State of Computer Science Education

2024

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 (CSTA), and the Expanding Computer Science Pathways (ECEP) Alliance extend their heartfelt thanks to the countless local champions and advocates—teachers, community members, researchers, nonprofits, universities, corporations, and government institutions—who have worked tirelessly to support the goal of providing computer science education to all students in all schools. Your dedication and support drive this movement forward. Thank you.

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America Succeeds
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The New Bohemian Innovation Collaborative (NewBoCo)
Thinking Media
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EXECUTIVE SUMMARY

The United States is at a critical juncture in education policy: How do we prepare our students for a world increasingly driven by computing and generative artificial intelligence? Since the last edition of this report, there has been growing recognition among U.S. policymakers of the urgency of this issue, with 11 states* now requiring students to earn credit in computer science to graduate from high school. The 2024 State of Computer Science Report urges policymakers to ensure that all students in every state learn computer science.

Over the last eight years, there has been significant progress, with more students than ever before taking computer science. Yet, millions of students still lack opportunities to engage in this essential subject. Only 60% of public high schools offer a foundational computer science course, and just 6.4% of high school students are enrolled annually. Young women, in particular, are far less likely to take computer science. This disparity underscores the urgent need for action.

The need for computer science education is understood worldwide. In 2023, the European Union called on all member countries to make computer science a required subject. Without decisive action, the United States risks falling behind on the global stage.

A recent University of Maryland study underscores the importance for all schools to invest in computer science education. The research reveals that offering just one computer science course in high school can increase students' earnings by at least 8% by age 24. Notably, the benefits are even more pronounced for low-income students, Black students, and young women.

The Code.org Advocacy Coalition recommends 10 policies to help build capacity and sustainability for K–12 computer science. When states take action and pass policies, students have more opportunities to benefit from computer science. This report provides updated policy, access, and participation data alongside examples and stories to guide policymakers and advocates in ensuring all students learn computer science.

> With Act 211 now signed into law, Louisiana is taking significant strides towards equipping our students with the essential skills. This new computer science graduation requirement will prepare our youth for future job markets and promote innovation and competitiveness in our state. I am proud to have championed this legislation and am excited to witness its positive impact on our education system and economy.
>
> **— Jason Hughes, State Representative, Louisiana**

> **Before the first day of my first computer science class, I didn't feel confident that I could be good at coding. However, now I can confidently say that with a great teacher and supportive friends that share my interest, computer science is my favorite class and has helped me strengthen my creativity and problem-solving.**
>
> **— Alexis Oh, 10th grade student, California**

*Alabama, Arkansas, Indiana, Louisiana, Nebraska, Nevada, North Carolina, North Dakota, Rhode Island, South Carolina, Tennessee

Highlights related to state policy adoption:

- 39 states have adopted at least six of the ten policies recommended by the Code.org Advocacy Coalition.
- States that have at least six policies have an average of 70% of their high schools offering foundational computer science, compared with 52% in states that adopted fewer than six policies.
- Alabama, Arkansas, Indiana, Louisiana, and Nevada have adopted all ten policies.
- In the past year, Alabama, Indiana, and Louisiana all passed a graduation requirement in computer science.
- Nebraska funded computer science education for the first time in 2024.
- In 2024, state budgets allocated more than $88M to computer science education.

Highlights related to foundational computer science:

- 60% of U.S. public high schools offer foundational computer science (up from 57.5% last year), but disparities in access persist.
- Rural high schools, urban high schools, and smaller high schools (<500 students) are less likely to offer foundational computer science.
- High schools with more than 50% of their students qualifying for free or reduced lunch are less likely to offer foundational computer science.
- Black/African American students, Hispanic/Latino/Latina/Latinx students, and Native American/Alaskan students are less likely to attend a high school that offers foundational computer science.
- 37%* of middle schools offer computer science.

Highlights related to participation in foundational computer science:

- In the past year, 6.4% of high school students enrolled in foundational computer science classes. If all students took one computer science course in their high school career, we would expect to see enrollment around 25%.
- Nationally, 33% of students enrolled in foundational computer science are young women.
- Nationally, Hispanic/Latino/Latina/Latinx students are 1.7 times less likely than their white and Asian peers to enroll in foundational computer science, even when they attend a school that offers it.
- Nationally, English language learners, students with disabilities, and economically disadvantaged students are underrepresented in foundational computer science compared to their overall population.
- In middle and elementary schools, disparities in participation are less pronounced among most demographic groups.

*This percentage is based off data received from 68% of middle schools, therefore the actual number of schools teaching may be higher.

INTRODUCTION

State of K–12 Education Over the Past Year

Education today feels fundamentally different than it did five years ago, a shift felt by students, teachers, and parents alike. While it may seem natural to avoid further changes to the education system as we still work to recover from the pandemic's impact, deprioritizing innovative education disservices our students. Policymakers and advocates must address the current challenges holistically and provide students with the best opportunities to succeed and grow, which includes foundational knowledge in computer science.

> **Through the Computing Educator Diversity Initiative (CEDI), we support educators from historically excluded communities in obtaining high school computer science teacher certification. By breaking down barriers and expanding the pool of certified educators, CEDI is helping to ensure that all students have access to quality computer science education and can see themselves in the field.**
>
> **— Allen Antoine, Director, Computer Science Education Strategy (EPIC), The University of Texas at Austin, Texas**

Teacher Workforce

The teaching profession across the U.S. is undergoing a transformation, with new data highlighting changes and challenges in teacher recruitment and retention. Nationally, the attrition rate for teachers is above 10%, far higher than the 3.4% attrition rate in other U.S. sectors post-pandemic.[1] Moreover, enrollment in preservice teacher education programs has dropped by half since 2010.[2] Although this decline began before COVID, the pandemic has spotlighted the issue.

To address these challenges, policymakers must be innovative and responsive, listening to educators and advocates on the ground to maximize flexibility and reduce unnecessary barriers in teacher preparation and classroom experiences. In some states, departments of labor and state education agencies are partnering with higher education institutions to create apprenticeships or residency models that pay preservice teachers while they train. Additionally, community colleges can play a crucial role by establishing pathways to teaching, and organizations like Beyond100K are working to amplify promising practices in teacher recruitment and retention.

Even with improved teacher training, some schools may still need help to employ qualified computer science teachers. However, alternative solutions exist. These schools can provide access by integrating computer science into other subject areas, virtually connecting to a course in a neighboring district, utilizing a state virtual school, or leveraging dual enrollment course opportunities. It is important to remember that these challenges, though daunting, are solvable. Many states have already successfully brought computer science to all schools and students, proving that with innovative thinking, we can overcome these obstacles and provide students with the education they deserve.

Continued Influence of AI in Education

Schools are also still grappling with how to best use and teach about AI tools. Recent survey data suggests that most teachers are excited about these tools but require support and guidance.[3] Teachers must receive comprehensive support in integrating AI in their classrooms to help them determine if, when, and how to use specific AI tools. It is equally important that students learn how AI works; a computer science classroom is the best environment for students to gain this knowledge. To learn more about AI education policy and state action, see **page 30**.

Imperative to Learn Computer Science

The recent Reimagining CS Pathways report summarized why computer science education is a necessity for all students. "Students of all identities and chosen career paths need quality computer science education to become informed citizens and confident creators of content and digital tools."[4]

> **In my classroom, we use AI in all sorts of ways, like generating voices when students feel awkward about doing narration, helping generate rubrics when I need to get started on a new project concept, thought partners on idea generation, and one-on-one for conversations and feedback. We use it with direction and guardrails for assignments and clear class understandings and agreements. It's really important that in my classroom it's transparent, modeled, learned about, and discussed.**
>
> **— Julie York, Computer Science and Media Teacher & Department Chair, South Portland High School, Maine**

The benefits of computer science education are multifaceted and far-reaching. Computer science offers students a unique platform for problem-solving, creative thinking, and engagement in projects relevant to their interests and communities. This connection can foster a deeper engagement in their learning, particularly for students who might otherwise feel disconnected from traditional academic subjects. The skills acquired through computer science extend far beyond the subject itself. Students develop critical thinking, problem-solving, and collaborative skills applicable across all other subjects and future careers. According to the Bureau of Labor Statistics, jobs in computer and information technology are expected to grow much faster than the average for all occupations over the next decade. On average, around 356,700 job openings are projected each year. In May 2023, the median annual wage for these roles was $104,420, significantly higher than the median wage for all occupations, which was $48,060.[5]

Recent research from Maryland further illuminates the long-term impact of high school computer science education on students' futures. The findings indicate that students who take computer science in high school are more likely to pursue it in college, and even those who choose different fields benefit from an increased likelihood of employment and early-career earnings. This correlation is even stronger for historically underrepresented students in computer science, emphasizing the role of computer science education in promoting equity and expanding opportunities for all students.

A great example of the far-reaching benefits of computer science is Connecticut's annual statewide Coding Challenge, sponsored by Lieutenant Governor Susan Bysiewicz. The 2023 prompt challenged students to "identify an issue and propose a computing solution that embraces the theme of Coding For Good." This challenge engaged students from grades 3–12, with the youngest students creating project ideas and the oldest students creating fully functional coding projects. These projects addressed a spectrum of issues personally important to the students involved.

> **Mridhulaa Rajagopal, a student from Avon High in Connecticut, created MemoryCare. This app was designed for older adults and those with memory issues and offers five key features: Personal Account, Reminders, Contacts, Emergency Contact, and Mind Exercise/Nap Timers. The app consolidates essential daily tasks to reduce stress and improve well-being. Mridhulaa's experiences with older individuals in a hospital setting inspired her to create this app.**

Ten Policies to Make Computer Science Foundational

The Code.org Advocacy Coalition developed 10 policy recommendations for computer science education, guided by five key principles: Clarity, Capacity, Leadership, Sustainability, and Equity and Diversity. These policies aim to promote access and participation in computer science courses and make computer science a foundational part of state education systems. For a detailed overview of state-level policy initiatives, refer to the Building Capacity Through Policy chapter (page 14).

Clarity in defining computer science and shared goals and strategies strengthens state efforts to expand access to computer science for all students. The **capacity** to offer computer science courses depends on the availability of qualified teachers, which requires state-level resources for preparing both preservice and inservice computer science educators. **Leadership** at the state, district, and school level is crucial for prioritizing computer science and effectively guiding its implementation. Ensuring the **sustainability** of computer science initiatives involves dedicating time to the subject in schools.

> **Empowering students from underrepresented groups in gaming is not just about inclusion—it's about innovation. Their voices are vital in disrupting long-standing inequities, bringing fresh perspectives that reshape the industry. Games like Animal Crossing, Portal, and Uncharted show that when diverse creators lead, they design experiences that resonate universally and leave an indelible mark on culture.**
>
> **— Fope Oladeji, 12th Grade Student, Stephen F. Austin High School, Texas**

Equity and diversity are core values embedded in the ten policies and must be explicitly addressed in policy development to prevent the perpetuation of existing disparities. Advocates and policymakers must carefully consider the factors influencing student engagement in computer science and address the systemic barriers that continue to make the subject inaccessible to many students. Some students, particularly those from rural areas, students with disabilities, economically disadvantaged students, and students from underrepresented racial and ethnic groups, are less likely to have access to high-quality computer science courses. When we address these disparities, we avoid missing out on the innovations and contributions that diverse creators bring.

Clarity

1. Create a statewide plan for K–12 computer science
2. Define computer science and establish standards for K–12 computer science

Capacity

3. Allocate funding for rigorous computer science teacher professional learning
4. Implement clear certification pathways for computer science teachers at elementary and secondary levels
5. Create programs at institutions of higher education to encourage all preservice teachers to gain exposure to computer science

Leadership

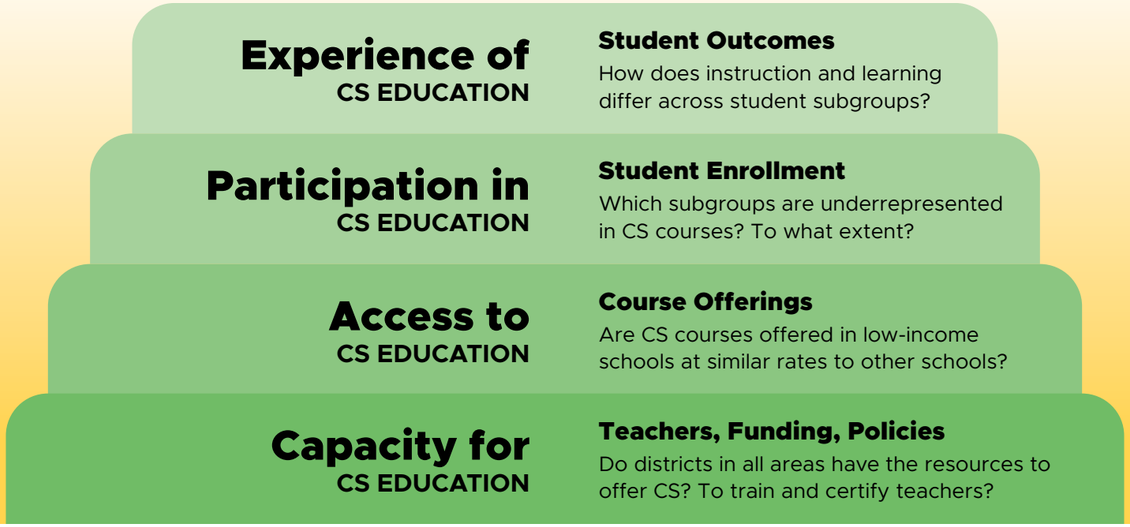
6. Establish dedicated computer science positions in a state education agency

Sustainability

7. Require that all schools offer computer science with appropriate implementation timelines
8. Allow computer science to count toward a core graduation requirement
9. Allow computer science to satisfy an admission requirement at higher education institutions
10. Require that all students take computer science to earn a high school diploma

Framework for Expanding Computer Science Education

This report utilizes the CAPE framework[6] to examine equity in computer science education. The framework addresses four components: the Capacity for, Access to, Participation in, and Experience of computer science education. These components progressively build on each other as capacity lays the foundation for access; access must come before participation, and participation is necessary for experience.



Capacity refers to having the resources to support and maintain high-quality computer science instruction. Such resources include qualified teachers, funding, and policies that make implementing courses possible. Refer to the Building Capacity Through Policy chapter (page 14) for more information.

Access is where students have the opportunity to enroll in a computer science course, meaning that students attend a school that offers such courses. Examining the demographics and locations of schools that offer courses, and those that do not, sheds critical light on who has access to computer science education. Refer to the Access to Foundational Computer Science chapter (page 40) for more information.

Participation occurs when students choose to enroll in computer science courses. Comparing participation rates by student demographics with state and national demographics provides insight into whether certain student groups are enrolling in computer science at disproportionate rates. Disparities in participation rates can indicate equity issues such as course recruitment strategies or student perceptions of computer science and whether they see themselves reflected in the field. Refer to the Participation in Foundational Computer Science chapter (page 54) for more information.

Experience encompasses a variety of student and teacher outcomes. For students, outcomes can include academic achievement, a sense of belonging, interest in computer science majors or careers, and subsequent computer science course enrollment. Outcomes for teachers include a sense of belonging, retention, and enjoyment as a computer science teacher. Advanced Placement (AP) computer science exam scores are the most widely available measures of student experience, with qualitative data on student and teacher experiences limited nationally. Refer to the Experience in the Classroom chapter (page 78) for more information.

By understanding disparities within each component of the CAPE framework, we can better guide efforts to address the root causes of inequities at different levels of the education system.

How We Collect and Analyze Data

Over the last eight years, we have continually worked to improve our data collection and reporting practices. When we began collecting data in 2017, only 24 states were able to provide data regarding high school course offerings in computer science. For the last four years, however, we have gathered data from every state and high school.

The goal of this report is to present comparative data across states and the national landscape, it has also helped encourage more states to collect robust data and publish their own reports and dashboards. Policymakers should also seek out these state-specific resources to better enhance their knowledge of the computer science education landscape.

As this is a national report, we strive for consistent methodology across all states, though limitations inevitably exist. One of our biggest challenges is the variety of data sources. Our most common and reliable source is state education agencies, which provide course offerings by school enrollment data. However, some state agencies do not collect this data or only collect it from a subset of schools. To fill these gaps and ensure comprehensive data collection from every school, we also use additional sources, such as AP data, teacher surveys, manual reviews of course catalogs and school websites, and input from state leaders in computer science education.

Another area for improvement is the capacity of state education agencies to collaborate with us. In some states, personnel are available to actively assist in requesting and verifying data, which enhances the accuracy of the information we present. For example, if a school miscodes their courses, state employees can use their local knowledge to identify and correct such errors.

Despite these challenges, the data presented in this report is still the most comprehensive and comparable national computer science education data.

We are committed to supporting data driven work and continually improving the quality of our reporting. As we strive to enhance our data, we also urge states to collect more comprehensive information, including:

- Intersectional data (i.e., the combination of identity characteristics such as gender + race, race + socioeconomic status) to better understand existing disparities;
- Longitudinal student data to evaluate the long-term impacts of taking computer science courses;
- Participation data in grades K–8 to understand the full K–12 trajectory; and
- Engagement and achievement data to gain deeper insights into the classroom experience.

How to Use This Report

This report is one component of your toolkit for strategic planning and affecting change. As you review your state's data in this report, we suggest that you consider the following questions:

- What are some areas to celebrate? What are some areas for improvement to consider?
- Who needs to know about this data?
- How will you share the data with specific audiences in a way that invites them to broaden participation in computer science?
- How will you use the data in this report to understand disparities in computer science in your state?
- What actions will you take to address the disparities the data highlights?
- How might the data in this report support policy adoption and implementation in your state?

BUILDING CAPACITY THROUGH POLICY

The Code.org Advocacy Coalition released its original policy recommendations in 2013 to address the urgent need to build capacity in computer science education. At that time, only 14 states and Washington, DC had adopted even one of the Coalition's policies. Today, the landscape has dramatically improved: most states (39) have implemented six or more of the ten recommended policies, with every state and DC having at least two in place.

We encourage states to continually review and refine their policies to meet the needs of students and local communities. As computer science advances, policies must evolve to ensure they remain effective. Accountability is crucial; while gathering meaningful data on outcomes may take several years, this information must be publicly available. When policy is not achieving intended results, it must be revised accordingly. Strong policies, supported by resources, action, and implementation, are key to building the capacity needed to improve student access, participation, and experience in computer science education.

In this year's report, we grouped policies together to show the interplay between them:

- The role of state education agencies: 1 **State plans** for computer science and 6 **computer science supervisors** at state education agencies;
- Supporting teachers and students: 2 **K–12 computer science standards**, 4 **teacher certification**, and 5 **preservice teacher programs**;
- Laying the groundwork for access: 8 **Making computer science "count"** and 7 **requiring all high schools** to offer computer science;
- Increasing participation: 10 **Graduation requirements** and 9 **higher education admissions**; and
- Implementation support: 3 **Funding** is needed to implement the other nine policies effectively.

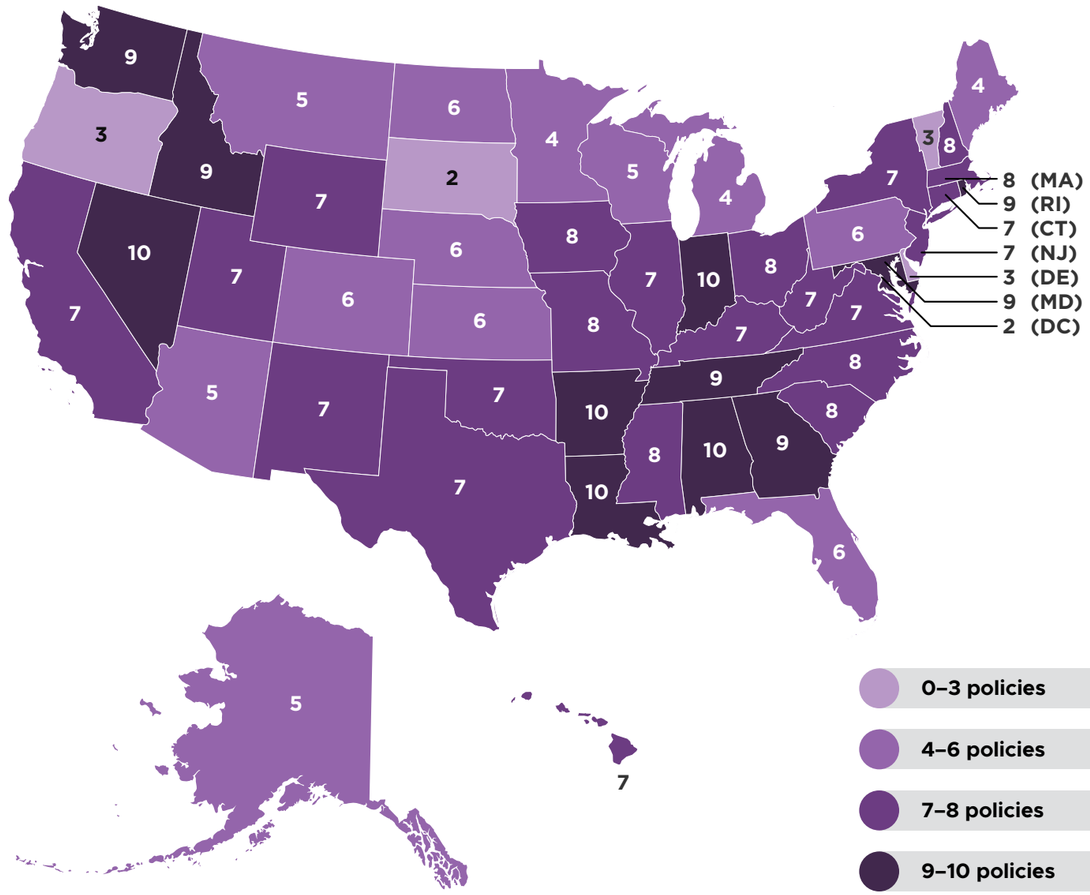
1	2	3	4	5
Create a statewide plan for K–12 computer science	Define computer science and establish standards for K–12 computer science	Allocate funding for rigorous computer science teacher professional learning	Implement clear certification pathways for computer science teachers at elementary and secondary levels	Create programs at institutions of higher education to encourage all preservice teachers to gain exposure to computer science

6	7	8	9	10
Establish dedicated computer science positions in a state education agency	Require that all schools offer computer science with appropriate implementation timelines	Allow computer science to count toward a core graduation requirement	Allow computer science to satisfy an admission requirement at higher education institutions	Require that all students take computer science to earn a high school diploma

Policy highlights from the past year include:

- 39 states have at least six of the ten policies recommended by the Code.org Advocacy Coalition;
- States that have at least six policies have an average of 70% of their high schools offering foundational computer science, compared with 52% in states that adopted fewer than six policies;
- Alabama, Arkansas, Indiana, Louisiana, and Nevada have adopted all ten policies;
- In the past year, Alabama, Indiana, and Louisiana all passed a graduation requirement in computer science;
- Nebraska funded computer science education for the first time in 2024; and
- In 2024, state budgets allocated more than $88M to computer science education.

Number of Policies Adopted by State



State Plans and Computer Science Supervisors

Making computer science a foundational part of a state's education system means adding a new subject to many schools. States need a comprehensive roadmap to address the policy and implementation issues necessary to integrate computer science into their existing systems. These plans are instrumental in aligning efforts, resources, and outcomes for computer science education, and a dedicated, permanent position at the state education agency is critical support for the expansion of computer science education.

Developing a comprehensive state plan for computer science lays a strong foundation for advancing the state's initiatives. It creates accountability, sets benchmarks for access and participation, and builds buy-in. A wide range of community members should participate in developing this plan; including teachers, parents, students, school administrators, higher education institutions, nonprofit organizations, and industry partners. Frequently, state education agencies direct these computer science plans, with a dedicated supervisor overseeing the work and ensuring the implementation of goals. State plans should function as living documents, regularly updated to remain relevant. For example, plans developed five years ago likely did not specifically address AI, but today, including this topic is essential.

The involvement of the state education agency's computer science supervisor often determines the effectiveness of a state plan. In some states, the supervisor is central to creating the plan and ensures continuity during departmental turnover. In others, the plan comes first, and then the state hires a supervisor to oversee its implementation.

Every state education agency should establish a permanent position dedicated to computer science, similar to other core subjects. Even when a state provides computer science education to all schools and all students, this position is still critical to maintain, just as it is with other subjects. As districts and schools build more robust programs and computer science offerings, additional positions within the department may become necessary, particularly given the difference between elementary and secondary computer science. As schools add and expand computer science offerings, they will benefit from the ability to receive support and direction from the state education agency. In many states, this position also plays a key role in addressing new aspects of computer science education, such as the integration of data science, cybersecurity, quantum computing, and AI policy for schools (see page 30 for more details on AI policy).

Rubric for State Plans

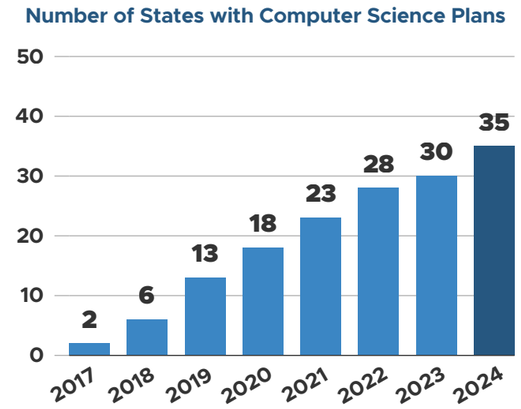
- Be specifically focused on computer science education;
- Include timelines, goals, and strategies for achieving these goals, and a schedule for how often it will be revisited and updated; and
- Be publicly available.

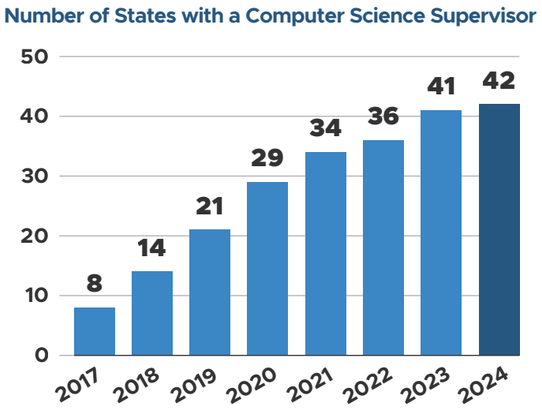
Rubric for State-Level Supervisor

- Located in a state agency;
- The title reflects a focus on K–12 computer science; and
- Clearly able to develop state policy/ regulations and create programs around computer science.

In 2017, only two states had plans for computer science education. Now, in 2024, 35 states have created such plans. Louisiana, Minnesota, and Nebraska published their computer science plans in the past year. On average, states with plans have 70% of their high schools offering computer science, compared to 56% in states without plans. States with plans and available participation data show an average of 7.2% of high school students enrolled in computer science classes, compared with 6.3% in states without plans.

In 2017, only eight states had computer science positions at their state education agency. In 2024, 42 states have dedicated supervisors, with several states having more than one position. In the past year, Missouri hired its first computer science supervisor. On average, states with supervisors have 68% of their high schools offering computer science, compared to 58% in states without supervisors. States with supervisors and available participation data show an average of 7.1% of high school students enrolled in computer science classes, compared with 6.2% in states without supervisors.





Arkansas

Arkansas began with five statewide computer science specialists in 2017; now, in 2024, there are eight specialists. These specialists developed over 100,000 hours of K–12 computer science professional development. In 2015, the state had 20 computer science teachers. Due to the training efforts of the computer science specialist team, and other partners such as the Arkansas School for Mathematics, Sciences, and the Arts, there are now over 750 high school teachers certified in computer science.

Minnesota

Minnesota published its state plan in March 2024. It includes a thorough overview of the state landscape and ten detailed recommendations with timelines for implementation. Key recommendations include establishing a permanent advisory committee, improving teacher licensure, funding professional development, and enhancing data reporting. The plan aims for every school in Minnesota to offer computer science learning opportunities for K–12 students within the next five years.

Wisconsin

Over the next year, Wisconsin is planning to update its state plan to improve its actionable goals:

"With a data-driven approach, the Wisconsin Department of Public Instruction continues to innovate, set measurable goals, and find ways to meet unique needs through our state's Computer Science State Plan, helping to grow an equitable and accessible computer science curriculum benefitting all students."

— Amy Bires, Computer Science Consultant, Wisconsin Department of Public Instruction

Standards, Teacher Certification, Preservice

It is necessary to establish clear and rigorous learning expectations through standards. Standards are also crucial for distinguishing between computer science and digital literacy. As the discipline evolves and more students begin learning computer science in earlier grades, it is also important for states to update their standards to align with current evidence and best practices.

As states implement computer science graduation requirements, they must prioritize developing and supporting the teaching workforce. Educators need thorough preparation to effectively and equitably teach computer science. Certification programs should be flexible and innovative, utilizing approaches like micro-credentials. This flexibility allows teachers to obtain certification tailored to their educational level and the specific needs of their students. Additionally, certification programs must recognize and validate prior teaching experience in the field. Any pathway should ensure that existing teachers are encouraged to continue to teach the subject they love.

Inservice training alone is insufficient to meet the demand for computer science courses. We must actively bring new teachers into the classroom through preservice training programs. For elementary school teachers, this would mean gaining competencies in computer science as part of their training so they can introduce these concepts early. For secondary teachers, it means having the opportunity to take one or more specialized courses in computer science education, equipping them with the knowledge and skills necessary to teach more advanced content and the ability to get a certification if they choose. We encourage states to review their computer science teacher pathways to ensure they are clear and encouraging.

CSTA is conducting a comprehensive revision to its K–12 Computer Science Standards, with an anticipated release in summer 2026. A three-year process will result in a thoughtful, comprehensive, and evidence-based revision to these standards, taking place across three stages: (1) Research, (2) Writing, and (3) Implementation. As a precursor to the new standards, the Reimagining CS Pathways project defined high school foundational computer science content, as well as learning progressions for AI, cybersecurity, data science, programming, and other specialty areas.

Next year, we hope to have more data on the number of teachers certified nationwide. In the meantime, we encourage those who want to understand more about the teacher landscape to read CSTA's survey report.

Rubric for Standards

- Form a coherent progression that aligns elementary, middle, and high school expectations; and
- Publicly accessible on the state's website.

Rubric for Certification

- Explicitly named "computer science" or has a related name (e.g., computer programming); and
- Enables a teacher to teach computer science courses.

How to Count Preservice

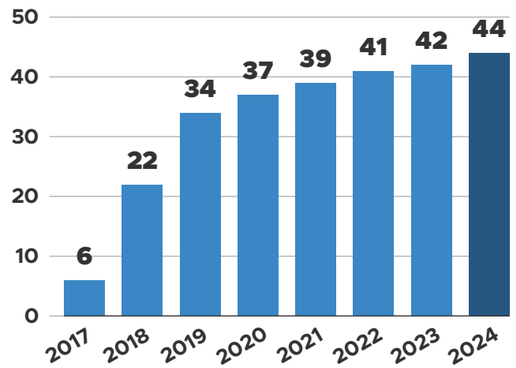
Currently, we count a state as a yes for preservice if there are incentives for higher education institutions to offer computer science content. Next year, our rubric will only count this policy if all preservice teachers are required to receive computer science exposure.

In 2017, only six states had K–12 computer science standards. Now, in 2024, 43 states have standards. In the past year, Colorado and Louisiana created K–12 standards. On average, states with standards have 67% of their high schools offering computer science, compared to 55% in states without standards. States with standards and available participation data show an average of 7.2% of high school students enrolled in computer science classes, compared with 4.3% in states without standards.

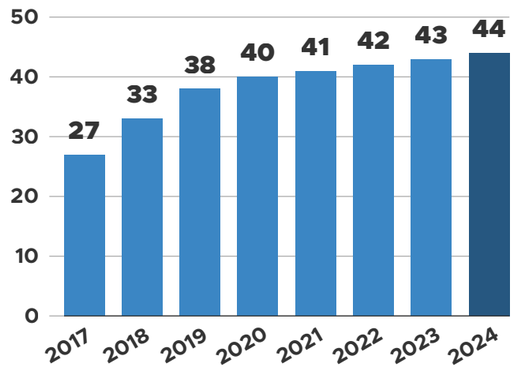
In 2017, 27 states had computer science teacher certifications. Now, in 2024, 44 states have a certification. On average, states with certification have 68% of their high schools offering computer science, compared to 53% in states without certification. States with certification and available participation data show an average of 7.4% of high school students enrolled in computer science classes, compared with 4.1% in states without certification.

While 24 states have state-level initiatives focused on preservice teachers, only six states require all preservice teachers to gain computer science exposure: Arkansas, Connecticut, Louisiana, Indiana, Nevada, and Ohio. A computer science module or course during preservice teacher programs provides a foundational background for teachers to begin teaching computer science.

Number of States with Computer Science Standards



Number of States with a Computer Science Certification



The PrepareCS project addresses the need for computer science teacher preparation in states with limited programs by increasing awareness, buy-in, and capacity. PrepareCS includes a workshop followed by virtual support meetings and mini-grants. This program is designed to foster collaboration among stakeholders and empower them to develop customized plans for computer science teacher preparation.

Tennessee

Tennessee has over 1,000 teachers who have completed the computer endorsement pathway and earned endorsements to teach computer science.

Make Computer Science Count and All High Schools Offer

"Making computer science count" was the first policy adopted by all 50 states and DC This policy allows computer science to substitute for an existing credit, often a fourth math or science credit. It also allowed students to take computer science while meeting graduation requirements, especially as more states began requiring high schools to offer computer science. These two policies laid the groundwork for states seeking to implement more robust changes, such as making computer science a graduation requirement.

Today, 32 states require high schools to offer computer science. Of these states, 17 also require their middle and elementary schools to offer computer science. Implementation and accountability are crucial; this policy is most successful when states monitor and support schools as they add computer science to their course catalog. Having a multi-year runway also helps schools build their capacity. In contrast, states that simply add computer science to the list of required subjects without also offering additional support are less successful.

Alabama

Alabama's robust legislative language and accountability in all high school policies contributed to almost every school's ability to offer computer science courses. Every year, Alabama publishes a dashboard that shows the landscape of computer science education across the state. This **dashboard** is a strong model for other states to emulate.

While these two policies are beneficial for **expanding access**, they are insufficient in guaranteeing student participation. In particular, young women continue to enroll in computer science at far lower rates than young men. Making computer science count and requiring high schools to offer computer science are still important policies but are more helpful as building blocks that lead to more effective policies down the road.

Graduation Requirements and Higher Education Admissions

More data than ever before shows how essential high school computer science courses are for student outcomes. Researchers from Maryland found that just offering one computer science course in high school can increase students' earning by at least 8% by age 24. Notably, the benefits are even more pronounced for low-income students, Black students, and young women.[7]

Changing graduation requirements is a large undertaking, but it is necessary to ensure all students learn computer science. When states update requirements to include computer science, we recommend a multi-year implementation runway for districts, teachers, and students to prepare for the new requirement, and state agencies should provide school districts with a list of courses that can fulfill this requirement. Additionally, there should be flexibility built into the policy, such as allowing virtual courses to count when it is not possible to offer in-person courses. More so with this policy than any other, the state agency should monitor student data to ensure equitable student outcomes.

States approached formatting and implementing graduation requirements differently. Some states increased the number of credits needed to graduate, others modified previous technology requirements, and others enabled this required computer science credit to substitute for an existing credit. Additionally, states have adopted different formats for their requirements, including semester-long courses, year-long courses, and a set of competencies. States should consider the number of credits already required and ensure students and schools are not overburdened.

One common concern about implementing a computer science graduation requirement is the potential need for more qualified teachers. While this is a valid consideration, it should not prevent students from receiving a well-rounded education that will prepare them for the workforce. Several strategies can help mitigate teacher shortages, including:

- Providing a long implementation runway;
- Funding preservice computer science teacher preparation programs;
- Offering financial stipends and incentives for teaching computer science; and
- Utilizing virtual options where necessary.

Moreover, most schools only need a part-time computer science teacher to implement this requirement. Schools with smaller student populations can train an existing teacher to teach one or more computer science sections. Since this requirement often substitutes for an existing credit, schools may be able to replace a section of math, for example, with a computer science course. Code.org and other professional development providers demonstrated that teachers can be upskilled to teach introductory courses through professional development programs. Lastly, and perhaps most importantly, several states have already shown they can find enough teachers for all their schools. For example, over the past decade, hundreds of teachers in Arkansas have been trained in computer science. As a result, computer science was the first secondary STEM subject in Arkansas to be taken off the list of subjects facing a critical shortage.

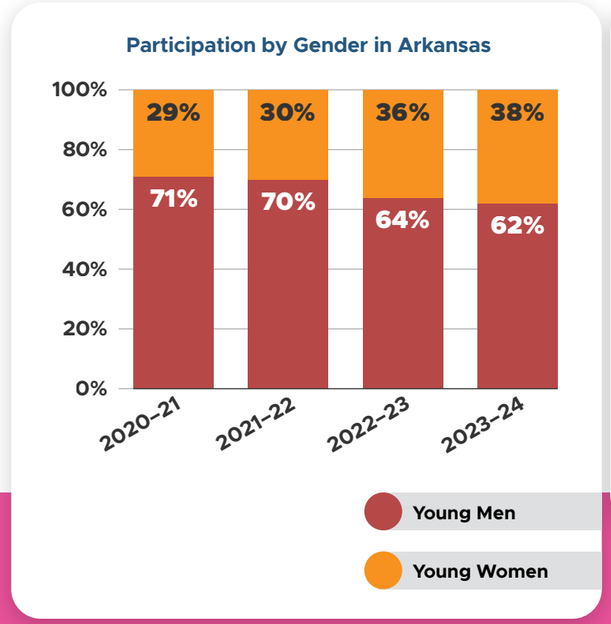
Rubric for Graduation Requirements

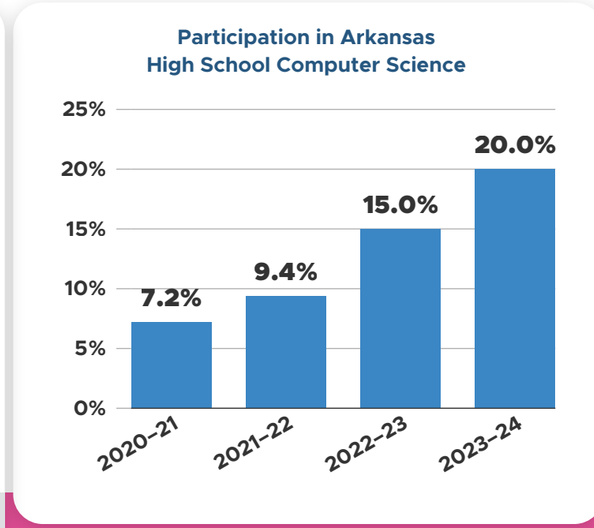
- Requires all students to earn a credit named "computer science" or a related name that includes "computer science" to receive a standard diploma for high school graduation;
- List of courses or standards that satisfy the requirement, all of which must include computer science topics and standards; this list must be available before the graduation requirement goes into effect; and
- Description of the requirement is publicly accessible.

State	Year Adopted	Year of Implementation
Alabama	2024	Class of 2032
Arkansas	2021	Class of 2026
Louisiana	2024	Class of 2030
Indiana	2024	Class of 2029
Nebraska	2022	Class of 2031
Nevada	2017	Class of 2023
North Carolina	2023	Class of 2030
North Dakota	2023	Class of 2029
Rhode Island	2022	Class of 2028
South Carolina	2018	Class of 2024
Tennessee	2021	Class of 2028

In 2017, Nevada was the only state that had passed a computer science graduation requirement; now, in 2024, 11 states have passed computer science graduation requirements. Alabama, Louisiana, and Indiana have all passed graduation requirements in the past year. On average, states that have passed graduation requirements (including states where the policy is not fully implemented and the two states with de facto requirements) have 76% of their high schools offering computer science, compared to 62% in states without graduation requirements. States with graduation requirements and available participation data show an average of 10.8% of high school students enrolled in computer science classes, compared with 5.2% in states without graduation requirements.

While only some states have fully implemented their graduation requirements, we are seeing exciting progress. In Arkansas, after the state adopted its graduation requirement, there was a significant uptick in the percentage of students taking computer science and, with notable progress in young women participating. Once graduation requirements are fully enacted, we expect to see all high schools offering computer science courses and around 25% of students taking computer science courses each year.





Other states, like Massachusetts, are planning strategically for a future graduation requirement. In 2023, the Massachusetts Department of Elementary and Secondary Education (DESE) hired a consultant to develop a **national landscape report** highlighting the challenges and opportunities presented when considering this policy. This report provided DESE with the data necessary to consider how and when to pursue a computer science graduation requirement by looking at all computer science policies and policy levers across states.

