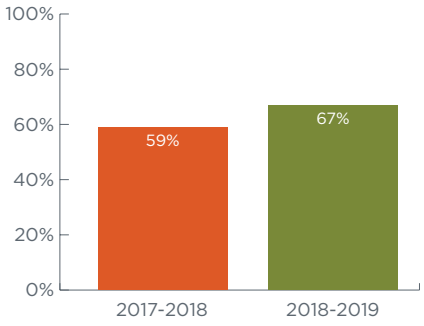
Hispanic/Latinx students are 2 times less likely and Black students are 4 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

New Jersey

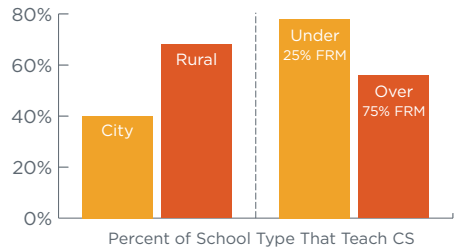
State Plan Yes	The Department of Education developed a state plan for computer science education implementation in 2019. The plan includes a section on equity and promotes equitable access in the mission and vision statements.
Standards Yes	The state adopted revised computer science and design thinking standards in June 2020. The standards' vision statement focuses on equitable access for all students and fostering their ability to participate in an inclusive and diverse computing culture that appreciates and incorporates perspectives from people of different genders, ethnicities, and abilities. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	The Secondary School Computer Science Education Initiative (PL 2018, Chapter 53) allocated $2M for FY 2019. SB 2500 renewed the $2M appropriation for FY 2020, but was later not included in the revised FY 2020 budget by NJ A3 (20R).
Certification Yes	Teachers with existing licensure can obtain a 9–12 CTE endorsement with a combination of previous teaching experience and academic coursework.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor In Progress	The Department of Education is currently in the process of hiring a Computer Science Coordinator.
All HS Offer Yes	A2873 (2018) required all high schools to offer a course in computer science by the 2018–2019 school year.
Grad Credit Yes	Any computer science course can count as a mathematics or science credit for high school graduation.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

New Jersey has CSTA chapters and Governor Phil Murphy is a member of the Governors' Partnership for K–12 Computer Science.

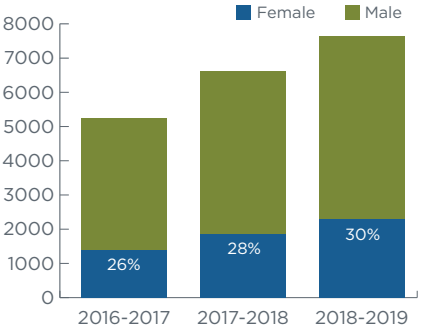
High Schools Teaching CS



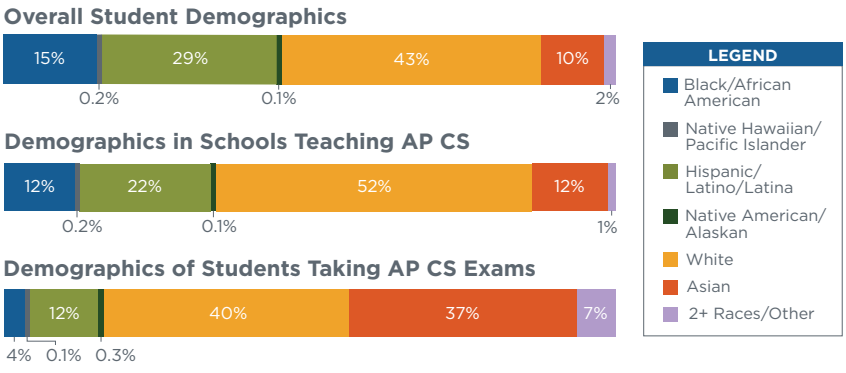
High Schools Teaching CS by School Type



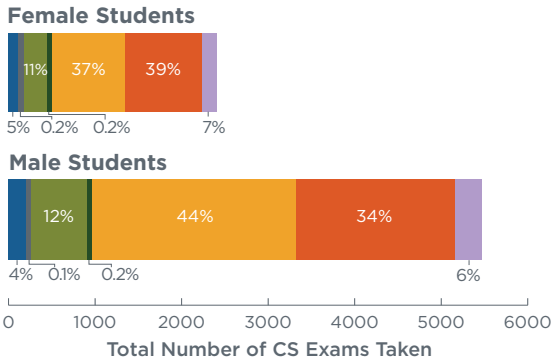
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



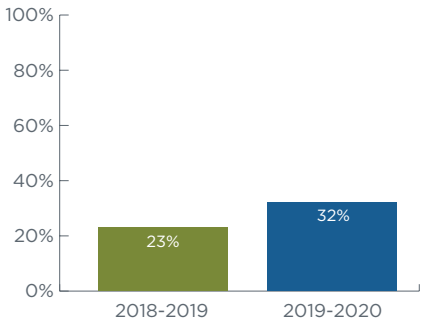
Hispanic/Latinx students are 1.6 times less likely than their white and Asian peers to attend a school that offers AP CS, and 2.3 times less likely to take an AP CS exam when they attend a school that offers it. Black students are 1.6 times likely than their white and Asian peers to attend a school that offers AP CS, and 4 times less likely to take an AP CS exam when they attend a school that offers it.

New Mexico

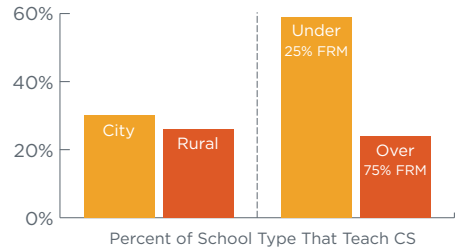
State Plan In Progress	The state is in the process of developing a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted the CSTA K–12 Computer Science Standards in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	HB 548 (FY 2020) allocated $200K annually to develop and implement teacher professional development courses. HB1 (first special session, FY 2021) amended the FY 2021 budget to allocate $300K for K–8 computer science. The application guidance includes professional development activities that are culturally and linguistically responsive, and awards prioritize high-need districts.
Certification No	The state does not yet have a computer science teacher certification.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor In Progress	The Public Education Department is in the process of hiring a Computer Science Specialist.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	Computer science can count as a mathematics or science credit for graduation, provided that a student has demonstrated competence in mathematics or science.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

New Mexico has a CSTA chapter.

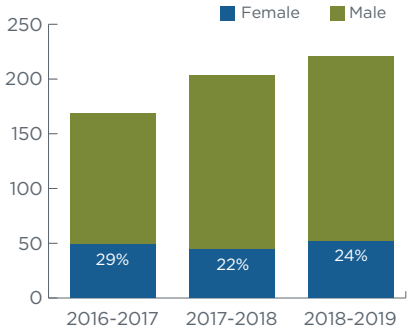
High Schools Teaching CS



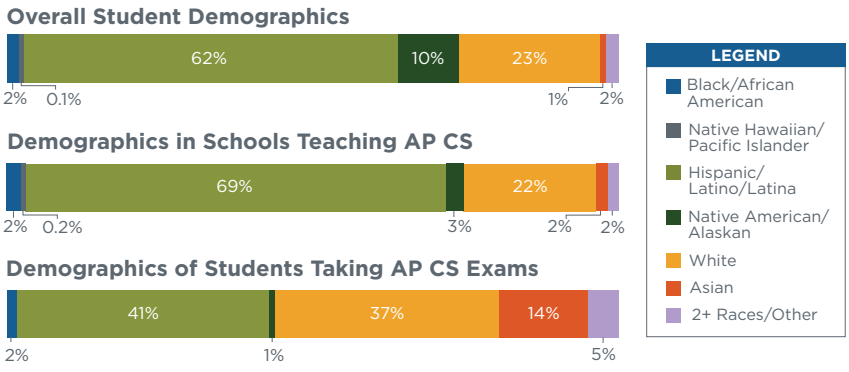
High Schools Teaching CS by School Type



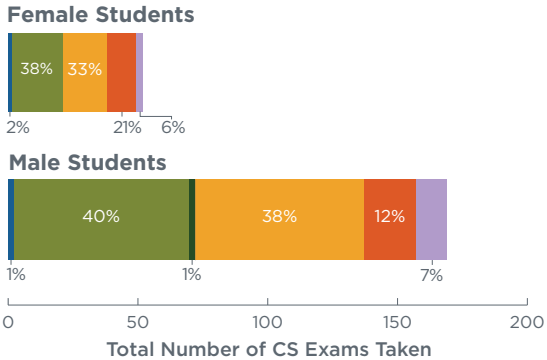
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



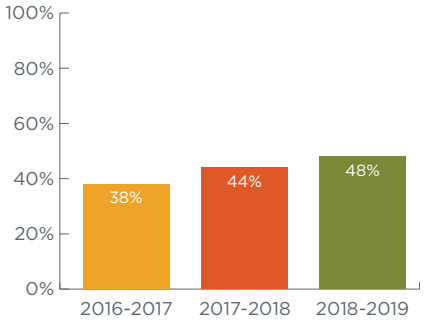
Hispanic/Latinx students are 3.6 times less likely and Black students are 3 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it. Although Native American students make up 10% of the overall student population, only 2 Native American students took an AP CS exam.

New York

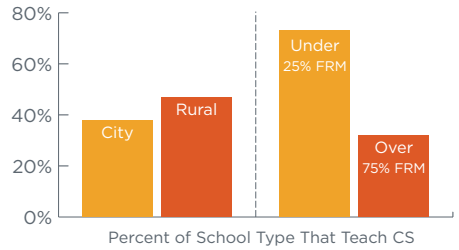
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards In Progress	The State Board of Regents conditionally approved the K–12 Learning Standards for Computer Science and Digital Literacy in January 2020; full approval is anticipated in fall 2020.
Funding Yes	A 9503/S 7503 (FY 2021), A 2003/S 1503 (FY 2020), and S 7504/A 9504 (FY 2019) allocated $6M annually (for an eventual total of $30M) to expand computer science education via the Smart Start program. The grantees should incorporate strategies for increasing participation in computer science by traditionally underrepresented groups, such as female students, students with differing abilities, English language learners/Multilingual learners, and/or Black/African American, Hispanic/Latino/Latina/Latinx, or Native American/Alaskan students.
Certification Yes	Teachers with or without existing licensure can obtain a 7–12 certification by completing one of the following: approved state teacher preparation program pathway, academic coursework, or industry experience and pedagogical coursework. Any licensed teacher who teaches computer science before September 2022 will be eligible to continue teaching computer science in the same district for ten years.
Preservice Yes	The State Education Department has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Dist. Decision	The state 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.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

New York has CSTA chapters.

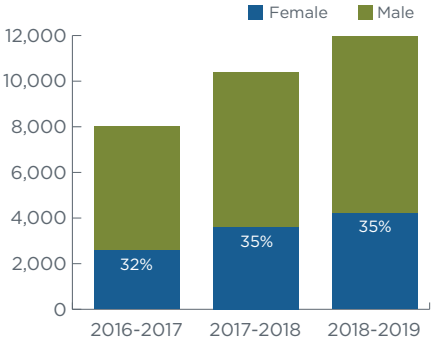
High Schools Teaching CS



High Schools Teaching CS by School Type

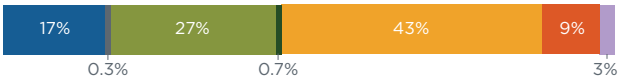


AP CS Student Participation



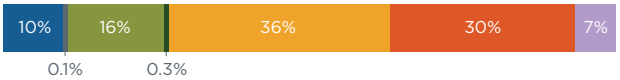
Access and Participation by Race/Ethnicity

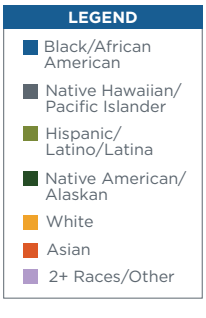
Overall Student Demographics



Demographics in Schools Teaching AP CS

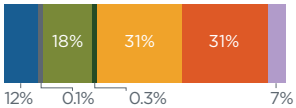
Demographics of Students Taking AP CS Exams



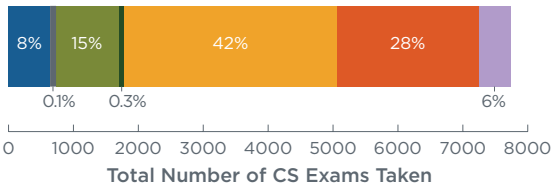


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



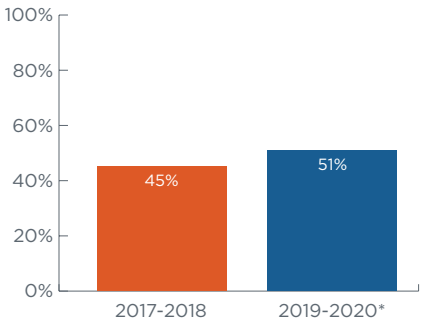
Pacific Islander students are 3 times less likely, Native American students are 2.5 times less likely, and Hispanic/Latinx and Black students are each 1.7 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

North Carolina

State Plan Yes	The North Carolina Department of Public Instruction developed—and presented to the legislature—a state plan for expanding computer science in 2018. The plan includes strategies to engage students from marginalized racial and ethnic groups underrepresented in computer science, female students, and low-income students.
Standards Yes	The state adopted K–12 computer science standards in August 2020, as required by HB 155 (2017). Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	SB 99 (FY 2019, continued in FY 2020) allocated $500K annually for implementation of the Computer Science Education Plan, which focuses on increasing participation for underrepresented student groups, including female students, low-income students, and students from marginalized racial and ethnic groups. Additionally, SB 99 (FY 2019) and SB 257 (FY 2018) allocated $400K annually for the Coding and Mobile Application Grant Program, which could be used for teacher professional development in computer science.
Certification Yes	Teachers with existing CTE licensure can obtain a 9–12 CTE computer programming endorsement through academic coursework.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The Department of Public Instruction has a Director of Computer Science and Technology.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	Computer science can count as the fourth mathematics credit for graduation in the Future-Ready Core track.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

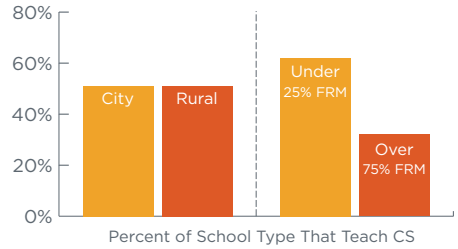
North Carolina is a member of the ECEP Alliance, has a CSTA chapter, and Governor Roy Cooper is a member of the Governors' Partnership for K–12 Computer Science.