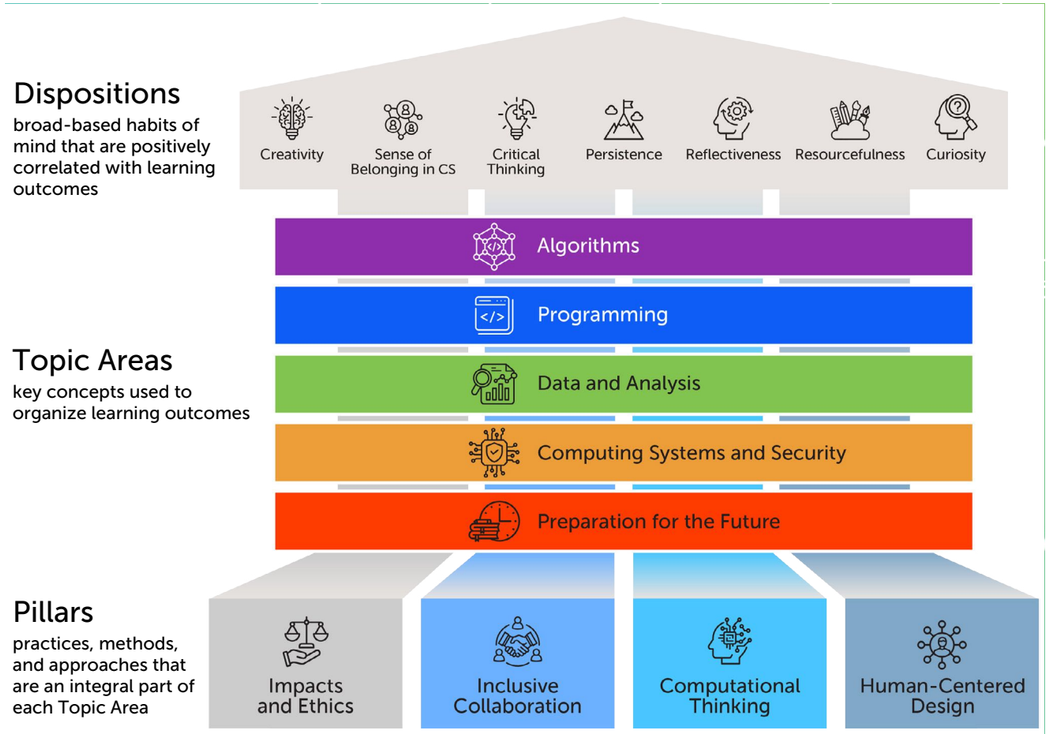
As more states adopt graduation requirements, it is crucial that higher education institutions update their admissions criteria to include computer science as an allowed credit. These changes should align with and recognize students' computer science courses in high school.

We encourage the remaining states to listen and learn from the eleven states that passed graduation requirements in computer science (AL, AR, LA, IN, NE, NC, ND, NV, RI, SC, TN). There are also many resources to help guide the implementation of graduation requirements.

> **My hope is that Indiana will be one of the top states preparing students for jobs of the future with computer science classes. With ever-evolving technology, we must continue to ensure our academics instill the knowledge and skills for students to be prepared after graduation.**
>
> **— Bob Behning, State Representative, Indiana**

> **All students should and need to learn computer science because it is the present and future. Everyday life is influenced by computer science, whether through the internet and social media or even household items like refrigerators. Computer science will only become more prevalent as technology advances further, thus it is important to understand how it works and the processes that allow these technologies to function.**
>
> **— Christina Novey, student, University of Nevada**

We recommend that states use the foundational content from ***Reimagining Computer Science Pathways*** to define the learning requirements of their computer science graduation requirements. This project articulated community consensus on the essential content all students need to learn before graduating high school. Foundational content is organized into topic areas, pillars, and dispositions. Through these topic areas and pillars, the goal is to develop persistence, reflectiveness, creativity, curiosity, critical thinking, and a sense of belonging. There are many flexible ways to implement this foundational content in high schools.



Alabama

Alabama's K–12 computer science initiative began in 2016, with the launch of the Alabama Computer Science for All initiative. This program included comprehensive teacher training, the development of curricula, and the introduction of rigorous computer science standards. By 2019, legislation mandating computer science education in all K–12 schools laid the foundation for a new era in education. In August 2024, Alabama took another significant step forward, becoming the 11th state in the nation to require computer science for graduation, solidifying its leadership in the field.

Louisiana

Louisiana made significant strides in computer science education through two key legislative acts. In 2022, Act 541, championed by Senator Hewitt, established the Louisiana Computer Science Education Advisory Commission. The Commission developed a K–12 Computer Science Education Plan. Building on this work, Act 211 of 2024, championed by Representative Hughes, took decisive steps by incorporating computer science into the core curriculum. This included making computer science a required subject for high school graduation, integrating it into middle school and elementary school curricula, and embedding it in teacher education programs.

Funding

Every policy detailed in this chapter requires some measure of support and investment. A key priority for ongoing funding is teacher professional learning. Teachers of all subjects need and deserve ongoing professional development to improve their craft. However, unlike other core subject areas, most computer science teachers did not complete a comprehensive teacher preparation program specific to the discipline. Oftentimes, teachers complete a one-week training; additional training is necessary to support teachers in developing their knowledge and skills. Moreover, given the rapid technological changes, ongoing professional development is necessary to teach about advances in computing. In fact, in a recent survey of computer science teachers, 88% expressed the need for professional learning to effectively teach with and about AI.[8] Policymakers must view funding as a tool to help upskill teachers to begin teaching computer science and support teachers already in the subject.

States allocate varying funding levels to support their K–12 computer science programs. In some states, computer science receives a yearly allocation; in others, funding is part of the general education budget. Our policy recommendation does not prescribe a specific funding amount for each state but emphasizes the need for ongoing funding until most schools offer computer science. All funding must be closely tracked to ensure it maximizes impact for students and teachers. Colorado leads in this regard, producing an annual legislative report that details which districts receive funding, how they spend the funds, and the impact on course offerings and student enrollment.

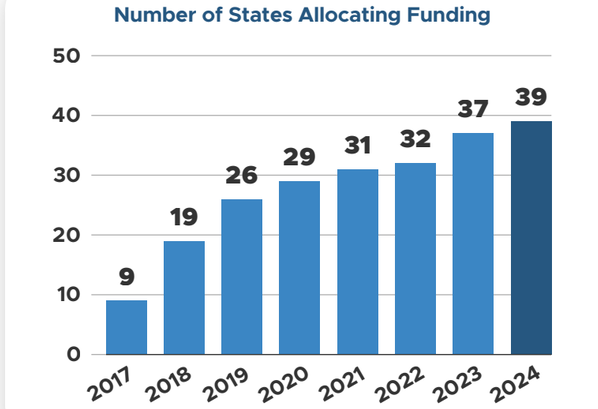
Many states also tap into other funding sources, including private grants or federal money, which can be helpful in the short term but are less consistent. For instance, many states used COVID-era federal funds (ESSER), but as those ended in September 2024, states must now rely on their own budgets to continue expanding computer science.

Rubric for Funding

- Funds are allocated via the approved state budget or state legislation;
- A description of the funds is publicly accessible; and
- The state allocated funds to computer science during the last two fiscal years.*

**If the state has not allocated funds within the last two years but previously allocated funds, and over 75% of its high schools offer computer science, the state is considered to meet the rubric.*

In 2017, only nine states funded computer science education; now, in 2024, 39 states allocated funding. In the past year, Nebraska funded computer science for the first time. On average, states with funding have 67% of their high schools offering computer science, compared to 61% in states without funding. States with funding and available participation data show an average of 7.3% of high school students enrolled in computer science classes, compared with 5.17% in states without funding. Across these 39 states more than $86 million was allocated to computer science education.



South Carolina

"South Carolina Department of Education has provided tremendous support for CSPDWeek since its inception in 2020. Not only do they provide monetary support to help pay for facilitators and other necessary expenses, but they issue certificates for 30 hours of continuing education credit for qualifying teachers, which meets the state's required credentials for teaching computer science courses. It is an important partnership that has helped us provide ongoing professional development for over 700 teachers across the state, forming a statewide network of CS teachers."

— Dr. Jennifer Albert, STEM Center Director, The Citadel, South Carolina

Ohio

Ohio's TeachCS program was created in the state budget in fiscal year 2024. The funding has been allocated to colleges, universities, and Educational Service Centers to provide educators with funding for computer science endorsements, supplemental licenses, or continuing education. Over 1,100 educators are estimated to be impacted, with 650 new educators qualified to teach computer science.

New Hampshire

The UpGrade program, created after the state legislature first funded computer science in 2023, will promote computer science across New Hampshire by credentialing more teachers and preparing more students in the field. Commissioner of Education Frank Edelblut stated, "This program encourages current educators and industry professionals to upgrade their skills and pass on their passion for technology and computer science to our youth. It also inspires new graduates, career changers, and expert retirees to consider teaching subjects in the computer science sector."

Puerto Rico Policies and Implementation

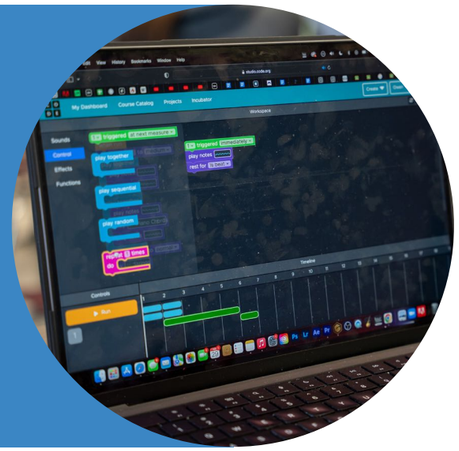
In October 2023, Puerto Rico Governor Pedro Pierluisi signed Executive Order 2023-031, requiring the Puerto Rico Department of Education (PRDE) to expand computer science education. This executive order was accompanied by a historic investment of $10M for the implementation of initiatives aimed at training teaching staff, designing curriculum, and investing in the adaptation and modernization of educational spaces to teach computer science. The order laid out several requirements, including:

- **By the 2024–25 school year**, PRDE must ensure that all 229 high schools offer at least one semester of Computer Science or Applied Technology courses.
- **Professional development** must be provided to all teachers instructing these Computer Science/ Applied Technology courses.
- **PRDE must develop a strategic plan** outlining a roadmap for implementing computer science education in all schools from 2024 to 2028.
- **Dual enrollment** opportunities will expand, allowing high school students to complete university-level courses in Computer Science/Applied Technologies.

In 2024, PRDE published the plan as mandated by the executive order, which details its goals for the next five years in computer science education, including:

- **Certification and recertification pathways** for computer science and applied technology teachers, beginning with high schools and expanding to middle and elementary schools.
- **Integration of computer science concepts** into teacher preparation programs required at the elementary and intermediate levels, as well as the creation of a new certification specifically designed for high school educators in this field.
- **Review existing technology standards** to incorporate computer science and applied technology concepts.

To achieve these goals, Puerto Rico plans to invest **$60M** in school infrastructure, including providing laptops, smart boards, robotics kits, and 3D printers to ensure all schools can teach computer science.



While we do not have the same level of school data from Puerto Rico as we do from other states, we are hoping to be able to get more robust access and participation from PRDE for future reports. However, we have examples of specific projects and initiatives that are impacting teachers and students.

Advocacy Coalition

To support Puerto Rico in implementing this mandate, Code.org has been working with the Department of Education to train 315 teachers selected by the Department to teach the CS Discoveries course during the 2024–25 academic year. Since the teachers did not have a background in computer science, nor did the students, Code.org began the training by teaching the teachers basic computer science concepts using the CS Fundamentals Express curriculum. The teachers implemented this curriculum with their students during the second half of the 2023–24 academic year to lay the foundation for teachers and students to more easily transition into the CSD curriculum starting in August 2024.

ECEP Expanding Computing Education Pathways

Puerto Rico joined the ECEP Alliance in 2015. The ECEP Puerto Rico team has significantly influenced the whole Alliance, contributed to local computer science education, and impacted the national CS for All movement. To address the need for Spanish-language curricula and professional development, the Puerto Rico team collaborated with Exploring Computer Science (ECS) to create the first fully translated curriculum and PD series. Approximately 200 teachers received ECS professional development in Spanish. In 2018, a National Science Foundation Research Practice Partnership enabled the pilot of the ECS curriculum in Spanish in five schools and established a course code for offering computer science courses at the elementary, middle, and high school levels.

CSTA

Since its founding in November 2016, CSTA Puerto Rico has been a key advocate for integrating computer science into Puerto Rico's schools, offering teacher development workshops and supporting programs like ECS, Mobile CSP, and CMU Academy. This effort contributed to the 2023 executive order to enhance computer science education from primary to post-secondary levels. Despite challenges like Hurricane María and earthquakes, CSTA Puerto Rico remains a strong and active voice for computer science education on the island.

Computer Science in the Age of Artificial Intelligence

The computer science education landscape is undergoing a profound transformation, driven by the rapid advancement of artificial intelligence (AI). In an era where AI is beginning to write code, debug programs, and create entire applications, a few central questions are resonating through computer science classrooms.

- Why is it still necessary to learn to program?
- What do students need to learn about AI?
- How do we leverage AI to broaden access and participation in computer science?

To address these questions, TeachAI and the CSTA developed Guidance on the Future of Computer Science Education in an Age of AI in July 2024, to aid educators and administrators wrestling with the potential benefits and risks of AI in education.

Launched in May 2023, TeachAI, led by Code.org, ETS, ISTE, Khan Academy, and the World Economic Forum, has grown to over 100 advisory committee members and 44 U.S. state education agencies. These organizations help guide education leaders and policymakers in transforming education through teaching with AI and teaching about AI. TeachAI and partners released three key resources in 2024: AI Guidance for Schools Toolkit, Foundational Policy Ideas for AI in Education, and Guidance on the Future of Computer Science Education in an Age of AI.

Teach AI

Why is it still important to learn to program?

Advancements in natural language processing, machine learning, and computing power resulted in increasingly powerful AI code-generating tools. However, programming is much more than just writing code, it remains a crucial skill that helps students develop critical thinking, problem-solving, and computational thinking abilities. Programming also fosters personal agency, empowering students to become active creators of technology rather than passive consumers. While AI can augment and enhance learning, it cannot replace the essential skills and disciplines central to computer science education. Despite this, common misconceptions about AI and programming continue to persist.

Common Myths	Reality
AI coding tools make programming knowledge and skills unnecessary.	AI is not magic. It needs human expertise and guidance.
Students do not need to learn to program because AI can do it accurately and independently.	AI is not perfect and requires human oversight.
Students do not need to learn to program because AI will replace all programming jobs.	AI will not replace the need for programmers. It needs human creativity and domain expertise.
The only purpose of learning to program is to produce programs; now, AI can do that for us.	AI can code, but there is more to programming than code.

Teaching With and About AI

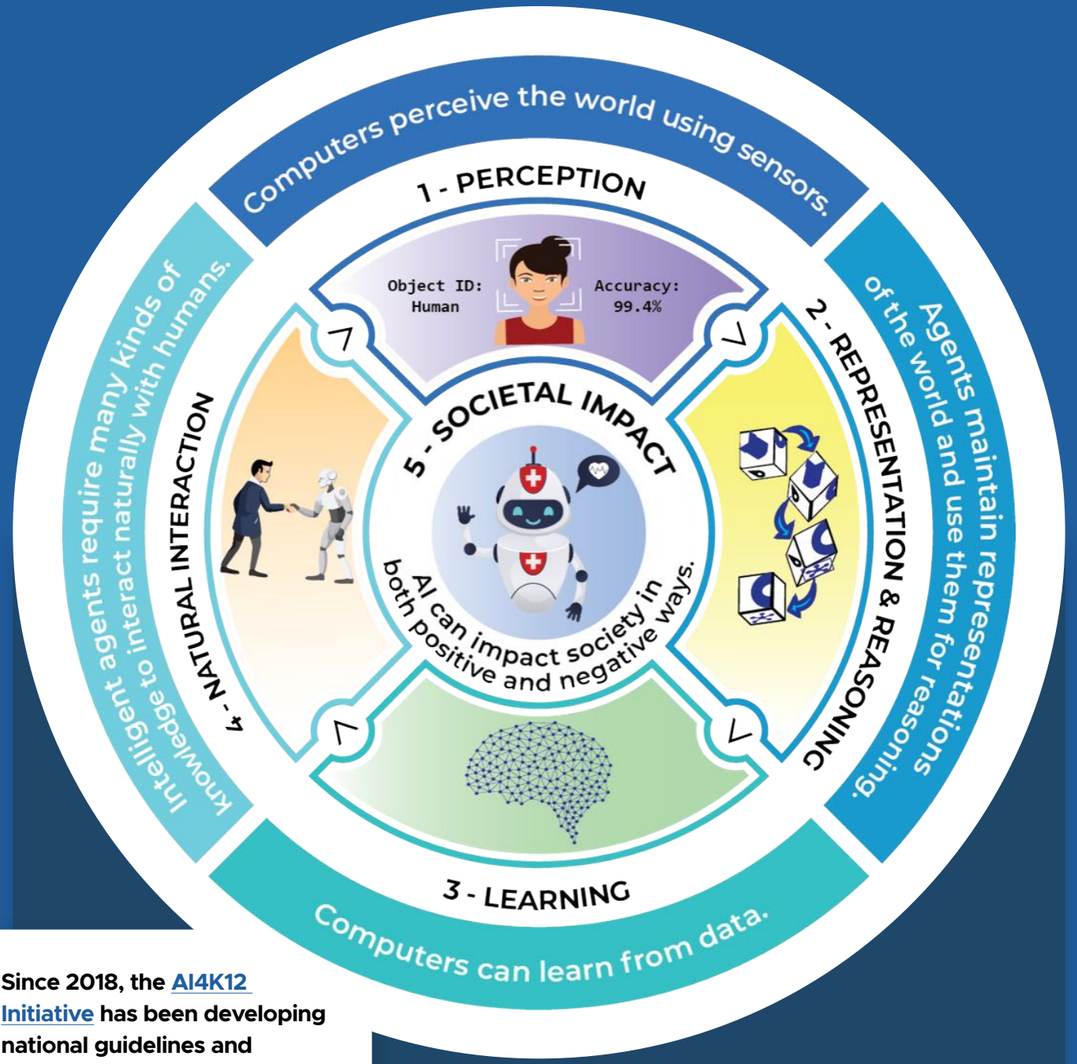
A recent survey conducted by TeachAI and CSTA asked computer science teachers how they feel about AI entering the classroom and how they currently use it; 88% of teachers responded that they need additional resources and training to teach with and about AI. They also noted the potential benefits of using AI to enhance student engagement, differentiate instruction, and personalize feedback. However, concerns about overreliance, plagiarism, bias, and ethical issues persist.

While educator surveys show how AI is currently implemented in the classroom, as AI rapidly changes, how it is used in the classroom changes just as fast. Continued and more detailed studies are needed to help guide educators on the best implementation practices.

As AI has the potential to play an outsized role in education, students must be prepared to become both critical consumers and responsible creators of AI. Computer science education must address these ethical and societal considerations, such as:

- transparency and accountability;
- information accuracy and integrity;
- privacy rights;
- fairness and justice; and
- ethical design.

> Students have a tendency to 'trust' the AI and blindly copy and paste the code but lack the skills to 'talk to' the code with AI and truly understand what is going on. This causes them frustration when later attempts don't work, and they lack the vocabulary or experience needed to properly explain what problems or tasks need to be done to their AI assistant.
>
> **— Graham Nolan, computer science teacher, Hong Kong International School**



Since 2018, the AI4K12 Initiative has been developing national guidelines and resources for teachers curious about how to incorporate AI in their classrooms.

Graphic from AI4K12

> When it comes to AI education, we do not have the luxury of burying our heads in the sand. Computer science teachers have the opportunity and responsibility to lead students in understanding the societal and ethical implications of AI: the good and the bad, the benefits and harms, the possibilities and realities.
>
> **— Charity Freeman, CSTA Board Chair**

AI in the Education Policy Landscape

The goal of AI in education policy should be to prepare administrators, educators, and students for a future where AI is prevalent in both society and the classroom. Core computer science concepts and practices remain important in this changing landscape. Teaching computer science in schools fuels innovation, expands access to high-paying jobs, and increases diversity in a variety of fields.[10] AI is both a field of computer science and a tool that will cut across numerous other subjects, including English language arts, science, and history.

In March 2024, 37% of teachers reported that their school had no policy or were unsure of any policies in place on generative AI.[11] As AI use in the classroom continues to rise, the need for policy and guidance on how to use it safely, responsibly, and effectively is amplified. State and local policymakers are helping school decision-makers pursue opportunities in AI education while managing its risks, by issuing guidance. The TeachAI **AI Guidance for Schools Toolkit** contains seven key principles to steer these efforts: purpose, compliance, knowledge, balance, integrity, agency, and evaluation.

Policymakers have taken notice of the gap emerging between AI and educational preparedness. As of September 2024, 24 states released AI guidance to better support teachers and classrooms.

At the federal level, while AI has dominated policy discussions on Capitol Hill over the two years, the importance of teaching with and learning about AI has been largely absent from those conversations, until recently. Lawmakers have introduced legislation that focuses on addressing AI literacy and its role in education, with likely more to follow. The Artificial Intelligence Literacy Act aims to define AI literacy, incorporate it in digital literacy programs, and increase AI literacy in education from elementary school to higher education. The NSF AI Education Act would create student scholarships, fellowships for professional development, AI guidance for K–12 teachers and new AI education hubs at community colleges. The Literacy in Future Technologies Artificial Intelligence Act—the LIFT AI Act—aims to enhance AI literacy education for K–12 students and teachers and improve educational efforts related to AI literacy. Code.org and TeachAI have been involved in the development of these bills and encouraging lawmakers to do more on this crucial topic.

Recommendations for AI Policy Development

TeachAI, in collaboration with national organizations including the School Superintendents Association, the Council of Chief State School Officers, the National Association of State Boards of Education, and the National Education Association, developed five Foundational Policy Ideas for AI in Education[12] to create the conditions for the safe, effective, and responsible use of AI in education.

Foster Leadership	Promote AI Literacy	Provide Guidance	Build Capacity	Support Innovation
Establish an AI in Education Task Force to oversee policy development and implementation.	Integrate AI skills and concepts, including their foundational principles, social impacts, and ethical concerns, into existing curriculum and instruction.	Equip schools with guidance on the safe, effective, and responsible use of AI.	Provide funding and programs to support educator and staff professional development on AI.	Promote the research and development of safe and effective AI in education practices, curricula, and tools.

> As a principal of a comprehensive high school, I am mindful of the impact that AI or any other technology tools can have on my school ecosystem. I would encourage my fellow school leaders to collaborate as we navigate the landscape of AI implementation because tools, no matter how powerful, can either enhance or hinder, depending on the user.
>
> **—Kip Glazer, Ed.D., Principal, Mountain View High School, California**

Foster Leadership

Task forces that bring together AI experts, educators, staff, administrators, parents, students, and policymakers with diverse perspectives can foster leadership and shape legislation, regulation, and guidance. Practicing educators are key voices for any decisions that impact the classroom. The task force should recommend policies, oversee pilot programs, and monitor unintended consequences to ensure AI adoption aligns with the education system's goals.

Promote AI Literacy

AI literacy combines an understanding of **how AI works**, including its principles, concepts, and applications, with **how to use AI**, such as its limitations, implications, and ethical considerations. AI literacy involves the ethical and responsible use of AI tools across all subjects and the study of foundational subjects such as computer science, data science, ethics, psychology, and statistics.

Education systems should consider various approaches to promoting AI literacy, including integrating AI concepts and practices into relevant existing academic standards. AI literacy prepares students to be informed consumers of AI and the future creators of technologies that utilize AI.

Revised CSTA K–12 Standards, slated for release in summer 2026, will include AI-related learning goals. In the meantime, the Reimagining CS Pathways project has defined foundational CS content that includes AI learning progressions.

Colorado

The Colorado Department of Education partnered with the Colorado Education Initiative and over 100 educators, policymakers, industry leaders, community members, and students to develop policy recommendations. The AI in Education Statewide Steering Committee for Colorado and working groups on curriculum, equity, policy, the role of teachers, and teacher tools met for seven months to develop the **Colorado Roadmap for AI in K-12 Education**.

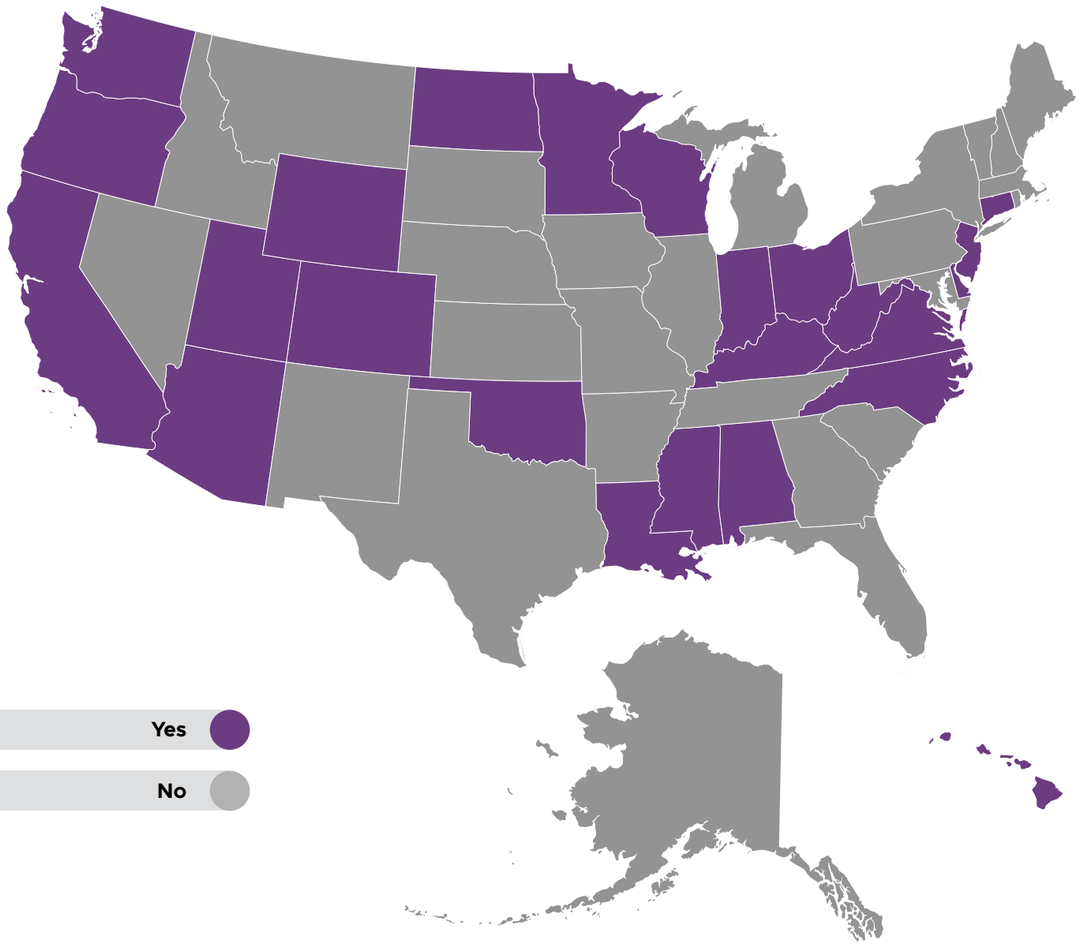
California

California Assembly Bill 2876, passed in September 2024, requires the Instructional Quality Commission to consider including AI literacy content in the curriculum frameworks and instructional materials during the next revision cycles for English, mathematics, science, and social studies.

Provide AI Guidance

Clear and practical guidelines at the national, state, and local levels empower schools to harness AI's benefits while ensuring student privacy and responsible use. Early guidance should tackle issues such as prioritizing equitable access to AI tools, minimizing bias, using legally and ethically created training sets and models, reaffirming adherence to privacy and security policies, and maintaining human decision-making. With robust guidance, education systems can decide how and when to integrate AI, improving safety and enhancing consistency in classroom adoption. As of September 2024, 24 states have released guidance on AI. Additionally, these states have specifically included computer science content in their guidance: **Indiana**, **Kentucky**, **North Carolina**, **Oklahoma**, **Utah**, **West Virginia**, and **Wyoming**.

States That Have Provided AI Guidance



Build Capacity

Funding for high-quality computer science professional development for administrators, teachers, and support staff remains vital to expanding student access and experience in computing. AI-focused professional development can build system-wide capacity for the responsible and effective integration of AI in education. Ongoing professional development should cover how AI works, including its limitations and ethical considerations, and how to use AI to complement teaching practices. These experiences should also be made available in teacher preparation programs.

Support Innovation

Funding research and development at every stage of AI integration, including pilot programs and evaluation, can help educators and staff make informed, research-based decisions.

The LIFT AI Act

H.R. 9211, the Literacy in Future Technologies (LIFT) Artificial Intelligence Act, establishes a grant program within the National Science Foundation for research and development of K–12 AI literacy curriculum and evaluation methods, supports professional learning opportunities to enhance educators' AI literacy, and promotes the creation of hands-on learning tools, the integration of AI literacy into existing curriculums, and the development of evaluation tools to assess AI literacy.

Indiana

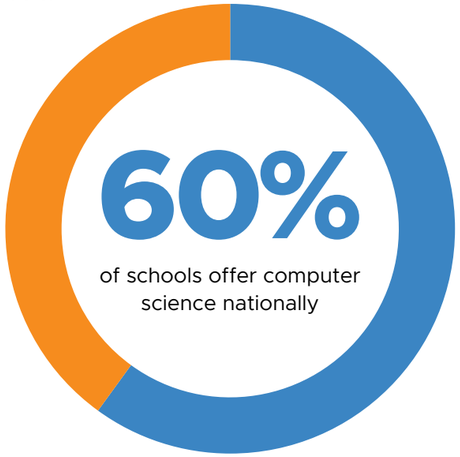
Indiana launched several competitive grant programs, including a **digital learning grant**, to aid schools in exploring the potential benefits of AI in the classroom. These grants can support schools' use of AI-powered platforms for student one-on-ones, high-dosage tutoring, and teacher administrative task support. They were first launched in 2023 and were incorporated into some of Indiana's existing grant programs.

COMPUTER SCIENCE ACCESS REPORT

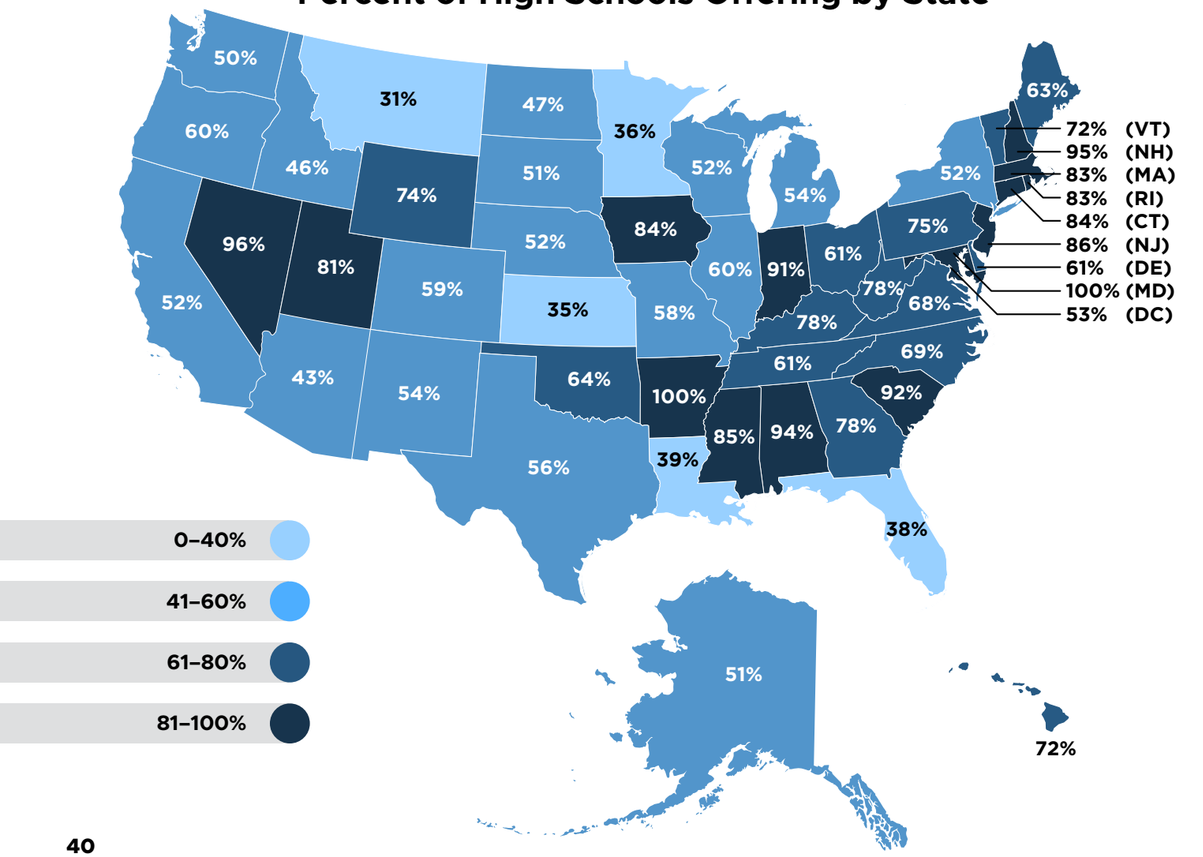
Since 2019, we have analyzed and reported on foundational computer science course offerings in all public and charter high schools in the U.S. We continue to expand our data collection to include elementary and middle schools and aim to eventually have data on all K–12 schools.

Based on the most recent data from 24,602 public high schools in the U.S., 60% of public high schools offer at least one foundational computer science course. The percentage of high schools offering computer science varies widely across states, from 31% to 100%. To see state-specific details, go to **page 82**.

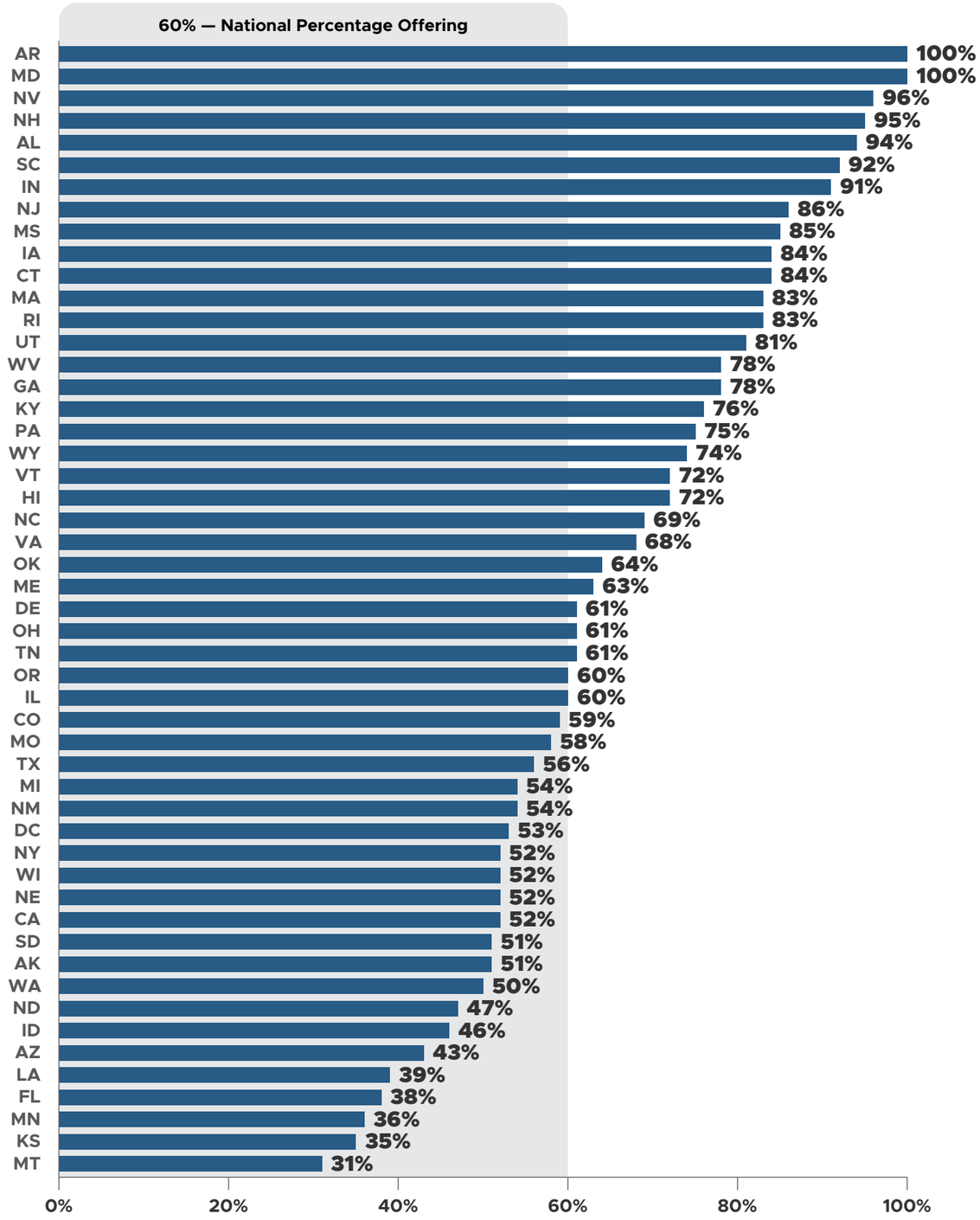
We define access as a high school offering at least one foundational computer science course, but more is needed to guarantee that every student can enroll. States must ensure that these courses are truly accessible by providing introductory classes that have no prerequisites and enough sections to accommodate all students. States should also support schools in offering multiple courses and pathways that allow students to explore progressively more rigorous computer science content.



Percent of High Schools Offering by State



States Ranked by Percentage of High Schools Offering Computer Science



Definition of a Foundational Computer Science Course

Although many schools offer their students some exposure to computer science in a limited capacity, such as an Hour of Code or after-school clubs, this report focuses on schools that provide instruction in foundational computer science in a course during the school day. In addition to aligning with the definition of computer science as defined by the K–12 Computer Science Framework, a foundational course must include a minimum amount of time applying learned concepts through programming—**at least 20 hours of programming/coding for grades 9–12 and at least 10 hours of programming/coding for grades K–8**. Although computer science is broader than programming, some direct programming experience is integral to learning the fundamental concepts. It is also a defining characteristic that differentiates foundational computer science and general technology courses.

Virtual courses are included in our analysis as long as they are readily accessible to students. For instance, some states offer virtual courses through statewide online schools. However, these courses are only included in our report if they are listed in the course catalog and if students are supported in their learning during the school day.

Given the limitations of data collection, it can be incredibly challenging to capture integrated computer science experiences. That should not be a discouraging factor for districts pursuing these course offerings. Instead, it is a call for policymakers to ensure schools can accurately categorize their courses when reporting data to the state agency.

Examples of Foundational Courses

While not all states use the federally aligned School Courses for the Exchange of Data (SCED codes), we have included the high school SCED codes for foundational computer science to give an example of the type of courses counted in the Access Report. To see the complete list of courses that are considered foundational for each state, please visit advocacy.code.org/stateofcs.

Foundational SCED codes

Course Code	Title	Course Code	Title
10011	Computer Science Principles	10156	Computer Programming—Other Language
10012	Exploring Computer Science	10157	AP Computer Science A
10013	PLTW Computer Science Essentials	10158	AP Computer Science AB
10014	PLTW Computer Science A	10159	IB Computer Science
10015	PLTW Computer Science Principles	10160	Particular Topics in Computer Programming
10019	AP Computer Science Principles	10197	Computer Programming—Independent Study
10021	Computer Science Discoveries	10198	Computer Programming—Workplace Experience
10054	Data Systems/Processing	10199	Computer Programming—Other
10151	Business Programming	10205	Computer Gaming and Design
10152	Computer Programming	10206	Mobile Applications
10153	Visual Basic (VB) Programming	21009	Robotics
10154	C++ Programming	02156	Computer Mathematics with Algebra
10155	Java Programming	71009	Robotics

Definition of a High School

To perform our analysis for the access report, we start with the list of public and charter high schools from the National Center on Education Statistics (NCES). We then work closely with states to refine the list of schools that should be included. Each year, this process becomes more collaborative, resulting in a more accurate representation of high school computer science access. Dedicated computer science specialists at the state level provide crucial expertise, ensuring the accuracy and reliability of the data we collect. Below are some criteria for determining which schools do and do not count:

Do Count	Do NOT Count
• Offers a high school diploma • Contains at least two high school grades (9–12) • Offers the majority of students' coursework	• Credit recovery schools • Junior high schools with grades 6–9 or 7–9 • Career and technical education centers where students spend part of their day • Schools that do not offer traditional courses

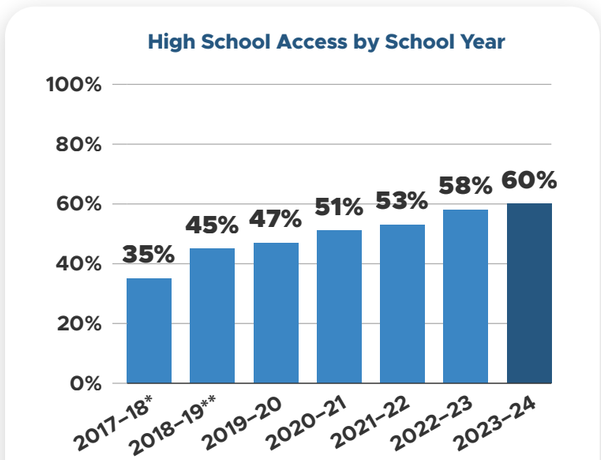
Ensuring that every student has access to computer science education, regardless of their educational environment, is essential for fostering equitable learning opportunities. While we strive to provide a comprehensive overview, we recognize that certain learning environments, such as alternative education settings, may not be reflected through traditional course codes, and some student opportunities may not be fully captured in this report.

Access to Foundational Computer Science Courses in High School

Across the country, 60% of public high schools offer at least one foundational computer science course, up from 57.5% of schools in 2023. Course offerings continue to grow each year.