High Schools Teaching CS

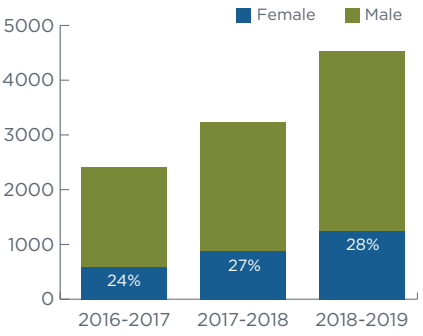


*Data was not collected for the 2018–2019 school year

High Schools Teaching CS by School Type

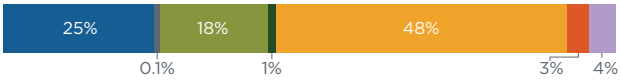


AP CS Student Participation

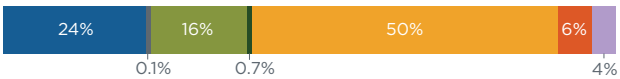


Access and Participation by Race/Ethnicity

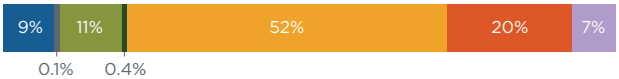
Overall Student Demographics

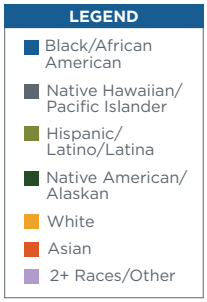


Demographics in Schools Teaching AP CS



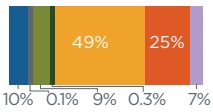
Demographics of Students Taking AP CS Exams



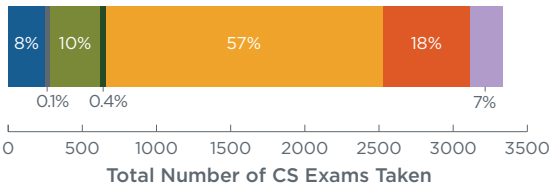


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



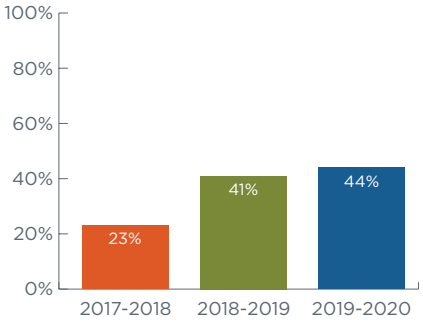
Native American students are 2.6 times less likely, Hispanic/Latinx students are 2 times less likely, and Black/African-American students are 3.5 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

North Dakota

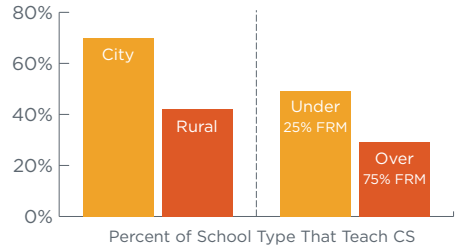
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted K–12 computer science and cybersecurity standards in 2019, becoming the first state to create K–12 cybersecurity standards.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification Yes	Teachers with existing licensure can obtain a grade level corresponding credential through academic coursework. Teachers are eligible to teach specific computer science courses for five years after earning a Level I (200 hours), Level II (40 hours), or Level III (15 hours) Computer Science and Cybersecurity Credential (effective April 1, 2020). Teachers can renew the credential by completing 30 hours of academic work during the five year period.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	AP Computer Science A or Mathematics for Computer Science/ Information Technology can count as a mathematics credit for graduation.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

North Dakota has a CSTA chapter and Governor Doug Burgum is a member of the Governors' Partnership for K–12 Computer Science.

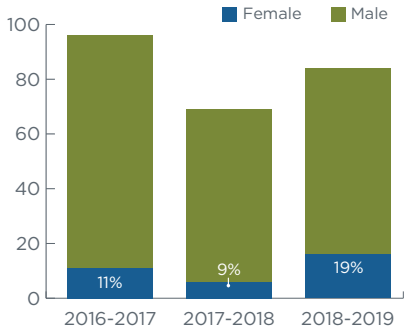
High Schools Teaching CS



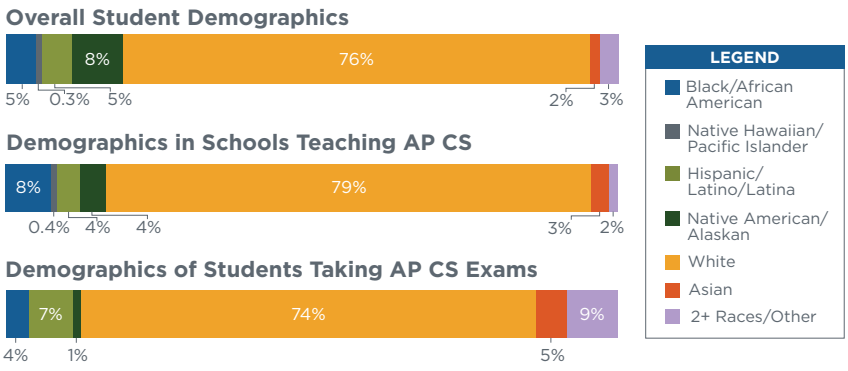
High Schools Teaching CS by School Type



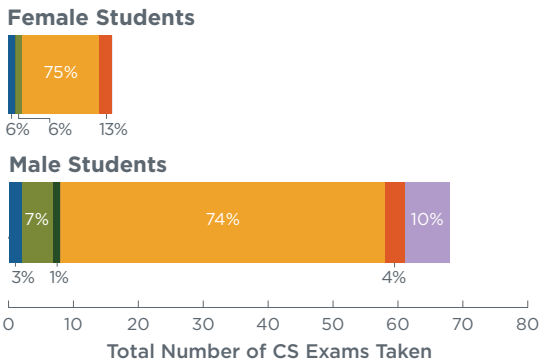
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



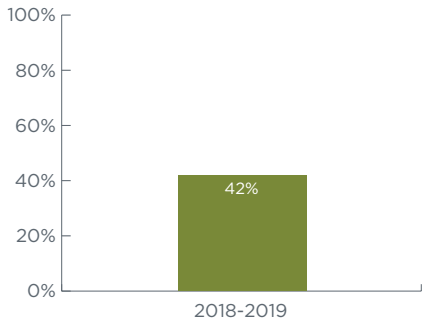
Although Native American students make up 8% of the overall student population, only 1 Native American student took an AP CS exam. Black students are 2 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Ohio

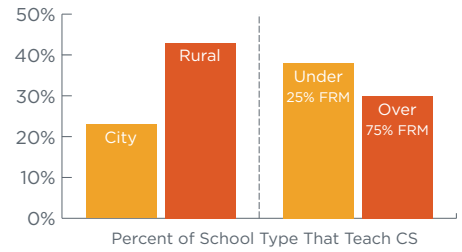
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted K–12 computer science standards and a model curriculum in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	HB 166 (FY 2020) appropriated $1.5M for teachers to become credentialed in computer science. Awards prioritized educators assigned to schools with greater than 50% of students classified as economically disadvantaged.
Certification Yes	Teachers can obtain a K–12 supplemental teaching license through passing the state content exam; teachers can also earn an initial license in computer science. Licensed 7–12 teachers who completed professional development are allowed to teach computer science until 2021.
Preservice Yes	The Department of Education has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.
CS Supervisor Yes	The Department of Education has a Computer Science Education Program Specialist.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	A computer science course that addresses mathematics standards and focuses on algorithms for problem-solving can count as a mathematics, advanced mathematics, or advanced science credit for graduation. One credit of advanced computer science can also satisfy one unit of algebra 2, math 3, or equivalent, or one unit of advanced science (excluding biology or life sciences), and a coding course can satisfy a required foreign (world) language credit.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

Ohio is a member of the ECEP Alliance and has a CSTA chapter.

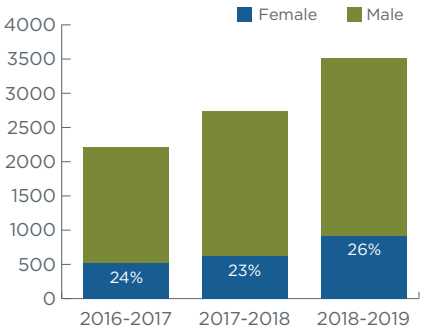
High Schools Teaching CS



High Schools Teaching CS by School Type



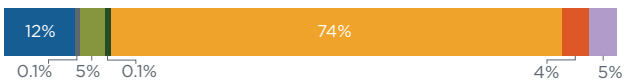
AP CS Student Participation



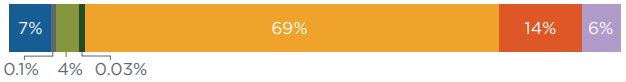
Access and Participation by Race/Ethnicity

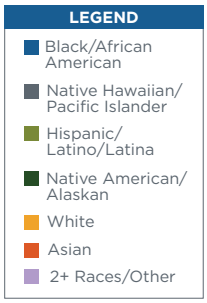
Overall Student Demographics

Demographics in Schools Teaching AP CS



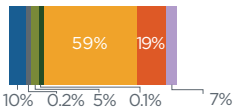
Demographics of Students Taking AP CS Exams



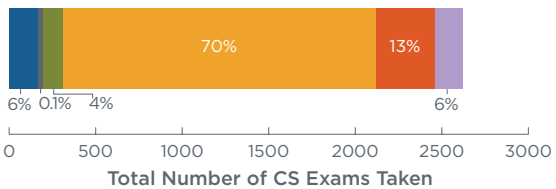


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



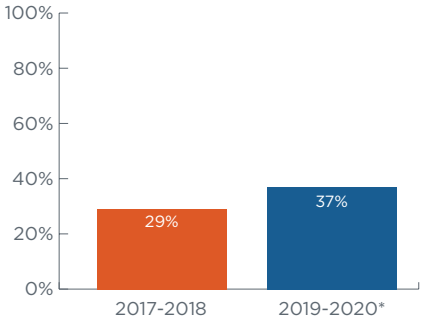
Black students are 1.5 times less likely than their white and Asian peers to attend a school that offers AP CS, and 2 times less likely to take an AP CS exam when they attend a school that offers it. Native American students are 4 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Oklahoma

State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted K–12 computer science standards in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding No	Although SB 593 (2019) authorized the State Department of Education to create a grant program for computer science professional learning and recommended $1M subject to authorization, no funds were appropriated for the program.
Certification Yes	Teachers with existing licensure can obtain a 9–12 certification through passing the state content exam; teachers can also earn an initial license in computer science.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The State Department of Education has a Director of Education Technology and Computer Science Education.
All HS Offer No	The state does not yet require that all secondary schools offer computer science. However, SB 593 (2019) directed the State Department of Education to develop a rubric for computer science programs in elementary, middle, and high schools to serve as a guide to schools for implementing quality computer science programs.
Grad Credit Yes	An approved computer science course can count as a mathematics or computer technology/world language credit in the Core Curriculum Standard Track.
IHE Admission Yes	Two computer science credits can count towards the additional required units in required content areas for admissions at institutions of higher education, which aligns with the high school graduation policy.

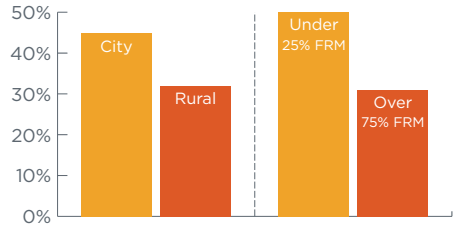
Oklahoma has a CSTA chapter.

High Schools Teaching CS



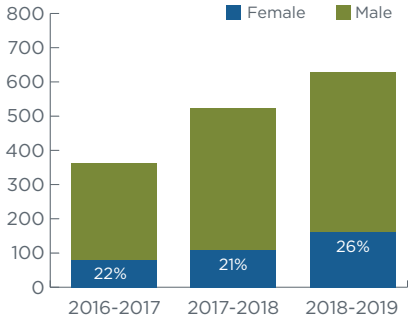
*Data was not collected for the 2018–2019 school year

High Schools Teaching CS by School Type



Percent of School Type That Teach CS

AP CS Student Participation

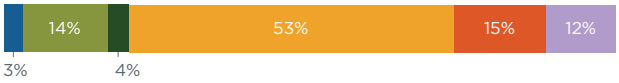


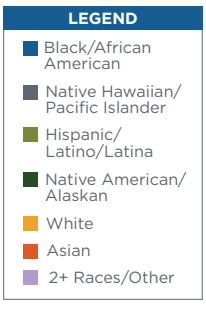
Access and Participation by Race/Ethnicity

Overall Student Demographics

Demographics in Schools Teaching AP CS

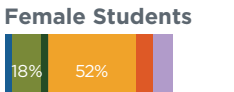
Demographics of Students Taking AP CS Exams



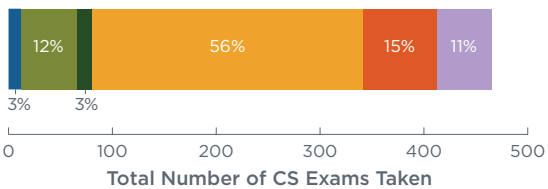


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



Total Number of CS Exams Taken

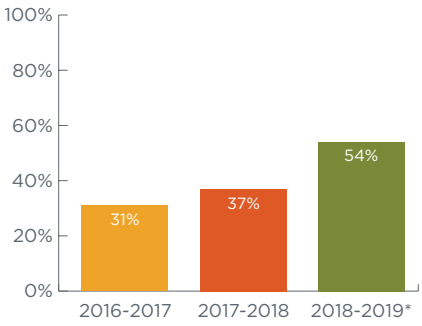
Native American students are 2 times less likely than their white and Asian peers to attend a school that offers AP CS, and 2.4 times less likely to take an AP CS exam when they attend a school that offers it. Hispanic/Latinx students are 2 times less likely and Black students are 5 times less likely to take an AP CS exam when they attend a school that offers it.

Oregon

State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards No	The state does not yet have a discrete set of rigorous computer science standards across K–12.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification No	The state does not yet have a computer science teacher certification.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Dist. Decision	The state 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.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

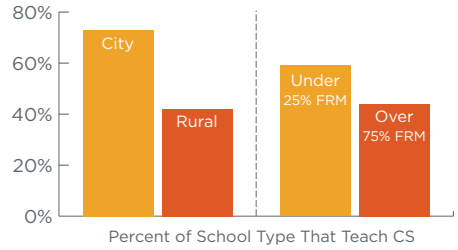
Oregon is a member of the ECEP Alliance and has a CSTA chapter.

High Schools Teaching CS

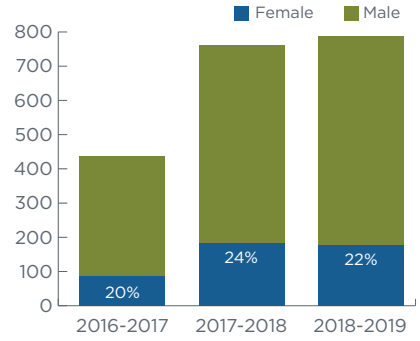


*2018 data includes Robotics courses that were not included in 2017

High Schools Teaching CS by School Type

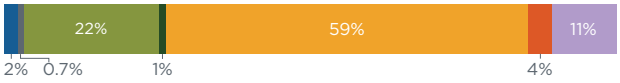


AP CS Student Participation



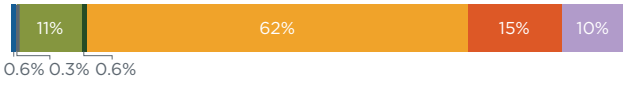
Access and Participation by Race/Ethnicity

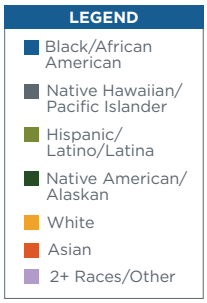
Overall Student Demographics



Demographics in Schools Teaching AP CS

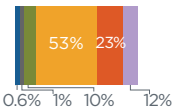
Demographics of Students Taking AP CS Exams



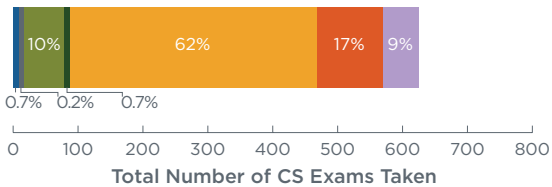


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



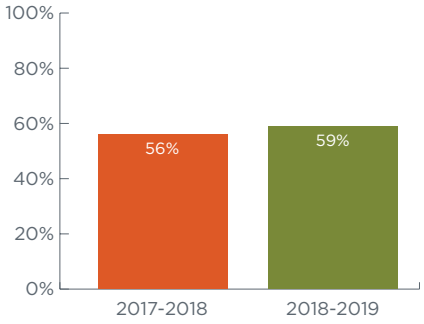
Native American students are 1.5 times less likely than their white and Asian peers to attend a school that offers AP CS, and 1.7 times less likely to take an AP CS exam when they attend a school that offers it. Hispanic/Latinx students are 2.4 times less likely and Black students are 4 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Pennsylvania

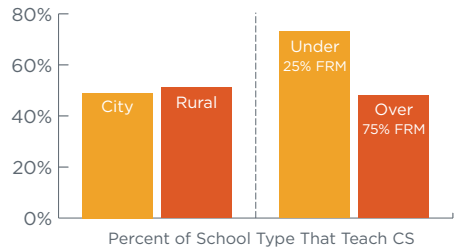
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state endorsed the CSTA K–12 Computer Science Standards in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	State budgets (Act 1A, FY 2019–FY 2021 interim budget) each dedicated $20M annually to PAsmart, a program established to expand STEM and computer science education, including teacher professional development. As of August 2020, $5.705M of the FY 2020 funding was distributed in targeted grants to LEAs with few computer science offerings. The balance of funds, intended for "Advancing Grants" to support STEM ecosystems, remains on hold due to the COVID-19 response. PAsmart grants prioritize proposals that boost participation in computer science education for historically underserved and underrepresented populations.
Certification No	The state does not yet have a computer science teacher certification.
Preservice Yes	The Department of Education developed specific program guidelines for state approval of professional educator programs in computer science and lists these programs publicly.
CS Supervisor Yes	The Department of Education has a Consultant to the Secretary of Education on STEM/Computer Science.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	Any computer science course aligned with the computer science standards can count as a mathematics or science credit for graduation.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

Pennsylvania has CSTA chapters and Governor Tom Wolf is a member of the Governors' Partnership for K–12 Computer Science.

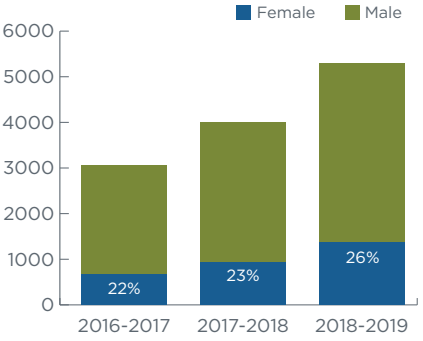
High Schools Teaching CS



High Schools Teaching CS by School Type

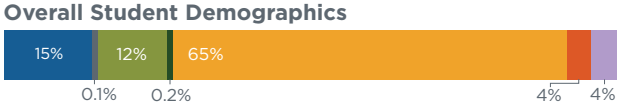


AP CS Student Participation

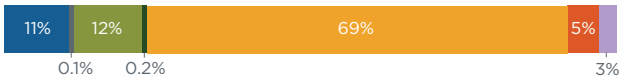


Access and Participation by Race/Ethnicity

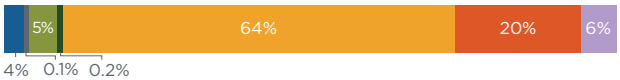
Overall Student Demographics

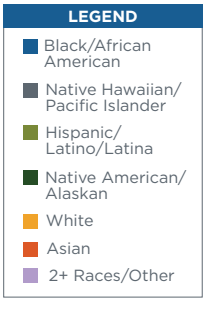


Demographics in Schools Teaching AP CS



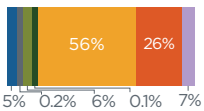
Demographics of Students Taking AP CS Exams



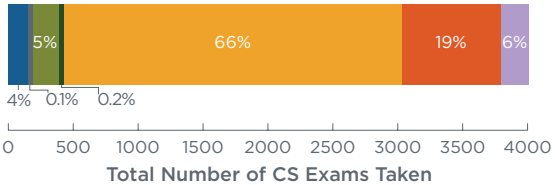


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



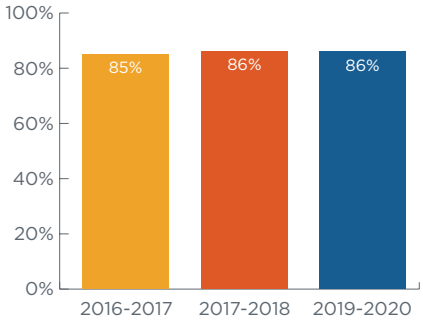
Hispanic/Latinx students are 2.5 times less likely and Black students are 3.6 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Rhode Island

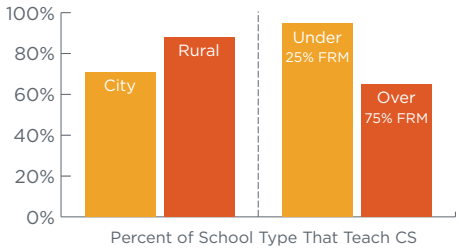
State Plan Yes	CS4RI (a partnership between the Governor's office and the Department of Education) created a state plan for computer science education implementation. One of the goals of the plan is to broaden participation among populations that are underrepresented in computer science.
Standards Yes	The state adopted K–12 computer science standards in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity. Additionally, standards can be met without computing devices or with limited hardware access, making implementation possible for all schools.
Funding Yes	H 5151A (FY 2020), H 7200A (FY 2019), H 5175 (FY 2018), and H 7454 (FY 2017) allocated $210K annually for computer science professional development. Grants focus on broadening participation, and priority is given to Title I-eligible schools. The Department received a $2.5M federal grant to support the creation of high school computer science pathways that incorporate work-based learning.
Certification Yes	Teachers with existing licensure can obtain an endorsement through academic coursework from an approved provider.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The Department of Education has a core team advancing the goals of CS4RI, including the Digital Learning Specialist, CS4RI High School Grant Project Manager, and CS4RI Work-Based Learning Specialist.
All HS Offer Other	The state does not yet require that all secondary schools offer computer science. However, the CS4RI initiative and the Governor's office set a goal for all students to have access to computer science courses by the end of 2017.
Grad Credit Yes	Computer science can count as a mathematics or science credit for graduation.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

Rhode Island is a member of the ECEP Alliance, has a CSTA chapter, and Governor Gina Raimondo is a member of the Governors' Partnership for K–12 Computer Science.

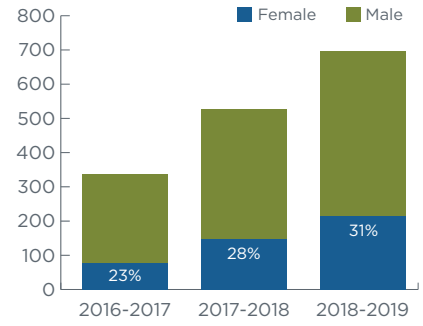
High Schools Teaching CS



High Schools Teaching CS by School Type



AP CS Student Participation

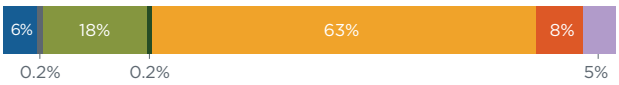


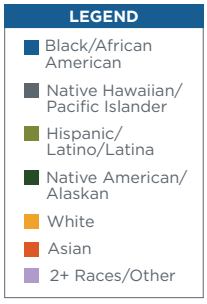
Access and Participation by Race/Ethnicity

Overall Student Demographics

Demographics in Schools Teaching AP CS

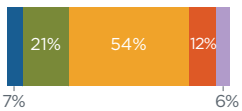
Demographics of Students Taking AP CS Exams



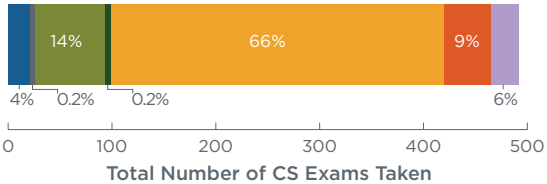


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



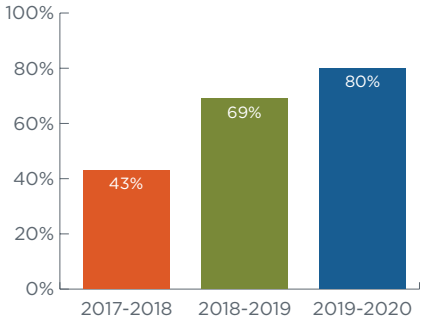
Hispanic/Latinx and Native American students are each 1.6 times less likely than their white and Asian peers to attend a school that offers AP CS. Black students are 1.3 times less likely than their white and Asian peers to attend a school that offers AP CS and 1.4 times less likely to take an AP CS exam when they attend a school that offers it.

South Carolina

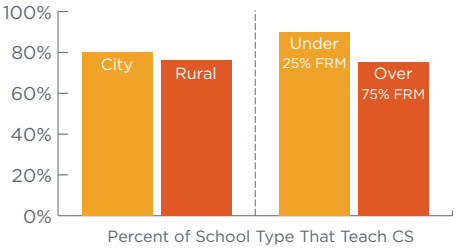
State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted K–8 computer science and digital literacy standards in 2017 and high school standards in 2018. Standards address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	H 4000 (FY 2020) allocated $500K to teacher professional development. H 3720 (FY 2018) allocated $400K to the Department of Education to implement the Computer Science Task Force's recommendations.
Certification Yes	Teachers with or without existing licensure can obtain 9–12 certification by completing an approved preparation program and passing the state content exam.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor In Progress	The Department of Education is in the process of hiring a Computer Science Specialist.
All HS Offer Yes	The Department of Education 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 the 2018–2019 school year (with waivers available until the 2020–2021 school year) and requiring all students to take at least one credit of computer science to graduate.
Grad Credit Yes	All students must take one credit of computer science to graduate. Multiple computer science courses are approved to meet the credit.
IHE Admission Yes	Computer science can count as the fourth mathematics credit required for admission at institutions of higher education, which aligns with the high school graduation policy. Further, students are strongly encouraged to take computer science as a high school elective.

South Carolina is a member of the ECEP Alliance and has a CSTA chapter.

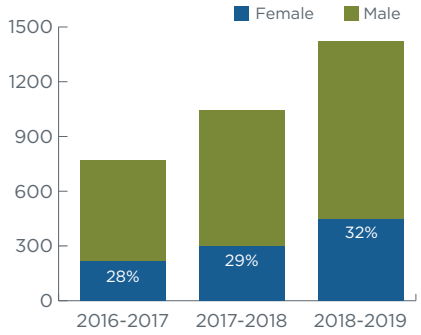
High Schools Teaching CS



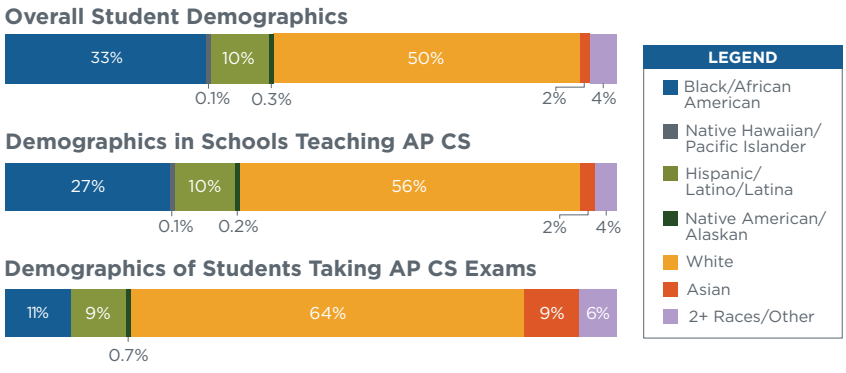
High Schools Teaching CS by School Type



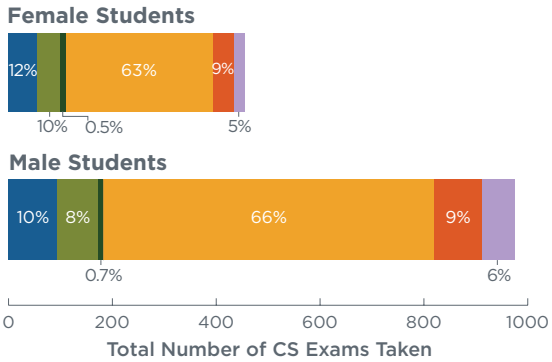
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender

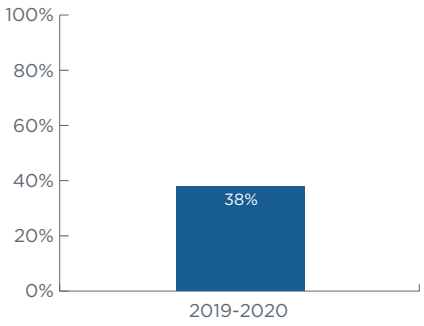


Black students are 3 times less likely and Hispanic/Latinx students are 1.4 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