South Carolina

The South Carolina Department of Juvenile Justice (SCDJJ) has partnered with Blaze Fire Games to offer students at 13 facilities statewide access to online certification programs in esports, cybersecurity, and game development. As the first juvenile justice facility in the nation to form such a partnership, SCDJJ aims to equip students with valuable skills for future careers in these rapidly growing industries.



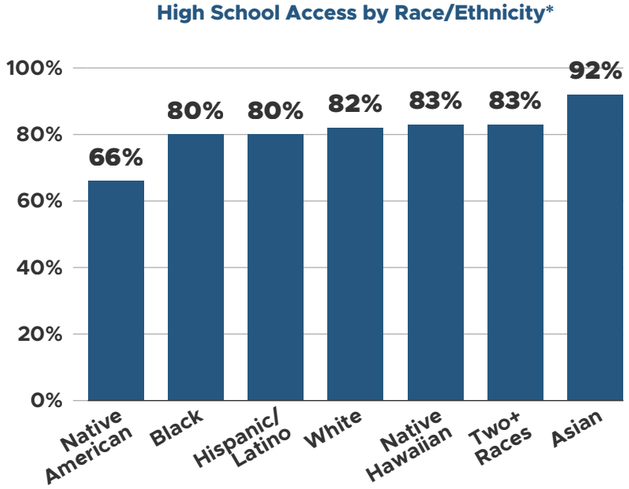
*Based on data from 24 states
**Based on data from 39 states

Definition of Student Groups

Through the state-by-state data we receive, we are able to report on data from specific student groups. Whenever possible, we identify and report on these groups individually rather than combining them. However, when it is not feasible to do so, we use the term "historically underrepresented student groups." In this report, this term encompasses young women and girls, Black/African American students, Hispanic/Latino/Latina/Latinx students, Native American/Alaskan students, Native Hawaiian/Pacific Islander students, students with disabilities, multilingual students, economically disadvantaged students, students from rural and urban areas, and students attending smaller schools. While there are undoubtedly other student groups historically underrepresented in computer science, we do not have data on additional groups or the intersection of these groups. We encourage stakeholders to reflect on the unique context of their state including which student groups have been historically underrepresented in their state and should be prioritized in future computer science initiatives.

Access to Foundational Computer Science by Race and Ethnicity

Students from racial and ethnic groups historically underrepresented in computer science are generally less likely to attend schools that offer it; Native American/Alaskan students experience the greatest disparity, with only 66% of students attending a school that offers computer science. Asian students have the greatest access to courses compared to their peers, with 92% of Asian students attending schools offering computer science. Access rates for Black/African American, Hispanic/Latino, Native Hawaiian/Pacific Islander, white, and multiracial students hover around 80%. All student groups maintained or improved their access rates compared to last year. Ensuring access is just one component of striving toward educational equity; just because a student has access to a course, does not mean they will enroll in the course. This is why using the CAPE framework is crucial for thinking about the whole educational landscape.

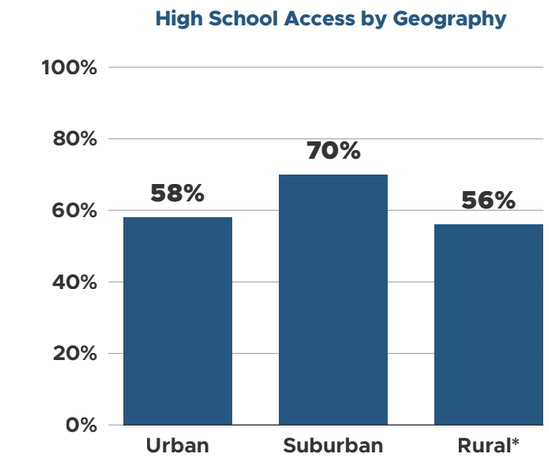


Last year, we reported 67% for Native American students, but this excluded Bureau of Indian Education students. The correct percentage should have been 63%

> Being able to advocate for and encourage underrepresented communities to explore computer science has shaped our community to be one of diversity, innovation, and new perspectives.
>
> **—Kelly Trinh, Freshman at Columbia University, New York, and former Computer Science Honor Society (CSHS) President, Tucker High School, Virginia**

Access to Foundational Computer Science by Geography

Suburban schools are more likely than urban and rural schools to offer foundational computer science courses; 70% of suburban schools provide these courses, compared to 58% of urban schools, and 56% of rural schools. Although access has increased across all geographic regions compared to last year, rural schools saw the smallest increase. Nationally, urban and rural schools offer computer science at similar rates, but this pattern does not hold true in every state. We used NCES educational demographic categorizations for this analysis, but recognize that this national definition may not be appropriate for every state. We encourage states to localize the definitions of rural and urban as needed. For detailed information on your state and the impact of geography, see page 82.

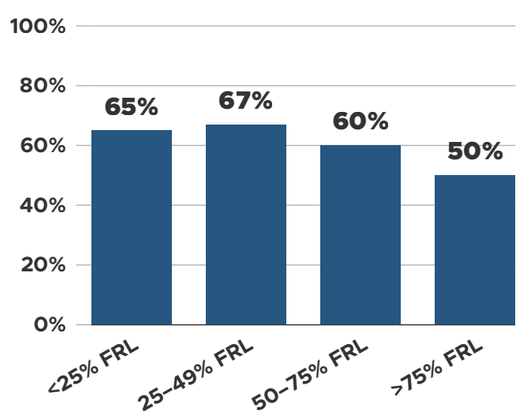


In this report, town and rural school designations from NCES Education Demographic and Geographic Estimates are combined as rural schools

The Small School District Association's (SSDA) CS4NorCal Grant, with the support from the Sacramento County Office of Education (SCOE) offered two years of computer science professional development to educators in six rural northern California communities. While visiting these schools, SSDA and SCOE have learned how important integrated computer science lessons are for small and rural schools. As the CS4NorCal Grant comes to an end in June of 2025, SSDA and SCOE will be sharing out data so the wider community can learn how to better support small and rural schools.

Access to Foundational Computer Science by Socio-Economic Factors

Schools with a higher percentage of students qualifying for free and reduced lunch are less likely to offer computer science courses. While free and reduced lunch (FRL) eligibility is an imperfect measure of student poverty, it nonetheless highlights a concerning trend: schools with wealthier student bodies are better positioned to provide computer science education. Although many states prioritize grant funding for low-income schools, this data indicates that more targeted efforts are needed to ensure all students have access to computer science education.



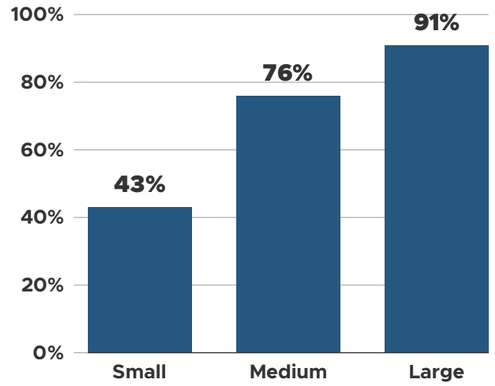
*only 43 states report free and reduced lunch data, to see state by state data visit advocacy.code.org

> **To mitigate these socioeconomic barriers, schools must provide comprehensive support systems that address the needs of students from diverse socioeconomic backgrounds. This includes offering financial assistance for course fees and exam costs, providing transportation to off-site programs and events, and establishing partnerships with local businesses to create internships and job-shadowing opportunities for students. Moreover, integrating computer science education into broader initiatives aimed at addressing poverty and inequality can help create pathways for social and economic mobility for underserved communities.**
>
> **—Leah Aiwohi, Computer Science Teacher, Kauai High School, Hawai'i**

Access to Foundational Computer Science by School Size

Last year was the first time we reported on the impact of school size on computer science course offerings. There is no nationally recognized definition of small or large schools, which likely contributes to why school size is not often considered in education policies. For the purposes of this report, we define school size in relation to the ability of all schools to fulfill a graduation requirement.

School size remains strongly correlated with the likelihood of offering foundational computer science. Large schools are 2.1 times more likely to offer these courses than small schools. The lack of access to foundational computer science is predominantly an issue for small schools. With over half of U.S. high schools falling into the "small" category and several million students attending these schools, we cannot overlook this disparity in access. It's also crucial to recognize that small schools exist in all types of communities, not just rural areas.



Small Schools

Enrollment under 500 students; these schools would just likely require an existing teacher teaching a few sections of computer science.

Medium Schools

Enrollment of 500–1,200 students; these schools would likely require a part-time or full-time computer science teacher.

Large Schools

Enrollment of more than 1,200 students; these schools would likely require more than one full-time computer science teacher.

Computer Science Prior to High School

While most policies recommended by the Code.org Advocacy Coalition focus on K–12 computer science, reflecting our belief in the importance of learning computer science via pathways from kindergarten through 12th grade, there continues to be less data for younger grades. Thus, this report focuses heavily on high school data. As we continue to gather more data on middle schools and elementary schools, we are able to get a better understanding of the computer science landscape for these students.

Definition of a Middle School

Schools that have 7th or 8th grade are considered middle schools as well as stand-alone 9th-grade schools. Schools in which 6th is the highest grade are considered elementary schools.

Middle School Data Collection and Limitations

Over the last four years, the State of Computer Science Report has been able to collect data from all public high schools in the U.S. We are not yet able to do this with middle schools, but every year we are able to collect more data. Currently, we receive data from some state agencies, and then we supplement this data with teacher surveys to get a sense of how many middle schools are teaching computer science. We call on all states to require all of their middle schools to report course offerings.

Access to Foundational Computer Science in Middle School

Based on the most recent data available, we know that at least 37% of U.S. public middle schools offer foundational computer science courses. This percentage is based on data received from 68% of the middle schools in the country. Therefore, it is likely that the actual number of middle schools teaching computer science is higher. Five states collect data on every middle school: Florida, Hawai'i, Ohio, Pennsylvania, and Wisconsin. However, other states have very little data from middle schools. States with a high percentage of their middle schools offering computer science also have a high percentage of their high schools offering. Since we do not have data from all middle schools, we do not further analyze the data by other features as we do with the high school data.

Percent of Schools Reporting Data and Offering CS

State	Percent of Middle Schools that Reported Data	Percent of Middle Schools we Know are Teaching
Alabama	98%	92%
Arkansas	89%	86%
Maryland	92%	81%
Nevada	79%	74%
Georgia	87%	73%
Utah	85%	71%
Hawai'i	100%	64%
South Carolina	97%	64%
Wyoming	65%	59%
North Carolina	73%	59%
Mississippi	96%	54%
Indiana	91%	53%
Iowa	72%	53%
Rhode Island	73%	49%
Alaska	91%	49%
Kentucky	66%	48%
Massachusetts	57%	46%
Colorado	65%	45%
Tennessee	99%	44%

Elementary School Data Collection and Limitations

Collecting data from elementary schools is even more challenging than gathering data from middle schools. In most states, elementary schools do not use course codes, making it difficult to determine whether they are teaching computer science. Computer science is often integrated into other areas of the curriculum, complicating tracking and reporting.

Definition of an Elementary School

Elementary schools are defined as K–5, 1–5, or schools in which the 6th is the highest grade.

A few state agencies provide elementary data, but the majority of our data is obtained through teacher survey data. **We have data from less than half of the elementary schools in the U.S., so this data should be viewed as extremely preliminary and provide motivation to continue investing in reporting and data collection.** Further complicating data reporting, is K–12 and K–8 schools. These schools may only be offering computer science to secondary students, but there is currently no way to distinguish that, so they also get counted as offering courses to elementary students.

Access to Foundational Computer Science in Elementary School

Based on the most recent data available, we know that at least 21% of U.S. public elementary schools offer foundational computer science. This percentage is based on data received from 47% of the elementary schools in the country. Therefore it is likely that the actual number of elementary schools teaching computer science is higher.

There are 14 states that use course codes for elementary computer science courses: Florida, Georgia, Hawai'i, Indiana, Maryland, Mississippi, New Jersey, Oklahoma, Pennsylvania, Rhode Island, Tennessee, Virginia, and West Virginia. Some of these states use grade-specific course codes, grade-banded courses, and other courses that can be taught at any grade level. A SCED code for computer science prior to secondary school is being rolled out in some states.

Kentucky Survey Data

In Kentucky, the state has leveraged its statewide digital readiness survey to gather information on computer science offerings. The survey asks: "How many of your K–8 schools provide computer science learning opportunities for students (anything beyond Hour of Code)?" This data helps the state have informed conversations with districts, especially those that have computer science at the elementary level but not at high school.

10022 Computer Science (prior to secondary)

In these courses, students learn how to develop and follow basic algorithms, collect and organize data, troubleshoot hardware and software issues, and think critically about online safety and responsibility. Courses may include learning about emerging technologies.

Percent of Schools Reporting Data and Offering CS

State	Percent of Elementary Schools that Reported Data	Percent of Elementary Schools we Know are Teaching
Alabama	99%	91%
Hawai'i	93%	78%
Mississippi	76%	64%
Nevada	72%	63%
Alaksa	80%	44%
Wyoming	42%	38%
Georgia	47%	37%
Maryland	48%	37%
Iowa	44%	32%
Indiana	93%	30%
New Jersey	52%	29%
Connecticut	38%	28%
Colorado	38%	27%
Tennessee	99%	26%
Arkansas	34%	25%
Florida	100%	25%
Utah	34%	24%
Michigan	39%	24%

Reflections on Access

While this chapter presents critical data on the availability of computer science courses, it's important to recognize that simply attending a school that offers these courses does not guarantee sufficient capacity for all students or that every student has an equal opportunity to enroll. Barriers such as prerequisites, academic scheduling conflicts, and limited course availability can act as gatekeepers. These structural challenges highlight the need for policies that expand course offerings and ensure that all students, regardless of background or circumstance, can truly access these opportunities.

Encouragingly, many states have begun to take significant steps toward greater transparency and accountability by publishing dashboards dedicated to computer science education. These dashboards offer a level of detail and granularity that often goes beyond what we can capture in a national report. They allow states to track and analyze enrollment data, participation rates, and demographic trends, providing a fuller picture of student matriculation in computer science education and better clarity on the gaps that remain.

> I find that we often see access defined as available. I define it much more specifically as access to everyone. Let's say a class is offered at a school, but that class is not actually accessible to visually impaired students or other students with disabilities. How are we serving them? How are we counting them? And are we essentially increasing the achievement gap when we do not take them into consideration as we implement computer science education initiatives?
>
> **—Sofía De Jesús, Associate Program Manager - CMU CS Academy, Carnegie Mellon University, Pennsylvania**

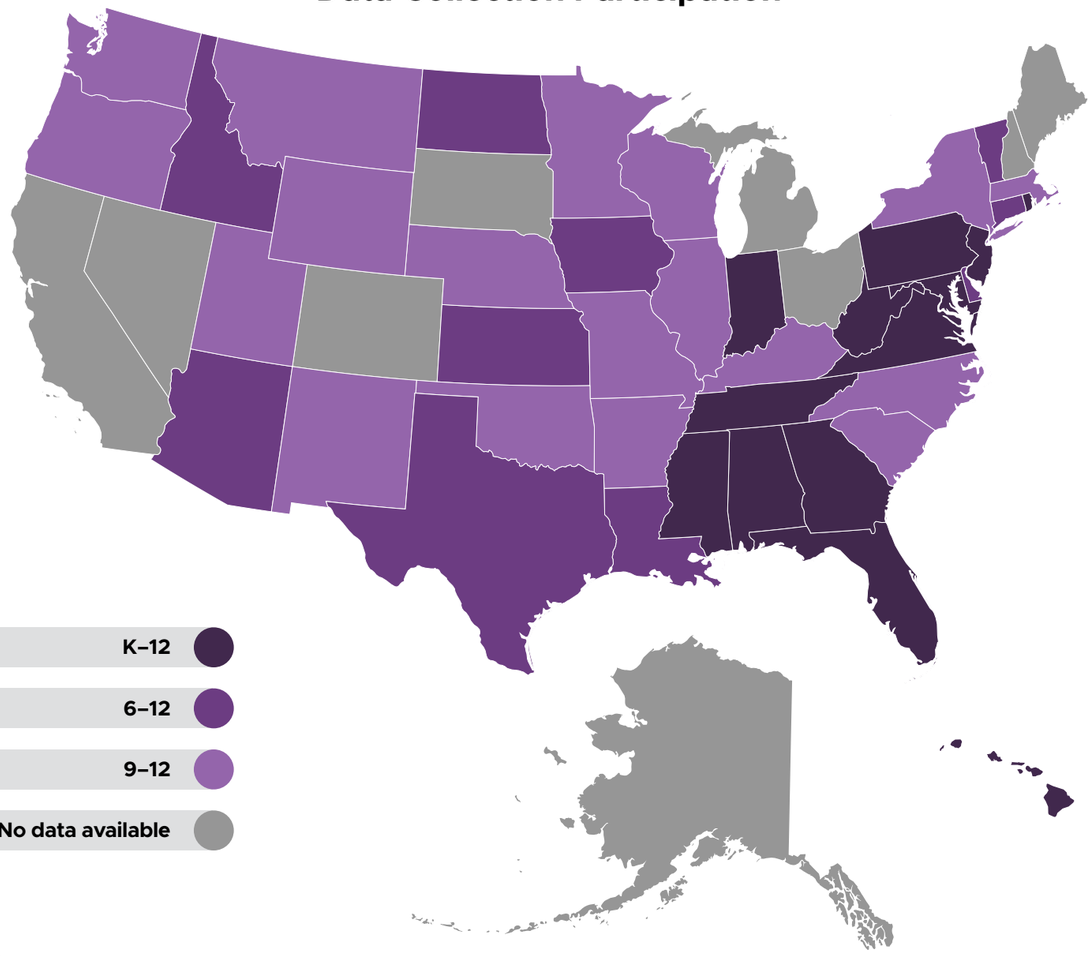
COMPUTER SCIENCE PARTICIPATION

When we first began the State of Computer Science Report, our primary focus was on access data. Over the years, however, we have been able to expand our reporting to include more detailed participation data. This year, for the first time, we are dedicating a separate chapter to participation, rather than combining it with access. This approach allows us to address the unique challenges involved in increasing participation.

One challenge with participation data is that it is reported on a year-by-year basis. We do not have data on the percentage of students who take a foundational computer science course over their entire high school career. We estimate that if states achieve 25% participation annually, it means that most students are taking at least one computer science course during high school.

Two states do provide data on graduating classes: Louisiana and Maryland. In Louisiana's class of 2023, 19% of graduating students took at least one computer science course. In Maryland's class of 2022, 37% of students took at least one computer science course. Importantly, in both of these states, this data includes some non-foundational courses. We call on all states to provide data on graduating students so we are able to more accurately determine how many students are engaging in computer science courses throughout their high school careers.

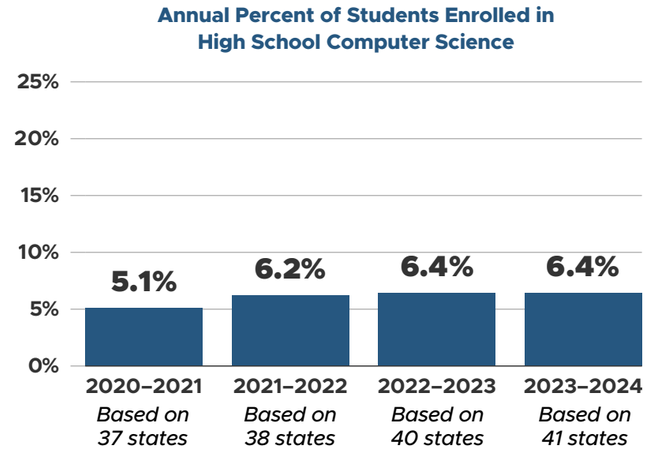
Data Collection Participation



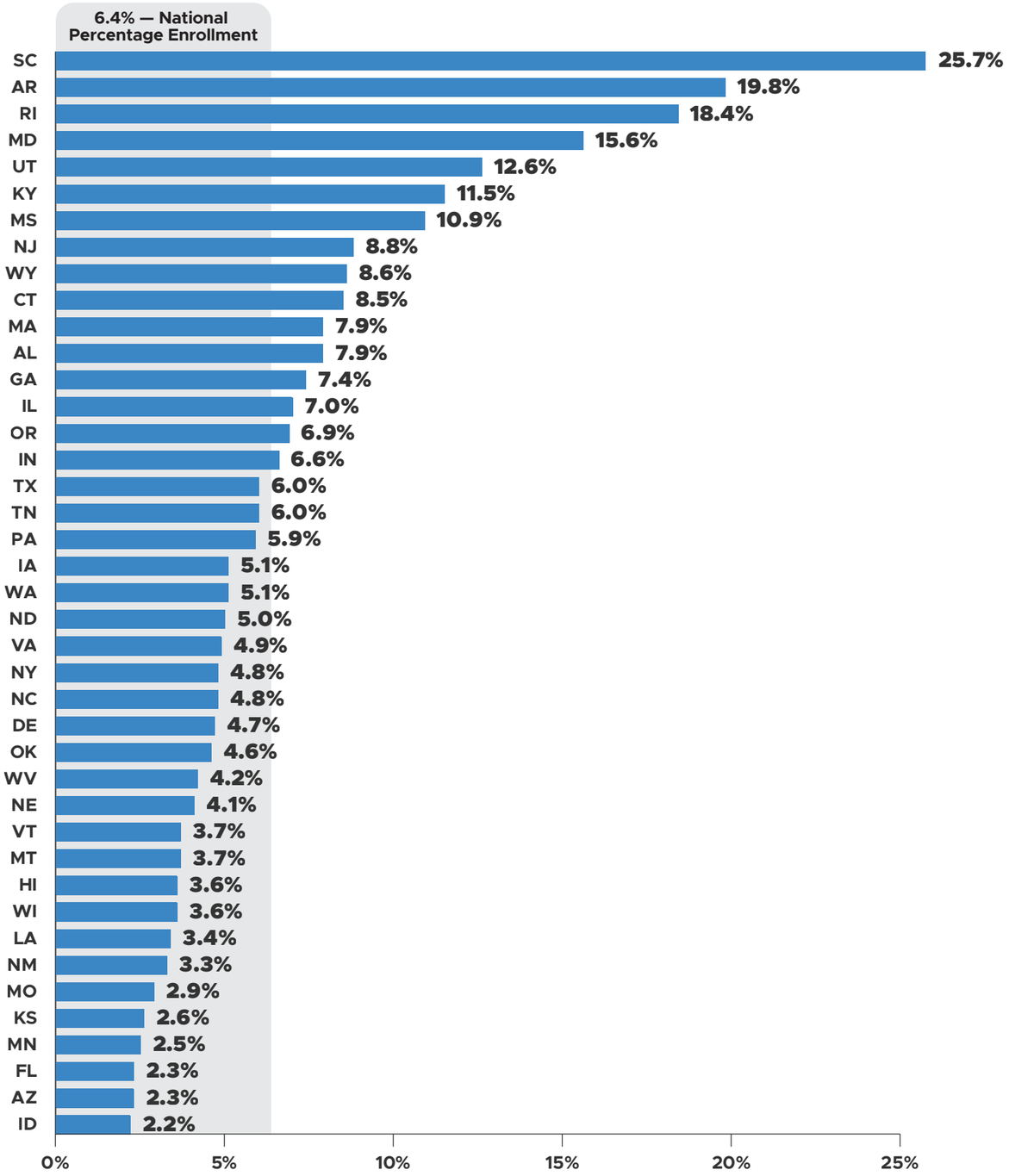
Participation in Foundational Computer Science Courses in High School

We received data from 41 states on students enrolled in computer science. We call on the remaining states to prioritize collecting computer science enrollment data. **Based on the most recent data from these 41 states, 6.4% of high school students are enrolled in foundational computer science the last school year.** The percent of high school students enrolled in computer science varies widely across states, from 2% to 26%.

To see state-specific details, go to page 82.



States Ranked by Percentage of Participation*



*only 41 states have provided participation data

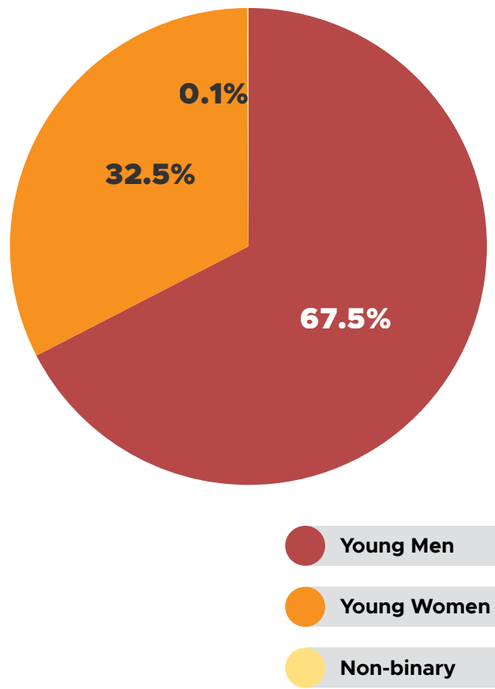
Participation in Foundational Computer Science by Gender

Approximately one third of students enrolled in computer science courses are young women, a figure that has remained consistent over the past four years. Young men are twice as likely as young women to take these foundational courses. Despite the significant effort and progress to promote computer science education over the years, the proportion of young women enrolled in these courses has not seen substantial growth. This gap in participation is one of the clearest examples that access to computer science courses alone is not sufficient to ensure all students participate.

However, there is a notable exception: states with graduation requirements in computer science have made meaningful progress. In fact, the only states where the enrollment of young women exceeds 40% are those with such requirements in place.

> **We have to be intentional about nurturing girls' interest early. It is essential for girls to see people in the field who look like them. We also cannot underestimate the role of mentoring in helping to increase computer science participation for girls. We cannot truly say computer science for all until computer science classes and careers are more reflective of the population.**
>
> **— Michelle Pierce, Middle School Computer Science Educator, Mallard Creek STEM Academy, Charlotte, NC**

Participation in High School Computer Science by Gender

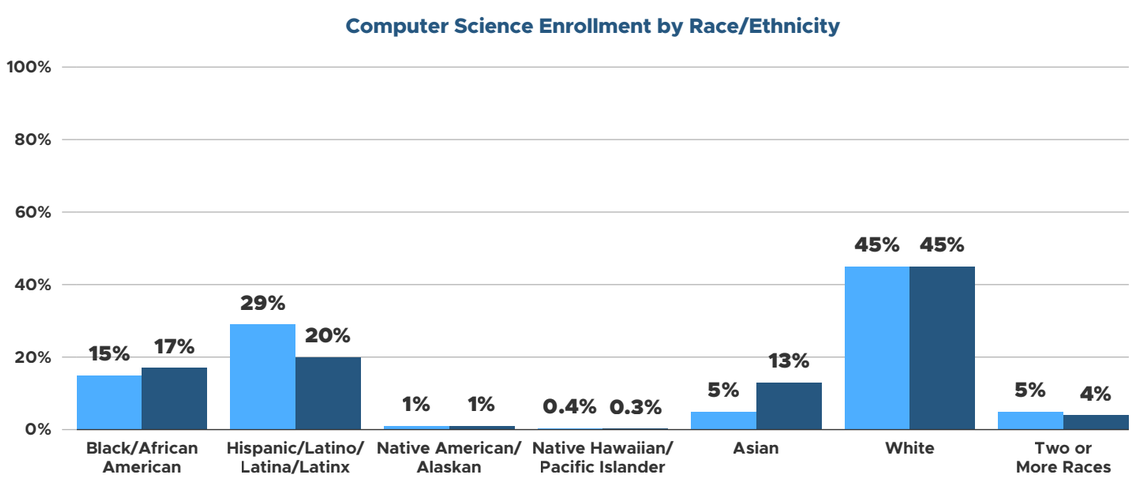


Participation in Foundational Computer Science by Race and Ethnicity

Nationally, student participation numbers often mask the reality at the local level, and we encourage policymakers to look at more nuanced data. Given the size of the U.S. population, many states do not follow national trends. **These national trends are based on data from 41 states**, and we are missing data from some large states including California and Ohio, which could impact data nationally.

Over the last four years of data, participation by race and ethnicity has been fairly consistent:

- Black/African American students, Native Hawaiian/Pacific Islander students, multiracial students, and white students are proportionally represented;
- Asian students are overrepresented compared to their population; and
- Hispanic/Latino/Latina/Latinx students are underrepresented compared to their population.
- This year, for the first time, Native American/Alaskan students are proportionally represented.



North Carolina

North Carolina is expanding their #IAmComputerScience campaign to include student-led regional based projects that partner with a local organization to broaden participation in computer science education. The #IAmComputerScience is a statewide initiative focusing on increasing equity and access of diverse students by demonstrating that careers in Computer Science, STEM, IT, and Technology are achievable, rewarding, and in high demand.

Illinois

Illinois has made tremendous strides in ensuring equitable access to computer science education across our state, especially for previously underrepresented students. We believe computer science education has the power to open doors for our students to high-paying and in-demand STEM careers. Our goal in Illinois is to create an environment where every student has the opportunity to explore their unique interests and thrive in the careers of the future.

— Dr. Tony Sanders, Illinois State Superintendent of Education

Participation in Foundational Computer Science by Native American/ Alaskan Students

Without participation data from key states with large Native American/Alaskan student populations including Alaska, Montana, and South Dakota, the data suggests that Native American/Alaskan students achieved proportional representation. It is imperative that we prioritize receiving more comprehensive data from all states in order to share a complete picture of Native American/Alaskan student participation in computer science.

The Northern Lights Collaborative for Computing Education at the University of Minnesota developed an Indigenous Computer Science curriculum that integrates Ojibwe and Dakota languages and cultures. The collaborative will support up to 15 schools with significant Native American student populations by offering stipends to attend a workshop, implement the curriculum, and provide feedback. In the 2023–2024 school year, two lessons were created and piloted with teachers.

“At first I was a little nervous about students asking, ‘What does corn and beans and squash have to do with art?’ but there wasn’t one student who asked that question. Students really seemed to understand the correlation between art, science, and computer science.”

— Chrissy Valento,
Art Teacher, Lincoln Park Middle School, Duluth Public Schools

Participation in Foundational Computer Science by Hispanic/Latino/ Latina/Latinx Students

While Hispanic/Latino/Latina/Latinx students have access to computer science education at similar rates to other racial and ethnic groups, they are less likely to participate in these courses. This suggests there are barriers to these students enrolling in computer science. We call upon researchers to investigate the factors that contribute to this disparity. Addressing these barriers is crucial to ensuring that Hispanic/ Latino/Latina/Latinx students are encouraged to learn computer science.

Increasing computer science participation among Latinx students is crucial for closing the digital divide, yet significant disparities persist. Working closely with Latinx communities, empowering parents to advocate for computer science access for their children, can ensure that their voices are heard and their children are exposed to, have access to, and can choose to pursue opportunities in the tech sector.

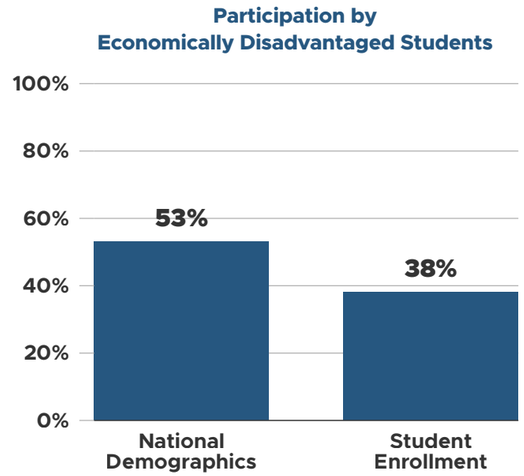
— Rudy Escobar, STEM and Computer Science Coordinator, Stanislaus County Office of Education, California

As a first-generation Latina, my parents didn’t come from a place with accessible technology. No one was there to encourage me to take CS classes, or tell me the benefits of taking them. I wholeheartedly believe that if I had the opportunity to learn about CS at a young age, I would’ve fallen in love with this field a lot sooner and would have been inspired to spread my excitement.

— Jacqueline Lopez, 11th grade student, New York

Participation in Foundational Computer Science for Economically Disadvantaged Students

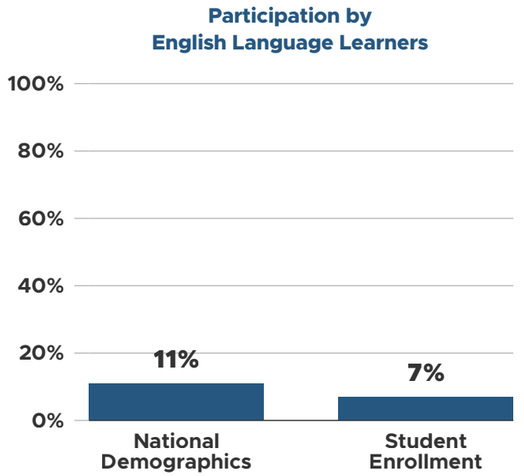
Students of all income levels deserve the opportunity to participate in computer science. States define which students qualify as economically disadvantaged differently, and nationally, the only available data source is students who qualify for free and reduced lunch data. This is an imperfect source, and in many states, it undercounts how many students experience poverty.



Nationally, 53% of students qualify for free and reduced lunch, and only 38% of students enrolled in foundational computer science classes are economically disadvantaged. This gap has remained consistent over the last four years. We know that schools with a more significant percentage of students who qualify for free and reduced lunch are less likely to offer computer science (see page 46), so while some of this gap can be attributed to a lack of courses, it is more than just an access issue. Even in some states with nearly all their schools offering computer science, there is still a gap in participation for students experiencing poverty.

Participation in Foundational Computer Science by English Language Learners

Over the last four years, participation by English Language Learners (ELLs) has remained relatively consistent. Nationally, 11% of students are English language learners and only 7% of students enrolled in foundational computer science classes are English language learners.. There can be challenges to providing computer science instruction to these learners, such as students receiving a large amount of dedicated English instruction may have limited room to take electives. However, computer science also has some advantages for ELLs, with many available online resources already translated into other languages. Further, the strategies that ELLs learn to use in other academic subjects to support their language development and discourse may help them learn computer science languages.



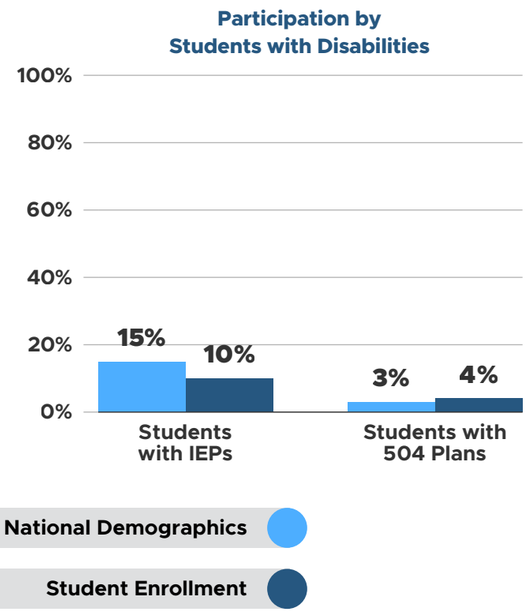
> Persistent disparities to computer science education for economically disadvantaged communities remain a significant challenge. At CodeCrew, we are committed to creating programs that empower diverse students with the skills and confidence to excel in a tech-driven world. We have directly impacted over 12,000 unique students. We believe talent is equally distributed, but opportunity is not—and we are proud to be a driving force in creating equitable access to computer science education, enabling young people to shine and tackle our global challenges.
>
> **— Meka Egwuekwe, Executive Director, CodeCrew, Tennessee**

> As a CSforEL facilitator, my intentional planning and implementation of strategies that allow English Learners to practice and improve upon both their receptive and expressive language skills has increased tremendously. The Lesson Planning Algorithm provides steps for purposeful integration in each of our lessons to allow time for developing language and increasing interaction and engagement. The strategies allow students to not only deepen their content knowledge, but to practice their language in a supportive environment as well. This program is truly the best professional development I have ever received and I continue to learn through my role as a facilitator.
>
> **— Lauren Curry, Computer Science Teacher, Las Cruces High School, New Mexico**

Participation in Foundational Computer Science for Students with Disabilities

Students with disabilities face significant and wide-ranging barriers to learning computer science. For example, blind students frequently encounter inaccessible programming tools, and Deaf students may encounter uncaptioned video. Students with disabilities are supported in two main ways in educational environments: 504 plans provide students with accommodations to meet the same educational goals as their peers, and individualized education plans (IEPs) may provide both accommodations and modifications to meet students' needs.

Students with 504 plans continue to be well-represented in foundational computer science, whereas students with IEPs remain underrepresented. There are many organizations dedicated to making sure computer science classes are accessible for all learners; however, there is still much work to do to ensure all students get this opportunity.



In 2022, the Maryland General Assembly passed a law requiring schools to make sure all digital tools are accessible. When schools buy or develop these tools, they must follow specific guidelines to ensure accessibility. If a vendor provides a digital tool that does not meet these accessibility standards, the vendor must fix it at their own cost within a set time. The law also shifts responsibility for overseeing these guidelines from the Secretary of Commerce to the Secretary of Disabilities, working together with the State Superintendent of Schools.

In 2020, Sreenidi Bala, a high school student created Code for All Minds. Through tutoring, Sreenidi saw the need to have more resources for teaching computer science to students who receive special education services.

"With Code for All Minds, I've seen firsthand how coding breaks down barriers. The beauty of innovation through coding is that anyone can write code—it's not judged by any factor other than if it works. This motivates me to help my friends with special needs discover their potential, empowering them to develop real skills and showing them that they belong in the tech world just as much as anyone else."

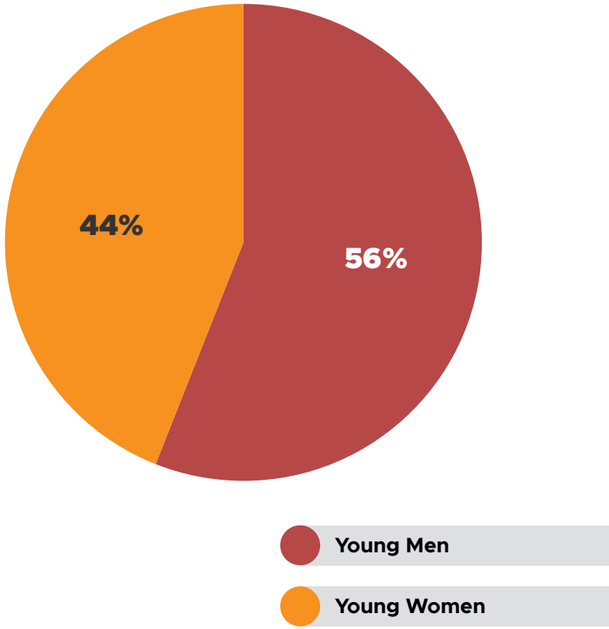
— Sreendi Bala, 12th Grader, Connecticut

Sara Frey, a computer science education consultant in Pennsylvania, conducted an analysis of participation data to better understand the experiences of students with disabilities in Computer Science Principles (CSP) courses. She found that students with disabilities are significantly underrepresented. Although they constitute about 18.2% of the overall student population in Pennsylvania, only 7.3% of those enrolled in CSP courses are students with disabilities. The disparity is even more pronounced in Advanced Placement CSP courses, where students with disabilities are much less likely to enroll. Additionally, certain disability categories, such as speech/language or hearing impairments, are underrepresented in CSP, while others, such as ADHD and autism, are overrepresented. These findings raise concerns about potential barriers and biases in course placement. Further research is needed, particularly regarding students with multiple disabilities, to fully understand these enrollment patterns.

Participation in Foundational Computer Science Courses in Middle School

Based on the most recent data from 31 states, at least 8.3% of middle school students are enrolled in foundational computer science. As previously noted, we do not receive data from all middle schools, so the actual number of students enrolled in these courses is likely higher.

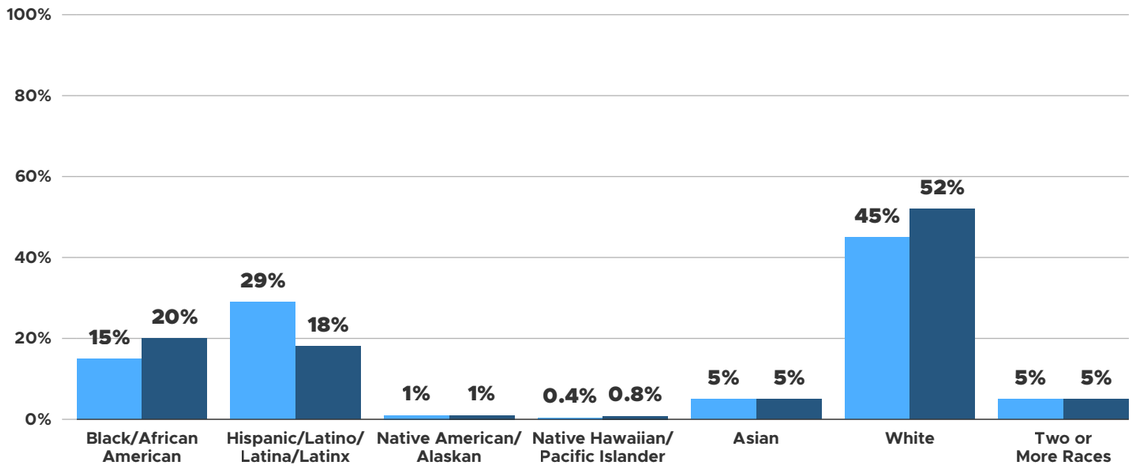
Generally, middle school computer science is more representative across many demographics than is high school computer science. This is perhaps most notable with gender: at the middle school level, 44% of enrolled students are young women, compared with only 33% at the high school level.



Comparing Participation by Race/Ethnicity

- Black/African American students, Native Hawaiian/Pacific Islander students, white students, and multiracial students are all enrolled at higher rates in middle school than high school students;
- Asian students are enrolled at lower rates in middle school than in high school, however, these students are still proportionally represented;
- Native American/Alaskan students are enrolled at the same rate in middle school compared to high school; and
- Hispanic/Latino/Latina/Latinx students are enrolled at even lower rates in middle school than in high school.

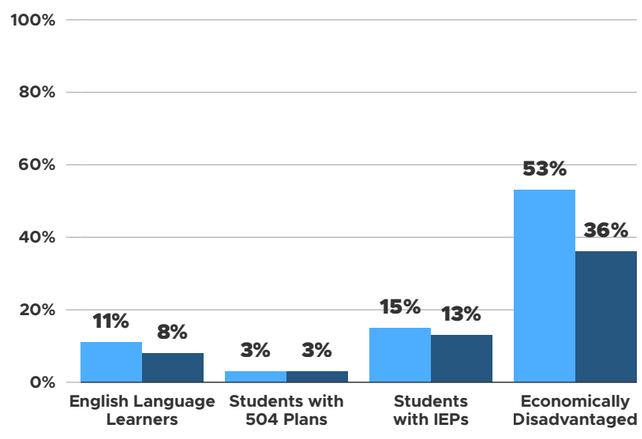
Middle School Participation by Race/Ethnicity



Comparing Participation by Specific Student Groups

- English language learners and students with IEPs are enrolled at higher rates in middle school than in high school; and
- Students with 504 plans and economically disadvantaged students are enrolled in slightly lower rates in middle school than in high school.

Middle School Participation by Subgroup



Participation in Foundational Computer Science Courses in Elementary School

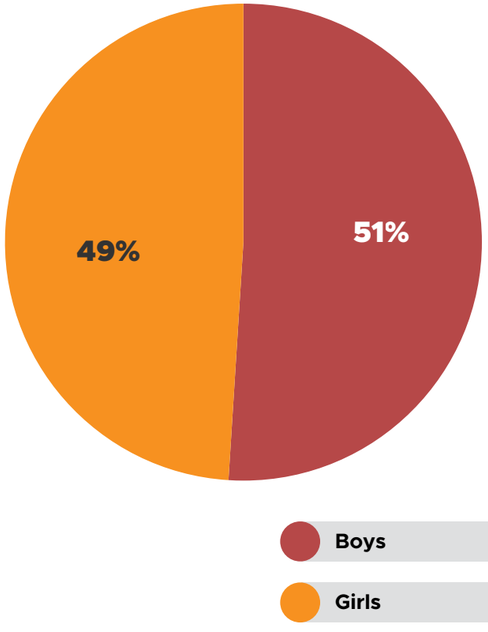
Based on the most recent data from 13 states, we know that at least 13% of elementary school students are enrolled in foundational computer science. As previously noted, it is particularly hard to gain insight into elementary computer science given the limitations with data collection. In the elementary grades computer science can also be integrated with other subjects, while this means that more students may be exposed to computer science it also means that deciphering when and where computer science is taught is challenging Generally, elementary computer science participation across demographics is the most representative of the overall student population in the country. This is likely because when computer science is offered, it is taught to entire grades rather than as an elective that students have to choose.

It is important to note that our data source for the student population is K–12 data, even though certain populations may not be consistent throughout school. For example, students with certain disabilities may not get diagnosed until later in their school careers. Conversely, data suggests that more students in elementary school qualify for English language services.[13] As with so many data points, we encourage policymakers to look at state and local data when making decisions.

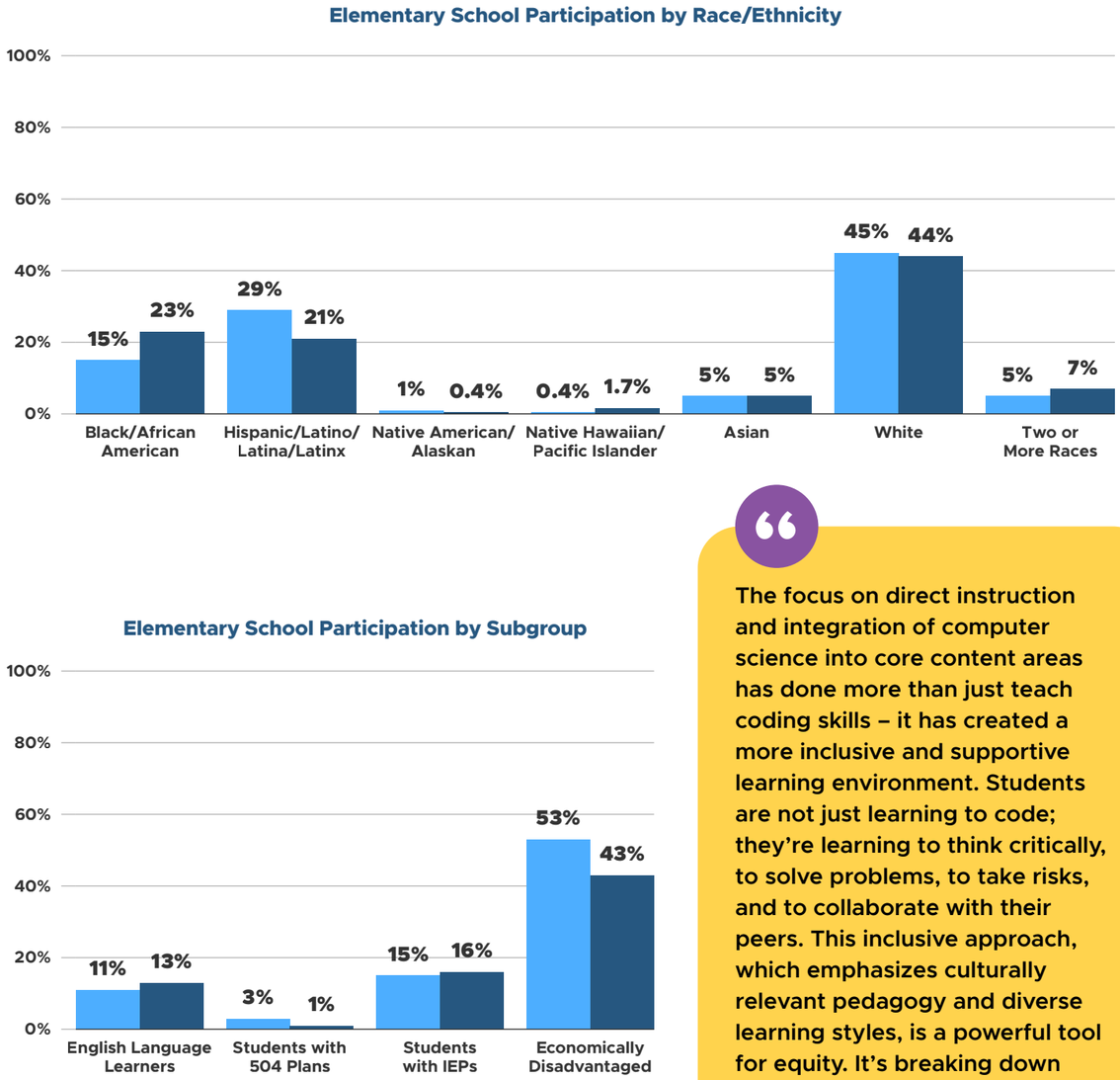
At the elementary school level, 49% of enrolled students are girls, compared with only 44% at the middle school level and 33% at the high school level.

> Teaching computer science to elementary school requires a lot of patience and creativity. One of the most joyful experiences I've had in teaching computer science is doing my unit on CS Heroes where I read a story about an unsung hero in STEM and then do an activity in honor of their contributions. I will never forget when one Kindergartener said, "She looks like me!" and made a personal connection to Dorothy Vaughan as an African-American female. Moments like these where students are inspired and see joyful learning are what make teaching computer science so worthwhile.
>
> **— Shiela Lee, former K–5 STEM/CS Teacher in NYC, currently Head of Education/Associate Software Engineer at Chibitronics**

Participation in Elementary School Computer Science by Gender



As this data is only from 13 states, we need to be careful about drawing conclusions from this data as compared to the high school data or even middle school data.



National Demographic

Student Enrollment

Expanding Data Collection

We continue to encourage states to collect as much student data as possible to identify areas to improve the student experience and target support to specific schools and student groups, especially for intersectional identities. For example, in Texas, the state has been able to identify that rural, Black/African American girls are the least likely to enroll in computer science classes.[16] This detailed data helps to ensure resources are directed to the areas of greatest need.

It can be especially challenging to collect intersectional data in smaller states when there are low student counts overall. While student privacy is paramount we also cannot allow that to prevent us from making data-driven decisions. Finding the right balance between privacy and the need for actionable data is key to advancing equity in computer science education.

In addition to intersectional data, we also encourage states to begin collecting longitudinal data. Longitudinal data would allow states to track students over time, providing a deeper understanding of how early exposure to computer science in elementary school influences high school enrollment and beyond. This type of data would enable more strategic planning and targeted interventions, ultimately leading to better outcomes for students.

We recognize that collecting more data is a significant undertaking but it provides value insight to improve educational outcomes for students.

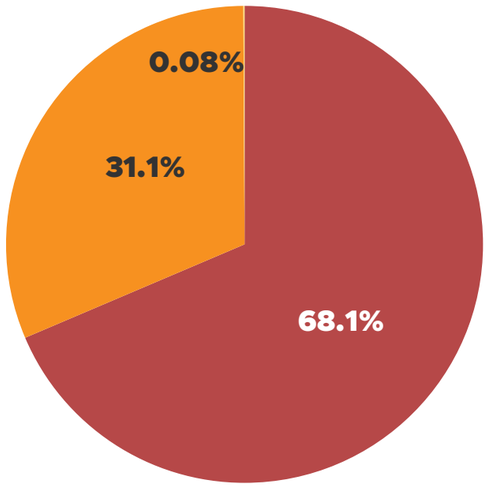
To see additional information on the data we collect please see the appendices.

> The focus on direct instruction and integration of computer science into core content areas has done more than just teach coding skills – it has created a more inclusive and supportive learning environment. Students are not just learning to code; they're learning to think critically, to solve problems, to take risks, and to collaborate with their peers. This inclusive approach, which emphasizes culturally relevant pedagogy and diverse learning styles, is a powerful tool for equity. It's breaking down barriers and giving all students, regardless of their background, a chance to succeed in computer science and beyond.
>
> **— Emily Lewis, Elementary Teacher, West Des Moines, Iowa**

AP Computer Science Exam Participation Data

The data in this section describe the College Board AP exam participation across two courses: AP Computer Science A and AP Computer Science Principles. For more detailed and course-specific data, see Appendix 3 and our **interactive dashboard**. AP Computer Science A focuses on problem-solving and object-oriented programming using the Java programming language. AP Computer Science Principles is a more introductory course with a focus on the breadth of topics encompassed by the field of computer science. While we report on this data because it enables us to view national trends for advanced coursework as well as student achievement data, AP data is generally less representative than all foundational computer science courses, and does not necessarily represent the same students who took AP classes and not the exam. For example, data from Texas have shown that Black/African American and Hispanic/Latino/Latina/Latinx students who are enrolled in AP Computer Science A and AP Computer Science Principles take the AP exams at lower rates than their white and Asian peers.[14]

Participation in AP CS Exams by Gender



Raw participation numbers have grown for both AP exams over the past few years, but young women and Black/African American, Native American/Alaskan, and Native Hawaiian/Pacific Islander students are still underrepresented in AP computer science exams.

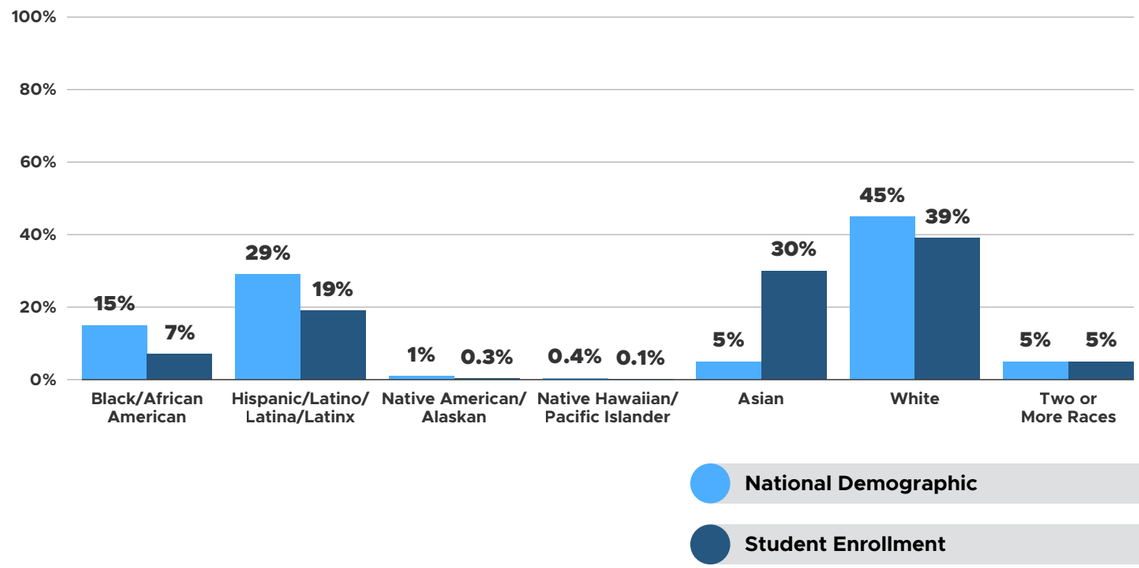
In data reported from the 2023 AP computer science exams, **31% of students who took the exam were female**, slightly lower than the national average for female students enrolled in foundational computer science courses. Similar to foundational courses, this participation number has hovered around 30% for the last four years.

Students of most races and ethnicities are underrepresented compared to their population in AP computer science exams. Black/African American, Hispanic/Latino/Latina/Latinx, Native American/Alaskan, Native Hawaiian/Pacific Islander, and white students are all underrepresented compared with their populations. Notably, Hispanic/Latino/Latina/Latinx students have a similar rate of participation in AP CS exams as they do in foundational computer science courses. AP data, unlike most state data, has a "no response" category for race, accounting for 4% of all test takers.

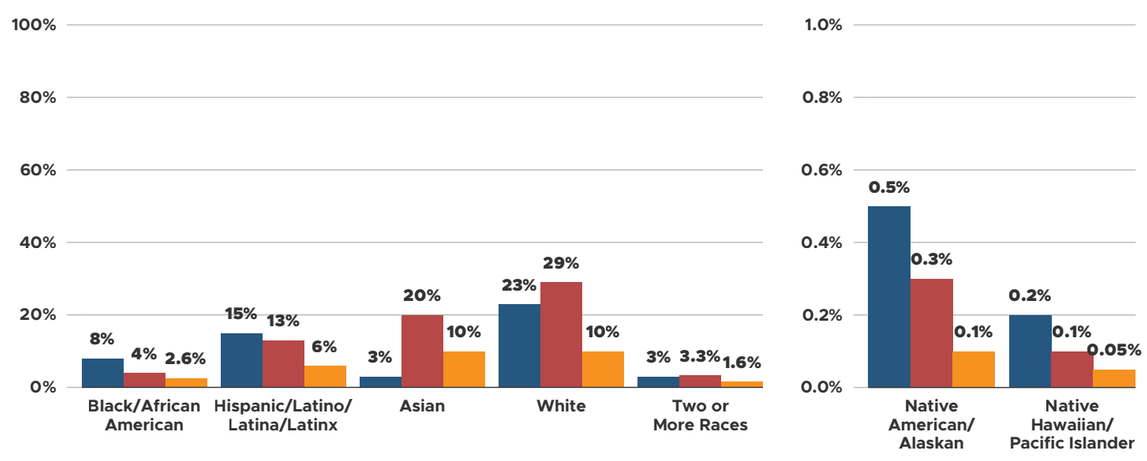
AP data also allows us to examine patterns in participation for gender and race/ethnicity. Young women of all races and ethnicities are less likely to take AP computer science exams compared to their male counterparts; the extent of this disparity varies significantly by race and ethnicity. For example, young white women are nearly three times less likely to take AP computer science exams than young white men, highlighting a substantial gender gap within this demographic.

While all Hispanic/Latino students are underrepresented in AP computer science exam participation, this underrepresentation is even more pronounced among young Hispanic/Latina women (a phenomenon known as a "double bind"[15]). This suggests that the participation disparities observed in foundational computer science courses for Hispanic/Latino students may be driven largely by the underrepresentation of young women. We strongly encourage states, particularly those with significant Hispanic/Latino populations, to further investigate these participation gaps and explore targeted interventions to address them.

AP Computer Science Exam Participation by Race/Ethnicity



AP Computer Science Exam Participation by Gender and Race/Ethnicity



SUCCESS IN THE MIDDLE GRADES

What Does Computer Science at the Middle School Level Look Like?

Middle school is a crucial bridge between the early exposure to computer science in elementary school, through programs like the Hour of Code, and more specialized high school coursework. Middle school computer science courses play a vital role in helping students transition from visual, block-based coding to more traditional, text-based programming languages and in developing more advanced levels of computational thinking. By ensuring that students gain a strong foundation in computer science during middle school, we can better prepare them to engage with more complex concepts in high school and beyond.

The national landscape of middle school computer science is more varied and inconsistent compared to that of high school. Some states offer only a few courses, while others provide a full range of topics similar to high school offerings. Computer Science Discoveries and Exploring Computer Science have become popular at the middle school level. These year-long courses introduce students to a broad spectrum of topics, including programming, algorithms, data, and the societal impacts of computing, providing a comprehensive introduction to the field of computer science. Many middle schools also offer semester-long courses such as robotics, coding with Minecraft, game design, and web design. Additionally, some schools integrate computer science into other subjects, though it can be challenging to gather accurate data on these implementations.

> Teaching middle school computer science is a constant adventure. Middle school students love to do hands-on activities like Micro Bits and arcade game design. In Pennsylvania, we are lucky to have a yearly regional and state design competition where students can present programming, 3D design, and Web Design projects. Students gain so much more when the assessments are authentic, so being able to have the competition gives them the experience that carries through high school and beyond.
>
> **— Sandra Hartman, Computer Science and Media Design Educator, Lehman Intermediate School, Pennsylvania**

Arkansas students take a 5-week coding course between 5th and 8th grade. This course is implemented in various ways, including a stand-alone block, embedding in another course at these grade levels, or expanding to a full semester-or-longer course. This coming year, the Arkansas Department of Education is offering grants to equip teachers of these courses with a classroom set of Circuit Playground Expresses. Along with the devices, teachers will attend a two-day training with one of the Statewide Computer Science Specialists focused on leveraging the Circuit Playgrounds in their classrooms.

Why Is Middle School Computer Science Important?

Middle school schedules allow students to explore a greater range of elective courses than in high school. The federal Department of Education has recognized the importance of the middle years by extending career and technical education (CTE) funding starting in 5th grade. By giving students access to CTE courses in middle school, students are better able to explore their potential career pathways within these years.

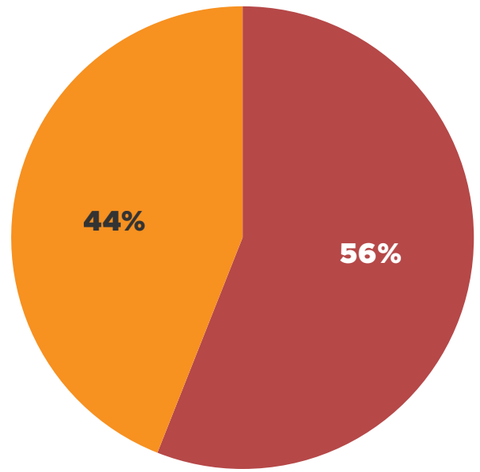
The middle school years are also a period of significant emotional and developmental transition. As students navigate the challenges of puberty and the pressures to fit in, offering computer science courses during this time allows them to explore the subject before preconceptions or social pressures further influence them. This early exposure is crucial for breaking down barriers and encouraging students to consider computer science as a viable and exciting option.

Unfortunately, broader conversations about expanding computer science education have often overlooked middle school. We urge policymakers to renew their focus on this critical stage in a student's educational journey, recognizing that middle school is a pivotal period for igniting interest and laying the groundwork for future success. We believe that exposing all middle school students to computer science will not only expand their future possibilities but also ensure a more inclusive and diverse field.

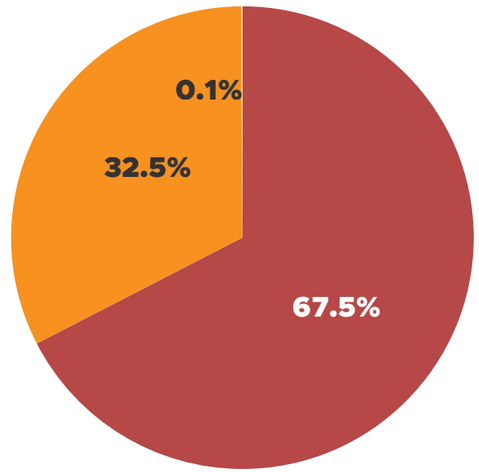
Participation Insights

In addition to being an important time in a student's educational journey, we also see exciting participation trends across demographics at the middle school level. When we normalize access rates between high school and middle school, overall participation per capita is nearly double in middle schools. This data suggests that when students can explore computer science in middle school, they take advantage of the opportunity. We want to understand these trends better to replicate them in high school. At the middle school level, 44% of students enrolled in computer science are young women, compared with only 32.5% at the high school level.

Participation in Middle School Computer Science by Gender



Participation in High School Computer Science by Gender

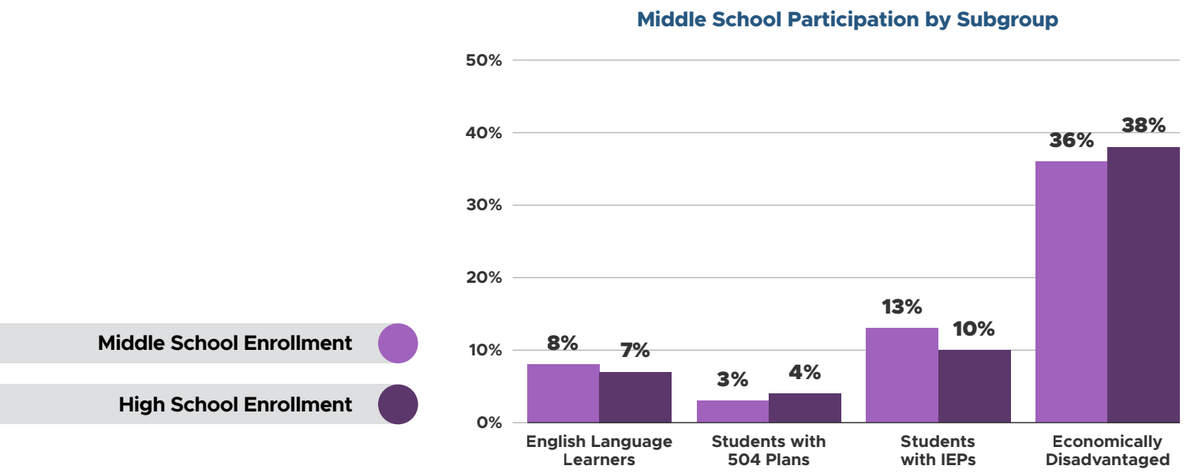


Young Men

Young Women

Non-binary

Black/African American students are better represented in middle school computer science than in high school computer science, whereas Hispanic/Latino students are less represented (see page 64 for graphic on middle school participation). Additionally, English language learners and students with IEPs are more represented in middle school computer science than in high school. Identifying what makes middle school computer science more accessible could offer important insights for reducing barriers at the high school level. While middle school computer science shows improved representation, there is still work to be done, as many historically underrepresented students are not yet enrolling. We should celebrate these successes while continuing efforts to close the remaining gaps in middle school computer science. As with all our data we encourage policymakers to look at their state and local data as the trends may differ from the national level.



How Have States Found Success in the Middle Grades?

While there has not been as much national focus on middle school computer science education, several states have made it a priority and have seen impressive participation numbers. These case studies provide valuable insights into policy levers that improve middle school computer science education. By examining the strategies that have proven successful in these states, others may learn how to replicate and adapt these approaches to their own contexts, ultimately leading to broader national improvements in middle school computer science participation and achievement. The strong participation numbers in these states underscore the impact of policy.

Hawai'i has seen significant success in boosting enrollment in both middle and elementary school computer science thanks to strong state policy and effective implementation. In 2021, Act 158 required all schools to phase in computer science offerings. As a result, middle school participation more than doubled between the 2022–2023 and 2023–2024 school years, with notable increases in diversity, particularly among female and Native Hawaiian students.

Key strategies contributing to Hawai'i's success include:

- **Leadership at the Local Level:** Each complex area (equivalent to a school district) has a designated computer science lead to keep the subject as a top priority.
- **Pathway Development:** The state collaborates with each complex area to create a comprehensive K–12 computer science implementation plan, ensuring student education continuity.
- **Teacher Support:** A cohort model for training and supporting computer science teachers fosters a strong community of skilled educators.
- **Student-Community Engagement:** Schools are encouraged to host community nights to showcase student learning, and the state organizes coding competitions for students to apply computer science in their own lives. Enabling students to share their achievements with parents and the wider community not only allows the students to feel accomplished but also encourages parents and community members to see computer science initiatives as worthwhile and beneficial.

Hawai'i is working to build a whole ecosystem for computer science education from kindergarten to the end of high school. States have different approaches as to whether they first build up computer science in the younger grades or first focus on high school, but either way, it is clear that middle school is a key bridge that needs to be specifically supported as well.

Rhode Island leads the nation with 34% of middle school students enrolled in computer science courses. Since its inception in 2016, the CS4RI initiative has strengthened middle school computer science instruction.

Key strategies contributing to Rhode Island's success include:

- **Statewide Leadership:** A 2019 federal grant enabled CS4RI to expand its staff, focusing specifically on district outreach.
- **Teacher Support and Development:** Since 2016, CS4RI has offered free professional development. 150 middle school teachers have received this training, and they can also receive stipends and endorsements.
- **Graduation Requirement:** In 2022, Rhode Island passed a graduation requirement for computer science. This requirement can be fulfilled at the middle school level, and early data indicates that many middle schools are giving students the option to fulfill it.
- **Cultivating Student Interest:** Rhode Island has targeted outreach to middle school students, including a summit hosted in 2023 to spark an interest in middle school students. Middle school students engaged with high school and even college computer science projects and saw the possibilities to connect this field to their future career aspirations.

The state education agency continues to encourage even more middle school students to take computer science, including a new middle school grant application. The agency hopes that with more middle school students taking computer science, more of those students will become interested in multi-course pathways in high school.

Alabama requires all its middle schools to offer computer science courses, and our most recent data suggests nearly all schools comply with this policy with strong student participation as well.

Key strategies contributing to Alabama's success include:

- **Dedicated Middle School Funding:** In 2020, Alabama created the Middle School Computer Programming Initiative, a competitive grant that may be used for professional development, training, and curriculum.
- **Providing Alternative Learning Opportunities:** When in-person courses are not available at their school, middle school students can take computer science through the state's online ACCESS program.

> **Since receiving the grant, I have been able to significantly expand our computer science curriculum. We introduced new programming courses that were previously unavailable due to a lack of resources. These courses have sparked a remarkable interest in computer science among our middle school students, leading to increased enrollment and enthusiasm in our after-school programs as well.**
>
> **—Tray Gilbert, teacher, Dekalb County, Alabama**

In the last few years, computer science has become a top priority in **Nebraska**, and enrollment, particularly at the middle school level, has dramatically increased.

Key strategies contributing to Nebraska's success include:

- **Teacher Support and Development:** Nebraska received an NSF grant for professional development in computer science for K–8 teachers. In practice, most of the teachers trained were at the middle school level.
- **Support from Higher Education:** The University of Omaha and the University of Nebraska-Lincoln have been key partners in training and supporting teachers at the secondary level.

Nebraska is working to create elementary and middle school computer science pathways that will support their graduation requirement, which will come into effect for the class of 2031. Beyond teacher training, Nebraska is also exploring ways to support school counselors in encouraging more students to enroll in computer science courses. School counselors can play a critical role in shaping students' academic choices. If counselors do not have the resources and training to actively promote computer science courses to all students, we will continue seeing participation disparities, particularly those from underrepresented groups.

Capitalizing on Progress

As more states adopt high school graduation requirements for computer science, it is crucial to consider the preparation that students receive before they reach high school. Middle school years are a critical time in students' cognitive development, and states must ensure that all students have the opportunities to learn computer science.

States must **prioritize collecting comprehensive data on course offerings and enrollment** at both middle and high school levels and across demographic groups. This data, especially when tracked longitudinally, will provide advocates and policymakers with powerful insights into local trends and student trajectories on who decides to continue to pursue computer science in high school. With comprehensive data we can identify best practices at high performance schools and seek to expand this success across all schools.

States should **fund professional development opportunities specifically for middle school teachers**. Additionally, collaboration with higher education institutions will help ensure that future middle school teachers receive the necessary preparation in computer science.

Parents are also a key group to engage. Schools should work to provide **authentic assessment opportunities with whole-school, parent and community engagement**, such as competitions, exhibitions and/or community nights. These initiatives help parents understand the importance of computer science, potentially encouraging their children to continue studying the subject in high school.

Successes in middle school are key to achieving greater representation in high school computer science enrollment. This requires a comprehensive K–12 approach, going beyond just standards, to create **district-level strategic plans for engaging students in computer science throughout their educational journey**. These plans must recognize and leverage the unique strengths and differences between elementary, middle, and high school. Counselors and teachers play a crucial role in guiding students on how to continue progressing, as the path forward in computer science is often less defined than in other core subjects, and students may need additional support.

With a targeted focus on middle school education, we can ignite student passion in computer science, break down barriers, pave the way for more inclusive high school classrooms, and ensure a solid foundation for students' continued success in computer science. We look forward to continuing to share more data and best practices on middle school computer science.

> Marion ISD's K–12 computer science team has continued to use its implementation plan, created from CSforALL's SCRIPT program, to grow access to computer science throughout the district. Collaboration with Grant Wood AEA has led to the redesign of 5–8 tech/computer science exploratory courses to include a clear scope and sequence of learning aligned to the CSTA standards, utilizing physical computing devices, and incorporating CS pedagogy. K–4 Educators in the district are growing their identity as computer science teachers through grant-funded unplugged professional development, curriculum adaptation to integrate micro:bits into 3rd and 4th-grade science units, and adding elementary computer science learning and coaching to educator professional development. Marion ISD is a prime example of how vision, collaboration, and intention can lead to providing computer science for all learners.
>
> **— Corey Rogers, Grant Wood AEA, Iowa Computer Science Consultant**

A special thank you to Stuart Drexler for his support and collaboration in this section

EXPERIENCES IN THE CLASSROOM

Understanding the experiences of both students and teachers in computer science education is crucial for creating effective learning environments. At each level of education, elementary, middle, and high school, the experience of learning and teaching computer science differs significantly.

In elementary schools, students are just beginning to explore the basics of coding and computational thinking. The experience here is often about building curiosity and confidence, with teachers needing to create a nurturing environment that makes technology accessible and fun. Teachers at this level may require specialized computer science training, which can influence their comfort and effectiveness in delivering the material.

As students transition to middle school, the complexity of computer science concepts increases. The focus shifts to problem-solving and applying coding to real-world scenarios. Teachers must balance advancing curriculum requirements with engaging diverse learners with varying interests and proficiency levels.

Computer science education becomes even more specialized in high school and in career and technical education (CTE) programs. Here, students delve into advanced topics such as algorithms, data structures, and cybersecurity. The experience is often more rigorous, and teachers play a crucial role in preparing students for potential careers in technology. However, the challenge lies in providing equitable access to resources and fostering an inclusive environment that encourages all students, regardless of background, to pursue computer science.

> **Not all students experience computer science the same way. If you are not sure if there are disparities in your system, or not, ask your students. Ask them if they feel like they belong, how they heard about computer science, and ideas for how more students could feel welcomed then separately ask them if they would be willing to identify themselves. You may be surprised at the disparities and their creative solutions. Our students are allies in this work.**
>
> **— Jackie Corricelli, Teacher and District Computer Science Curriculum Specialist, West Hartford Public Schools, Connecticut**

Despite a growing interest in understanding the long-term outcomes of computer science education, we need more research on the impact of multiple learning exposures over several years. To address this gap, the Practice-based Research for Ongoing and Actionable Guidance in Computer Science Education (PROACT-CS) project, led by the Institute for Advancing Computing Education (IACE), is conducting a study on how multi-year experiences in computing education affect students. This project brings together a consortium of educators, researchers, industry leaders, and nonprofits to ensure the study aligns with the needs of all stakeholders. The evidence gathered from this research will directly support educators in making informed decisions about computing education initiatives in their schools.

Peeking into the Classroom

While large-scale experience data is not yet available, qualitative insights can provide valuable perspectives on the classroom environment. It is essential to monitor and report on these experiences regularly to inform policy, improve teaching strategies, and ensure that all students have the opportunity to thrive in computer science education.

Mr. Aguilar's Elementary Classroom

At Memorial Elementary School in Houston, TX, they use LEGO Education Letters, Tubes, Coding Express, and STEAM Park to encourage all their students to unleash their creativity and imagination as they build and explore. In the early grades, they also teach students how to use a mouse and keyboard in the computer lab, helping them familiarize themselves with this essential technology.

Mr. Aguilar, an elementary teacher at Memorial School, stated: "Learning about computer science is becoming increasingly important in today's digital world. As an elementary teacher, it's crucial to provide early exposure to these opportunities for all students at our school. I've observed how positively students respond to computer science, they enjoy the engaging activities, the chance to express their creativity through block coding (e.g., Scratch Jr., Scratch, Code.org), and seeing the relevance of computer science in their lives. However, it's important to recognize that some students may face challenges and need additional support to succeed in learning computer science. By addressing these challenges, I can inspire more students to pursue this exciting field and better prepare them for the digital future."

> Explicitly measuring diverse students' experiences in computer science, in the form of both learning outcomes and sense of belonging, is vital to achieving our goal of developing computational literacy for all K–12 students. Experience is where the rubber meets the road, and where all of our work to build capacity, access, and participation gets translated into meaningful outcomes for students.
>
> **— Dr. Carol Fletcher, Director of EPIC (Expanding Pathways in Computing), UT Austin's Texas Advanced Computing Center and Principal Investigator, ECEP Alliance, Texas**

Mr. Gonzales's 5th Grade Classroom

The University of Hawai'i at Mānoa and the Hawai'i State Department of Education are collaborating on a grant project to integrate computer science with Hawaiian history. Through professional development workshops, the project provides teachers with instructional modules that introduce core computer science concepts while fostering students' cultural competence and critical consciousness. Kawika Gonzales, a fifth-grade teacher at Kaunakakai Elementary School on Moloka'i, has implemented these modules in his classroom. "The lessons in these modules help students see the connections between computer science and their interests and lives," Mr. Gonzales shared. After a lesson where students recreated local petroglyphs (lava rock carving) and told stories about them using Code.org's Sprite Lab, he noted, "Learning about our culture, learning about petroglyphs, and connecting these elements with computer science brings pride to us living here." According to Mr. Gonzales, the project has helped him and his students discover unexpected connections between computer science and Hawaiian history and culture.

Ms. Pareo and Ms. Traylor's Middle School Classroom

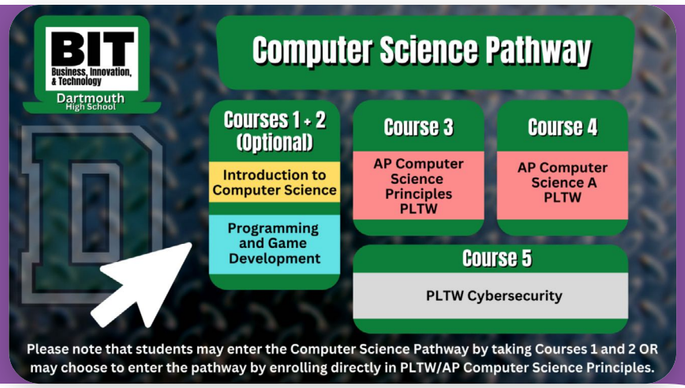
Over the past several years, the Albuquerque Public Schools in New Mexico school district has developed an integrated art and computer science class for secondary school students. The course teaches students the principles of computer science while applying them to the increasingly interdisciplinary field of art. Middle school teachers Shannyn Pareo and Amy Traylor developed and taught the inaugural class during the 2023–24 school year. Ms. Pareo shared, "This course was far more gender-balanced than other computer science courses I've taught. Many young women signed up because of the art component, but as the class progressed, they became increasingly interested in the computer science aspects. One project the students particularly enjoyed was coding their creature characters using JavaScript and Processing. Once the students made their their creatures, they wrote code to embroider them onto fabric and make vinyl stickers. Students then incorporated their creatures into phone app games they created, allowing students to 'brand' their designs and promote them across the school. Students saw their ideas come to life across many different media forms. Classes like this are crucial for showing students that computer science can be applied to a wide range of fields."

While this course is an exciting innovation, it encountered some challenges during its initial rollout. There were delays in providing the necessary course codes for it to be implemented smoothly at the middle school level. This experience highlights the importance of ongoing communication between policymakers and teachers to ensure that innovative ideas are effectively supported and implemented.

Mr. Perrotti's High School Classroom

The Dartmouth High School Computer Science Program in Massachusetts made significant strides in recent years, both in course offerings and lab facilities. They now have three full-time teachers in the Business, Innovation, and Technology department dedicated to teaching all computer science classes. This allows for greater collaboration among faculty and provides time to pursue additional opportunities, such as securing grants for the program.

The school has developed a comprehensive pathway that begins with Introduction to Computers and extends to AP Computer Science. Students can also take specialized courses in Programming, Game Development, and Cybersecurity. Additionally, Dartmouth High offers an ESports team that meets after school and competes in various tournaments, with last year's team advancing to the semifinals in the Super Smash Brothers tournament.



Mr. Perrotti, the department's lead teacher, stated, "I am excited that we are able to give students the skills they need to move into the modern day and into the future. We want to try to bring all our students up to the professional level so that when they graduate, they're already ahead of their peers."

Achievement Data

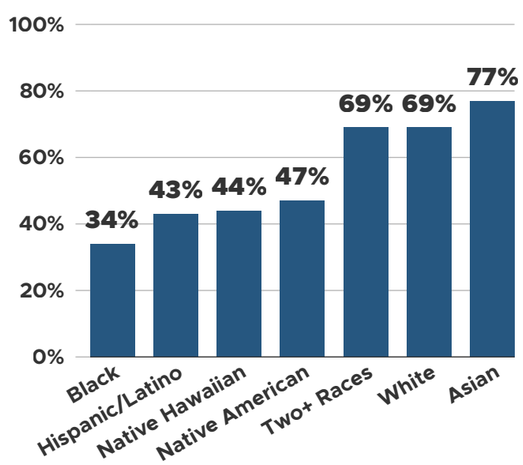
In addition to specific classroom experience, we also have data from the College Board on student scores on Advanced Placement computer science exams. While achievement is just one aspect of experience it does provide useful insights. The AP program allows students to qualify for college credit through their exam scores, with a score of three or above generally considered to be a qualifying score. As previously mentioned, AP exam data is an imperfect measure and does not capture all the students who enroll in AP computer science courses but do not take the exam.

While the gender gap persists in participation in AP computer science exams, young women who take the exam qualify at similar rates as young men. 61% of young women earn a qualifying score, and 65% of young men earn a qualifying score.

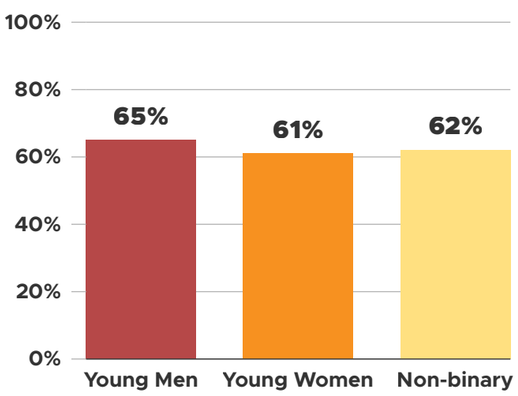
Black/African American, Native American/Alaskan, and Native Hawaiian/Pacific Islander students who take the exam qualify at much lower rates than their Asian and white peers. The gaps between races/ethnicities are pronounced and suggest disparities in student experience that need to be addressed.

While AP exams are useful to examine, they are only a window into high school student performance for students engaging in college-level content. However, states are beginning to consider how to collect data on computer science learning for all students and in earlier grades.

Percent of Students Who Earn a Qualifying Score by Race/Ethnicity



Percent of Students Who Earn a Qualifying Score by Gender



Indiana was the first state to assess computer science learning beginning in 2019, assessing fourth and sixth-grade students on computer science standards through Indiana ILEARN science assessments. In the spring of 2024, a new assessment version aligned with the updated computer science standards was administered. Computer science items comprise about 17% of the science assessments, and a subset of Indiana's computer science standards are assessed in a given year.[17]

Results from Indiana's spring 2024 test will be publicly available at the end of 2024. They will provide insight into elementary and middle-level student computer science performance on a statewide scale. This information will serve as valuable input when aiming to answer critical questions around equity of experience across student demographics, efficacy and effectiveness of instructional materials and practices, and validation of school- and district-wide implementation plans.