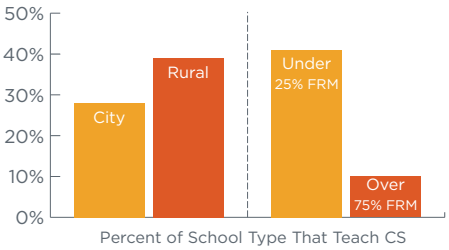
South Dakota

State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards No	The state does not yet have a discrete set of rigorous computer science standards across K–12.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification Yes	Teachers with existing licensure can obtain a K–6 or 7–12 endorsement through academic coursework or passing the Praxis CS exam.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	A state-approved advanced computer science course can count as a science credit for students who earn a regular diploma.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

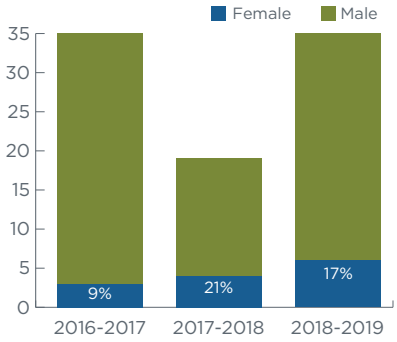
High Schools Teaching CS



High Schools Teaching CS by School Type



AP CS Student Participation

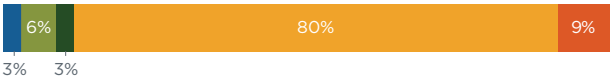


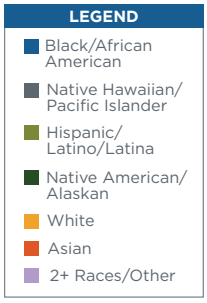
Access and Participation by Race/Ethnicity

Overall Student Demographics

Demographics in Schools Teaching AP CS

Demographics of Students Taking AP CS Exams

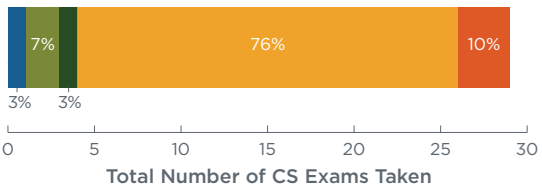




AP CS Participation by Race/Ethnicity and Gender

Female Students

Male Students

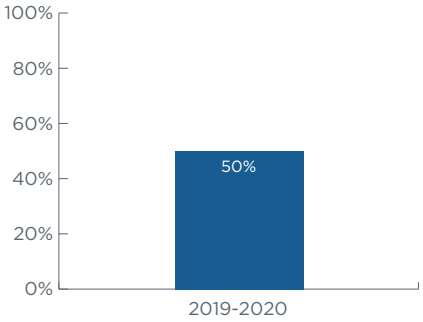


Although Native American students make up 11% of the overall student population, only 1 Native American student took an AP CS exam. Hispanic/Latinx students make up 6% of the overall student population, but only 2 Hispanic/Latinx students took an AP CS exam.

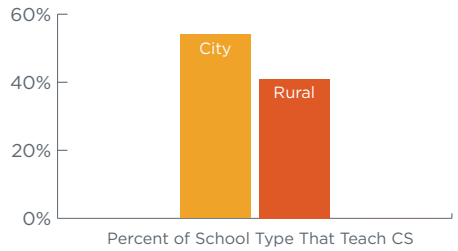
Tennessee

State Plan Yes	The Tennessee Department of Education presented the Tennessee Computer Science State Education Plan to the legislature in April 2020 and posted a timeline for each recommendation on the department website.
Standards Yes	The state published a comprehensive set of K–12 computer science standards in July 2020.
Funding Yes	PC 651 (FY 2021) includes $518K for computer science education, including professional development, within the Governor's Future Workforce Initiative.
Certification Yes	Teachers with existing licensure can obtain the Computer Science Employment Standard endorsement after completing approved professional development. An initial license in computer science requires completing academic coursework and passing the Praxis CS exam.
Preservice In Progress	The state has approved a teacher preparation program in computer science, but it is not yet posted on the state website.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	Computer science can count as a mathematics credit for graduation.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.
Tennessee has CSTA chapters.	

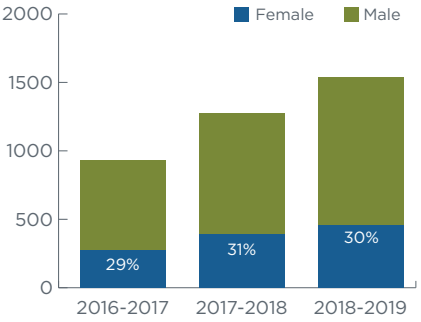
High Schools Teaching CS



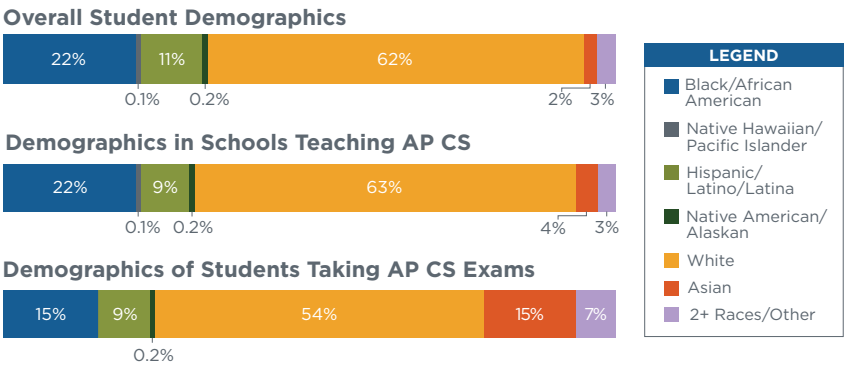
High Schools Teaching CS by School Type



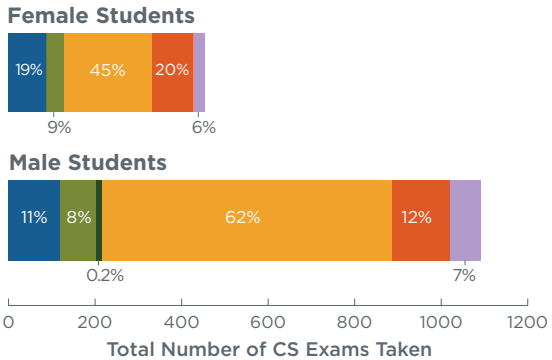
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



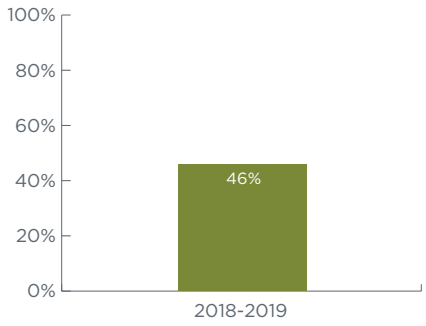
Black students are 1.5 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it. Hispanic/Latinx students are 1.3 times less likely than their white and Asian peers to attend a school that offers AP CS.

Texas

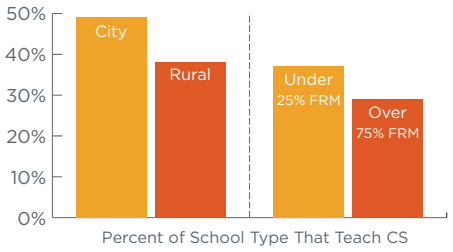
State Plan In Progress	The state is in the process of creating a plan for K–12 computer science that includes goals, strategies, and timelines, as required by HB 2984 (2019).
Standards In Progress	The Texas Essential Knowledge and Skills (TEKS) at the high school level contain computer science standards, and HB 2984 (2019) directed the State Board to review and modify the K–8 TEKS for Technology Applications to include coding and computational thinking by December 31, 2020.
Funding Other	Although the state does not yet provide dedicated state funding for computer science professional development, HB 3 and HB 963 (2019) consolidated all computer science (or technology applications) courses into CTE and allowed schools to receive weighted funding for students enrolled in those courses in grades 7–12.
Certification Yes	Teachers with or without existing licensure can obtain an 8–12 certification by completing a state-approved teacher preparation program and passing certification exams.
Preservice Yes	The Texas Education Agency has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer Yes	The State Board of Education added computer science courses to the list of required offerings at high schools (19 TAC § 74.3) in 2014.
Grad Credit Yes	AP Computer Science A, IB Computer Science Higher Level, or discrete math can count as a required mathematics course for graduation. Computer science can also count as an advanced science credit, and multiple course options can satisfy the foreign language requirement.
IHE Admission Yes	Computer science can count as the fourth mathematics credit required for admission at institutions of higher education.

Texas is a member of the ECEP Alliance and has CSTA chapters.

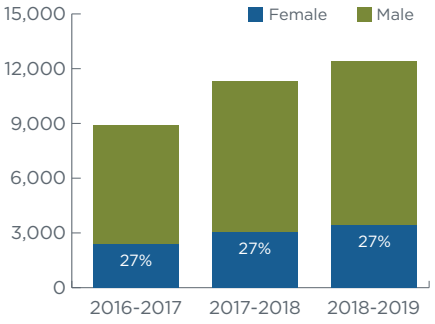
High Schools Teaching CS



High Schools Teaching CS by School Type



AP CS Student Participation



Access and Participation by Race/Ethnicity

Overall Student Demographics

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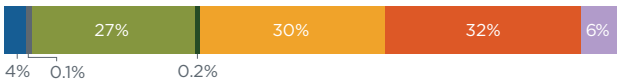
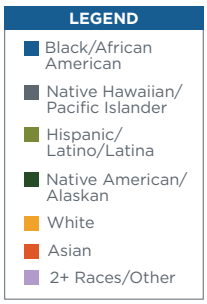
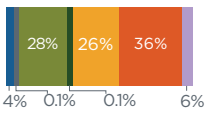
Demographics of Students Taking AP CS Exams



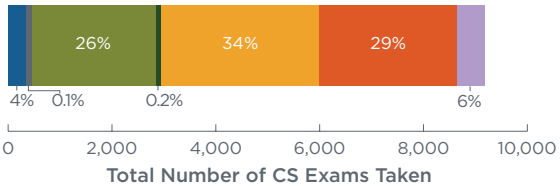


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



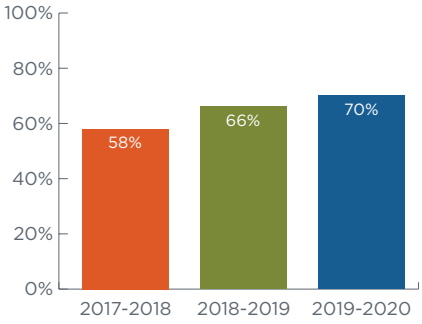
Native American students are 3.5 times less likely, Hispanic/Latinx students are 3 times less likely, and Black students are 6 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Utah

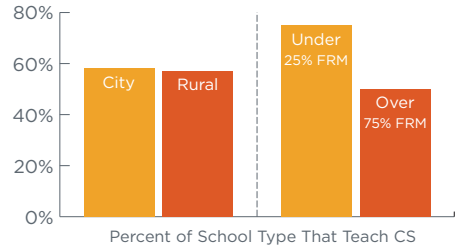
State Plan Yes	The state adopted a plan in 2019 that includes goals and recommendations to expand access to rural, low-income, and female students. The Silicon Slopes Computer Science Fund was created to invest in state plan initiatives.
Standards Yes	The state adopted K–5 computer science standards in September 2019 and 6–12 standards in May 2020. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Yes	HB 227 (FY 2020) allocated $3.15M for the Computer Science for Utah Grant Program. Applicants must describe how they will increase the number of female and traditionally underserved students, ensure content is accessible to all students, and strategies for increasing diversity. SB 190 (FY 2018 and 2019) allocated $1.2M annually for the Computing Partnerships Grants program. SB 93 (FY 2017) allocated $400K for computer science.
Certification Yes	Teachers with secondary or CTE licensure can obtain up to six course-specific 6–12 endorsements. Each endorsement requires a combination of experience or coursework, exams, professional development, and more.
Preservice Yes	The State Board of Education has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.
CS Supervisor Yes	The State Board of Education has a Computer Science State Specialist.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Yes	A computer programming course can replace the third mathematics credit by parent request. AP Computer Science, Computer Science Principles, and Computer Programming II can count as a science credit.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

Utah is a member of the ECEP Alliance, has a CSTA chapter, and Governor Gary Herbert is a member of the Governors' Partnership for K–12 Computer Science.

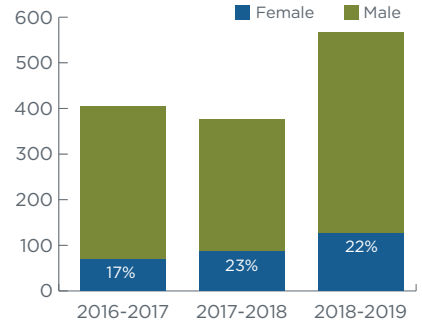
High Schools Teaching CS



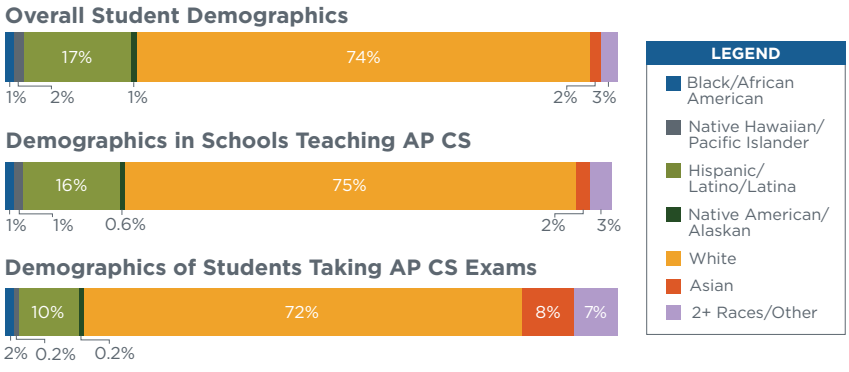
High Schools Teaching CS by School Type



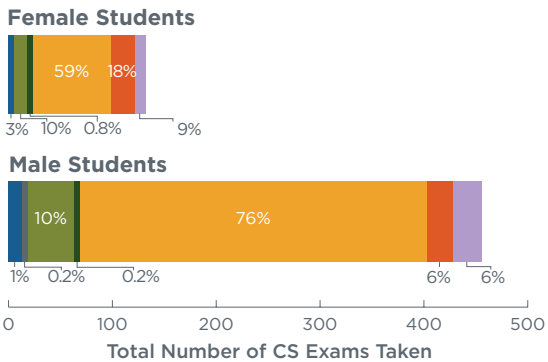
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender

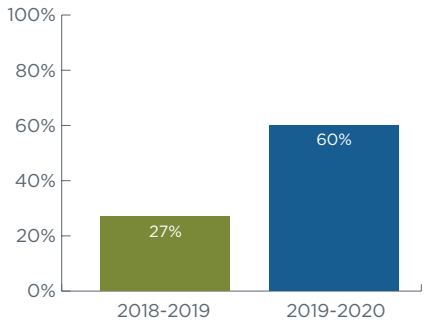


Hispanic/Latinx students are 1.6 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it. Native American students are 1.7 times less likely than their white and Asian peers to attend a school that offers AP CS.

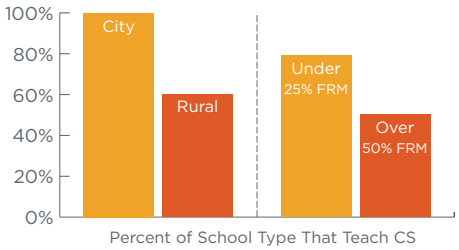
Vermont

State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards No	The state does not yet have a discrete set of rigorous computer science standards across K–12.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification Yes	Teachers with existing licensure can obtain a 7–12 endorsement by demonstrating knowledge standards, performance standards, and completing academic coursework.
Preservice Yes	The Agency of Education has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	The state does not yet require that all secondary schools offer computer science.
Grad Credit Dist. Decision	The state passed a permissive and encouraging policy to allow computer science to count towards a core graduation requirement, but it is a district decision.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.
Vermont has a CSTA chapter.	

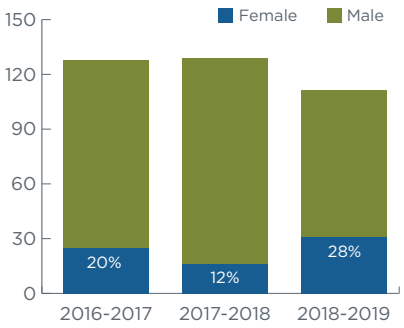
High Schools Teaching CS



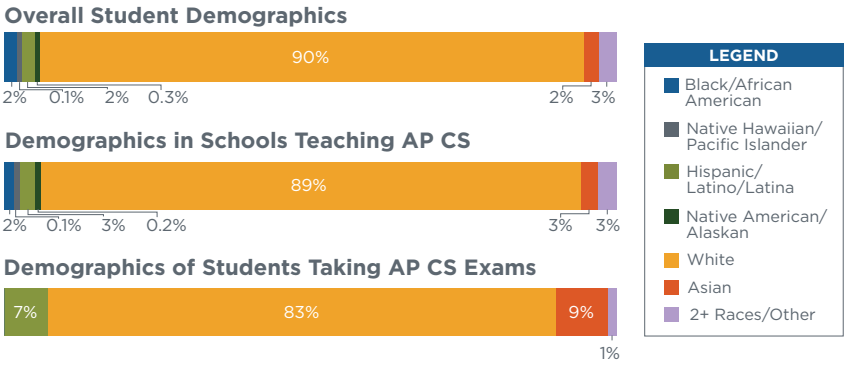
High Schools Teaching CS by School Type



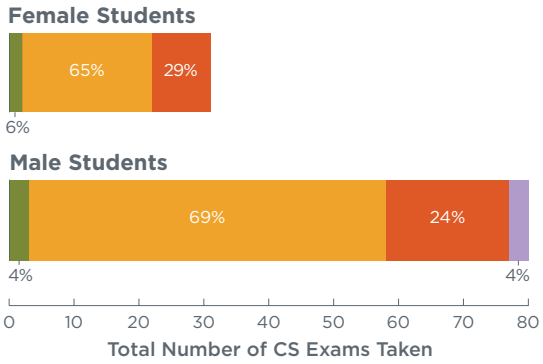
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



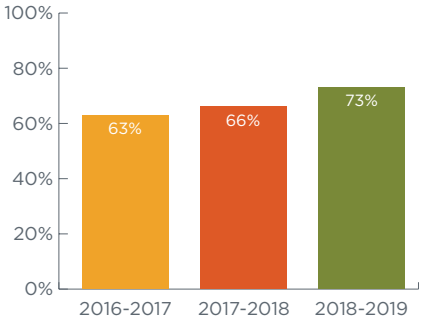
Although Black students make up 2.4% of the overall student population, no Black students took an AP CS exam.

Virginia

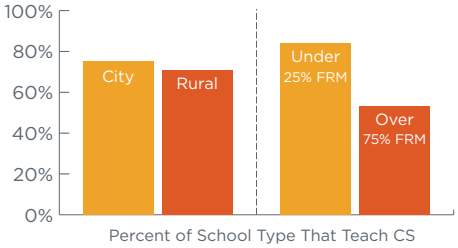
State Plan No	Although the state has not yet created a state plan, HB 1663 (2017) established a Computer Science for All Virginia Students advisory committee and public-private partnership.
Standards Yes	The state added mandatory K–12 computer science standards to the state Standards of Learning in 2017, effectively requiring all K–12 schools to offer instruction in computer science. Standards within each grade band address concepts of equity.
Funding Yes	HB 30 (FY 2021 and 2022) allocated $1.35M annually to support computer science education and implementation of the standards, including professional development. HB 30 (FY 2021 and 2022), HB 1700 (FY 2019 and 2020), and HB 1500 (FY 2017 and 2018) also allocated $550K annually for CodeVA.
Certification Yes	Teachers can obtain an endorsement through coursework or passing the Praxis CS exam. An initial license in computer science requires completing a state-approved program or coursework. The Department of Education convened a workgroup on micro-credentials and is now developing recommendations per HB 836 (2020).
Preservice Yes	The Department of Education has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.
CS Supervisor Yes	The Department of Education has a Computer Science and Virtual Learning Specialist.
All HS Offer Yes	HB 831 (2016) added computer science into the state's K–12 Standards of Learning, which all schools must implement.
Grad Credit Yes	A variety of computer science courses can count as a credit for graduation in lab science, career and technical education, or mathematics at or above the level of Algebra II. Students in English as a Second Language programs can add a computer science elective for graduation credit if they test out of their foreign language requirement.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

Virginia is a member of the ECEP Alliance, has CSTA chapters, and Governor Ralph Northam is a member of the Governors' Partnership for K–12 Computer Science.

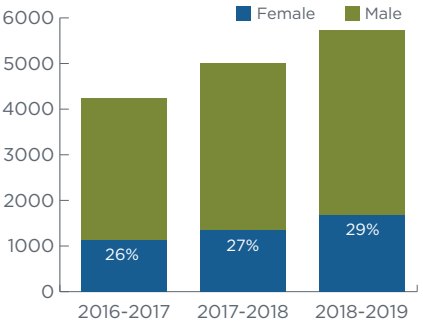
High Schools Teaching CS



High Schools Teaching CS by School Type



AP CS Student Participation

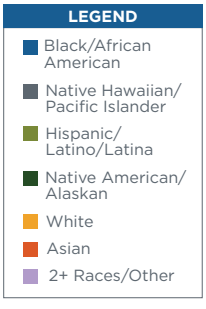


Access and Participation by Race/Ethnicity

Overall Student Demographics

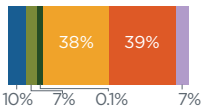
Demographics in Schools Teaching AP CS

Demographics of Students Taking AP CS Exams

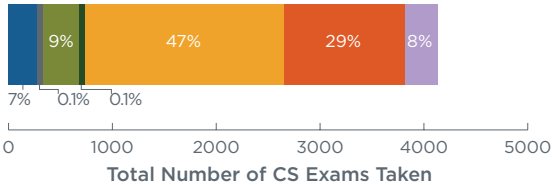


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



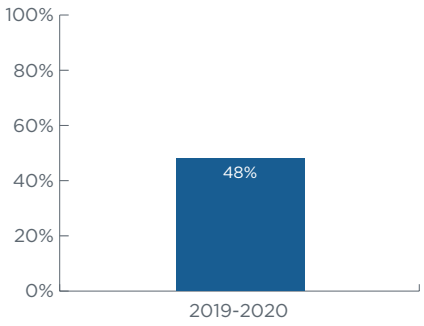
Hispanic/Latinx students, Black students, and Native American students are each 3 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Washington

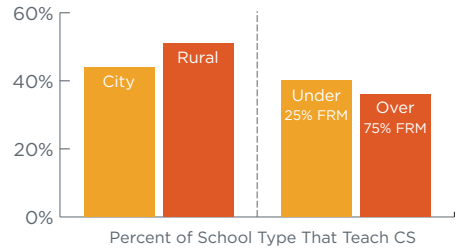
State Plan No	Although the state has not yet created a state plan, the Office of Superintendent of Public Instruction (OSPI) published guidance on teaching computer science in 2020.
Standards Yes	The state adopted updated K–12 computer science standards based on the CSTA standards in 2018. Standards within each grade band address concepts of equity.
Funding Yes	HB 1109 (FY 2020 and 2021), SB 5883 (FY 2018 and 2019), and SB 6052 (FY 2016 and 2017) appropriated $1M annually for the computer science education grant program with a one-to-one private match requirement. HB 1109 exempted the match requirement for districts with greater than 50% of students eligible for free and reduced-price meals. Grants are intended to engage female students, low-income students, and students in underrepresented racial and ethnic groups.
Certification Yes	Teachers with existing licensure can obtain a K–12 endorsement through passing the state content exam. State funding for computer science can support credentialing for teachers.
Preservice Yes	The OSPI has approved computer science teacher preparation programs. The Washington State Opportunity Scholarship also provided funding for Central Washington University and Western Washington University to develop a computer science endorsement program.
CS Supervisor Yes	The Office of the Superintendent of Public Instruction has a Computer Science Program Specialist.
All HS Offer Yes	SB 5088 (2019) required that each school district that operates a high school must provide access to an elective computer science course by the 2022–2023 school year. HB 1577 (2019) required each school district to report the number of computer science course offerings and demographics of enrolled students, starting in June 2020.
Grad Credit Yes	Computer science can count as the third required mathematics credit or a science credit for graduation.
IHE Admission Yes	AP Computer Science A can count as a mathematics credit required for admission at institutions of higher education.

Washington is a member of the ECEP Alliance, has CSTA chapters, and Governor Jay Inslee is a member of the Governors' Partnership for K–12 Computer Science.

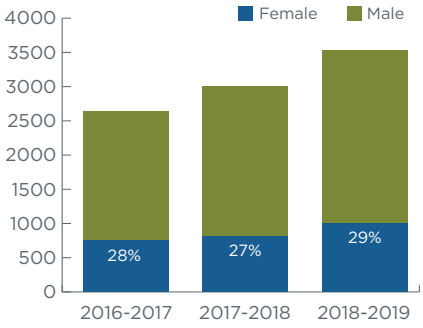
High Schools Teaching CS



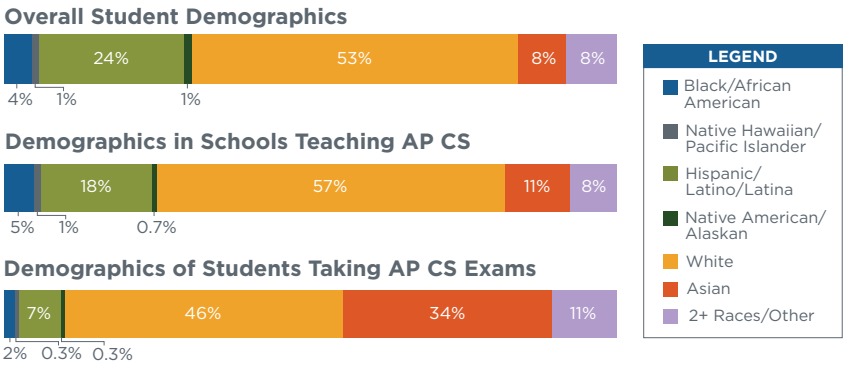
High Schools Teaching CS by School Type



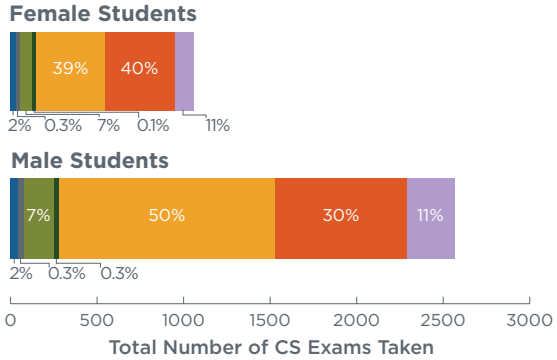
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



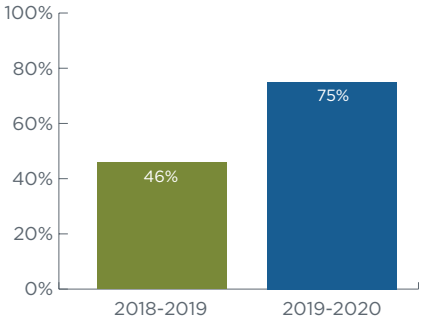
Native American, Hispanic/Latinx, and Black students are each 3 times less likely and Pacific Islander students are 4.6 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

West Virginia

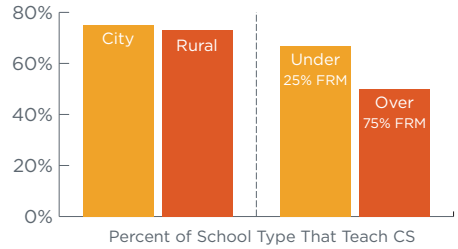
State Plan Yes	The Department of Education approved a state plan for expanding computer science in October 2019.
Standards Yes	The state adopted K–12 computer science standards in 2019.
Funding Yes	With the state plan's publication in October 2019, the state also allocated yearly funding for professional development for teachers as recommended by SB 267 (2019).
Certification Yes	Teachers with existing licensure can obtain course-specific authorizations for Introduction to Computer Science, Computer Science Discoveries, and/or Computer Science Fundamentals by completing specified professional development.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The Department of Education has a Computer Science Supervisor.
All HS Offer Yes	SB 267/HB 2415 (2019) required the state board to adopt a policy detailing the appropriate level of computer science instruction that shall be available to students at each programmatic level prior to the 2020–2021 school year. Policy 2510, revised in 2015, required all high schools to offer a computer science course.
Grad Credit Yes	An AP computer science course can count as the fourth mathematics credit or a science credit for graduation.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

West Virginia has a CSTA chapter.