STATE SUMMARIES

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

- The state's status on each of the ten policies described previously.
- Details on policy implementation and recommendations for further policy development.
- Comparison to four other neighboring states and/or states of similar size.
- Data on high schools that offer foundational computer science.
- Data on student participation in high school computer science.
- Details on elementary and middle school computer science.

See page 84-85 for a guide how to read each state page. We encourage you to look at other state page to better understand the computer science landscape to review our graphics which order states based on the percentage of high schools offering computer science and the percentage of student enrolled in those course (**page 190**).

Further Information:

- Up-to-date policy information can be viewed at **bit.ly/10CSpolicies**.
- See **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–12 students in computing and computing-related degrees.
- Refer to **csteachers.org/chapters** to find your CSTA chapter.
- Data sources are described in more detail in **Appendix 2** and complete data tables can be viewed at **advocacy.code.org/stateofcs**.

Thank You

A special thank you to all of our partners in helping collect our state level data: College Board, Computer Science Teachers Association, ECEP Alliance, State Education Agencies, and The University of Texas at Austin.

GUIDE TO STATE SUMMARIES

Policy Sliders

These sliders indicate whether the state has each policy in place. Red means no policy, yellow means in progress and green means a policy has been passed. For “Can Count” policy yellow means districts can decide if computer science can count. For “Preservice” yellow means there are incentives for preservice, next year this will count as red.
See **Appendix 1** for the rubric to determine each state’s status.

Policy Implementation

This section will include at least one of the following: details on how policies are being implemented across states, plans for the upcoming school year, or recommendations for future policies. Each state’s information is tailored to its specific local context. For more detailed information, we encourage you to reach out directly to stakeholders within the respective state.

Comparative Access to Computer Science Courses (% of HS offering)

This graphic compares the state’s policy landscape and high school computer science offerings to four other neighboring states and/or states of similar size. The states are ordered based on the percentage of their high school offering computer science. Each state’s status on three key policies: state plan, state funding, and graduation requirement, is displayed for comparison.

Percentage of Public High Schools Offering Foundational Computer Science

Access by School Year

Shows the percentage of public (including public charter) high schools in the state offering foundational computer science for any of past 6 years in which a full data set was available.

Access by Geography*

Refers to the percentage of high schools in each community type (urban, suburban, rural) that offer foundational computer science for the most recent school year available.

Access by School Size*

Refers to the percentage of high schools in each category for the most recent school year available.

Small (<500 students)
Medium (500–1,200 students)
Large (>1,200 students)

Participation in Foundational High School Computer Science

Participation by School Year

Shows the percentage of high school students (grades 9–12) in the state that took foundational computer science in a given school year for any of the past four years in which a full data set was available. Some states do not have any participation data. Due to changes in methodology, these participation numbers are different from last year—see appendix 2 for details.

Participation by Gender

Shows the percentage of students who took foundational computer science in the most recent participation data by gender. For states that do not have on all computer science courses, we use AP data.

This text compares participation rates for Native American, Native Hawaiian, Black, Hispanic/Latino, and multiracial students to those of their white and Asian peers. Again, if a state does not have data on all computer sciences courses, we use AP data. For any race/ethnicity that makes up less than 1% of the total student population, we do not comment on representation due to the small sample size, but we still encourage the state to focus on ensuring participation for all student groups, regardless of the number of students who identify.

This section also compares participation rates for students with disabilities, English language learners, and economically disadvantaged students to their representation in the general population. Not all states collect data on these student groups and for any state that we use AP data for, we don’t have any data on these groups.

Computer Science Prior to High School

This is a new section this year which provides details on elementary and middle school computer science. For some states we have preliminary course offerings and enrollment. For other states we provide an overview of the statewide work targeted at younger students.

ALABAMA

Ten Policies to Make Computer Science Foundational

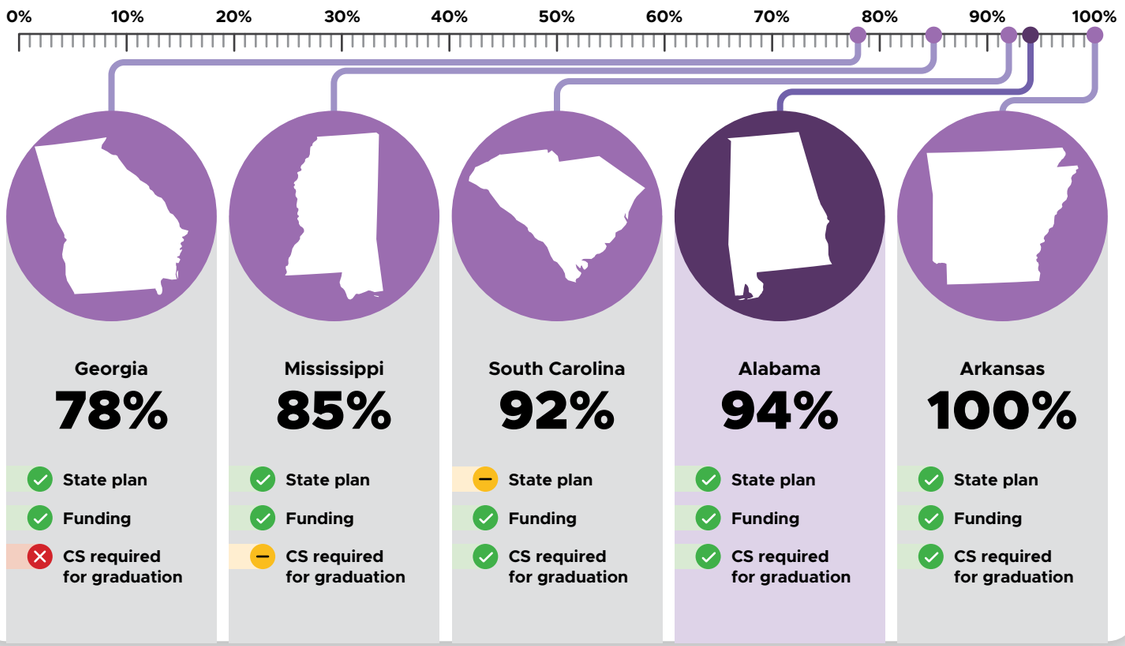
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

The Alabama Legislature continued to fund computer science professional development, appropriating $9.27M to the State Department of Education in 2024. Over the last nine years, the state has invested over $37M in computer science education.

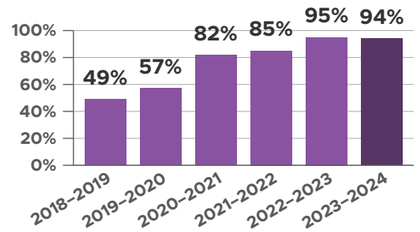
The Alabama State Board of Education adopted a measure requiring all high school students to take computer science to graduate starting with the class of 2032.

Comparative Access to Computer Science Courses (% of HS offering)

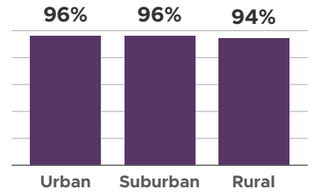


Percentage of Public High Schools Offering Foundational Computer Science

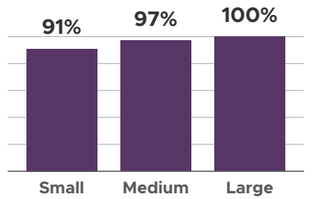
Access by School Year



Access by Geography*



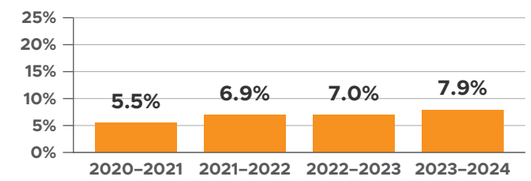
Access by School Size*



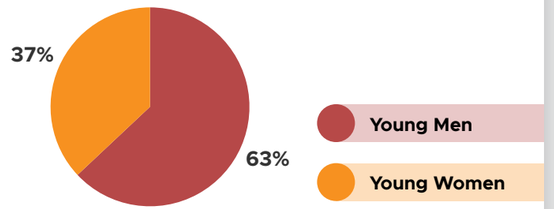
**Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, economically disadvantaged students

Student Groups That Are Underrepresented

Young women, students with IEPs, English language learners

We lack enough data on Native American students and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org/report-data/*

Computer Science Prior to High School

Elementary School Computer Science

All elementary students are required to have computer science instruction during the school year.

Middle School Computer Science

92%* of middle schools offer foundational computer sciencet with 13% of students enrolled.

**This percentage is based on data received from 98% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

ALASKA

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

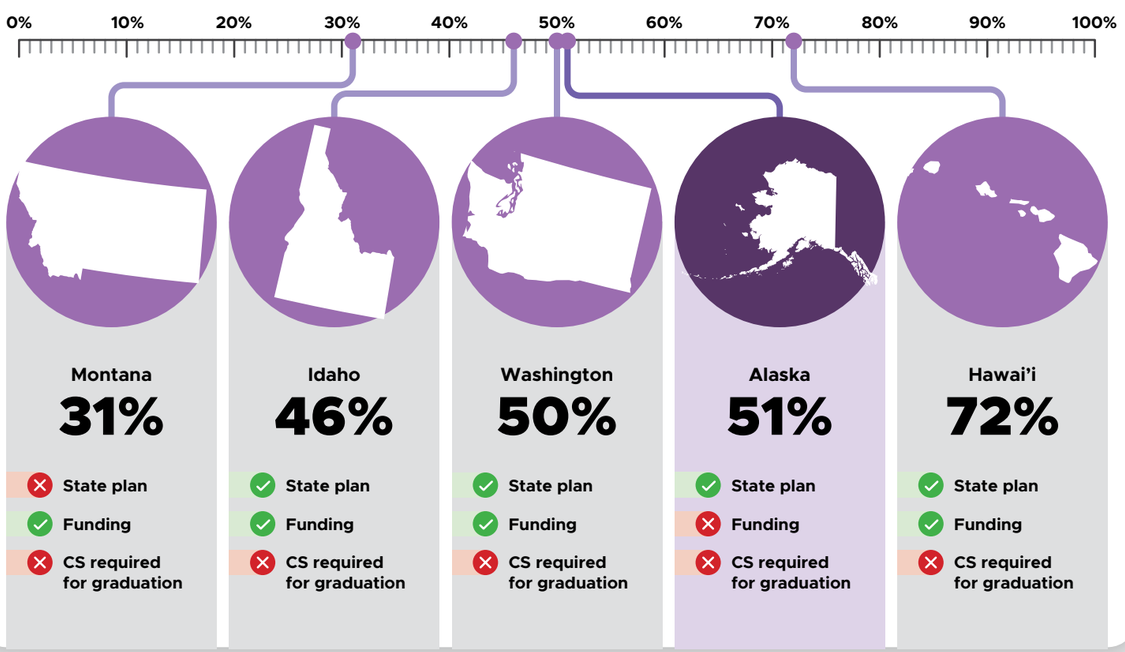
Policy Implementation

A bill requiring all juvenile detention centers to offer computer science was introduced in the 2024 legislative session but did not ultimately move.

Alaska's budget included funding for the department's computer science supervisor position, this position was previously supported by federal ESSER funds.

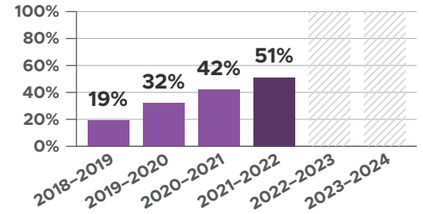
In future years, we encourage the state to allocate dedicated state funding for professional development in computer science to increase the number of qualified teachers in this crucial subject.

Comparative Access to Computer Science Courses (% of HS offering)

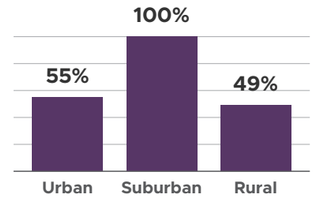


Percentage of Public High Schools Offering Foundational Computer Science

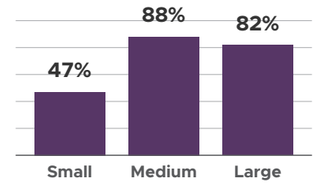
Access by School Year



Access by Geography*



Access by School Size*



**Data is from the most recent data school year 2021–2022; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

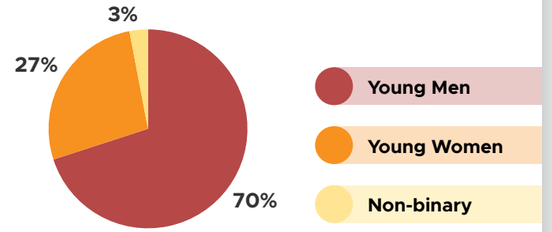
We are working closely with the state to get updated data for next year

Participation in Foundational High School Computer Science*

Participation by School Year

Alaska does not collect enrollment data for all foundational computer science courses. We have used AP data from the College Board for participation statistics, but we know participation in all foundational computer science courses is broader than just AP. We encourage the state to begin collecting and reporting comprehensive course enrollment data.

Participation by Gender in AP Exams



Student Groups That Reached or Neared Parity in AP Exams

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented in AP Exams

Young women, Black students, Hispanic/Latino students, Native American students

We lack enough data on students with disabilities, English language learners, and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

Over 1,000 elementary school teachers have received professional learning in computer science through the Alaska Staff Development Network. They are continuing to host workshops during the school year, including courses on AI.

Middle School Computer Science

The Alaska Staff Development Network received a federal grant to fund professional development training for middle and high school teachers at low or no-cost.

ARIZONA

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
●	●	●	●	●

State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement
●	●	●	●	●

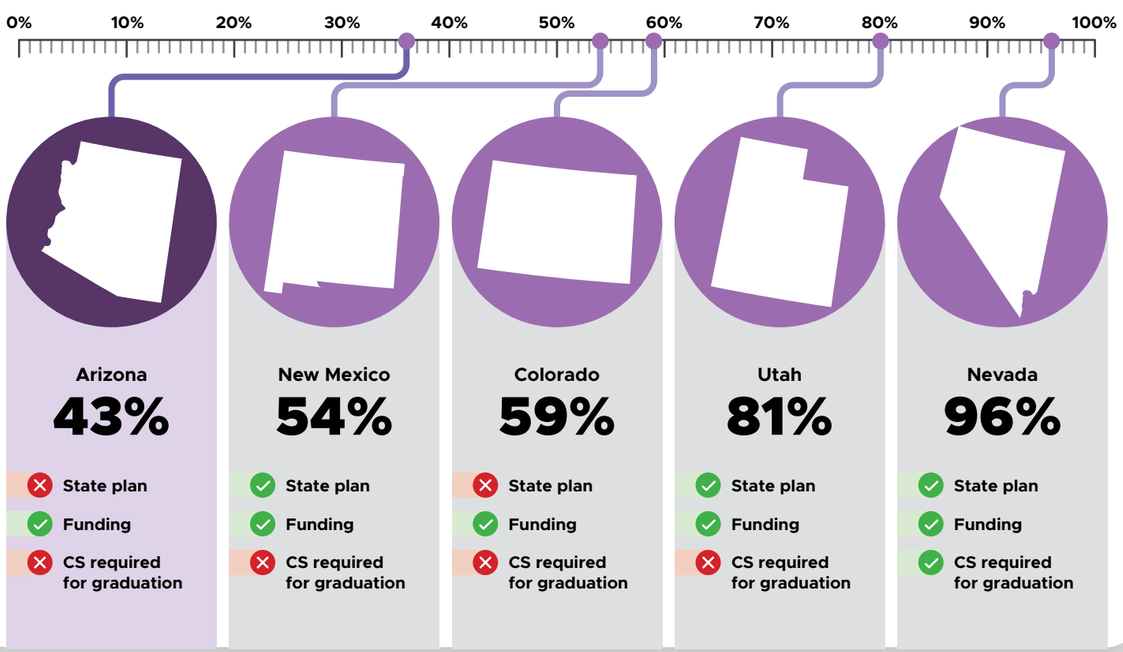
Policy Implementation

The Arizona Legislature continued to fund computer science professional development, appropriating $1M to the State Department of Education in 2024. Over the last eight years, the state has invested over $7M in computer science education.

Over the next year, the Arizona Department of Education plans to continue supporting the annual professional development week in June.

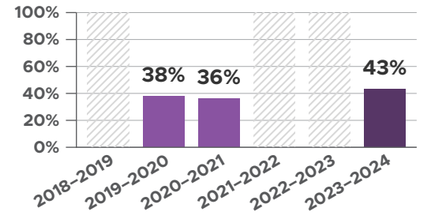
We strongly encourage the state to publish a state plan on computer science education.

Comparative Access to Computer Science Courses (% of HS offering)

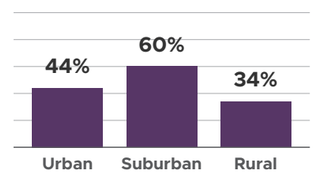


Percentage of Public High Schools Offering Foundational Computer Science

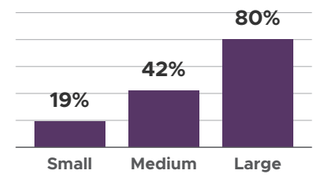
Access by School Year



Access by Geography*



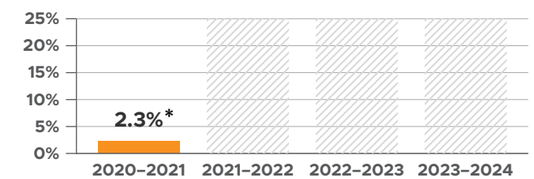
Access by School Size*



**Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/*
We are working closely with the state to fill in the missing data for next year

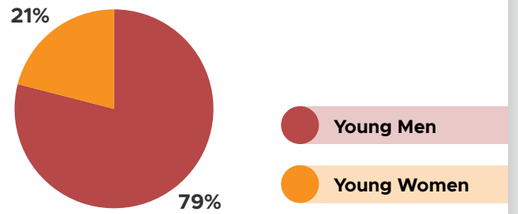
Participation in Foundational High School Computer Science*

Participation by School Year



** We are working closely with the state to get updated participation data*

Participation by Gender



Student Groups That Reached or Neared Parity

Black students

Student Groups That Are Underrepresented

Young women, Hispanic/Latino students, Native American students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

There is no statewide initiative focused on elementary or middle computer science, but the Department of Education is helping schools integrate computer science into other subjects. We encourage the state to develop K–12 goals, policies, and strategies for computer science education.

We know that 29%* of middle schools offer computer science.

**This percentage is based on data received from 50% of middle schools in the state, therefore the actual number of schools teaching may be higher*

ARKANSAS

Ten Policies to Make Computer Science Foundational

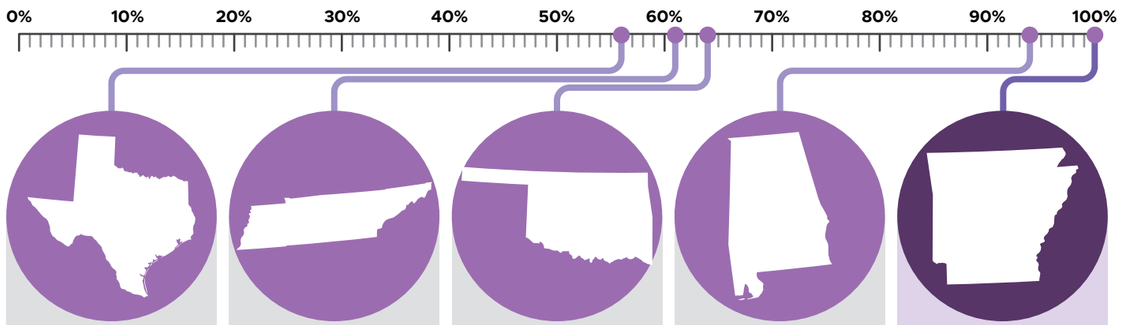
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

The Arkansas Legislature continued to fund the Computer Science Initiative, appropriating $3.5M to the Department of Education in 2024. Over the last nine years, the state has invested over $30M in this initiative.

In 2023, the General Assembly passed legislation allowing Career and Technical Education courses that incorporate computer science to satisfy the state's graduation requirements. The state's computer science team is in the process of identifying and developing these courses.

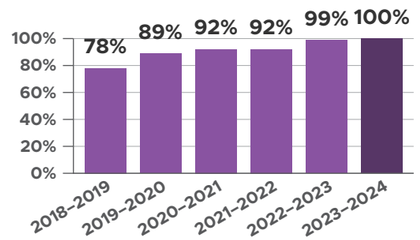
Comparative Access to Computer Science Courses (% of HS offering)



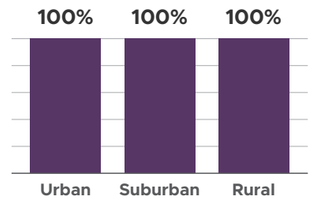
Texas	Tennessee	Oklahoma	Alabama	Arkansas
56%	61%	64%	94%	100%
✗ State plan	✓ State plan	✓ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✗ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation	✓ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

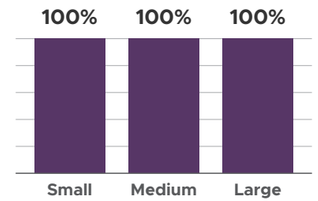
Access by School Year



Access by Geography*



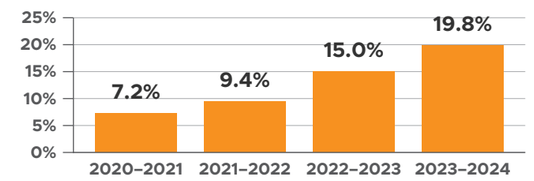
Access by School Size*



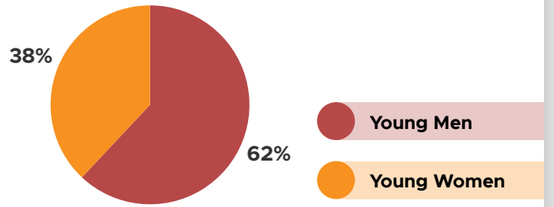
**Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, students with 504 plans

Student Groups That Are Underrepresented

Young women, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

Arkansas has adopted grade-level specific computer science standards that require integrated instruction of these concepts to all students.

Middle School Computer Science

86%* of middle schools offer computer science and all students are required to take a 5-week coding block between grades 5–8.

**This percentage is based on data received from 89% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

CALIFORNIA

Ten Policies to Make Computer Science Foundational

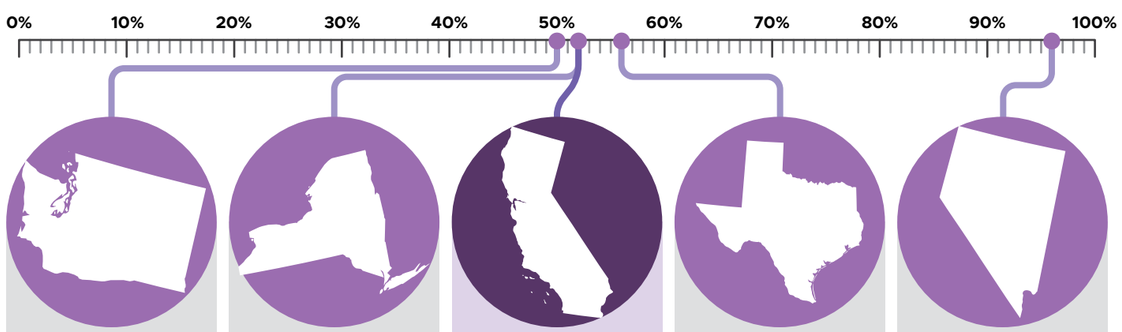
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

The California Legislature introduced a bill requiring all high schools to offer computer science, as well as strengthening data reporting of computer science courses, but ultimately this bill did not pass. We strongly encourage the state to pass this legislation in the future, as it would greatly help support the 48% of high schools that currently do not offer any compute science courses.

In July 2024, California held its first ever statewide in-person computer science professional development week with participants from 35 counties. This was funded through a Educator Workforce Investment Grant.

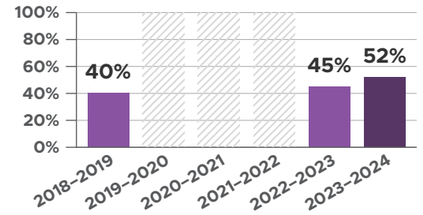
Comparative Access to Computer Science Courses (% of HS offering)



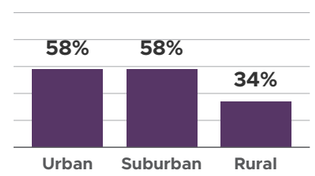
Washington	New York	California	Texas	Nevada
50%	52%	52%	56%	96%
✓ State plan	✓ State plan	✓ State plan	✗ State plan	✓ State plan
✓ Funding	✓ Funding	✓ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

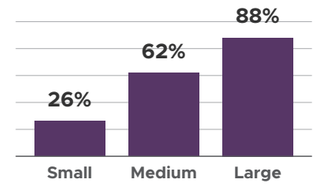
Access by School Year



Access by Geography*



Access by School Size*



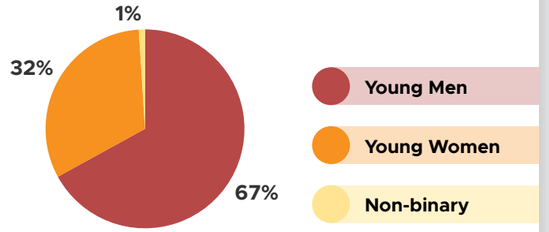
**Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year

California does not collect enrollment data for all foundational computer science courses. We used AP exam data from the College Board for participation statistics, but we know participation in all foundational computer science courses is broader than just AP. We encourage the state to begin collecting and reporting comprehensive course enrollment data.

Participation by Gender in AP Exams



Student Groups That Reached Parity in AP Exams

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented in AP Exams

Young women, Black students, Hispanic/Latino students

We lack enough data on Native American students, students with disabilities, English language learners, and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

Over 300 elementary teachers participated in hands-on professional development workshops in the summer of 2024. Two follow-up sessions will be held during the school year to support these teachers.

Middle School Computer Science

Middle school teachers also attended professional development workshops where they learned how to integrate computer science into their curriculum and teach stand-alone courses.

COLORADO

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
●	●	●	●	●

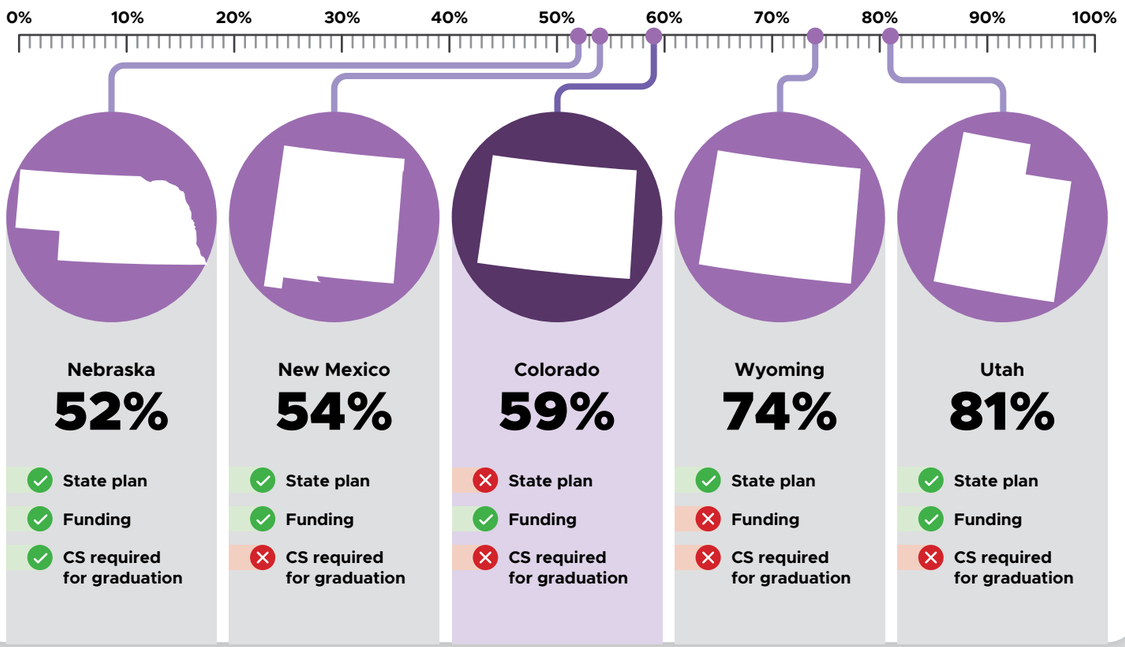
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement
●	●	●	●	●

Policy Implementation

The Colorado Legislature continued to fund computer science education grants for teachers, appropriating $552K to the State Department of Education in 2024. Over the last seven years, the state has invested over $6 Million in computer science education.

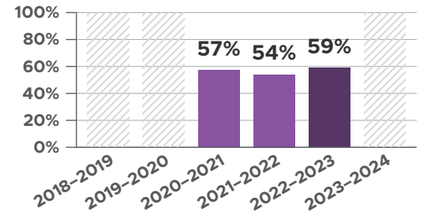
The Colorado State Board approved a full set of K–12 computer science standards in May 2024. We now encourage the state to ensure schools are implementing these standards by passing legislation requiring all schools to offer instruction in computer science.

Comparative Access to Computer Science Courses (% of HS offering)

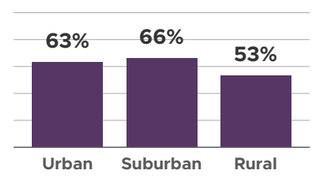


Percentage of Public High Schools Offering Foundational Computer Science

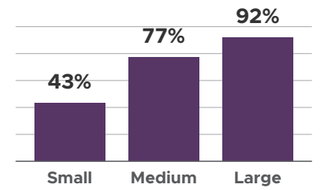
Access by School Year



Access by Geography*



Access by School Size*



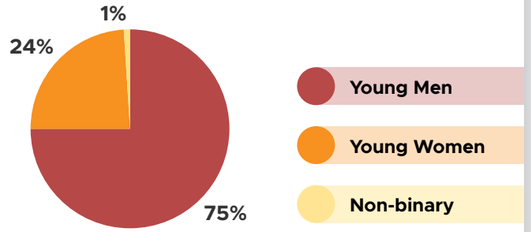
**Data is from the most recent data school year 2022–2023; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year

Colorado does not collect enrollment data for all foundational computer science courses. We used AP exam data from the College Board for participation statistics, but we know participation in all foundational computer science courses is broader than just AP. We encourage the state to begin collecting and reporting comprehensive course enrollment data.

Participation by Gender in AP Exams



Student Groups That Reached or Neared Parity in AP Exams

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented in AP Exams

Young women, Black students, Hispanic/Latino students

We lack enough data on Native American students, students with disabilities, English language learners, and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Colorado's Computer Science Education Grants have significantly impacted elementary and middle schools statewide. In the most recent round of grants, over 300 elementary school teachers and more than 75 middle school teachers received training in computer science education.

To build on this work, we recommend that the Colorado Department of Education require all elementary and middle schools to report their course offerings and make this data publicly accessible.

CONNECTICUT

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

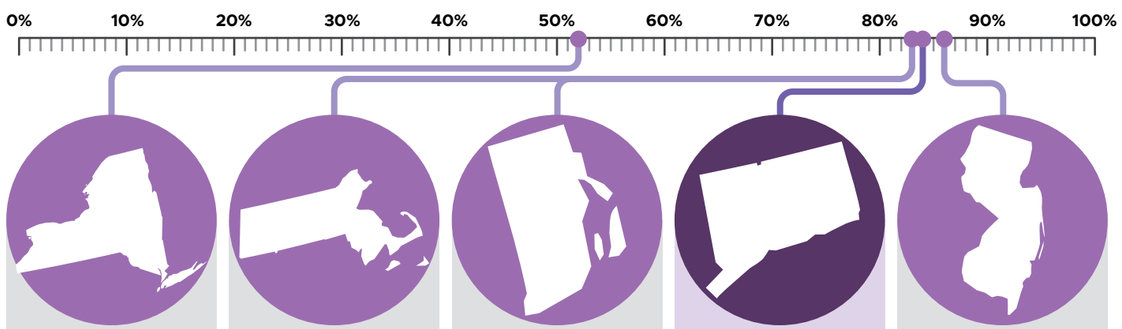
Policy Implementation

Connecticut's computer science teacher certification has changed from K–5 and 7–12 endorsements to a PK–12 endorsement, helping districts fill computer science positions, especially in middle grades.

Senate Bill 957 (2019) created a fund for computer science education, but no funding has been allocated. We encourage the state to allocate funds for professional development in computer science.

The Department of Education will be updating its state plan this coming year, the first revision since 2020.

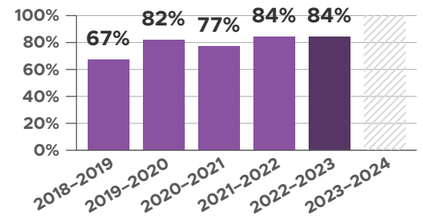
Comparative Access to Computer Science Courses (% of HS offering)



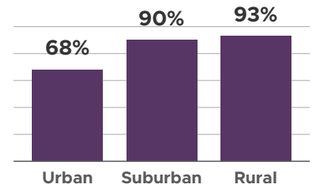
New York	Massachusetts	Rhode Island	Connecticut	New Jersey
52%	**83%**	**83%**	**84%**	**86%**
✓ State plan	✓ State plan	✓ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✓ Funding	✗ Funding	✓ Funding
✗ CS required for graduation	– CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

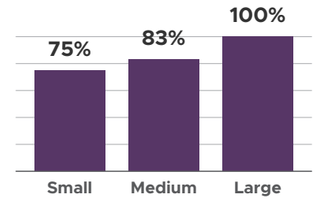
Access by School Year



Access by Geography*



Access by School Size*



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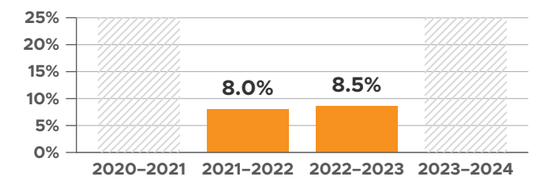
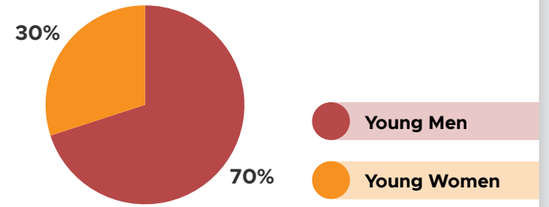
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Hispanic/Latino students

Student Groups That Are Underrepresented

Young women, Black students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Computer science education is now included in all elementary teacher preparation programs.

The state plan aims for "all K–12 schools in Connecticut to offer computer science instruction aligned with state-approved standards, taught by a qualified teacher" by 2024.

While the Department of Education does not currently collect course data from elementary and middle schools, they are using survey data to bridge this gap as they work to achieve the goals outlined in the state plan.

DELAWARE

Ten Policies to Make Computer Science Foundational

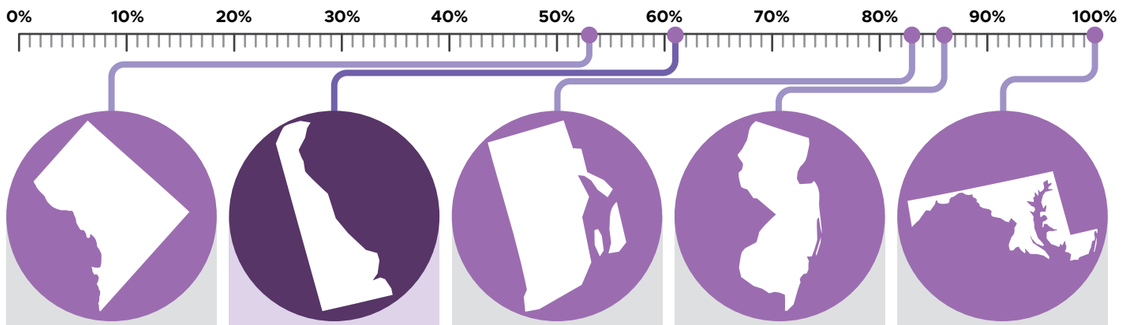
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

We are not aware of any updates in statewide computer science education policies.

We encourage the state to renew their focus on this crucial subject; creating a statewide plan and hiring a computer science supervisor in the Department of Education will help to guide this work.

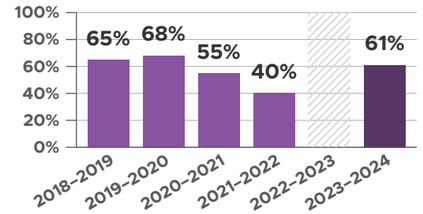
Comparative Access to Computer Science Courses (% of HS offering)



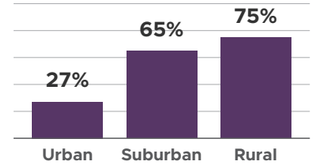
District of Columbia	Delaware	Rhode Island	New Jersey	Maryland
53%	**61%**	**83%**	**86%**	**100%**
✗ State plan	✗ State plan	✓ State plan	✓ State plan	✓ State plan
✗ Funding	✗ Funding	✓ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	– CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

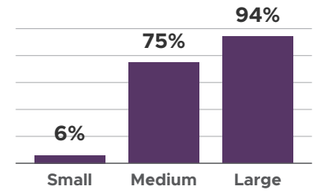
Access by School Year



Access by Geography*



Access by School Size*



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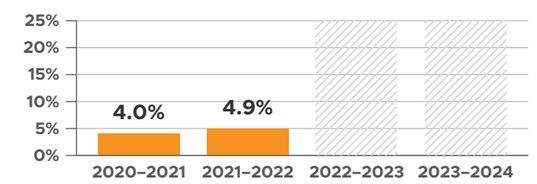
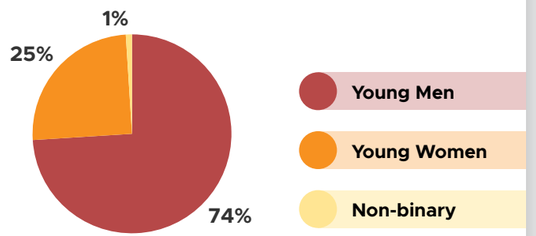
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students

We lack enough data on Native American students, students with disabilities, English language learners, and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

Through survey data we know that 23%* of elementary schools offer computer science.

Middle School Computer Science

Through survey data we know that 33%** of middle schools offer computer science.

**This percentage is based on data received from 43% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*
***This percentage is based on data received from 61% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

DISTRICT OF COLUMBIA

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
●	●	●	●	●

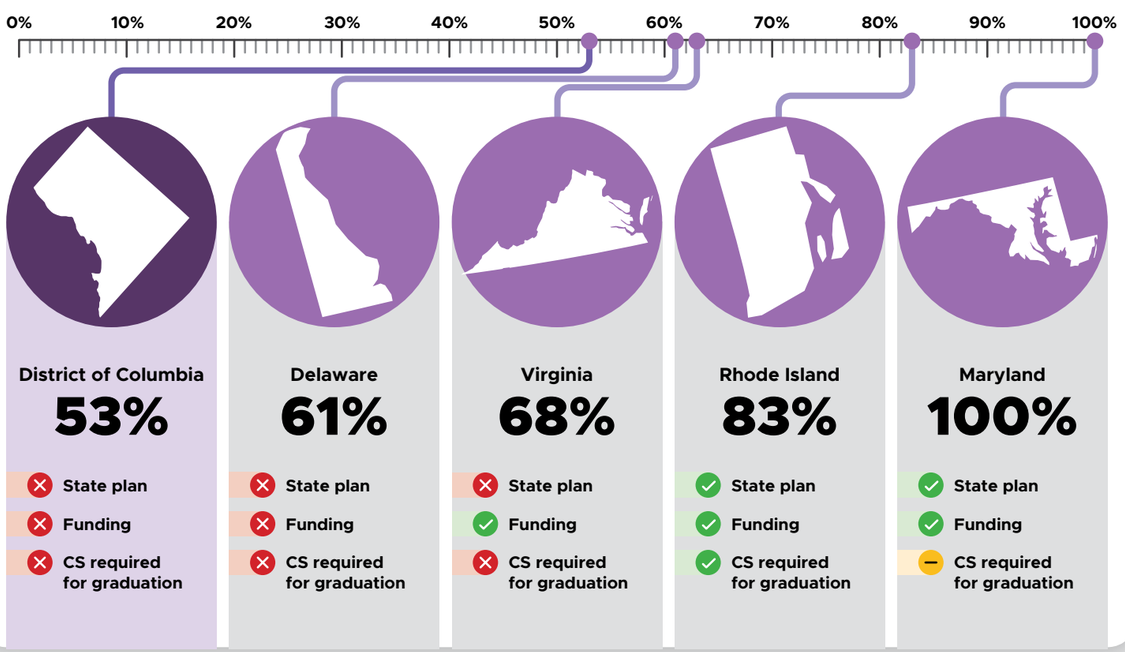
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement
●	●	●	●	●

Policy Implementation

We are not aware of any updates in district-wide computer science education policies.

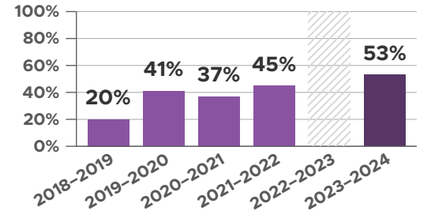
We encourage DC to renew their focus on this crucial subject; creating a districtwide plan and hiring a computer science supervisor will help to guide this work.