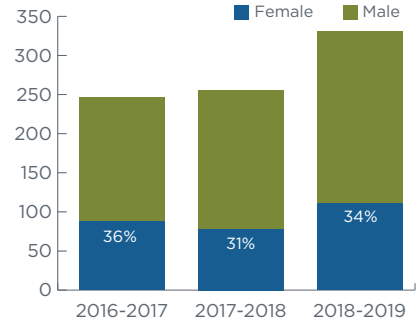
High Schools Teaching CS



High Schools Teaching CS by School Type

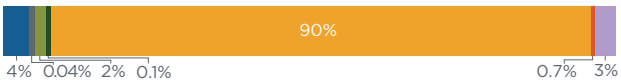


AP CS Student Participation

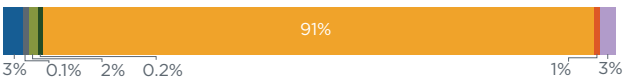


Access and Participation by Race/Ethnicity

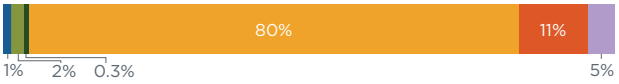
Overall Student Demographics

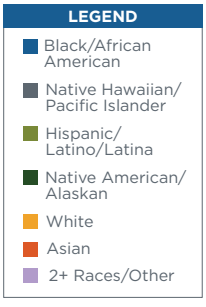


Demographics in Schools Teaching AP CS



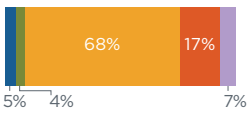
Demographics of Students Taking AP CS Exams



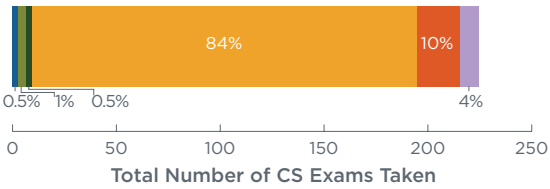


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



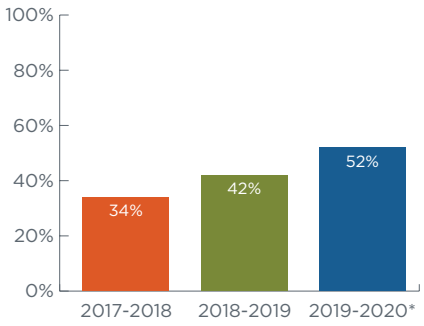
Black students are 2.6 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Wisconsin

State Plan No	The state has not yet created a plan for K–12 computer science that includes goals, strategies, and timelines.
Standards Yes	The state adopted K–12 computer science standards in 2017. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding No	The state does not yet provide dedicated state funding for rigorous computer science professional development and course support.
Certification Yes	Teachers with existing licensure can obtain a 4–12 supplementary license by passing the Praxis CS exam. An initial license in computer science requires completing a state-approved preparation program.
Preservice Yes	The Department of Public Instruction has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.
CS Supervisor No	The state does not yet have a dedicated computer science education supervisor position.
All HS Offer No	Although the state does not yet require that all secondary schools offer computer science, state statute 118.01(2)(a)5 requires each school board to provide an instructional program designed to give students knowledge in computer science, including problem-solving, computer applications, and the social impact of computers.
Grad Credit Yes	Computer science courses that meet the department's definition of computer science can count as a mathematics credit for graduation.
IHE Admission No	The state does not yet allow computer science to count as a core admission requirement at institutions of higher education.

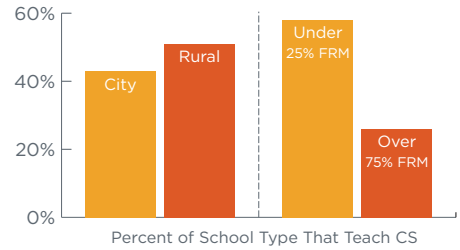
Wisconsin has a CSTA chapter.

High Schools Teaching CS



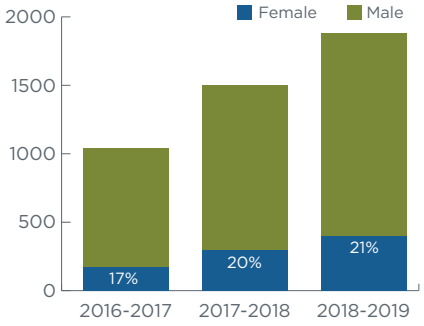
*2019 data includes Robotics courses that were not included in prior years

High Schools Teaching CS by School Type



Percent of School Type That Teach CS

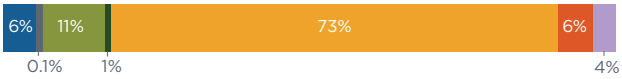
AP CS Student Participation



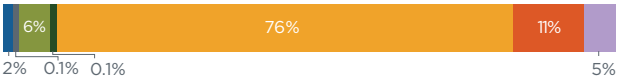
Access and Participation by Race/Ethnicity

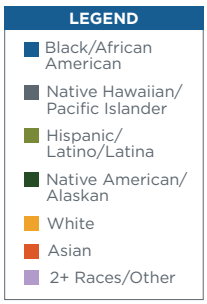
Overall Student Demographics

Demographics in Schools Teaching AP CS



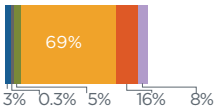
Demographics of Students Taking AP CS Exams



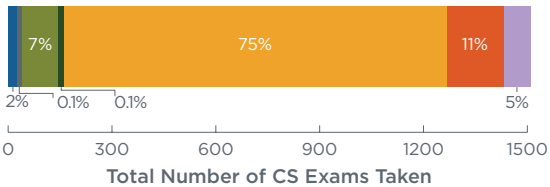


AP CS Participation by Race/Ethnicity and Gender

Female Students



Male Students



Total Number of CS Exams Taken

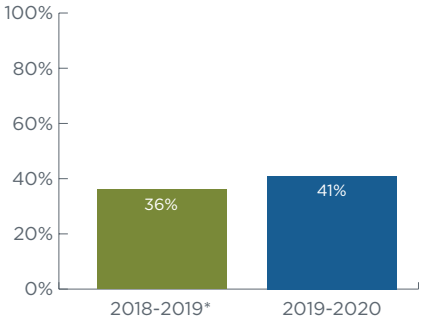
Hispanic/Latinx students are 2 times less likely, Black students are 4 times less likely, and Native American students are 9 times less likely than their white and Asian peers to take an AP CS exam when they attend a school that offers it.

Wyoming

State Plan Yes	The Wyoming Department of Education created a task force in 2017 to develop and implement a long-term plan for expanding computer science.
Standards Yes	The state adopted K–12 computer science standards in February 2020. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.
Funding Other	Although the state does not yet provide dedicated state funding, the Wyoming Trust Fund for Innovative Education prioritized computer science applications in 2018–2020.
Certification Yes	Teachers with existing licensure can obtain a 6–12 endorsement by completing a program that leads to licensure or a combination of coursework and passing the Praxis CS exam. Another pathway requires coursework and work experience. Teachers can receive authorization to teach some computer science courses through a state and district-approved professional development plan.
Preservice No	The state has not yet established guidelines or approved programs at institutions of higher education to offer computer science to preservice teachers.
CS Supervisor Yes	The Department of Education has a Math and Computer Science Consultant.
All HS Offer Yes	SF 29 (2018) required all schools to include computer science and computational thinking by the 2022–2023 school year.
Grad Credit Yes	Computer science can count as one year of science, fourth year mathematics, or career credits required for admission at institutions of higher education, which aligns with the high school graduation policy.
IHE Admission Yes	Computer science can count as one year of science, mathematics, or career credits required for admission at institutions of higher education, which aligns with the high school graduation policy.

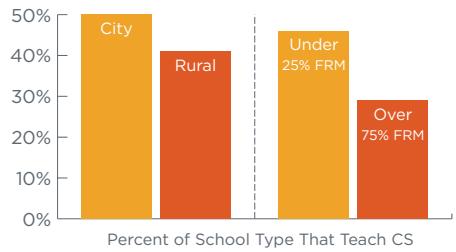
Wyoming has a CSTA chapter.

High Schools Teaching CS

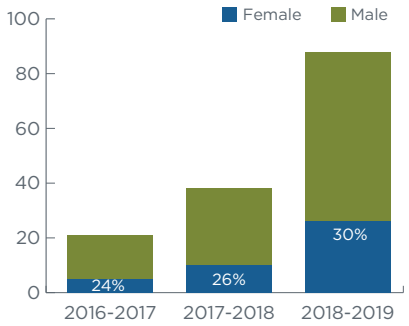


*Reflects a correction of last year's published number

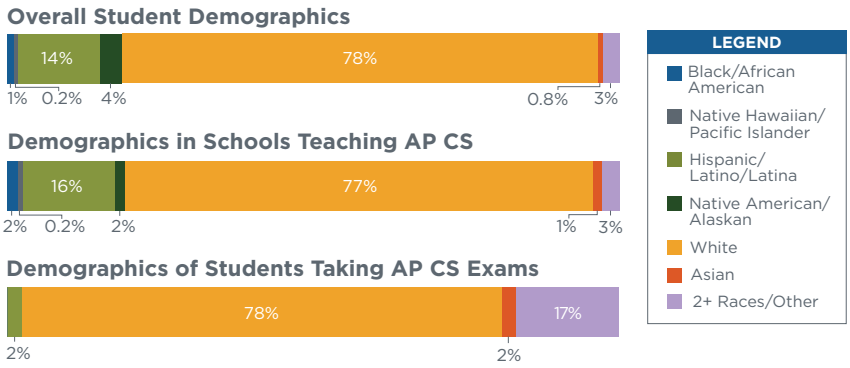
High Schools Teaching CS by School Type



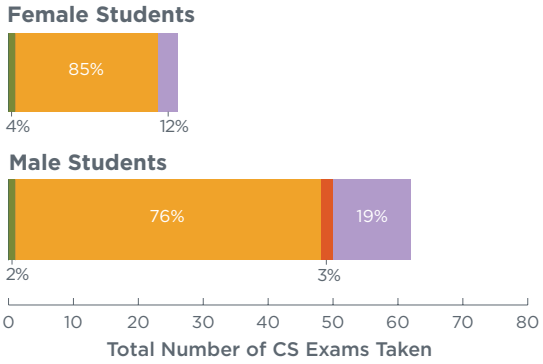
AP CS Student Participation



Access and Participation by Race/Ethnicity



AP CS Participation by Race/Ethnicity and Gender



Native American students make up 4% of the overall student population, but no Native American students took an AP CS exam. Hispanic/Latinx students make up 14% of the overall student population, but only 2 Hispanic/Latinx students took an AP CS exam.

Appendices

1 Appendix 1: Nine Policies Overview

The Code.org Advocacy Coalition created recommendations for nine policies to make computer science fundamental from five key principles: Equity and Diversity, Clarity, Capacity, Leadership, and Sustainability.

Equity and Diversity

Prioritizing equity requires advocates and policymakers to focus on the systemic factors influencing the diversity of students in computer science education. Data clearly show that students from underrepresented groups are less likely to have access to high-quality computer science content. If unaddressed, we will continue to exclude entire populations from this fast-growing field and miss out on the innovations and contributions that diversity promotes. Equity and diversity are overarching values reflected in each of the nine policies and must be specifically addressed in policy development to avoid perpetuating disparities.

Clarity: State Plan, Standards

State implementation is strengthened by clarity around what computer science is and how to achieve goals around expanding access. **State plans** articulate the goals for implementing 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. In addition to a plan, high-quality **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 and the Computer Science Teachers Association (CSTA) K–12 Computer Science Standards.

Capacity: Funding, Certification, Preservice Education

Schools' capacity for offering computer science courses is directly related to the availability of teachers prepared to teach the subject. States should provide resources to prepare inservice teachers from diverse backgrounds to teach K–12 computer science. States should prioritize **funding** for districts that make demonstrable efforts to engage underrepresented groups. States should also create clear, navigable, and rewarding professional paths tied to computer science **certification** for teachers to help grow their ranks and increase equitable access to the subject. Finally, the computer science teacher shortage should be addressed by exposing more teachers to computer science during their required **preservice education** coursework and by creating specific pathways for computer science teachers. States should fund partnership opportunities between local school districts and schools of education to create direct pathways for teachers into high-need school districts, addressing equity concerns.

Leadership: State Supervisor

Implementation of policy reforms is bolstered by centralized leadership at the state to oversee statewide initiatives. Creating a **computer science supervisor** position within the State Education Agency allows states to support policy implementation and rapid scaling of equitable computer science. This position would monitor the scaling process for issues of equitable access, and diversity of students reached.

Sustainability: All High Schools, Core Graduation Requirement, Core Admission Requirement

Making computer science a fundamental part of the K–12 education system requires sustainability of computer science initiatives. All students should have the opportunity to learn computer science in elementary, middle, and high school. States should **require all high schools** to offer at least one computer science course based on rigorous standards and accessible to all students. These courses should satisfy existing **graduation requirements** in a core subject such as mathematics or science; or, increasingly, in computer science. Admission policies for colleges and universities should align to high school graduation requirements and allow rigorous computer science courses to meet **core admission requirements**. Aligning these policies would incentivize students to explore computer science earlier, which is an essential step to increasing diversity in the field.

These nine policy ideas are a menu of choices for states 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 and funding. States should adopt the policies they are best positioned for and continually work to ensure that computer science is at the core of their education system.

Read more about these policies at bit.ly/makecsfundamental.

Policy Principles

- **Clarity**
- **Capacity**
- **Leadership**
- **Sustainability**
- **Equity and Diversity***

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

2 Appendix 2: Policy Rubrics and Lists of States

State Plan for K–12 Computer Science Education

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

The following states have state plans for K–12 computer science:

Arkansas
California
Connecticut
Georgia
Hawaii
Idaho
Indiana
Maine
Maryland
Nevada
New Hampshire
New Jersey
North Carolina
Rhode Island
Tennessee
Utah
West Virginia
Wyoming

K–12 Computer Science Standards

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
- are publicly accessible on the state's website

The following states have K–12 computer science standards:

Alabama
Alaska
Arizona
Arkansas
California
Connecticut
Delaware
Florida
Hawaii
Idaho
Indiana
Iowa
Kansas
Kentucky
Maryland
Massachusetts
Michigan
Mississippi
Missouri
Nevada
New Hampshire
New Jersey
New Mexico
North Carolina
North Dakota
Ohio
Oklahoma
Pennsylvania
Rhode Island
South Carolina
Tennessee
Utah
Virginia
Washington
West Virginia
Wisconsin
Wyoming

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

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

- the funds are allocated via the approved state budget or state legislation
- a description of the funds is publicly accessible

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

Alabama
Arizona
Arkansas
Colorado
Florida
Georgia
Hawaii
Idaho
Indiana
Iowa
Kentucky
Maryland
Massachussets
Mississippi
Missouri
Nevada
New Jersey
New Mexico
New York
North Carolina
Ohio
Pennsylvania
Rhode Island
South Carolina
Tennessee
Utah
Virginia
Washington
West Virginia

State Computer Science Certification

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)
- enables a teacher to teach computer science courses

The following states have computer science teacher certification:

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

State-Approved Preservice Teacher Preparation at Institutions of Higher Education

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

- the state requires all preservice teachers (from any subject) be exposed to computer science content and/or pedagogy within a teacher's preservice program
- the state provides scholarships for preservice teachers to take computer science
- the state provides funds to teacher preparation institutions to establish preservice computer science education programs
- the state approves programs at institutions of higher education that prepare preservice teachers to teach computer science and lists those programs publicly

Note that each of the above involves a state-led effort; individual programs led by universities are not sufficient to meet this state policy.