Comparative Access to Computer Science Courses (% of HS offering)



Percentage of Public High Schools Offering Foundational Computer Science

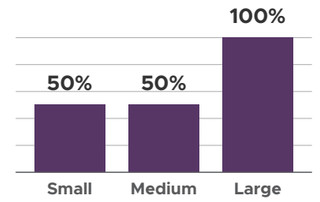
Access by School Year



Access by Geography

All schools in DC are urban so we so not use this graphic for DC.

Access by School Size*



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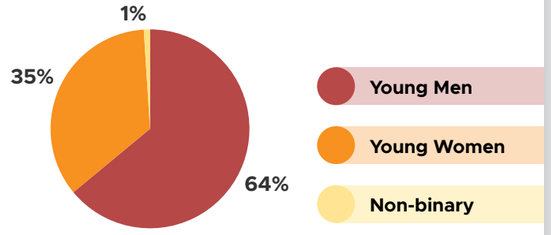
Participation in Foundational High School Computer Science*

Participation by School Year

DC does not collect enrollment data for all foundational computer science courses. We used AP exam data from the College Board for participation statistics, but we know participation in all foundational computer science courses is broader than just AP. We encourage the state to begin collecting and reporting comprehensive course enrollment data.

Participation by Gender in AP Exams



Student Groups That Reached or Neared Parity in AP Exams

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented in AP Exams

Young women, Black students, Hispanic/Latino students

We lack enough data on Native American students, students with disabilities, English language learners, and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Unfortunately, we have very little data from the District of Columbia on elementary and middle school computer science education. We encourage the district to collect and report on K–12 course offerings and enrollment.

FLORIDA

Ten Policies to Make Computer Science Foundational

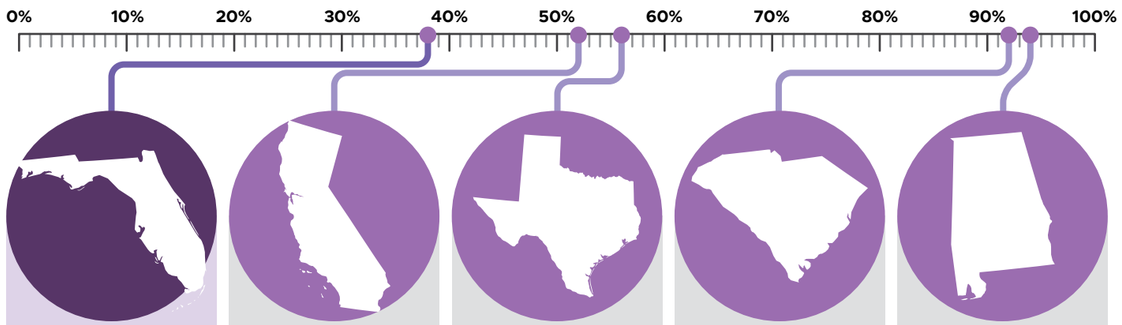
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

The Florida Legislature continued to fund computer science teacher certification and professional development, appropriating $10M to the State Department of Education in 2024. Over the last five years, the state has invested $60M in computer science education.

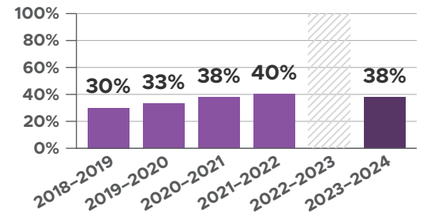
The CSEveryone Center for Computer Science Education at the University of Florida began developing a state plan for computer science education. We commend this grassroot effort and encourage the Florida Department of Education to participate in the development and consider adopting it as the state's official plan.

Comparative Access to Computer Science Courses (% of HS offering)

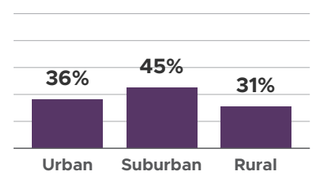


Percentage of Public High Schools Offering Foundational Computer Science

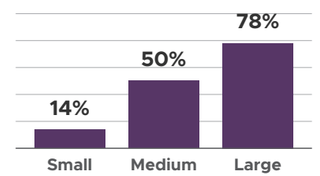
Access by School Year



Access by Geography*



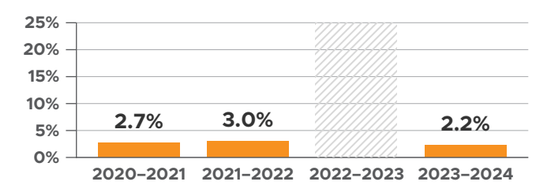
Access by School Size*



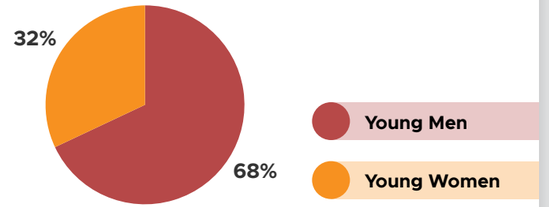
**Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

25%* of elementary schools offer computer science and 18% of students are enrolled.

Middle School Computer Science

34%* of middle schools offer computer science and 3% of students are enrolled.

**Florida, unlike most other states, reports on data from all middle and elementary schools.*

GEORGIA

Ten Policies to Make Computer Science Foundational

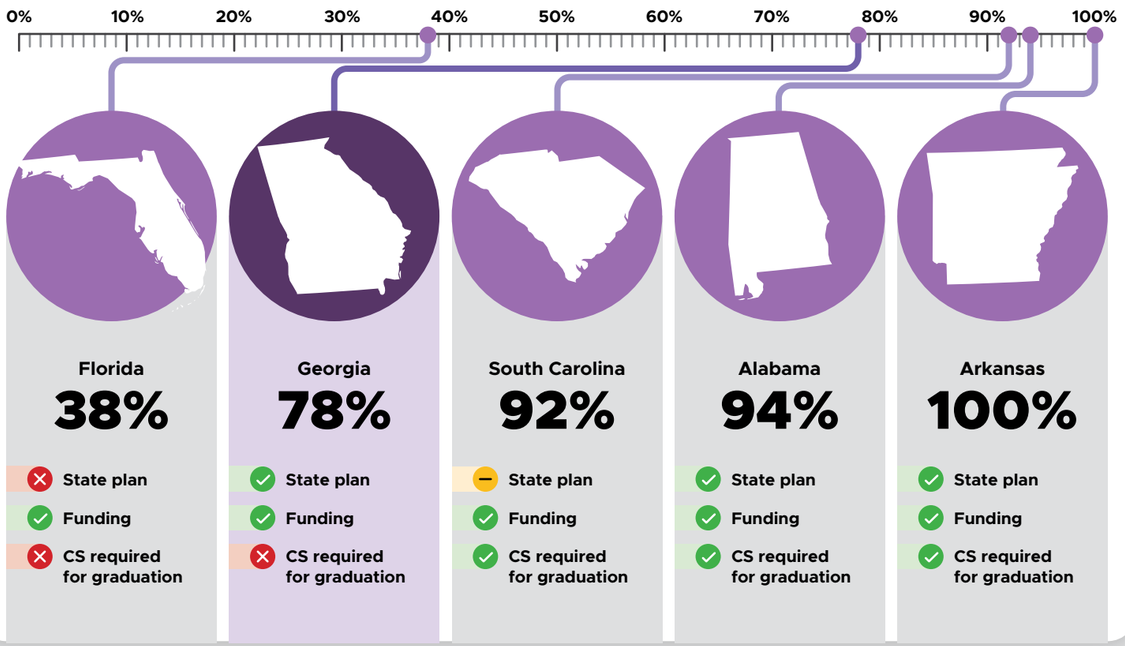
Policy Implementation

The Georgia Legislature continued to fund professional development for computer science education, appropriating $750K to the State Department of Education in 2024. Over the last eight years, the state has invested over $7M in computer science education.

Legislation requiring every student to take computer science prior to graduating high school was introduced in the 2024 session but did not ultimately pass.

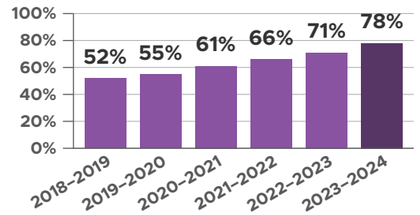
We encourage Georgia to revamp their preservice policy to ensure all teachers are getting adequate preparation.

Comparative Access to Computer Science Courses (% of HS offering)

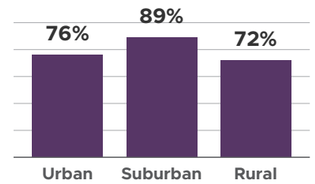


Percentage of Public High Schools Offering Foundational Computer Science

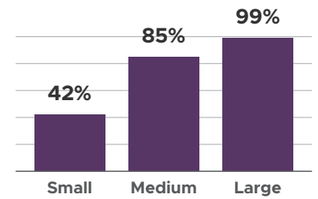
Access by School Year



Access by Geography*



Access by School Size*



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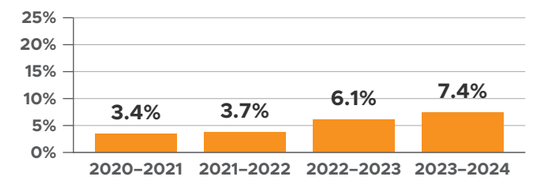
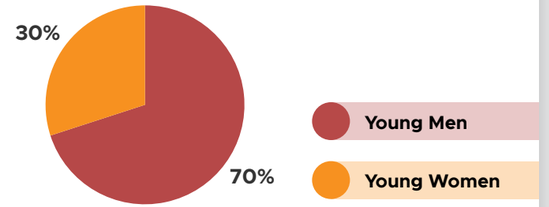
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, English language learners

We lack enough data on Native American students, economically disadvantaged students, and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

37%* of elementary schools offer computer science and 13% of students are enrolled.

Middle School Computer Science

73%** of middle schools offer computer science and 12% of students are enrolled.

**This percentage is based on data received from 47% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*
***This percentage is based on data received from 87% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

HAWAI'I

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

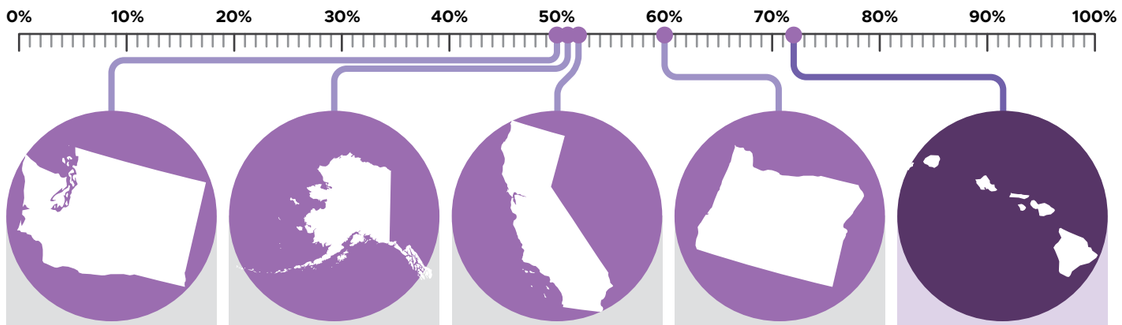
Policy Implementation

The Hawai'i Board of Education is considering amending graduation requirements for all high school students, which would include adding a requirement in computer science. We strongly encourage the state to take this action.

The Hawai'i Legislature funded professional development for computer science teachers for the first time since 2018, appropriating $500K to the State Department of Education in 2024.

Act 158 (2021) required all middle, elementary, and charter schools to offer computer science by the 2024–2025 school year.

Comparative Access to Computer Science Courses (% of HS offering)



Washington
50%
- State plan
- Funding
- CS required for graduation

Alaska
51%
- State plan
- Funding
- CS required for graduation

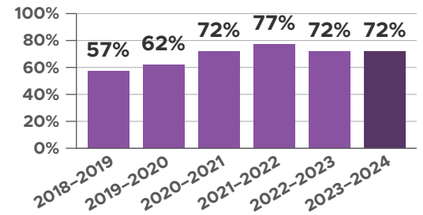
California
52%
- State plan
- Funding
- CS required for graduation

Oregon
60%
- State plan
- Funding
- CS required for graduation

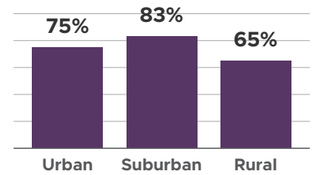
Hawai'i
72%
- State plan
- Funding
- CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

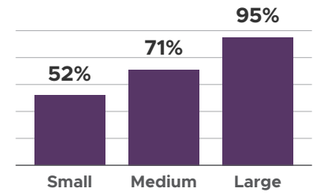
Access by School Year



Access by Geography*



Access by School Size*

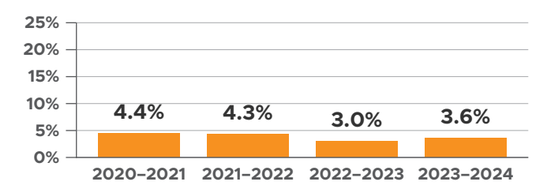


**Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

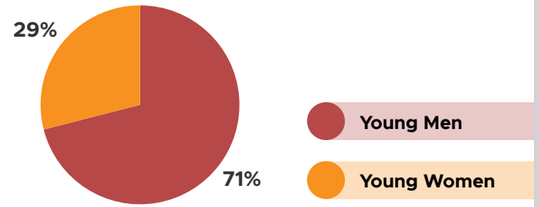
This data does include public charter schools

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Students with 504 plans

Student Groups That Are Underrepresented

Young women, Hispanic/Latino students, Native Hawaiian students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Black students and Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

78%* of elementary schools offer computer science and 58% of students are enrolled.

Middle School Computer Science

64%** of middle schools offer computer science and 25% of students are enrolled.

**This percentage is based on data received from 93% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*
***Hawai'i reports on data from all middle schools.*

IDAHO

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
●	●	●	●	●

State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement
●	●	●	●	●

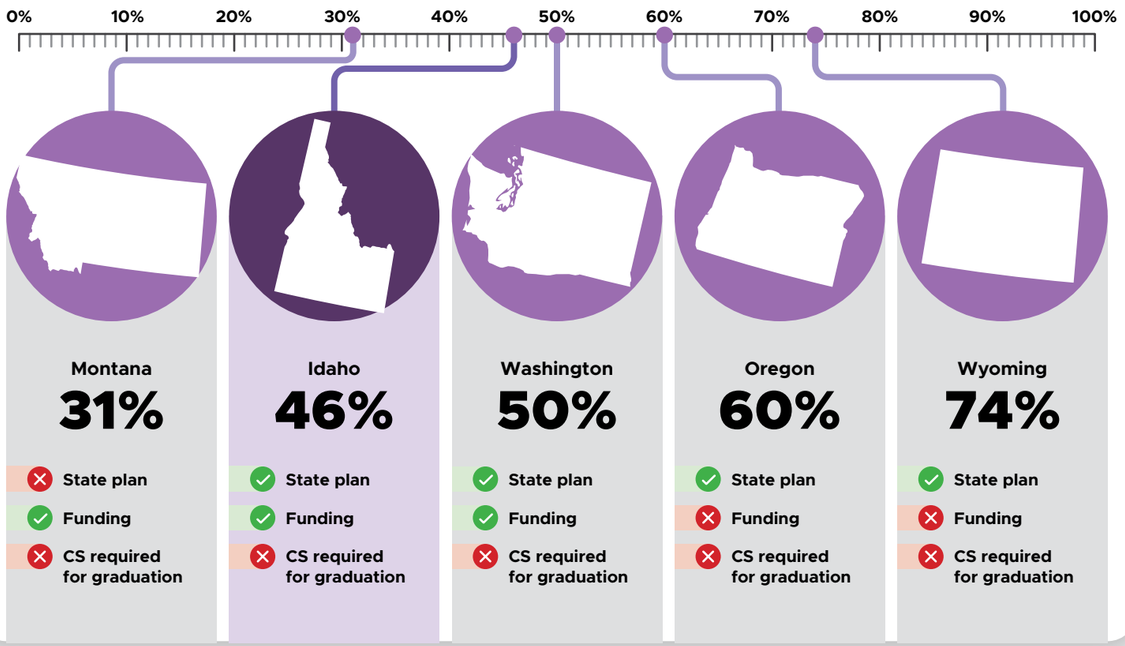
Policy Implementation

Idaho continued to fund computer science education expansion through the Idaho STEM Action Center, appropriating $500K in 2024. Over the last eight years, the state has invested over $9M in computer science education.

Idaho revised its K–12 computer science standards which were approved by the State Board of Education in June, replacing the state's standards that were adopted in 2017.

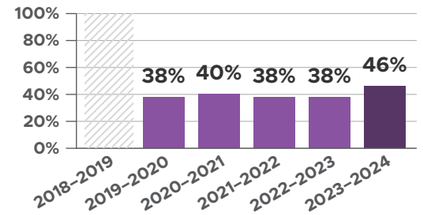
We encourage Idaho to revamp their preservice policy to ensure all teachers are getting adequate preparation.

Comparative Access to Computer Science Courses (% of HS offering)

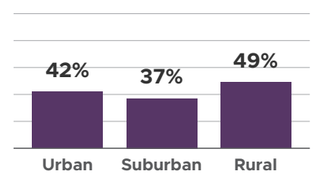


Percentage of Public High Schools Offering Foundational Computer Science

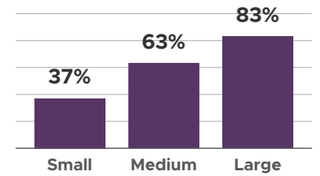
Access by School Year



Access by Geography*



Access by School Size*



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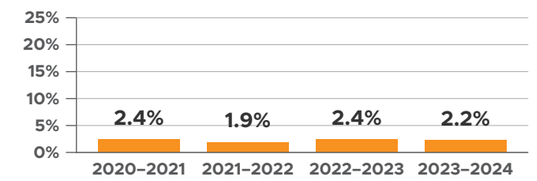
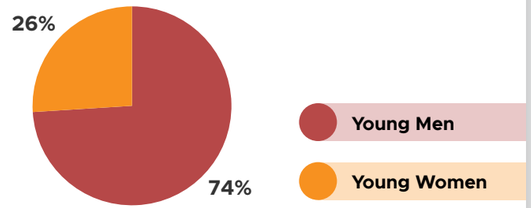
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Hispanic/Latino students, students with 504 plans

Student Groups That Are Underrepresented

Young women, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Black students and Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

In 2024, the Idaho State Board made a rule change that now requires (1) all elementary schools to offer computational thinking and digital literacy and (2) all middle school students to receive education in areas of computational thinking and digital literacy.

24%* of middle schools offer computer science.

**This percentage is based on data received from 39% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

ILLINOIS

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
●	●	●	●	●

State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement
●	●	●	●	●

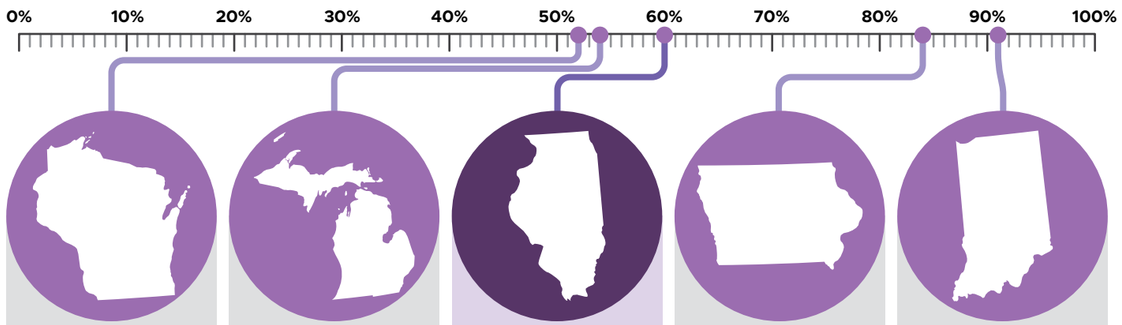
Policy Implementation

The Illinois Legislature continued to fund the Computer Science Equity Program, appropriating $3M to the Illinois State Board of Education in 2024. This is the second year of the program, totalling $6M.

The Illinois State Board of Education and the state's ECEP chapter have begun facilitating workgroups to write Illinois' first state plan for computer science.

We encourage Illinois to consider passing a computer science graduation requirement in order to strengthen its all high schools offer policy and more fully expand equitable access to the subject.

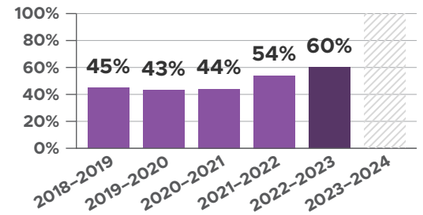
Comparative Access to Computer Science Courses (% of HS offering)



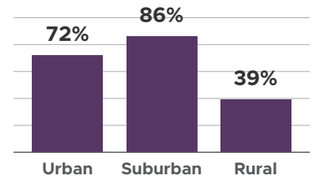
Wisconsin	Michigan	Illinois	Iowa	Indiana
52%	**54%**	**60%**	**84%**	**91%**
✗ State plan	✗ State plan	– State plan	✓ State plan	✓ State plan
✗ Funding	✓ Funding	✓ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

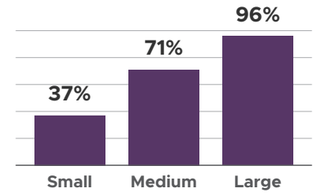
Access by School Year



Access by Geography*



Access by School Size*



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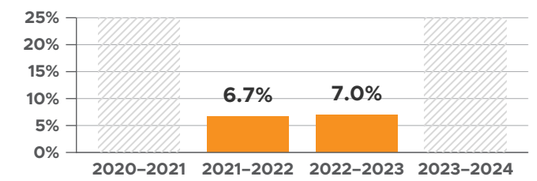
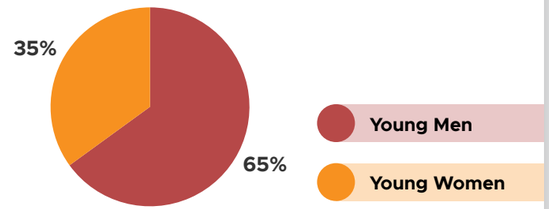
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students

Student Groups That Are Underrepresented

Young women, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

"Interest in K–8 computer science is growing in Illinois. Beyond standards, there is not any specific guidance for schools that are interested in teaching computer science. At the elementary level, there are three common implementations: 1) integration into the regular education classroom, 2) as a stand alone concept in a STEM focused class or 3) as part of library/media time along with other digital literacy skills. At the middle school level, similar implementations exist, but it is more common for computer science to be offered as a stand alone course. These tend to be a quarter to semester long course offering."

—Sarah Phelps, Program Manager, Computer Science and STEM, Learning Technology Center

INDIANA

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

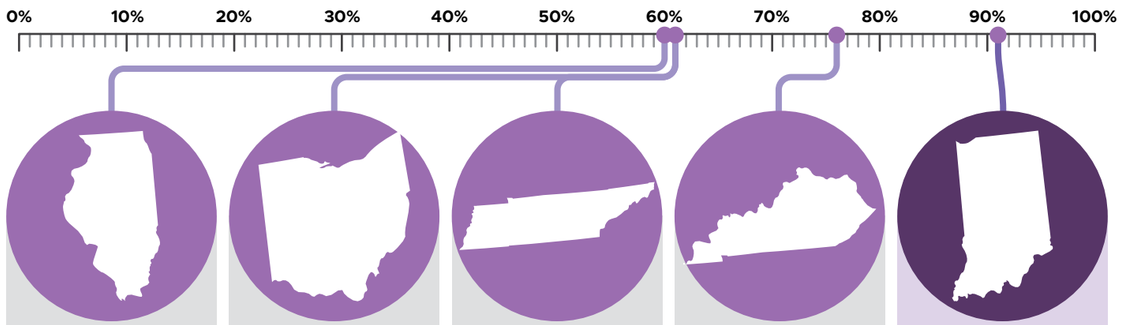
Policy Implementation

The Indiana Legislature passed a bill requiring every student to take computer science to graduate from high school, beginning with the graduating class of 2029.

The Indiana Legislature continued to fund professional development for computer science education, appropriating $6M to the State Department of Education in 2023 for the next two years. Over the last six years, the state has invested over $18M in computer science education.

In 2023, the Indiana Department of Education updated the K–12 computer science standards.

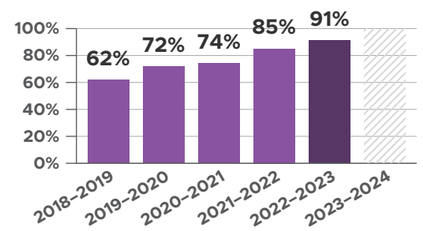
Comparative Access to Computer Science Courses (% of HS offering)



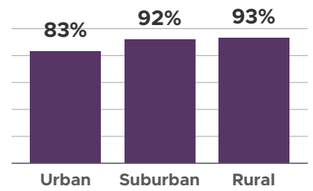
Illinois	Ohio	Tennessee	Kentucky	Indiana
60%	**61%**	**61%**	**76%**	**91%**
– State plan	✓ State plan	✓ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✓ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

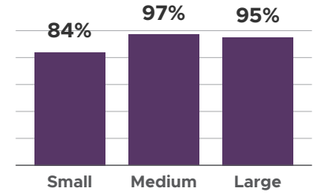
Access by School Year



Access by Geography*



Access by School Size*

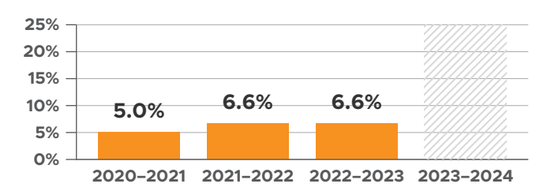


**Data is from the most recent data school year 2022–2023; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

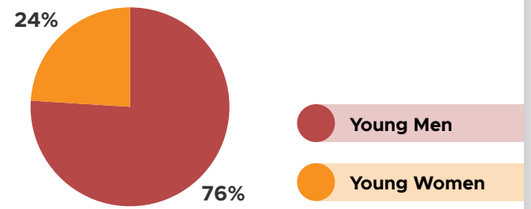
We are working closely with the state to get updated data for next year

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, students with 504 plans, English language learners

Student Groups That Are Underrepresented

Young women, economically disadvantaged students

We lack enough data on Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

30%* of elementary schools offer a dedicated computer science class and 28% of students are enrolled.

Middle School Computer Science

53%** of middle schools offer computer science and 19% of students are enrolled.

**This percentage is based on data received from 93% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*

***This percentage is based on data received from 91% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

IOWA

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
●	●	●	●	●

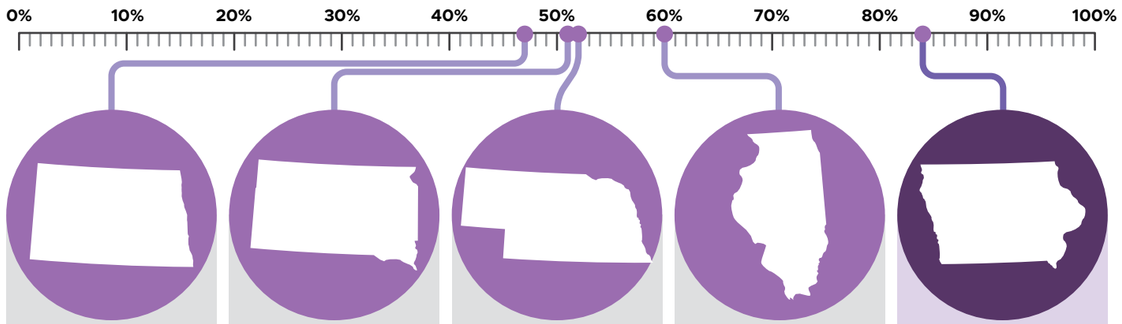
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement
●	●	●	●	●

Policy Implementation

The Iowa Legislature continued to fund the Computer Science Professional Development Incentive Fund, appropriating $500K to the Iowa Department of Education in 2024. Over the last seven years, the state has invested $4M in computer science education. We encourage the state to increase the overall amount of money dedicated to this fund, including increasing the funding going directly to districts for teacher capacity.

The Legislature considered a computer science graduation requirement to be implemented for the class of 2030, but it ultimately did not pass.

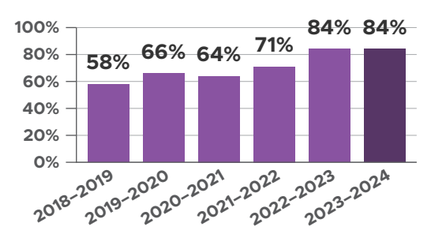
Comparative Access to Computer Science Courses (% of HS offering)



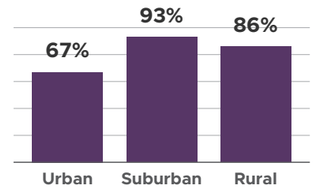
North Dakota	South Dakota	Nebraska	Illinois	Iowa
47%	**51%**	**52%**	**60%**	**84%**
✓ State plan	✗ State plan	✓ State plan	– State plan	✓ State plan
✗ Funding	✗ Funding	✓ Funding	✓ Funding	✓ Funding
✓ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

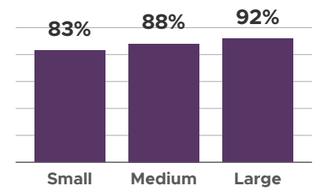
Access by School Year



Access by Geography*



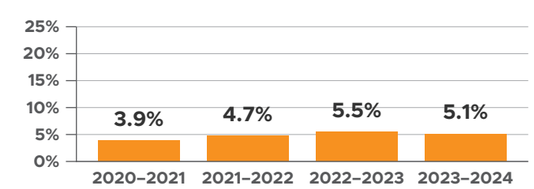
Access by School Size*



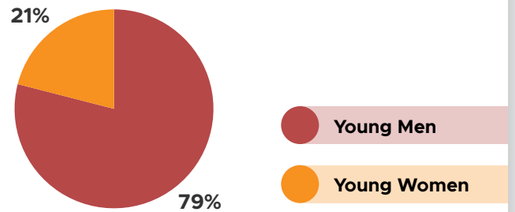
**Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Students with 504 plans

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, economically disadvantaged students, students with IEPs

We lack enough data on Native American students and English language learners to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

33%* of elementary schools offer computer science.

Middle School Computer Science

53%** of middle schools offer computer science.

**This percentage is based on data received from 44% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*
***This percentage is based on data received from 72% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

KANSAS

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
●	●	●	●	●

State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement
●	●	●	●	●

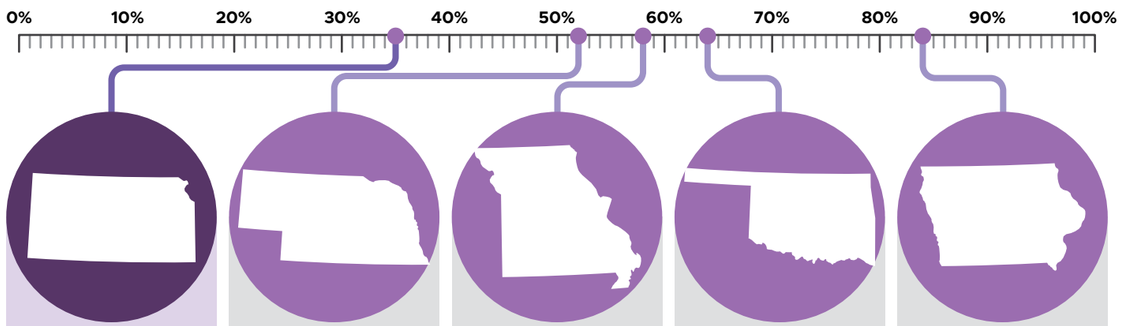
Policy Implementation

The Kansas Legislature funded computer science preservice grants, appropriating $1M to the State Board of Regents in 2024. The legislature previously appropriated $2M for professional development in computer science education.

Over the next year, the Kansas Department of Education will be focusing on training inservice teachers to help expand computer science offerings.

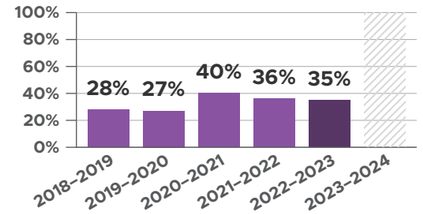
We encourage Kansas to revamp their preservice policy to ensure all teachers are getting adequate preparation.

Comparative Access to Computer Science Courses (% of HS offering)

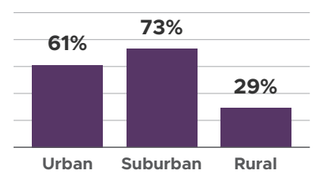


Percentage of Public High Schools Offering Foundational Computer Science

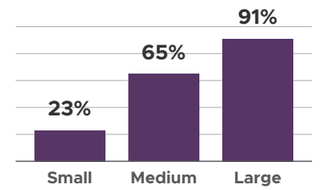
Access by School Year



Access by Geography*



Access by School Size*



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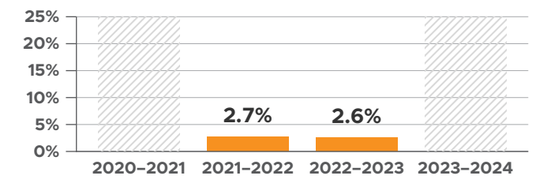
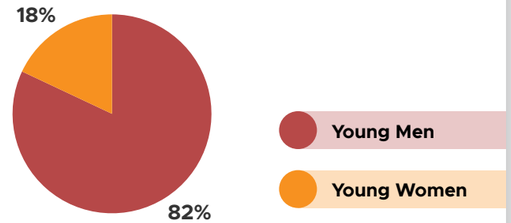
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Students with 504 plans

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

The state has focused on expanding computer science in high school and does not have statewide initiative explicitly on elementary or middle computer science. We encourage the state to build on this high school progress by developing goals, policies, and strategies for K–12 computer science education, ensuring all students gain foundational knowledge throughout their schooling.

KENTUCKY

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

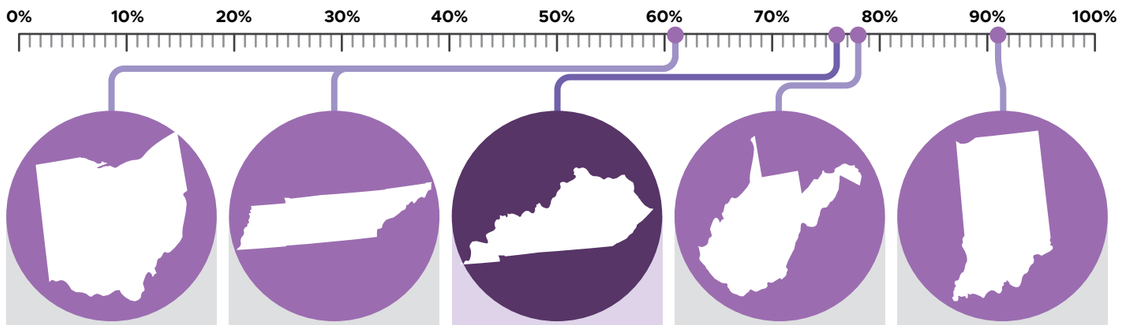
Policy Implementation

Every year, as mandated by legislation, the Kentucky Department of Education publishes a detailed report on student access and participation in computer science.

The Department of Education is in the process of revising and modernizing all their computer science pathways in career and technical education (CTE).

We encourage Kentucky to consider passing a computer science graduation requirement to fully expand equitable participation to the subject.

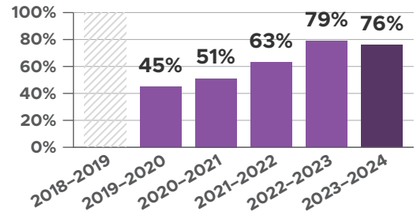
Comparative Access to Computer Science Courses (% of HS offering)



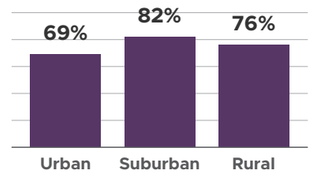
Ohio	Tennessee	Kentucky	West Virginia	Indiana
61%	61%	76%	78%	91%
✓ State plan	✓ State plan	✓ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✓ Funding	✗ Funding	✓ Funding
✗ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

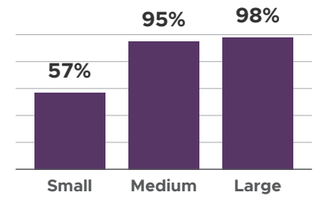
Access by School Year



Access by Geography*



Access by School Size*



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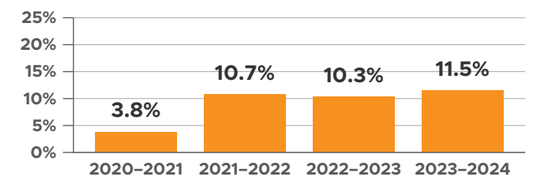
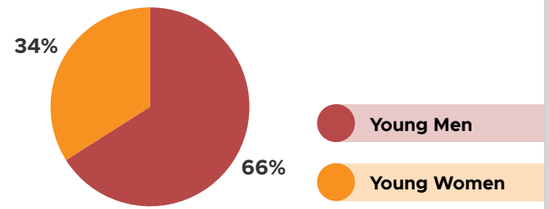
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, economically disadvantaged students, English language learners

Student Groups That Are Underrepresented

Young women, Students with IEPs

We lack enough data on Native American students and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

The Digital Readiness Survey (DRS) in Kentucky provides an annual overview of technology infrastructure and educational opportunities across the state. In the 2022–23 school year, 113 districts reported offering computer science opportunities to K–8 students, often through the Kentucky Student Technology Leadership Program (STLP). STLP, a project-based learning initiative, has been instrumental in promoting computer science education and aligning with Kentucky's Academic Standards. Kentucky credits its recent growth in high school computer science participation to investments in programs like STLP across all grade levels.

LOUISIANA

Ten Policies to Make Computer Science Foundational*

- State Plan
- Standards
- Funding
- Certification
- Preservice
- State CS Position
- Require HS to Offer
- Can Count
- Admissions
- Graduation Requirement

*Louisiana passed 6 policies this past year, as the state fully implements all these policies we expect to see an significant increase in access and participation

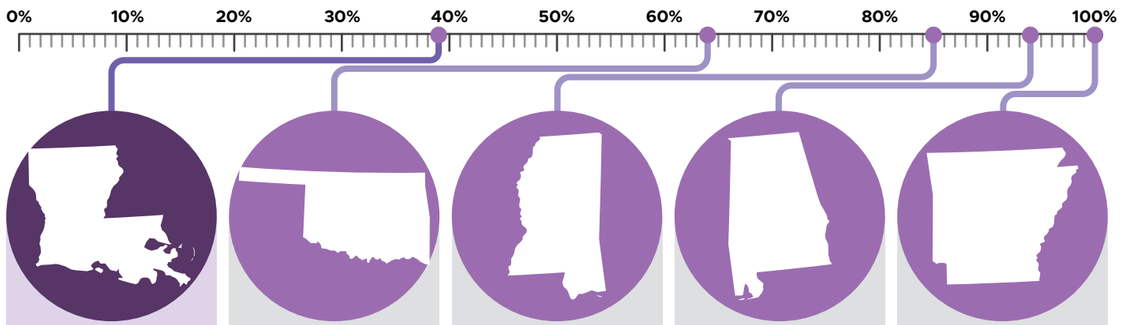
Policy Implementation

The Legislature passed a bill requiring every student to take one credit in computer science, beginning with the graduating class of 2030. This legislation also requires elementary and middle schools to offer computer science and teacher preparation programs to provide instruction in computer science.

The Legislature continued to fund computer science education, appropriating $2M to the Department of Education. Over the last two years, the state has invested over $7M in computer science education.

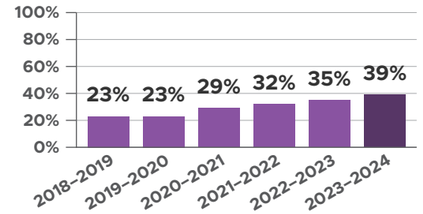
Over the course of the last year, Louisiana passed 6 new policies, resulting in Louisiana being the 5th state to pass all 10 recommended policies.

Comparative Access to Computer Science Courses (% of HS offering)

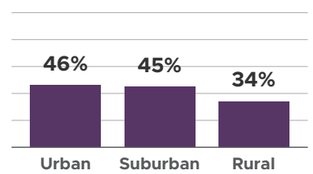


Percentage of Public High Schools Offering Foundational Computer Science

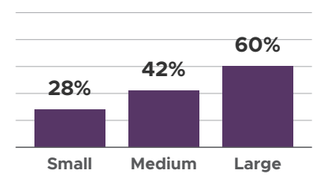
Access by School Year



Access by Geography*



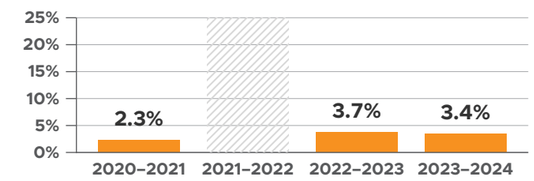
Access by School Size*



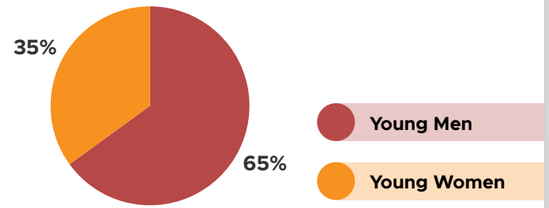
*Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, students with 504 plans

Student Groups That Are Underrepresented

Young women, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students to determine representation.