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

Alabama
Arkansas
Connecticut
Georgia
Idaho
Indiana
Massachusetts
Maryland
Michigan
Montana
Nevada
New Hampshire
New York
Ohio
Pennsylvania
Texas
Utah
Vermont
Virginia
Washington
Wisconsin

State-Level Computer Science Supervisor

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
- the title reflects a focus on K–12 computer science
- clearly able to develop state policy/regulations and create programs around computer science

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

Alabama
Arkansas
Colorado
Connecticut
Florida
Georgia
Hawaii
Idaho
Indiana
Iowa
Kansas
Kentucky
Maine
Maryland
Massachusetts
Michigan
Minnesota
Nevada
New Hampshire
North Carolina
Ohio
Oklahoma
Pennsylvania
Rhode Island
Virginia
Washington
West Virginia
Wyoming

A Requirement for All High Schools to Offer Computer Science

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
- a description of the requirement is publicly accessible

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

Alabama
Arkansas
Connecticut
Delaware
Florida
Georgia
Hawaii
Idaho
Indiana
Iowa
Maryland
Nevada
New Hampshire
New Jersey
South Carolina
Texas
Virginia
Washington
West Virginia
Wyoming

Computer Science Can Satisfy a Core High School Graduation Requirement

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
- a description of the policy is publicly accessible

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

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

*The state has passed a permissive and encouraging policy, but it is not a requirement for schools to allow computer science to satisfy a core graduation requirement.

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

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)
- a description of the policy is publicly accessible

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

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

3 Appendix 3: Data Sources Methodology

K–12 Computer Science Access Report Methodology

Data Sources

Data Source	Description
National Center for Education Statistics (NCES)	Database of schools in the country with demographic information, including enrollment in Free and Reduced Lunch programs, student demographics, and grades offered. We currently use the 2017–2018 NCES list of schools for the overall number of schools (with exceptions in some states where state employees identified schools to exclude from the list of high schools—schools that do not teach any high school grades or are supplemental educational centers).
School Courses for the Exchange of Data (SCED)	SCED is a common classification system for middle and high school courses. Some states use SCED for a course classification system.
State departments of education	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.
District/school course catalogs	Direct contact with school employees and school course catalogs for course names and descriptions.
Survey responses	Completed surveys on Code.org and Hourofcode.com from teachers, administrators, and parents.

Data from state education agencies was collected through direct collaboration or via requests submitted through an online portal. State data included school codes, course codes, course descriptions, and course enrollment. Data was collected throughout the school year, starting in spring 2020. States with complete data sets are defined as those where all public high schools report their course offerings to the state Department of Education, or data was collected for every public high school (see table above for more detail). This year we collected data from all public schools across 50 states + DC.

School codes were cross-referenced with data from the National Center for Education Statistics (NCES) to determine each school's community type, the percentage of students from underrepresented racial and ethnic groups, and the percentage of economically disadvantaged students (defined as students who are eligible for free and reduced-price meals under the National School Lunch Program). The NCES uses four main categories for community type (City, Suburban, Town, Rural). Underrepresented racial and ethnic groups are students from the following racial and ethnic groups: Black/African American students, Hispanic/Latino/Latina students, Native American/Alaskan students, and Native Hawaiian/Pacific Islander students. State

departments of education and organizations interested in providing statewide implementation data should contact accessreport@code.org.

Course Listings

SCED and state-level course catalogs, released for the current year, were examined, and courses were added (or deleted) based on course descriptions. These courses were either new courses in the state catalog, new state course descriptions that fit our definition, CTE courses, or courses that were re-examined within the state that fit the definition of what counts as a foundational computer science course. Course lists differ slightly for each state based on state course descriptions (e.g., for some states, robotics courses included programming whereas others did not).

Inferring Between Years

Each year, unless new data is provided, it is inferred that if a school taught computer science in the previous year, the school is still teaching computer science. This ensures any data obtained from a school course catalog or survey (and not reported from the state department of education or a national organization) is carried forward to the new year. This data is only carried over for two years, before being replaced with new data or changing to a no.

K–12 School Data

So far, the initiative has collected data on 65% of all public and public charter K–12 schools and 99% of all public high schools. Based on this data, at least 38,406 public schools in the U.S. teach computer science (there are 98,613 public schools in the nation). This is an increase from 55% of all public K–12 schools and 83% of all public high schools (and full data sets from 39 states) reported last year. Refer to code.org/yourschool for an interactive map of the most up-to-date data.

The current data set includes elementary, middle, and high schools from every state with the most data coming from public high schools (including public charter schools and any schools that offer at least one high school grade). High school courses must include at least 20 hours of programming to count as foundational computer science courses, but K–8 elementary and middle school must include at least 10 hours of programming. The Access Report data in National Momentum and the state summaries only reflect public high schools.

Participation Data Methodology

Demographic Data

The data on computer science course enrollment was provided by several states for the foundational computer science courses considered in the Access Report. The statewide demographic data comes from the U.S. Department of Education National Center for Education Statistics 2018 Digest of Education Statistics, Tables 204.70[12] (2017–2018); 204.20[13] (fall 2017); 204.10[14] (2016–2017); and 203.20[15] (fall 2017).

[12] https://nces.ed.gov/programs/digest/d18/tables/dt18_204.70.asp
[13] https://nces.ed.gov/programs/digest/d18/tables/dt18_204.20.asp
[14] https://nces.ed.gov/programs/digest/d18/tables/dt18_204.10.asp
[15] https://nces.ed.gov/programs/digest/d19/tables/dt19_203.20.asp

	Students Who Receive Special Education Services Under IDEA		Students Who Are English Language Learners		Students Who Are Eligible for Free and Reduced-Price Meals	
	Percent of Students in CS Courses	Percent of Students in the State	Percent of Students in CS Courses	Percent of Students in the State	Percent of Students in CS Courses	Percent of Students in the State
Alabama**	6.51%	12.21%	1.99%	3.47%	40.59%	51.58%
Arkansas	8.12%	14.75%	5.23%	8.31%	54.91%	63.58%
Connecticut	8.93%	15.10%	2.62%	7.43%	30.31%	35.66%
Florida*	6.65%	13.71%	2.33%	10.12%	37.49%	58.10%
Hawaii*/**	10.29%	10.62%	6.38%	8.24%	44.06%	47.58%
Indiana	10.76%	16.80%	3.39%	5.37%	37.53%	47.94%
Massachusetts*	8.05%	18.04%	2.53%	9.98%	18.18%	39.92%
Mississippi*	10.68%	14.46%	3.09%	2.72%	74.92%	74.99%
New Jersey	7.45%	16.94%	0.97%	5.92%	18.67%	37.88%
New Mexico*	11.86%	15.78%	11.55%	16.29%	54.84%	71.45%
Texas**	5.06%	9.21%	11.94%	18.00%	39.52%	58.95%
Weighted Average	**7.60%**	**12.90%**	**5.60%**	**11.22%**	**41.26%**	**53.86%**

* Data for CS course enrollment includes a different list of courses than those included in the Access Report. HI and MS included additional courses. FL, MA, and NM masked data at either the state level (NM) or at the school level (FL, MA) for courses with low enrollment.
**Data for CS course enrollment listed under "students eligible for free and reduced-price meals" was provided under a different definition from the state.

Disparity Index

A disparity index[16] is used to quantify the difference in access and participation for each underrepresented racial and ethnic group. It compares the ratios of students from specific populations underrepresented in computer science to populations overrepresented in computer science. An example of a disparity index formula for Hispanic/Latino/Latina student participation is:

$$\frac{\frac{\textit{number of white and Asian students who took the exam}}{\textit{number of white and Asian students in the school population}}}{\frac{\textit{number of Native American/Alaskan students who took the exam}}{\textit{number of Native American/Alaskan students in the school population}}}$$

The disparity index is used to describe the disparity in access or participation for each underrepresented racial and ethnic group (e.g., Native American/ Alaskan students are 2 times less likely to attend a school that offers AP computer science as their white and Asian peers). White and Asian students are overrepresented in computer science, and so these populations of students are used to calculate the disparity in access and participation for each underrepresented racial and ethnic group.

The disparity index for access is computed by dividing the rate of access for one demographic group by the rate of access for another demographic group. The rate of access is calculated by dividing the number of students in a given group who attend schools that teach AP computer science by the total number of students of that group in the state. Statewide and school demographics are from the National Center for Education Statistics (NCES), and the list of schools offering an AP computer science course is provided directly to Code.org from the College Board.

The disparity index for participation is computed by dividing the rate of participation for one demographic group to the rate of participation for another demographic group. The rate of participation is calculated by dividing the number of participating students for a given group by the total number of students of that group who attend schools that teach AP computer science. AP data is used because it provides a national data set on participation and diversity in computer science courses. The data for "2+ Races/Other" includes data from the College Board for 2 or more races, other, and no response.

[16] Warner, J. R., Childs, J., & Fletcher, C. L. (2020, Apr) Texas computer science: access, participation, and intersectionality. In Progress and Challenges in K-12 Computer Science Education: Evidence from Four States [Symposium session]. American Education Research Association Annual Meeting.

4 Appendix 4: K–12 Computer Science Access Report Charts and Tables

State Quick Look					Computer Science Access by Community Type: Percentage of Schools in Each Community Type That Teach CS					
State	Reporting Year	Number Policies	% Teaching CS This Reporting Year	% Teaching CS Prior Year	City	Suburban	Town	Rural	Less than 25% students qualify for FRL	Greater than 75% students qualify for FRL
AK*	2019	2	32%	19%	36%	57%	39%	30%	30%	26%
AL**	2019	8	46%	38%	46%	60%	39%	43%	85%	54%
AR	2019	9	89%	78%	93%	78%	89%	89%	86%	72%
AZ	2019	4	30%	N/A	33%	41%	15%	25%	29%	27%
CA	2017	5	47%	45%	45%	49%	25%	32%	55%	37%
CO	2017	4	38%	N/A	38%	45%	36%	33%	46%	28%
CT	2018	6	67%	N/A	53%	77%	30%	81%	78%	21%
DC*	2019	2	41%	20%	41%	N/A	N/A	N/A	41%	N/A
DE	2019	3	68%	65%	44%	63%	67%	92%	65%	N/A
FL	2019	6	33%	30%	30%	39%	18%	29%	15%	27%
GA	2019	8	55%	52%	48%	74%	36%	51%	58%	33%
HI*	2019	7	62%	47%	64%	67%	58%	59%	63%	38%
IA	2019	7	66%	58%	71%	71%	71%	63%	74%	31%
ID	2019	9	38%	N/A	49%	37%	34%	36%	33%	17%
IL	2018	3	45%	37%	53%	58%	32%	27%	61%	39%
IN	2019	9	72%	62%	68%	78%	79%	69%	75%	40%
KS**	2019	2	27%	26%	73%	65%	25%	16%	33%	50%
KY**	2019	6	45%	39%	47%	49%	42%	45%	23%	19%
LA	2019	3	23%	23%	30%	33%	21%	15%	40%	10%
MA	2018	7	75%	67%	63%	77%	82%	83%	74%	N/A
MD	2018	9	83%	62%	68%	87%	90%	93%	89%	40%
ME	2019	3	56%	N/A	60%	81%	53%	52%	67%	0%
MI	2019	3	37%	N/A	33%	40%	33%	39%	55%	20%
MN	2018	2	19%	N/A	15%	19%	21%	22%	23%	9%
MO	2019	4	50%	38%	53%	67%	47%	46%	60%	26%
MS	2019	5	48%	47%	83%	56%	40%	48%	50%	35%
MT*	2019	3	36%	31%	56%	N/A	46%	33%	51%	23%
NC**	2019	6	51%	45%	51%	58%	40%	51%	62%	32%
ND	2019	3	44%	41%	70%	50%	54%	42%	49%	29%
NE	2018	1	44%	40%	67%	73%	50%	38%	54%	43%
NH	2019	7	67%	49%	78%	69%	56%	67%	77%	0%
NJ	2018	6	67%	59%	40%	70%	80%	68%	78%	56%
NM	2019	3	32%	23%	30%	40%	42%	26%	59%	24%
NV	2019	9	77%	57%	74%	92%	73%	76%	69%	78%
NY	2018	4	48%	44%	38%	71%	47%	47%	73%	32%
OH	2018	6	42%	N/A	23%	60%	38%	43%	38%	30%
OK**	2019	5	37%	29%	45%	61%	42%	32%	50%	31%
OR*	2018	1	54%	37%	73%	55%	58%	42%	59%	44%
PA	2018	5	59%	56%	49%	69%	63%	51%	73%	48%
RI	2019	6	86%	86%	71%	91%	N/A	88%	95%	65%
SC	2019	6	80%	69%	80%	86%	87%	76%	90%	75%
SD	2019	2	38%	N/A	28%	100%	38%	39%	41%	10%
TN	2019	5	50%	N/A	54%	69%	50%	41%	49%	N/A
TX	2018	5	46%	N/A	49%	60%	43%	38%	37%	29%
UT	2019	7	70%	66%	58%	77%	69%	57%	75%	50%
VA	2018	7	73%	66%	75%	77%	60%	71%	84%	53%
VT	2019	3	60%	27%	100%	50%	56%	60%	79%	N/A
WA	2019	8	48%	N/A	44%	52%	41%	51%	40%	36%
WI*	2019	4	52%	42%	43%	69%	49%	51%	58%	26%
WV	2019	7	75%	46%	75%	73%	80%	73%	67%	50%
WY*	2019	7	41%	36%	50%	N/A	36%	41%	46%	29%

Student Access to Computer Science Courses: Percentage of Students in Each Population Demographic Who Attend a School That Teaches CS						
State	% Black/African American Students	% Native Hawaiian/Pacific Islander Students	% Hispanic/ Latino /Latina Students	% Native American/ Alaskan Students	% White Students	% Asian Students
AK*	48%	50%	57%	37%	59%	60%
AL	69%	77%	74%	70%	68%	88%
AR	88%	96%	93%	93%	92%	94%
AZ	73%	66%	67%	50%	73%	81%
CA	73%	76%	71%	61%	79%	87%
CO	63%	66%	58%	60%	65%	75%
CT	64%	79%	71%	76%	83%	90%
DC*	49%	67%	58%	52%	77%	71%
DE	78%	81%	82%	77%	87%	88%
FL	69%	73%	75%	70%	71%	82%
GA	74%	77%	82%	81%	78%	93%
HI*	89%	69%	78%	77%	79%	82%
IA	82%	89%	83%	85%	78%	82%
ID	66%	68%	65%	44%	62%	66%
IL	68%	85%	84%	82%	75%	94%
IN	76%	77%	85%	76%	82%	92%
KS	76%	66%	67%	45%	51%	77%
KY	79%	86%	85%	82%	78%	91%
LA	34%	56%	42%	13%	32%	55%
MA	77%	89%	78%	86%	89%	89%
MD	78%	86%	86%	89%	96%	96%
ME	78%	77%	64%	70%	66%	77%
MI	52%	71%	63%	61%	68%	76%
MN	56%	65%	57%	35%	59%	70%
MO	68%	85%	79%	69%	73%	86%
MS	53%	56%	57%	50%	61%	64%
MT*	58%	45%	52%	49%	55%	60%
NC	64%	65%	68%	39%	67%	80%
ND	88%	76%	63%	44%	68%	90%
NE	91%	78%	79%	51%	71%	90%
NH	87%	89%	89%	77%	80%	87%
NJ	70%	88%	80%	86%	91%	94%
NM	60%	64%	52%	44%	59%	65%
NV	96%	96%	96%	88%	91%	96%
NY	51%	62%	56%	55%	71%	75%
OH	39%	53%	53%	50%	57%	75%
OK	56%	69%	55%	46%	56%	75%
OR*	81%	86%	79%	63%	75%	90%
PA	62%	84%	74%	78%	81%	85%
RI	90%	97%	88%	93%	98%	96%
SC	89%	94%	94%	90%	93%	96%
SD	79%	44%	65%	40%	63%	57%
TN	66%	75%	66%	67%	66%	79%
TX	70%	77%	66%	68%	72%	86%
UT	86%	83%	87%	85%	86%	88%
VA	78%	88%	88%	82%	84%	92%
VT	70%	63%	62%	90%	63%	76%
WA	83%	86%	80%	63%	84%	91%
WI*	61%	84%	70%	68%	80%	87%
WV	87%	79%	84%	92%	87%	95%
WY*	68%	60%	67%	60%	62%	66%

* AK: 2019 data combines historic data from 2018 with new 2019 AP and survey data

* DC: 2019 data includes CTE courses that were not included in 2018

* HI: Data includes public DOE and public charter schools; skipped a year reporting so this shows two years growth

* MT: Reflects a correction of last year's published number

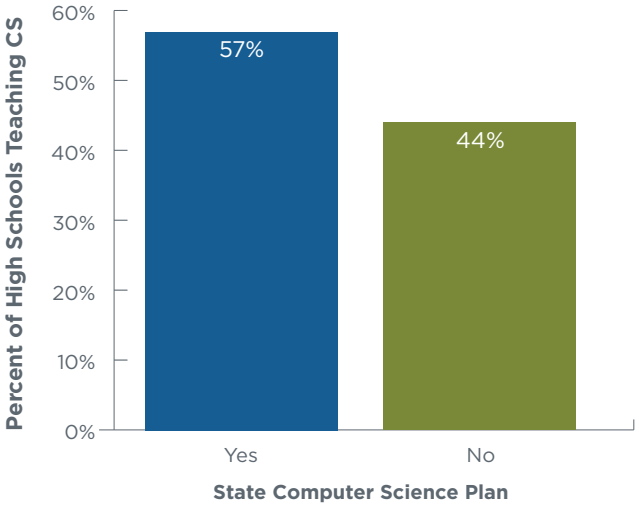
* OR: 2018 data includes Robotics courses that were not included in 2017

* WI: 2019 data includes Robotics courses that were not included in 2018

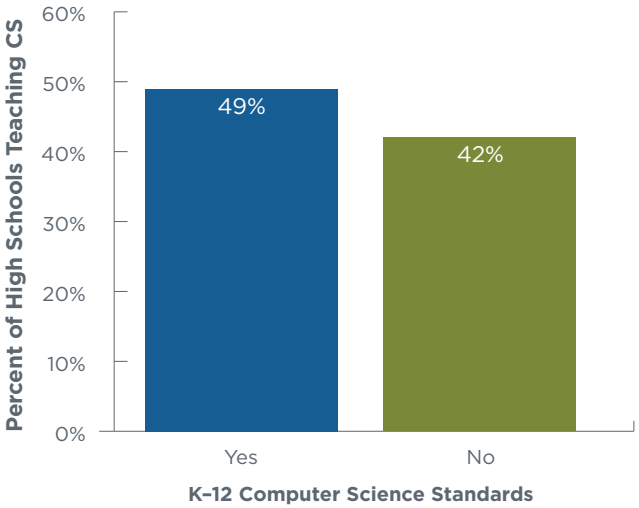
* WY: Reflects a correction of last year's published number

** Skipped a year reporting so this shows two years growth

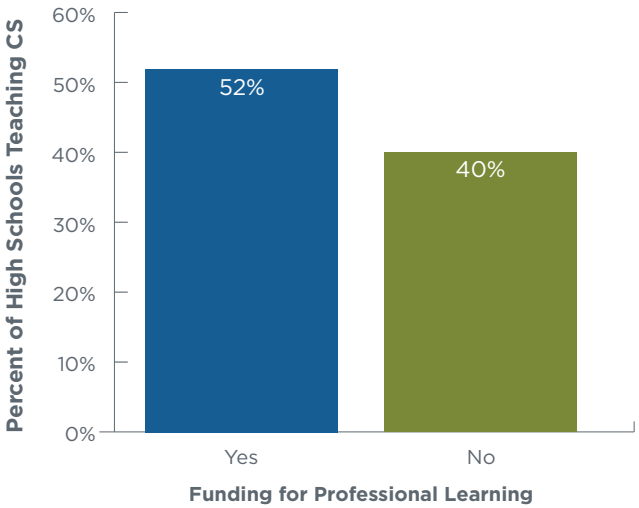
State Plan and Access to Computer Science



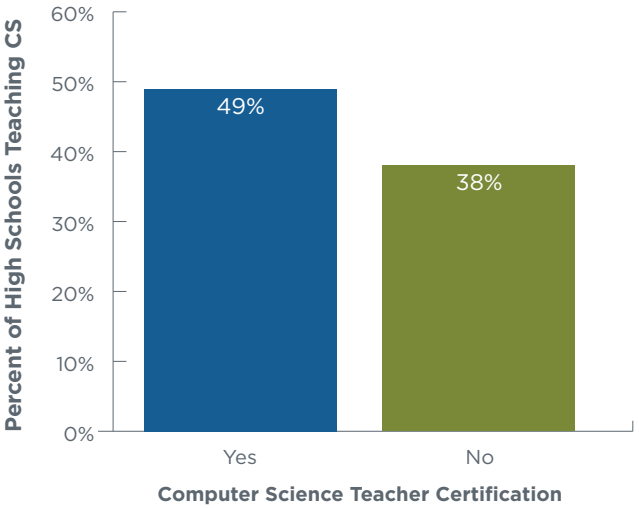
K–12 Standards and Access to Computer Science



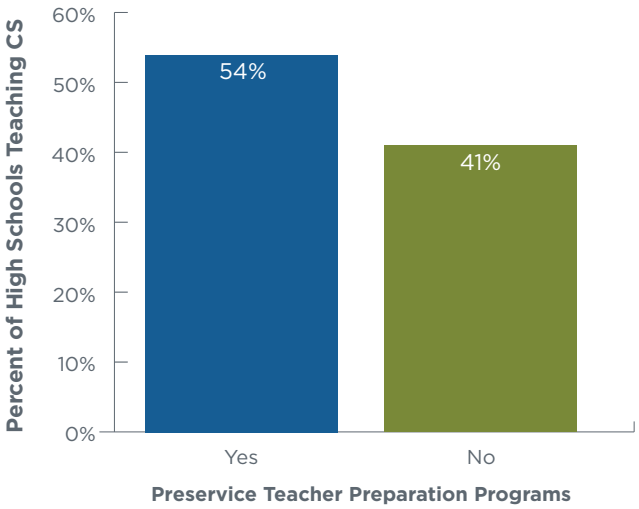
Funding and Access to Computer Science



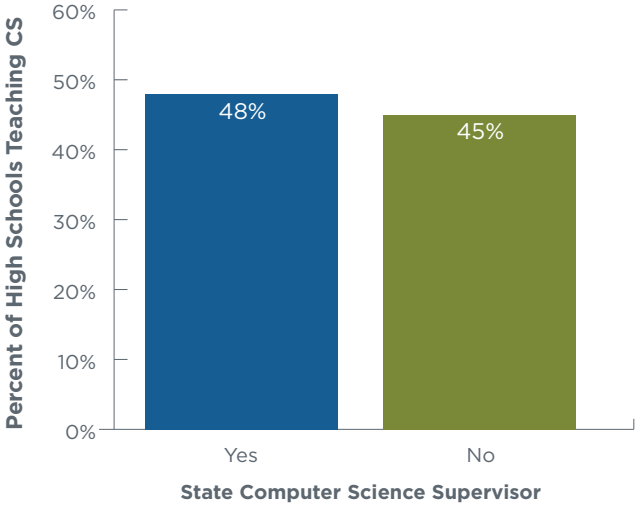
Certification and Access to Computer Science



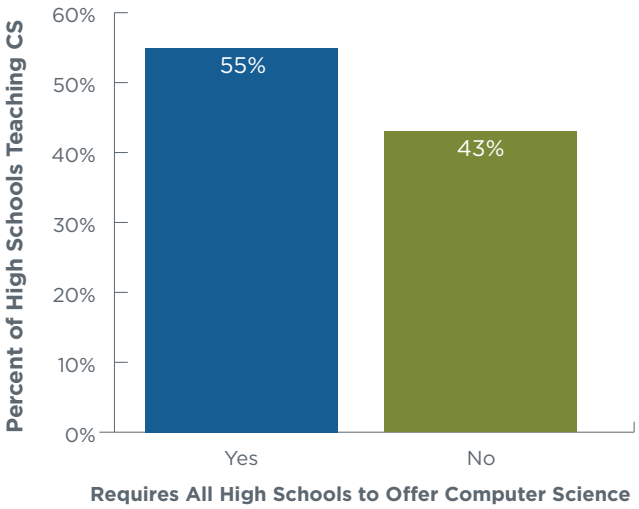
Preservice Teacher Preparation Programs and Access to Computer Science



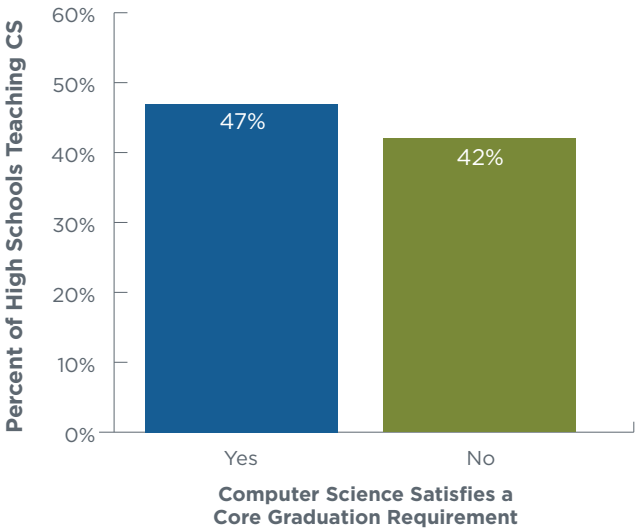
State Supervisor and Access to Computer Science



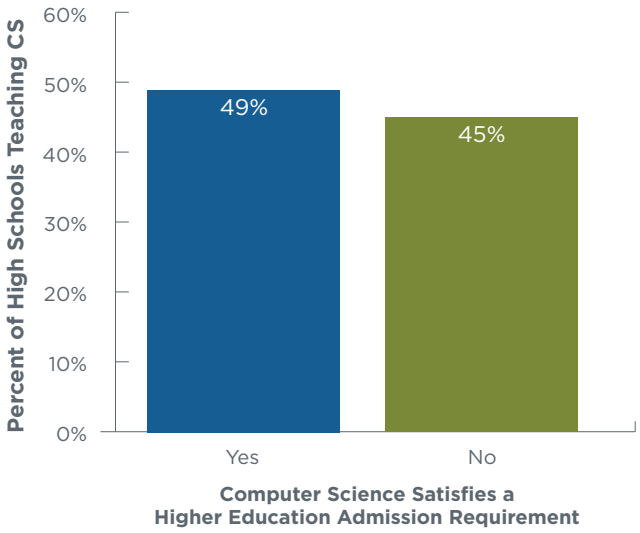
Requiring Schools to Offer Computer Science and Access to Computer Science



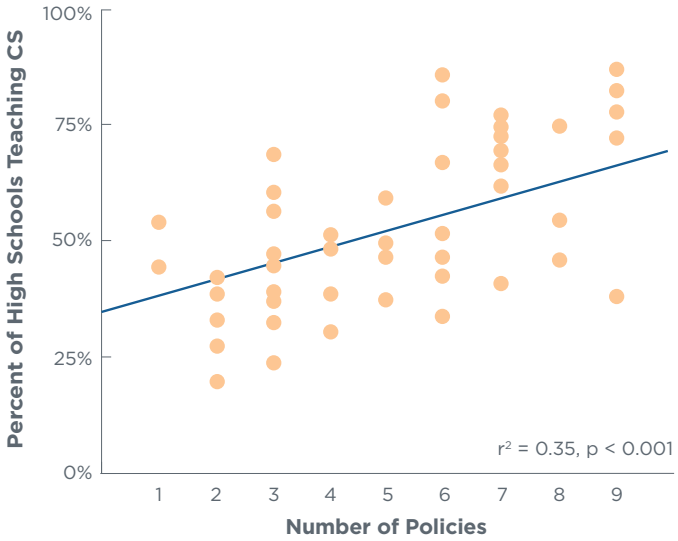
Computer Science Satisfying a Core Graduation Requirement and Access to Computer Science



Computer Science Satisfying a Higher Education Admission Requirement and Access to Computer Science



Policy Adoption and Access to Computer Science



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visit **advocacy.code.org/stateofcs**

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

For the latest K–12 computer science access data,
visit **code.org/yourschool**

For more information on joining the CSTA or CSTA chapters,
visit **csteachers.org**

For more information about ECEP state teams,
visit **ecepalliance.org**

About the Code.org Advocacy Coalition

Advocacy Coalition

Bringing together more than 70 industry, nonprofit, 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

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.

About the ECEP Alliance

ECEP Expanding Computing Education Pathways

The Expanding Computing Education Pathways (**ECEP**) Alliance is an NSF-funded Broadening Participation in Computing Alliance (NSF-CNS-1822011). As an alliance of 22 states and Puerto Rico, ECEP seeks to increase the number and diversity of students in computing and computing-intensive degrees through advocacy and policy reform.