*Detailed data on student participation is available at advocacy.code.org

Computer Science Prior to High School

Elementary School Computer Science

Ignite, which is a legislative funded program, focuses on developing teaching strategies, pedagogical tools, and content knowledge for integrating computer science into elementary education.

Middle School Computer Science

The Middle Grades Robotics Lab Pilot combines math and technology to introduce students to robotics and computational thinking through hands-on learning. Now in its second year, the pilot includes 35 schools.

MAINE

Ten Policies to Make Computer Science Foundational

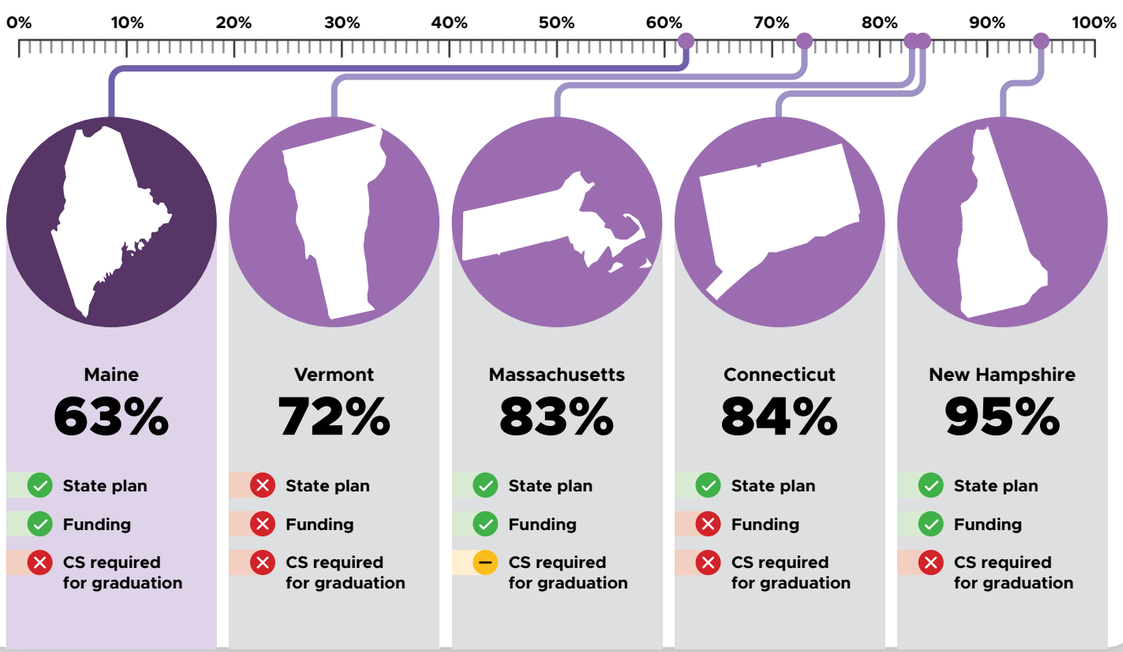
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

The ongoing #MaineTeachesCS initiative is a broad scale effort to broaden participation in computer science education in all levels of education in Maine. This initiative has included computer science technology provision, targeted professional learning, and more for all schools across the state.

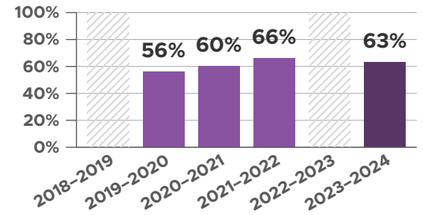
The Department of Education is working to publish an updated state plan that reflects the progress made since it was established at the end of 2019. They are also working with the University of Maine to conduct and publish a statewide, PK-12 landscape study of computer science education in Maine.

Comparative Access to Computer Science Courses (% of HS offering)

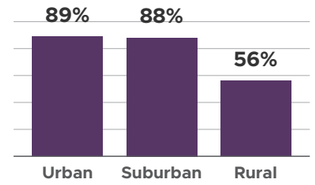


Percentage of Public High Schools Offering Foundational Computer Science

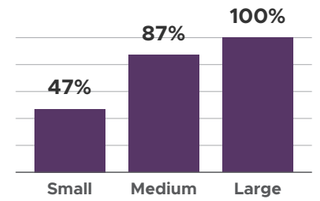
Access by School Year



Access by Geography*



Access by School Size*



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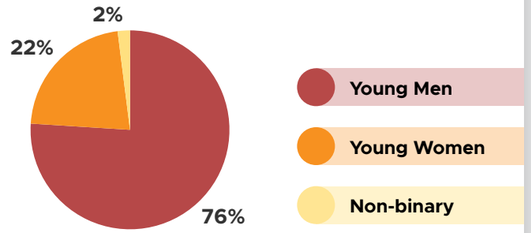
Participation in Foundational High School Computer Science*

Participation by School Year

Maine does not collect enrollment data for all foundational computer science courses. We used AP exam data from the College Board for participation statistics, but we know participation in all foundational computer science courses is broader than just AP. We encourage the state to begin collecting and reporting comprehensive course enrollment data.

Participation by Gender in AP Exams



Student Groups That Reached or Neared Parity in AP Exams

Black students, Hispanic/Latino students

Student Groups That Are Underrepresented in AP Exams

Young women

We lack enough data on Native American students, students with disabilities, English language learners, and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

The Maine Learning Technology Initiative has been expanded to elementary grades to further support the growing needs of elementary computer science.

Middle School Computer Science

The Maine Department of Education continues to work closely with middle schools across the state to expand computer science, both in stand-alone courses and integrated courses.

MARYLAND

Ten Policies to Make Computer Science Foundational

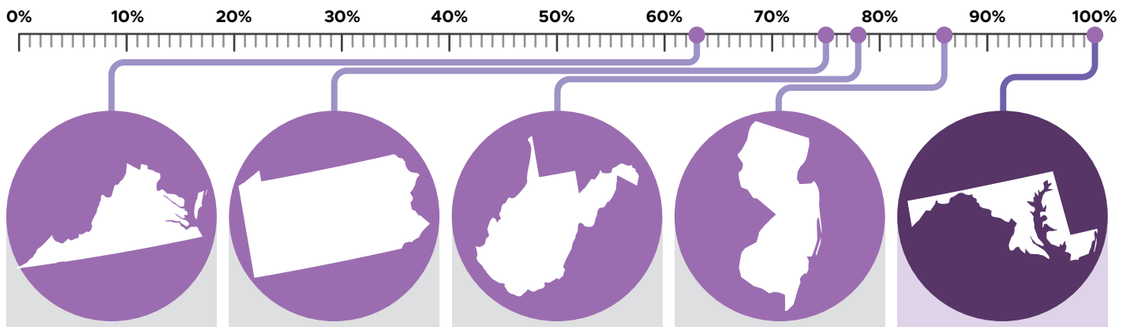
State Plan	Standards	Funding	Certification	Preservice
●	●	●	●	●

State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement
●	●	●	●	●

Policy Implementation

The Maryland Legislature continued to fund computer science education, appropriating $1M to the Maryland Center for Computing Education in 2024. Over the last seven years, the state has invested $11M in computer science education.

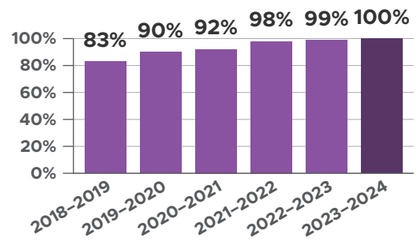
Comparative Access to Computer Science Courses (% of HS offering)



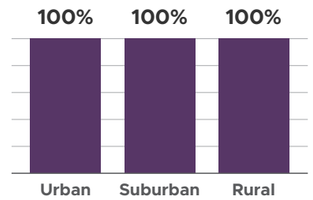
Virginia	Pennsylvania	West Virginia	New Jersey	Maryland
68%	**75%**	**78%**	**86%**	**100%**
✗ State plan	✗ State plan	✓ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✗ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	– CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

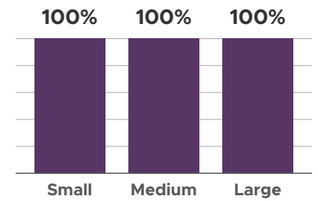
Access by School Year



Access by Geography*



Access by School Size*



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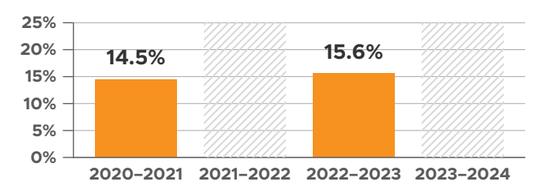
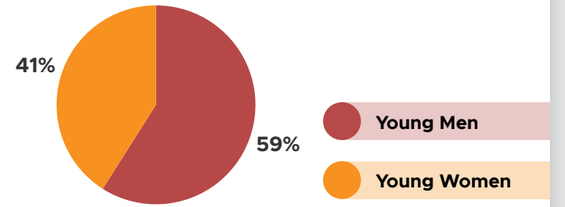
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, students with 504 plans

Student Groups That Are Underrepresented

Young women, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

The state has developed a website for library media specialists with lessons aligned to computer science standards and onboarded the sixth cohort of elementary computer science ambassadors, bringing the total to about 100 statewide.

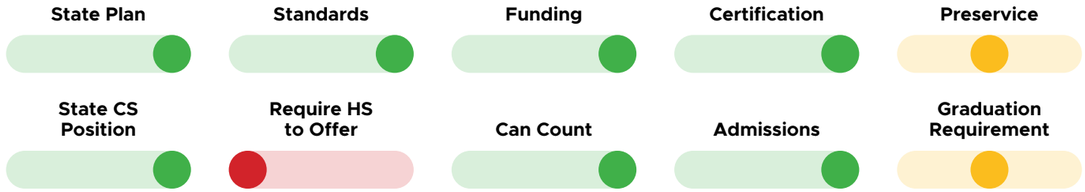
Middle School Computer Science

81%* of middle schools offer computer science and 23% of students are enrolled.

**This percentage is based on data received from 92% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

MASSACHUSETTS

Ten Policies to Make Computer Science Foundational



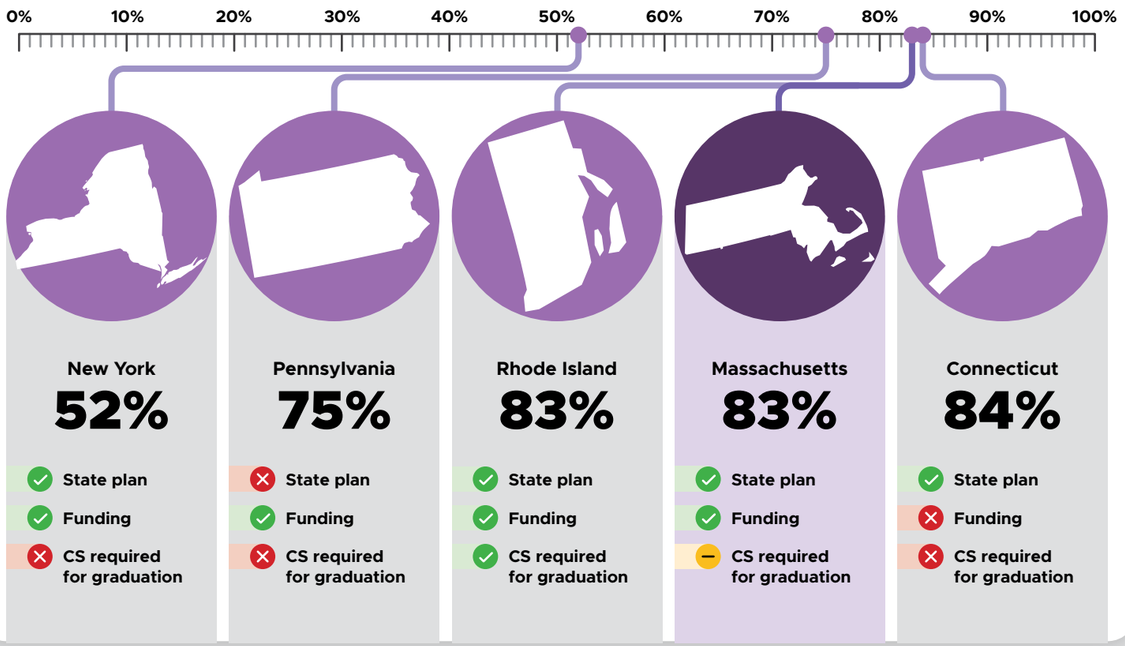
Policy Implementation

Legislation passed in 2022 requested recommendations for a computer science graduation requirement. The Massachusetts Department of Elementary and Secondary Education (DESE) has developed a national landscape analysis and in the coming year will publish a report providing a recommendation on a computer science graduation requirement.

Massachusetts updated its certifications to include two computer science certifications: PK–6 and 5–12.

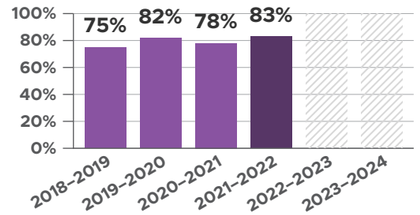
We encourage Massachusetts to revamp their preservice policy to ensure all teachers are getting adequate preparation.

Comparative Access to Computer Science Courses (% of HS offering)

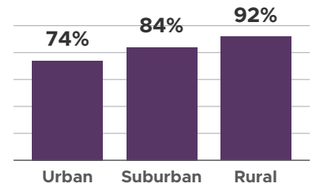


Percentage of Public High Schools Offering Foundational Computer Science

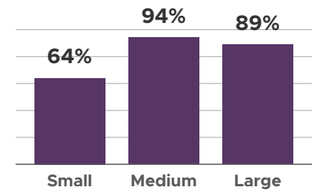
Access by School Year



Access by Geography*



Access by School Size*

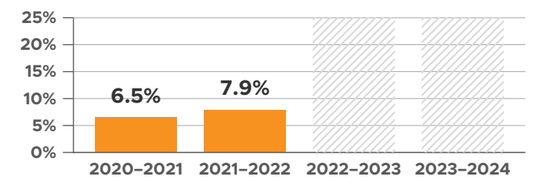


**Data is from the most recent data school year 2021–2022; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

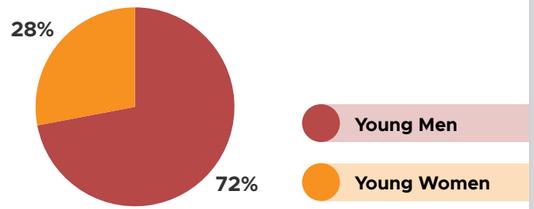
We are working closely with the state to get updated data for next year

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students

Student Groups That Are Underrepresented

Young women, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

CSforMA and DESE created 3-day workshops with elementary and middle school educators, allowing teachers to experience computer science concepts as students. Additionally, CSforMA developed a 9-day program, in which educators meet the competencies for the PK–6 license.

Middle School Computer Science

46%* of middle schools offer computer science and 4% of students are enrolled.

**This percentage is based on data received from 57% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

MICHIGAN

Ten Policies to Make Computer Science Foundational

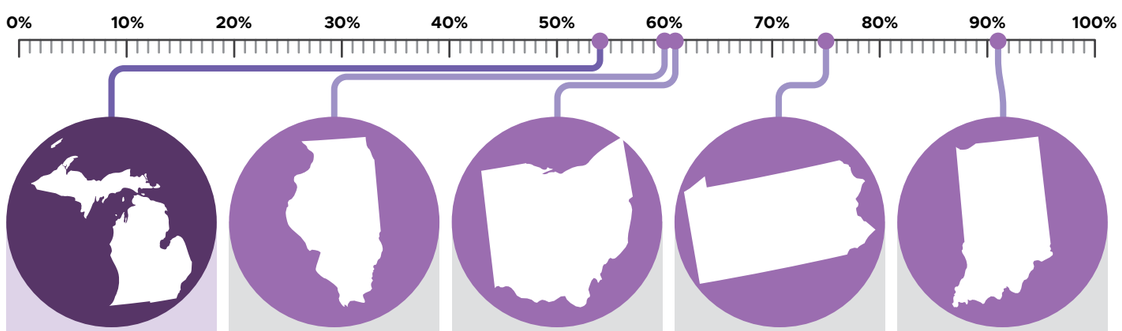
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

The Michigan Legislature continued to fund computer science teacher professional development for the second year, appropriating $500K for this purpose to the Michigan Department of Education in 2024.

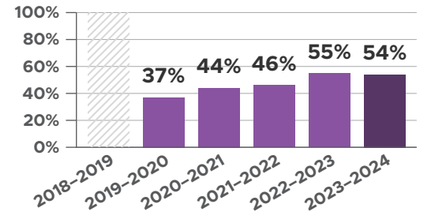
As of this report's publication, the Legislature is considering a bill that would ensure every high school offers computer science to students by the 2027–28 school year. We encourage the state to pass legislation to enact this crucial policy.

Comparative Access to Computer Science Courses (% of HS offering)

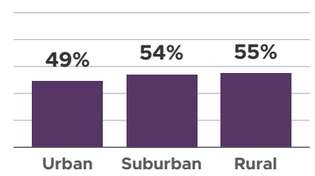


Percentage of Public High Schools Offering Foundational Computer Science

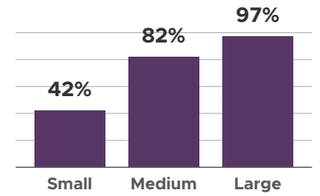
Access by School Year



Access by Geography*



Access by School Size*



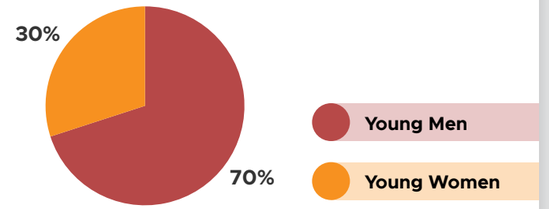
**Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year

Michigan does not collect enrollment data for all foundational computer science courses. We used AP exam data from the College Board for participation statistics, but we know participation in all foundational computer science courses is broader than just AP. We encourage the state to begin collecting and reporting comprehensive course enrollment data.

Participation by Gender in AP Exams



Student Groups That Reached or Neared Parity in AP Exams

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented in AP Exams

Young women, Black students, Hispanic/Latino students

We lack enough data on Native American students, students with disabilities, English language learners, and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Project Tomorrow launched the Computational Thinking Integration Project (CTIP) during the 2022–23 school year to help K–8 instructional coaches support teachers in integrating computational thinking (CT) across the curriculum. In 2023, the initiative expanded with the backing of the Michigan Department of Education and the Section 99b grant. With support from the state, CTIP has increased from 3 to 17 districts.

44%* of middle schools offer computer science.

**This percentage is based on data received from 71% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

MINNESOTA

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

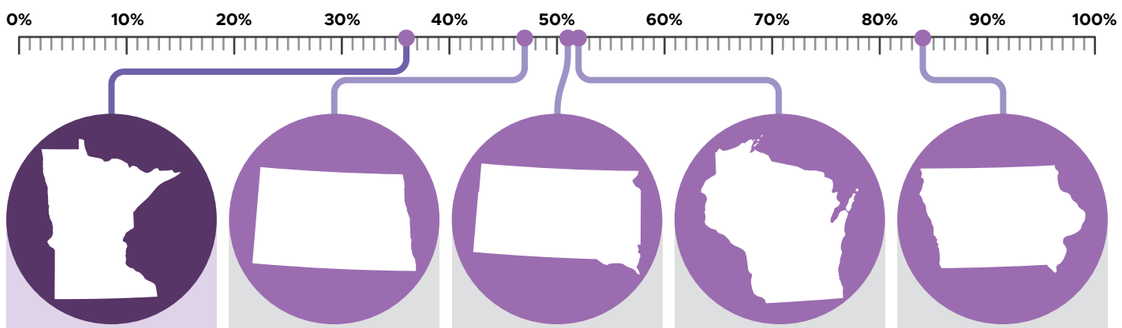
Policy Implementation

The Minnesota Computer Science Working Group published its state plan in March 2024, which includes 10 recommendations to expand access to computer science in the state; recommendations include establishing an advisory committee, flexible teacher certification pathways, grant programs, requiring integration of computer science in grades K–8, and requiring all high schools to offer computer science.

We encourage the state to begin to implement this plan in the upcoming year, with a particular focus on getting more schools to teach computer science.

Minnesota had the largest increase of high schools offering computer science among all states.

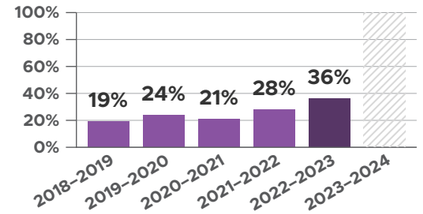
Comparative Access to Computer Science Courses (% of HS offering)



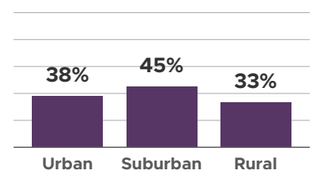
Minnesota	North Dakota	South Dakota	Wisconsin	Iowa
36%	**47%**	**51%**	**52%**	**84%**
✓ State plan	✓ State plan	✗ State plan	✗ State plan	✓ State plan
✓ Funding	✗ Funding	✗ Funding	✗ Funding	✓ Funding
✗ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

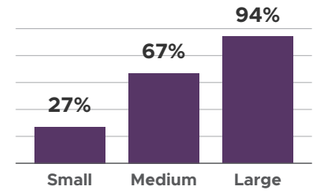
Access by School Year



Access by Geography*



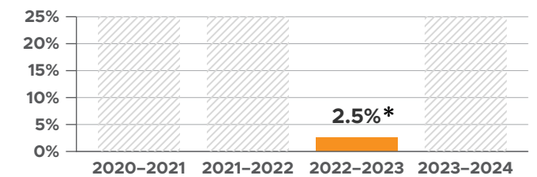
Access by School Size*



**Data is from the most recent data school year 2022–2023; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

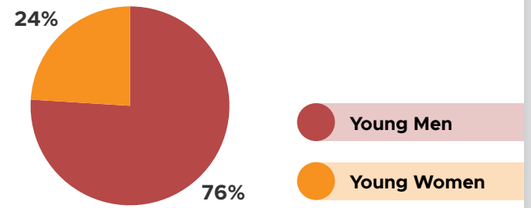
Participation in Foundational High School Computer Science*

Participation by School Year



**Minnesota does not collect participation data from all schools, so the actual number of students enrolled in computer science is likely higher.*

Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, students with 504 plans

Student Groups That Are Underrepresented

Young women, Native American students, economically disadvantaged students, students with IEPs, English language learners

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

The Minnesota Department of Education is working with districts and charter schools to define expectations for reporting K–8 computer science data, including defining courses, classifications, and integrating this information into student information systems.

30%* of middle schools offer computer science and 4% of students are enrolled.

**This percentage is based on data received from 64% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

MISSISSIPPI

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
●	●	●	●	●

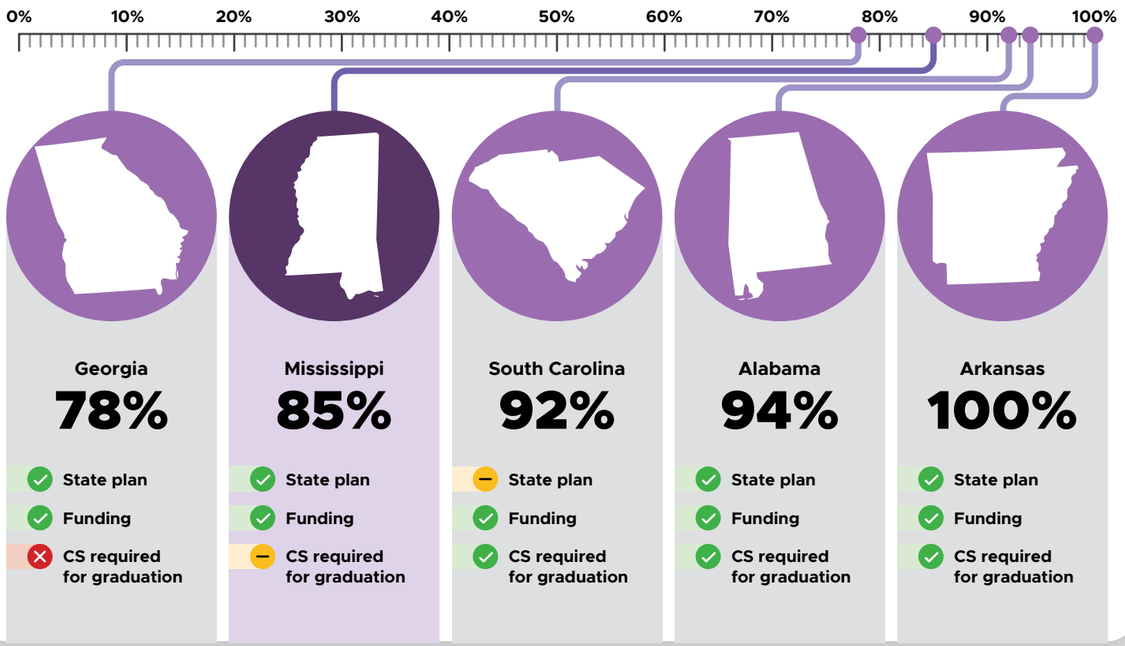
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement
●	●	●	●	●

Policy Implementation

The Mississippi Legislature continued to fund development of computer science courses and professional development, appropriating $1M to the Mississippi State University Center for Cyber Education in 2024. Over the last five years, the state has invested over $4M in computer science education.

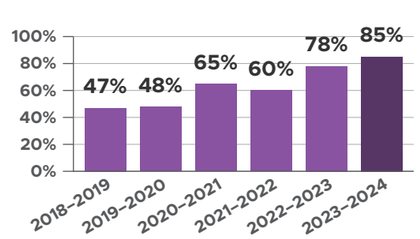
Mississippi should update its Public School Accountability Standards to require that every student earn one credit in “Computer Science” or “Technology with Computer Science Embedded” in place of the current requirement of “Technology” or “Computer Science” requirement.

Comparative Access to Computer Science Courses (% of HS offering)

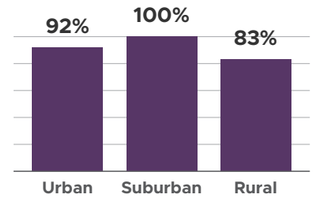


Percentage of Public High Schools Offering Foundational Computer Science

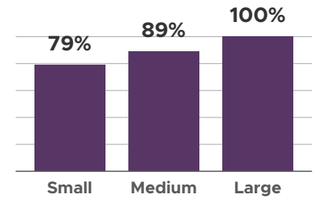
Access by School Year



Access by Geography*



Access by School Size*



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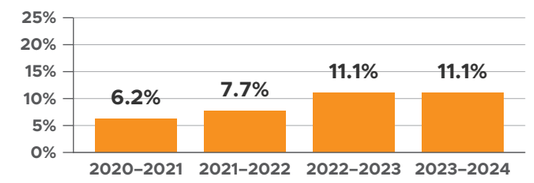
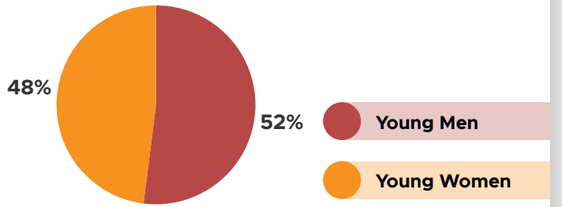
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, students with 504 plans, English language learners

Student Groups That Are Underrepresented

Young women, economically disadvantaged students, students with IEPs

We lack enough data on Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

64%* of elementary schools offer computer science with 35% of students enrolled.

Middle School Computer Science

54%** of middle schools offer computer science with 11% of students enrolled.

**This percentage is based on data received from 76% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*
***This percentage is based on data received from 96% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

MISSOURI

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

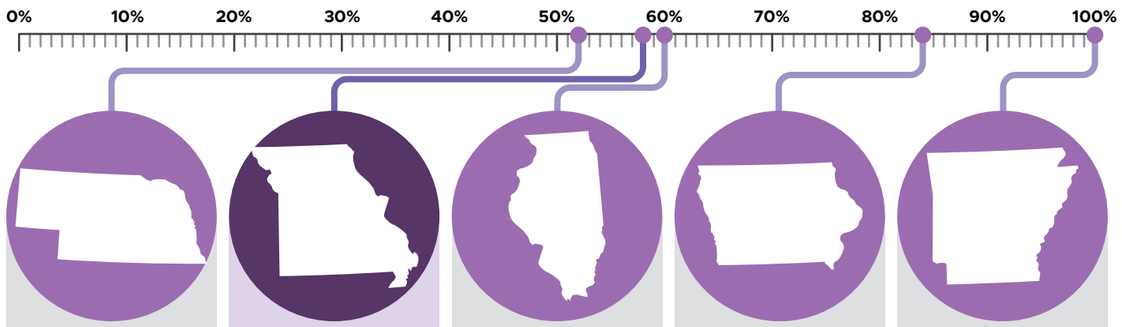
Policy Implementation

The Missouri General Assembly continued to fund the Computer Science Education Fund, appropriating $450K to the Department of Elementary and Secondary Education (DESE) in 2024. Over the last five years, the state has invested over $2M in computer science education.

Missouri now has a state plan and a computer supervisor at the Department to implement the plan.

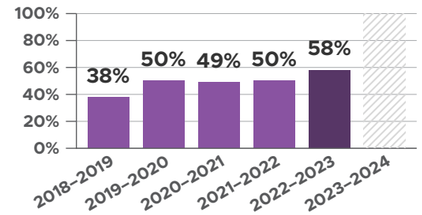
DESE is creating pathways for industry professionals to become certified computer science teachers and is developing a stand-alone certification for high school teachers.

Comparative Access to Computer Science Courses (% of HS offering)

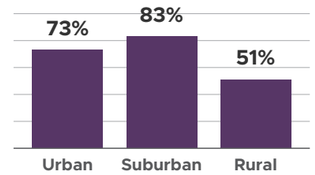


Percentage of Public High Schools Offering Foundational Computer Science

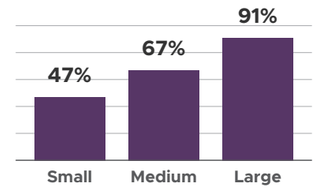
Access by School Year



Access by Geography*



Access by School Size*



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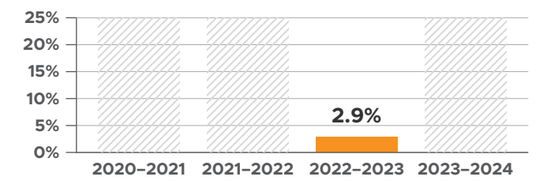
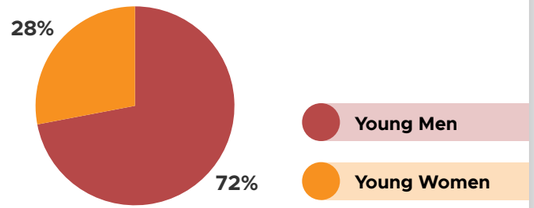
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, English language learners

Student Groups That Are Underrepresented

Young women, economically disadvantaged students, students with IEPs

We lack enough data on Native American students and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

DESE is beginning to develop and encourage K–8 integration of computer science standards in existing curriculum. As the state begins to focus more on elementary and middle school computer science, we urge them to collect course offerings and enrollment data.

MONTANA

Ten Policies to Make Computer Science Foundational

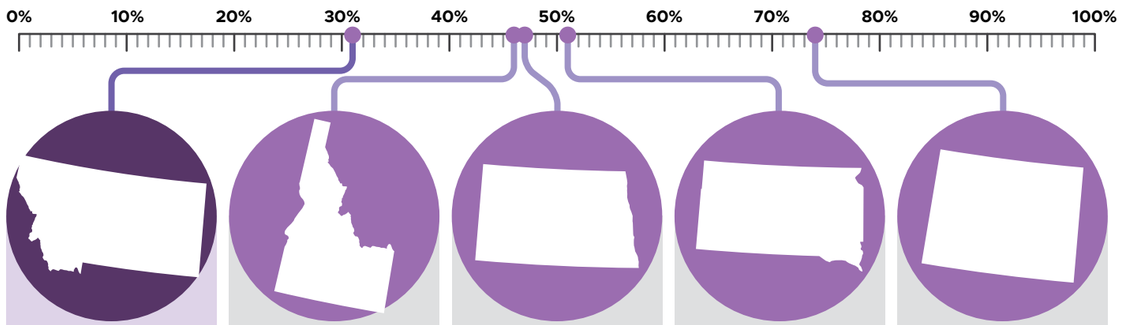
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

Montana has created and funded the Tribal Computer Program Boost Scholarship which supports computer programming courses at schools located on Indian reservations in Montana or that serve members of the Little Shell Chippewa tribe.

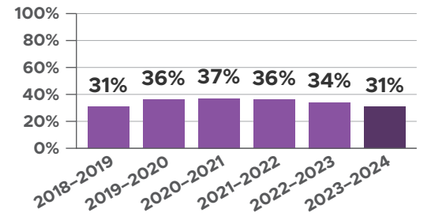
We encourage the state to renew their focus on this crucial subject; creating a statewide plan and hiring a computer science supervisor in the Montana Office of Public Instruction will help to guide this work.

Comparative Access to Computer Science Courses (% of HS offering)

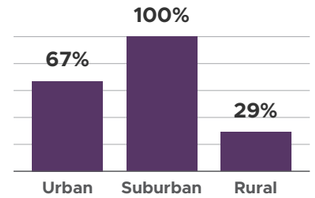


Percentage of Public High Schools Offering Foundational Computer Science

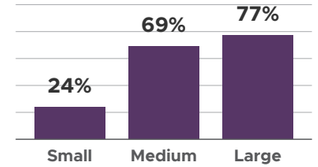
Access by School Year



Access by Geography*



Access by School Size*



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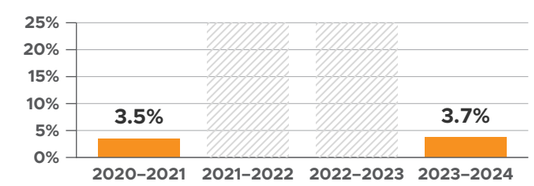
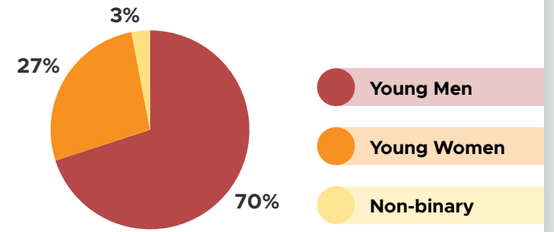
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender in AP Exams**



Student Groups That Reached or Neared Parity in AP Exams

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented in AP Exams

Young women, Hispanic/Latino students

We lack enough data on Native American students, Black students, students with disabilities, English language learners, and economically disadvantaged students to determine representation.

***Montana reports the total number of students enrolled in foundational courses, but it does not provide demographic breakdowns. Therefore, we rely on AP data for all demographic information.*

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Unfortunately, we have very little data from Montana on elementary and middle school computer science education. We encourage the state to collect and report on K–12 course offerings and enrollment.

NEBRASKA

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

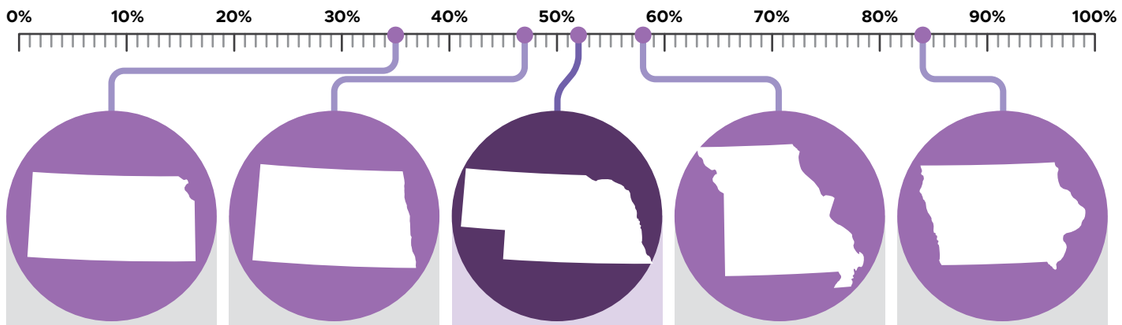
Policy Implementation

The Nebraska Legislature funded the newly created Computer Science and Technology Education Fund, appropriating $2M to the State Department of Education in 2024. The legislature intends to transfer an additional $500K each fiscal year with receipt of private matching funds.

The Department has published a plan for the computer science education for the next 5 years.

Over the next year, the Department is planning to focus on training inservice teachers in computer science as well as trying to get computer science included in preservice programs.

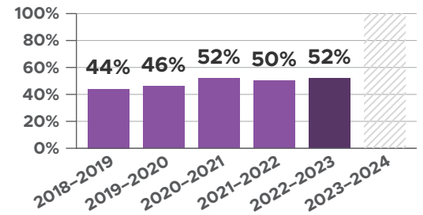
Comparative Access to Computer Science Courses (% of HS offering)



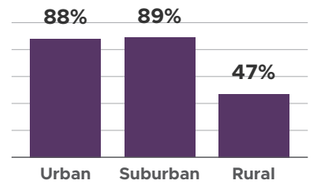
Kansas	North Dakota	Nebraska	Missouri	Iowa
35%	**47%**	**52%**	**58%**	**84%**
✗ State plan	✓ State plan	✓ State plan	✓ State plan	✓ State plan
✓ Funding	✗ Funding	✓ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✓ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

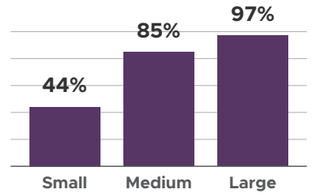
Access by School Year



Access by Geography*



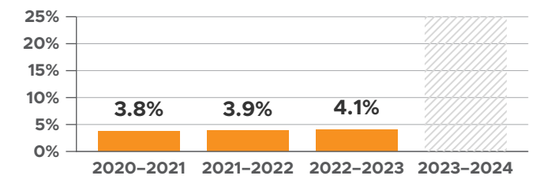
Access by School Size*



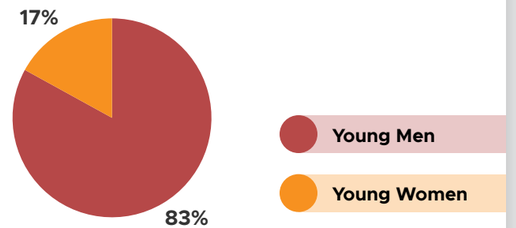
**Data is from the most recent data school year 2022–2023; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

By school year 2025–26, each school district will include computer science and technology education aligned to the academic content standards in all elementary, middle, and high schools. The Department is creating implementation guides for K–12 classrooms to ensure all schools can meet this requirement.

36%* of middle schools offer computer science with 17% of students enrolled.

**This percentage is based on data received from 97% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

NEVADA

Ten Policies to Make Computer Science Foundational

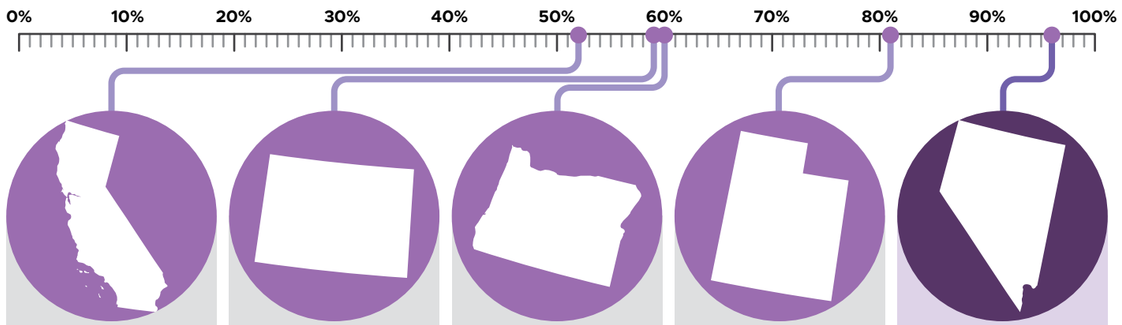
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

An endorsement process was established in 2022 so that teachers can take the required courses for the certification at a very low cost. This helped boost the number of licensed teachers

We encourage Nevada to revamp their preservice policy to ensure all teachers are getting adequate preparation.

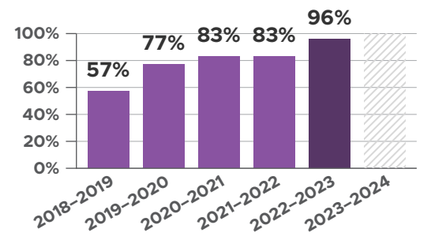
Comparative Access to Computer Science Courses (% of HS offering)



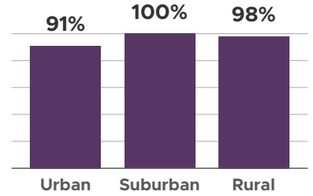
California	Colorado	Oregon	Utah	Nevada
52%	**59%**	**60%**	**81%**	**96%**
✓ State plan	✗ State plan	✓ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✗ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

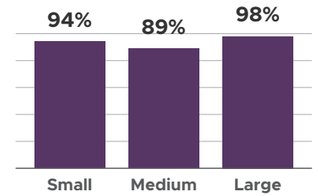
Access by School Year



Access by Geography*



Access by School Size*



**Data is from the most recent data school year 2022–2023; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

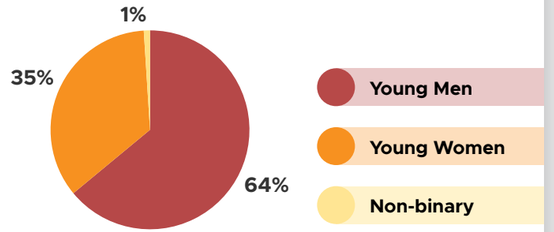
We are working closely with the state to get updated data for next year

Participation in Foundational High School Computer Science*

Participation by School Year

We are working closely with the state to get more accurate participation data. For this year, we used AP exam data from the College Board for participation statistics.

Participation by Gender in AP Exams



Student Groups That Reached or Neared Parity in AP Exams

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented in AP Exams

Young women, Black students, Hispanic/Latino students

We lack enough data on Native American students, students with disabilities, English language learners, and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

63%* of elementary schools offer computer science.

Middle School Computer Science

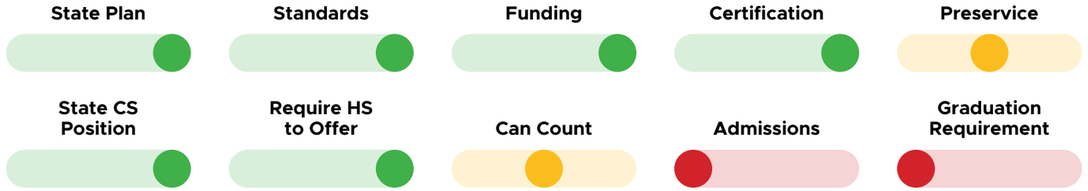
74%** of middle schools offer computer science.

**This percentage is based on data received from 72% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*

***This percentage is based on data received from 79% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

NEW HAMPSHIRE

Ten Policies to Make Computer Science Foundational

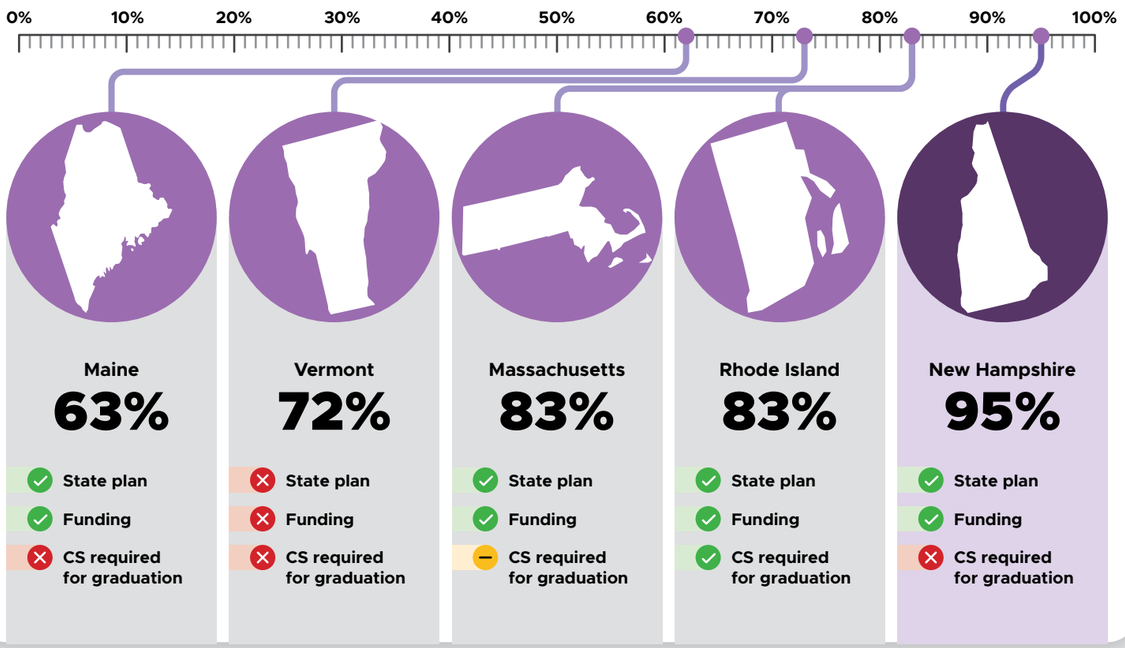


Policy Implementation

UpGrade New Hampshire, a program funded by the FY 2024 computer science education state budget, is now public. This program provides funding for existing teachers to obtain computer science teaching credentials and industry credentials. Additionally, to recruit tech professionals, UpGrade is providing up to $10,000 in bonuses for becoming computer science teachers.

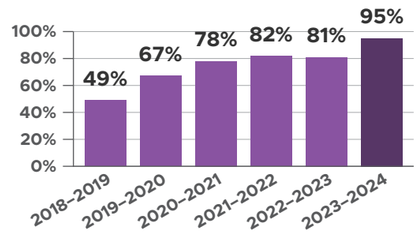
We encourage New Hampshire to consider passing a computer science graduation requirement to fully expand equitable participation to the subject.

Comparative Access to Computer Science Courses (% of HS offering)

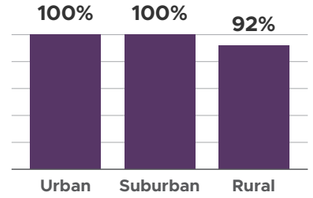


Percentage of Public High Schools Offering Foundational Computer Science

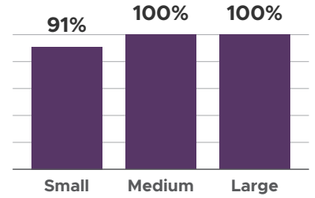
Access by School Year



Access by Geography*



Access by School Size*



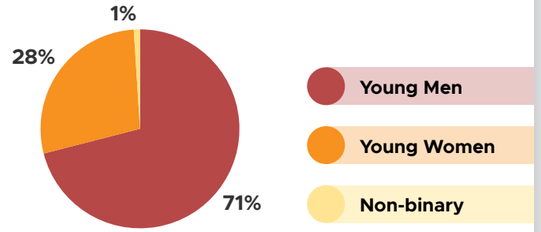
**Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year

New Hampshire does not collect enrollment data for all foundational computer science courses. We used AP exam data from the College Board for participation statistics, but we know participation in all foundational computer science courses is broader than just AP. We encourage the state to begin collecting and reporting comprehensive course enrollment data.

Participation by Gender in AP Exams



Student Groups That Reached or Neared Parity in AP Exams

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented in AP Exams

Young women, Black students, Hispanic/Latino students

We lack enough data on Native American students, students with disabilities, English language learners, and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

New Hampshire's standards state that: "A strong K–12 CS district or school offers students time dedicated specifically to CS education, organized in a coherent progression, and also integrates CS with other areas. Standards also recommend that all middle school students take a computer science class.

We encourage the state to collect and report on K–12 course offerings and enrollment.

NEW JERSEY

Ten Policies to Make Computer Science Foundational

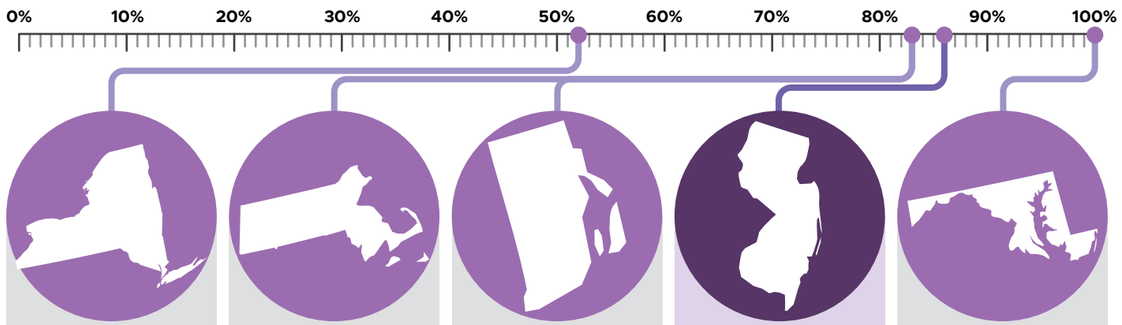
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

The New Jersey Legislature continued to fund the K–12 Computer Science Education Initiative, appropriating $1.6M in 2024. Over the last six years, the state has invested over $10M in computer science education.

We encourage New Jersey to consider passing a computer science graduation requirement to fully expand equitable participation to the subject.

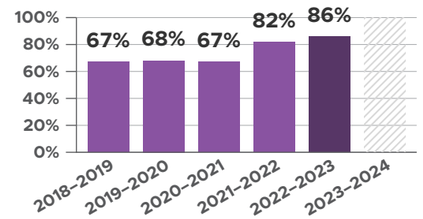
Comparative Access to Computer Science Courses (% of HS offering)



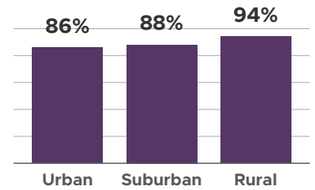
New York	Massachusetts	Rhode Island	New Jersey	Maryland
52%	**83%**	**83%**	**86%**	**100%**
✓ State plan	✓ State plan	✓ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✓ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	– CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	– CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

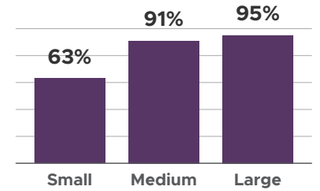
Access by School Year



Access by Geography*



Access by School Size*



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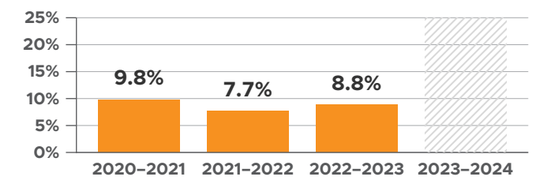
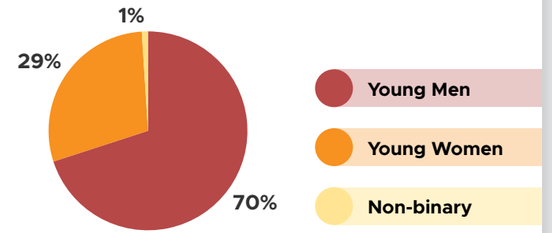
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

29%* of elementary schools offer computer science with 8% of students enrolled.

Middle School Computer Science

40%** of middle schools offer computer science with 8% of students enrolled.

**This percentage is based on data received from 52% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*
***This percentage is based on data received from 68% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

NEW MEXICO

Ten Policies to Make Computer Science Foundational

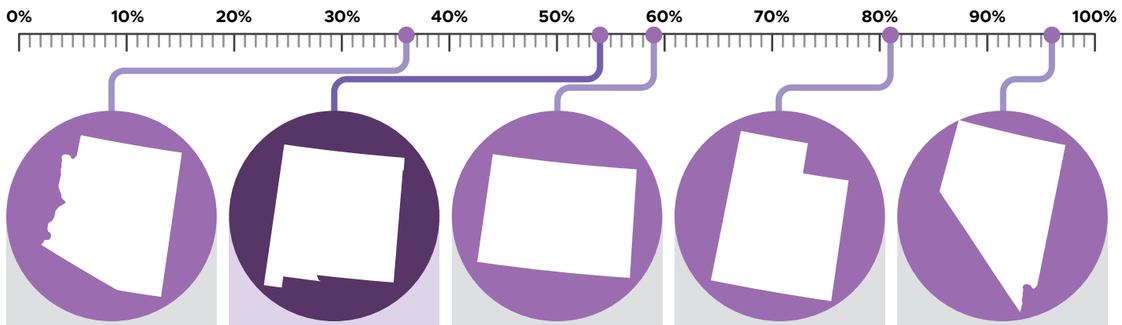
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

The New Mexico Legislature passed a bill requiring that computer science be offered in all high schools beginning in the 2025–26 school year.

New Mexico has previously funded computer science education; we encourage the state to resume this funding to make sure all students have the opportunity to learn computer science.

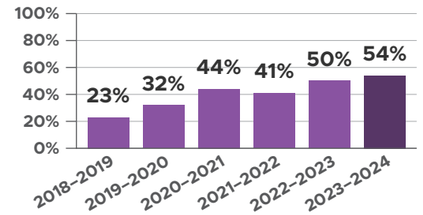
Comparative Access to Computer Science Courses (% of HS offering)



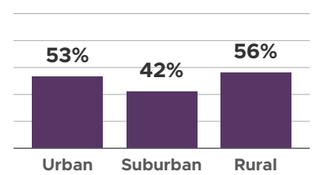
Arizona	New Mexico	Colorado	Utah	Nevada
43%	54%	59%	81%	96%
✗ State plan	✓ State plan	✗ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✓ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

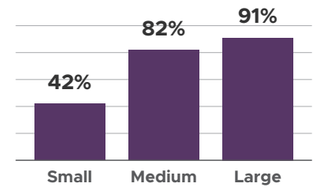
Access by School Year



Access by Geography*



Access by School Size*



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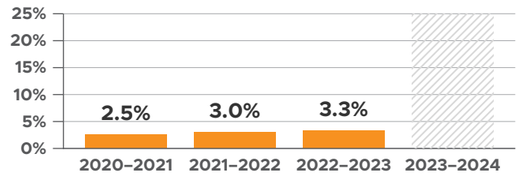
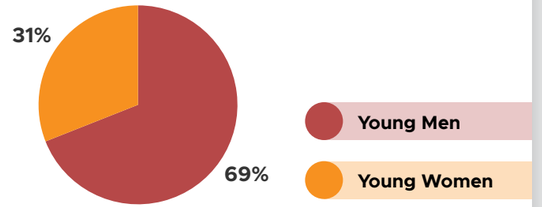
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Native American students

Student Groups That Are Underrepresented

Young women, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

The state has focused on expanding computer science in middle and high school and does not have statewide initiative explicitly on elementary computer science.

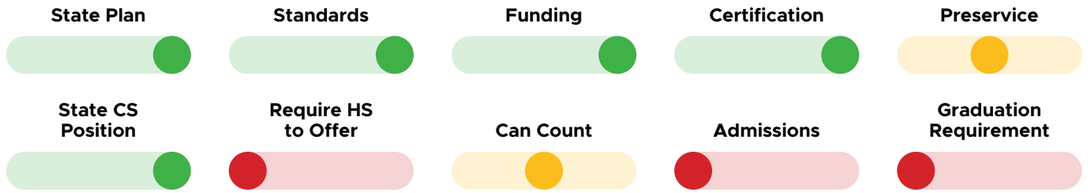
Middle School Computer Science

31%* of middle schools offer computer science.

**This percentage is based on data received from 51% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

NEW YORK

Ten Policies to Make Computer Science Foundational



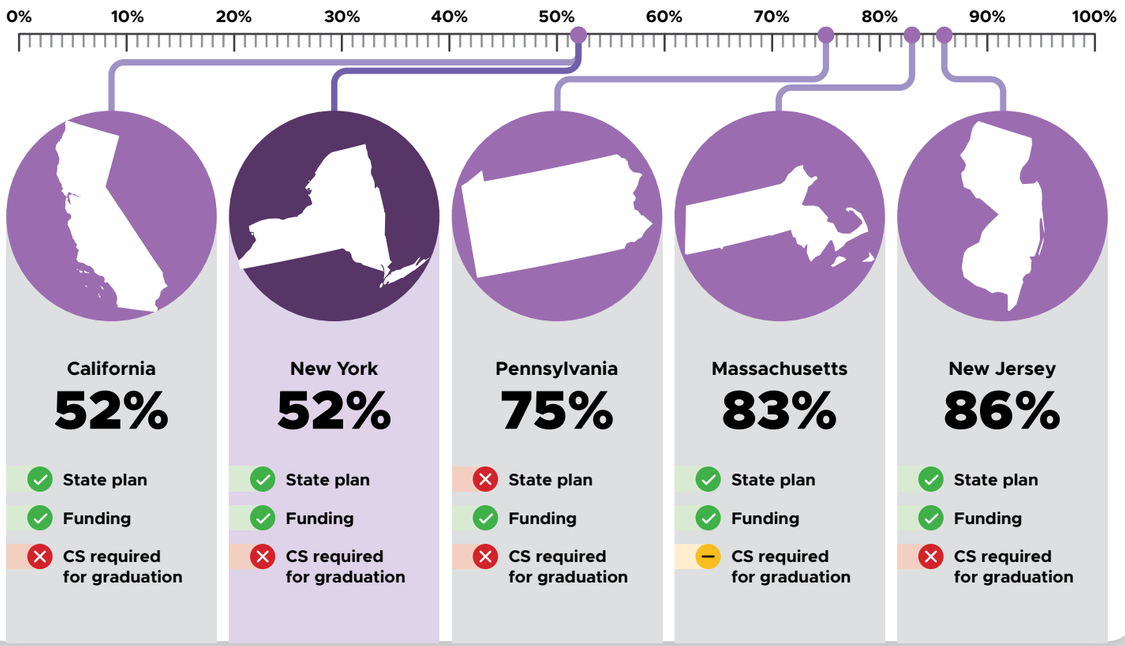
Policy Implementation

The New York Legislature continued to fund the Smart Start program, appropriating $6M in 2024. Over the last six years, the state has invested $42M in computer science education.

The Legislature considered a bill requiring computer science for high school graduation, but it ultimately did not pass. We strongly encourage the state to pass this legislation in the future.

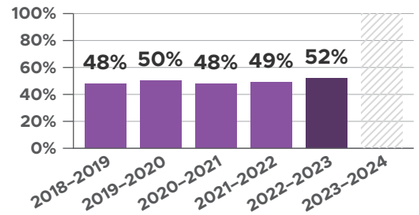
Increased requirements for computer science teacher credentialing took effect in September 2024. We encourage the state to ensure no undue barriers prevent teachers from obtaining this certification.

Comparative Access to Computer Science Courses (% of HS offering)

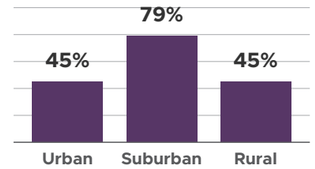


Percentage of Public High Schools Offering Foundational Computer Science

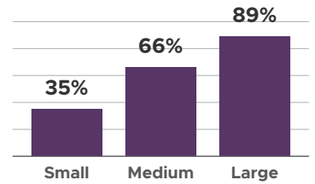
Access by School Year



Access by Geography*



Access by School Size*



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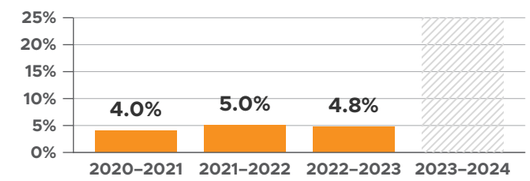
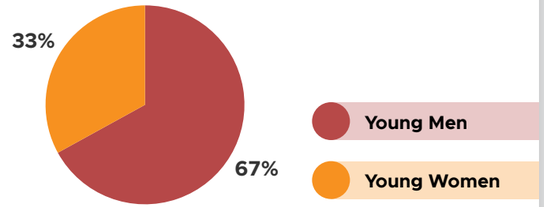
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students and students with 504 plans to determine representation.

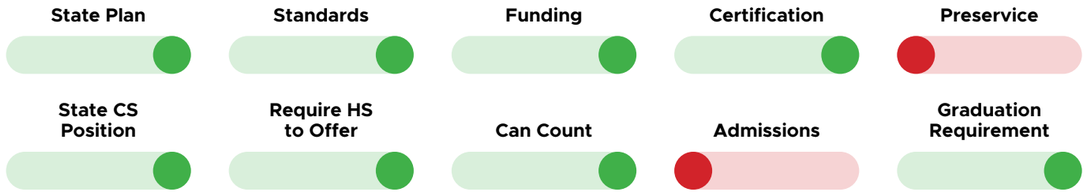
**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

While we do not have statewide updates from New York we have district updates. The Computer Science for All (CS4All) initiative of NYC Public Schools works to ensure that schools expand CS exposure, offer access to real-life CS experiences, and create an inclusive community in computer science for all students. CS4All provides support on three grade-specific integrated units (K-2, 3-5, and 6-8). The Integrated Units Program prepares teachers to implement one foundational unit of CS either as a standalone CS unit or integrated into the content area of the school's choice.

NORTH CAROLINA

Ten Policies to Make Computer Science Foundational

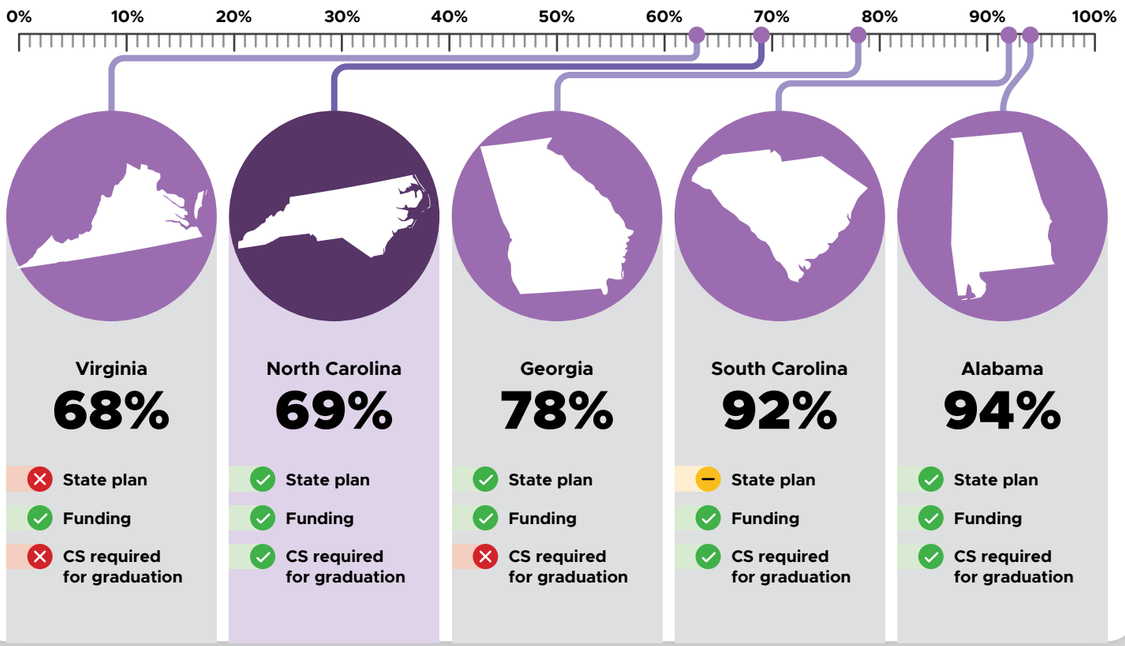


Policy Implementation

In 2023, the General Assembly passed a graduation requirement in computer science starting with the class of 2030. This past year, the Department of Public Instruction published a list of courses that would satisfy the requirement.

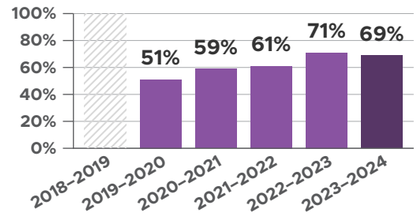
Over the next year, the Department of Public Instruction plans to create a specific computer science licensing option, as the only current licensing option for computer science is for CTE teachers.

Comparative Access to Computer Science Courses (% of HS offering)

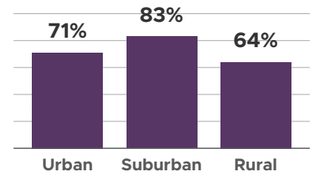


Percentage of Public High Schools Offering Foundational Computer Science

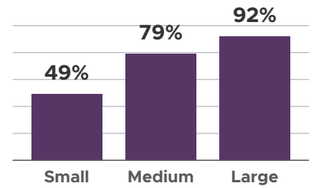
Access by School Year



Access by Geography*



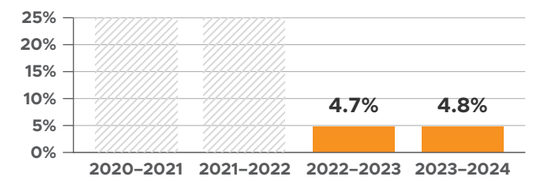
Access by School Size*



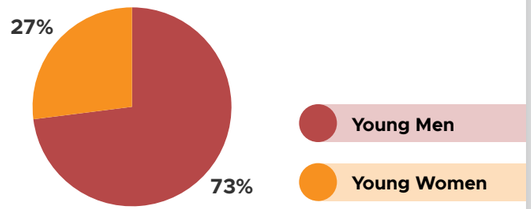
**Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Students with 504 plans

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, students with IEPs, English language learners

We lack enough data on Native American students and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

The Department plans to create an online course focusing on understanding computer science principles for elementary teachers as well as regional professional learning communities.

Middle School Computer Science

59%* of middle schools offer a foundational computer science course. The Department is working with districts to help them implement an introductory course by the 2025–26 school year.

**This percentage is based on data received from 73% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

NORTH DAKOTA

Ten Policies to Make Computer Science Foundational

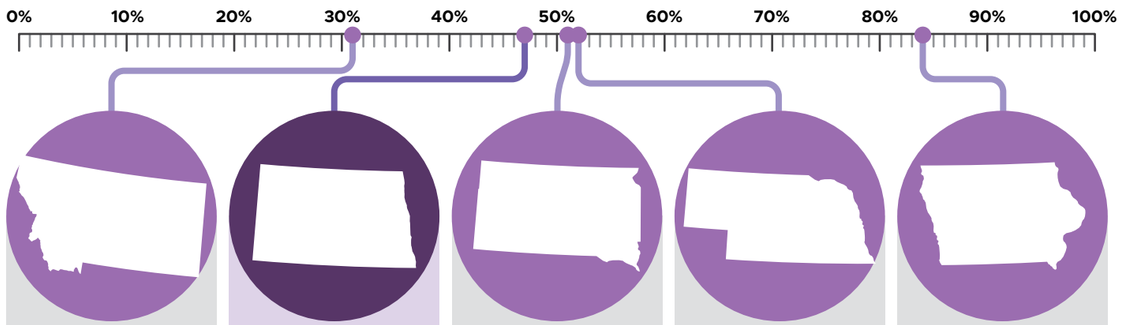
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

In 2023, the North Dakota legislature passed a requirement that every public and nonpublic high school must provide at least one unit of study in computer science or cybersecurity to every student, beginning with the graduating class of 2029. Elementary and middle schools are also required to offer instruction in computer science or cybersecurity.

Although North Dakota does not yet provide dedicated state funding, the Department of Public Instruction allocated federal ESSER funds to provide professional development in computer science and cybersecurity to educators, as well as funding the Center for Distance Education.

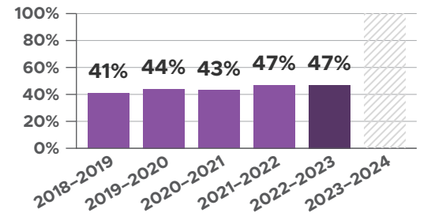
Comparative Access to Computer Science Courses (% of HS offering)



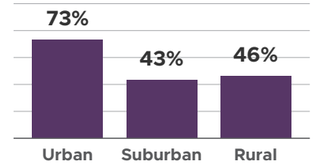
Montana	North Dakota	South Dakota	Nebraska	Iowa
31%	47%	51%	52%	84%
✗ State plan	✓ State plan	✗ State plan	✓ State plan	✓ State plan
✓ Funding	✗ Funding	✗ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

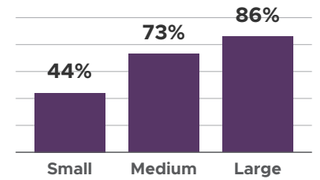
Access by School Year



Access by Geography*



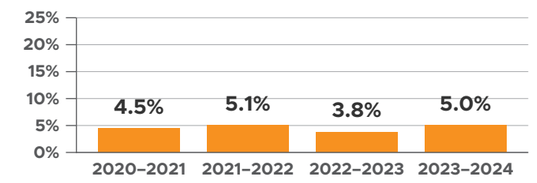
Access by School Size*



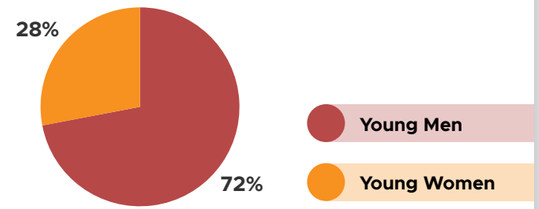
**Data is from the most recent data school year 2022–2023; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity**

We do not have data that indicates there are student groups that have reached parity.

***North Dakota reports the total number of students enrolled in foundational courses, but it does not provide demographic breakdowns by race. Therefore, we rely on AP data for demographic information.*

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, Native American students

We lack enough data on students with disabilities, English language learners, and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

North Dakota is piloting 'Family Code Night' at 50 schools, where families and students complete an Hour of Code to boost engagement and demystify computer science and cybersecurity.

Middle School Computer Science

North Dakota will be holding its 3rd annual, middle-school 'Cyber Madness' competition. The event brings together teams of middle schoolers from across the state to complete various, timed cybersecurity tasks.

OHIO

Ten Policies to Make Computer Science Foundational

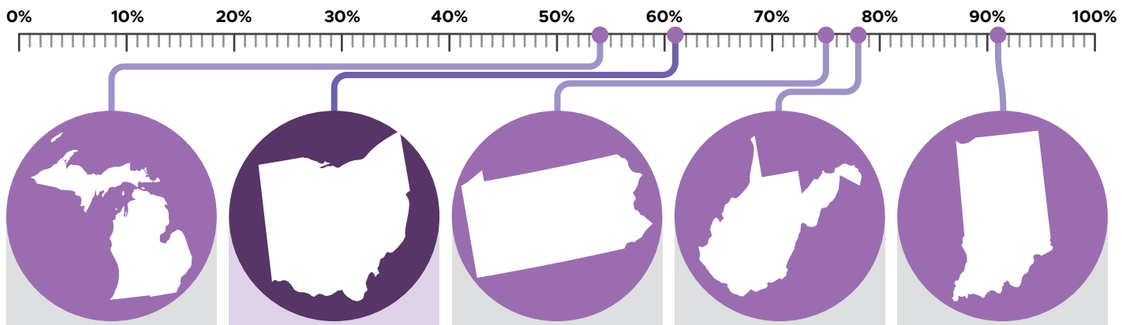
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

Ohio disbursed funding for computer science under the TeachCS Grant Program, allocating $8M to 17 colleges, universities, and Educational Service Centers to provide educators with funding for computer science endorsements, licenses, or continuing education. At least 1,100 educators are estimated to be impacted, with 650 of those newly qualified to teach computer science.

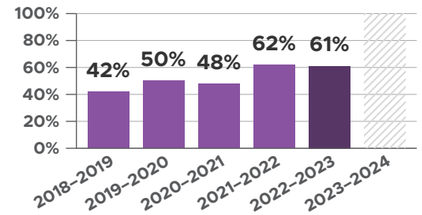
We encourage Ohio to consider passing a computer science graduation requirement to fully expand equitable participation in the subject.

Comparative Access to Computer Science Courses (% of HS offering)

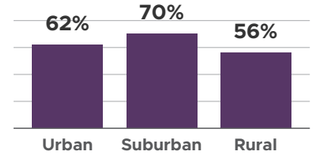


Percentage of Public High Schools Offering Foundational Computer Science

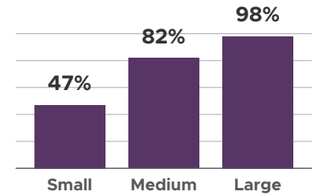
Access by School Year



Access by Geography*



Access by School Size*



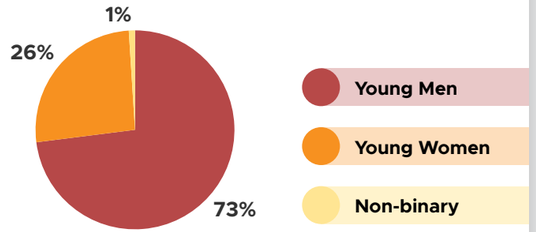
**Data is from the most recent data school year 2022–2023; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year

Ohio does collect enrollment data for all foundational computer science courses; however it is not in a format that we are able to use for this report. We are working with the state to disaggregate the data. For this year, we used AP exam data from the College Board for participation statistics.

Participation by Gender in AP Exams



Student Groups That Reached or Neared Parity in AP Exams

We do not have data that indicates there are student groups that have reached parity.

Student Groups That Are Underrepresented in AP Exams

Young women, Black students, Hispanic/Latino students

We lack enough data on Native American students, students with disabilities, English language learners, and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

The Ohio STEM Learning Network has developed a K–5 Computer Science Cohort program for teachers across Ohio. The cohort focuses on how to integrate computer science into their classroom.

The TeachCS program, which funded computer science teacher certification and licensure in 2024, also allows teachers to earn a supplemental license based on their existing grade level certification, this will help more elementary and middle school teachers to become certified to teach computer science.

OKLAHOMA

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

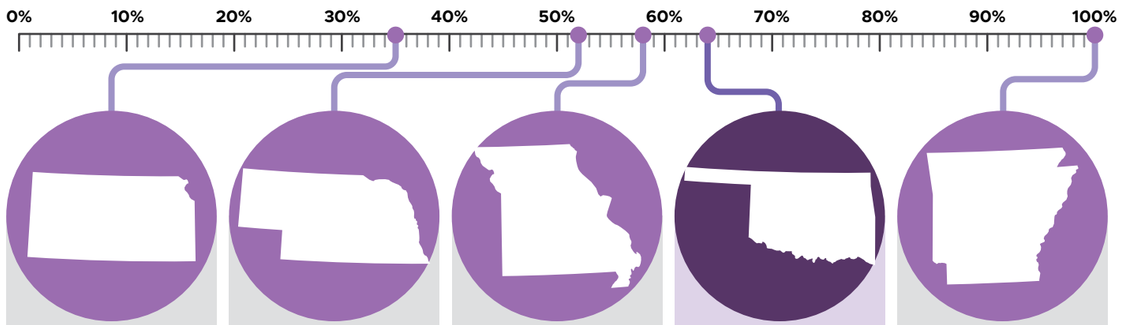
Policy Implementation

House Bill 3278 bolstered Oklahoma's make computer science count policy allowing for additional flexibility for students.

Senate Bill 593 (2019) authorized the Oklahoma State Department of Education to create a grant program for computer science professional learning, but no funding has been allocated. We encourage the state to allocate funds to these grants.

Oklahoma is in a great position to adopt a computer science graduation requirement, with an appropriate implementation timeline, during the 2025 session.

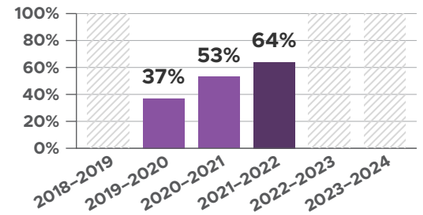
Comparative Access to Computer Science Courses (% of HS offering)



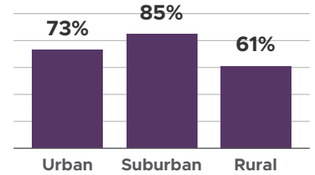
Kansas	Nebraska	Missouri	Oklahoma	Arkansas
35%	52%	58%	64%	100%
✗ State plan	✓ State plan	✓ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✓ Funding	✗ Funding	✓ Funding
✗ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

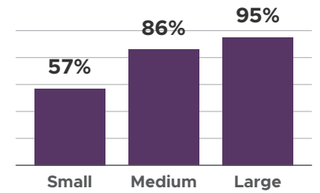
Access by School Year



Access by Geography*



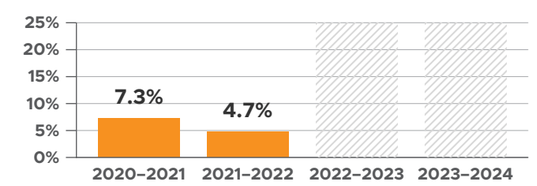
Access by School Size*



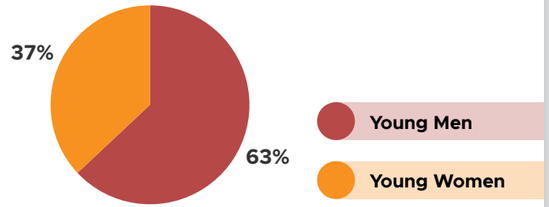
**Data is from the most recent data school year 2021–2022; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Native American students, students with 504 plans

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Beginning in the 2024–25 school year, all Oklahoma public elementary and middle schools (including public charter schools) will be required to offer instruction aligned to the Oklahoma Academic Standards for Computer Science.

OREGON

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
●	●	●	●	●

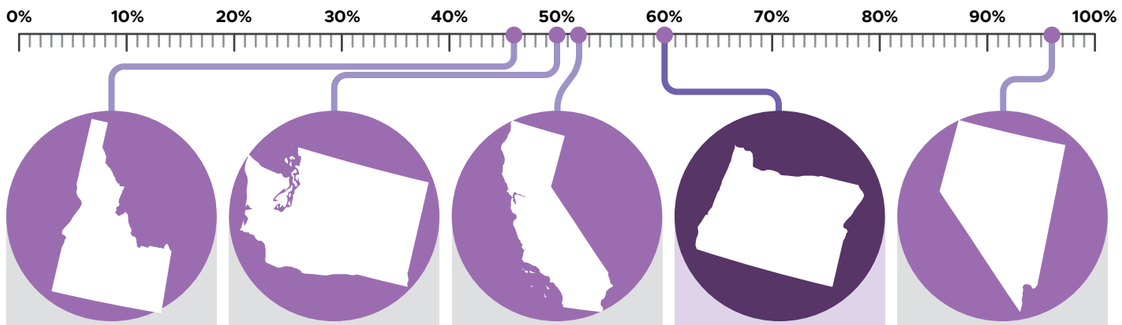
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement
●	●	●	●	●

Policy Implementation

The Oregon Department of Education and the Higher Education Coordinating Committee developed a state plan to expand computer science education, which was presented to the State Board of Education.

The State of Oregon has not currently provided a permanent position for computer science education at the Oregon Department of Education. Code.org strongly encourages that the State of Oregon provide permanent funding and position authority to continue the work on computer science education.

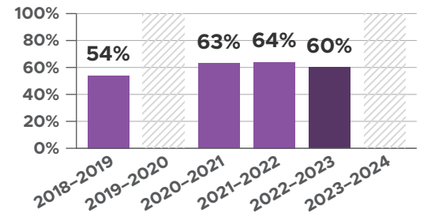
Comparative Access to Computer Science Courses (% of HS offering)



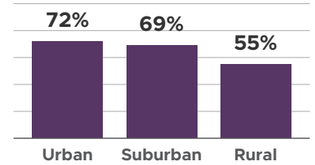
Idaho	Washington	California	Oregon	Nevada
46%	**50%**	**52%**	**60%**	**96%**
✓ State plan	✓ State plan	✓ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✓ Funding	✗ Funding	✓ Funding
✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

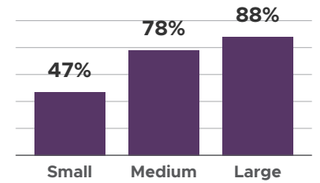
Access by School Year



Access by Geography*



Access by School Size*



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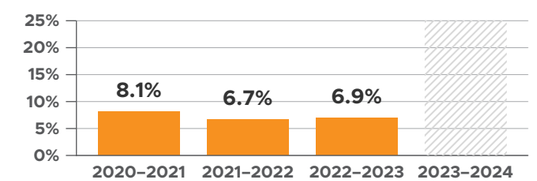
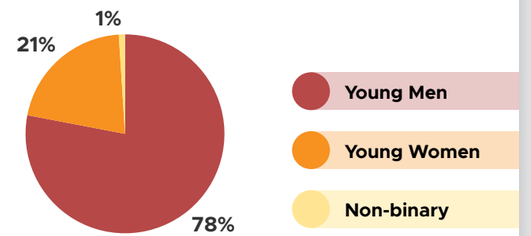
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, economically disadvantaged students**

Student Groups That Are Underrepresented

Young women, Hispanic/Latino students, students with IEPs, English language learners

We lack enough data on Native American students and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

***Oregon uses a different state definition of economically disadvantaged students and their data indicates these student are underrepresented.*

Computer Science Prior to High School

Elementary School Computer Science

Southern Oregon University is conducting NSF-funded research on computational thinking in elementary classrooms and developing a teacher-leader cohort to enhance the integration in elementary schools.

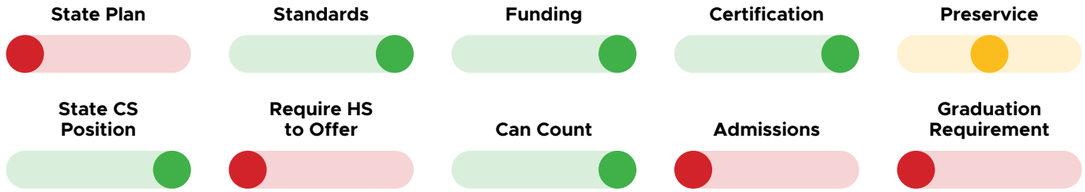
Middle School Computer Science

30%* of middle schools offer computer science with 5% of students enrolled.

**This percentage is based on data received from 51% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

PENNSYLVANIA

Ten Policies to Make Computer Science Foundational

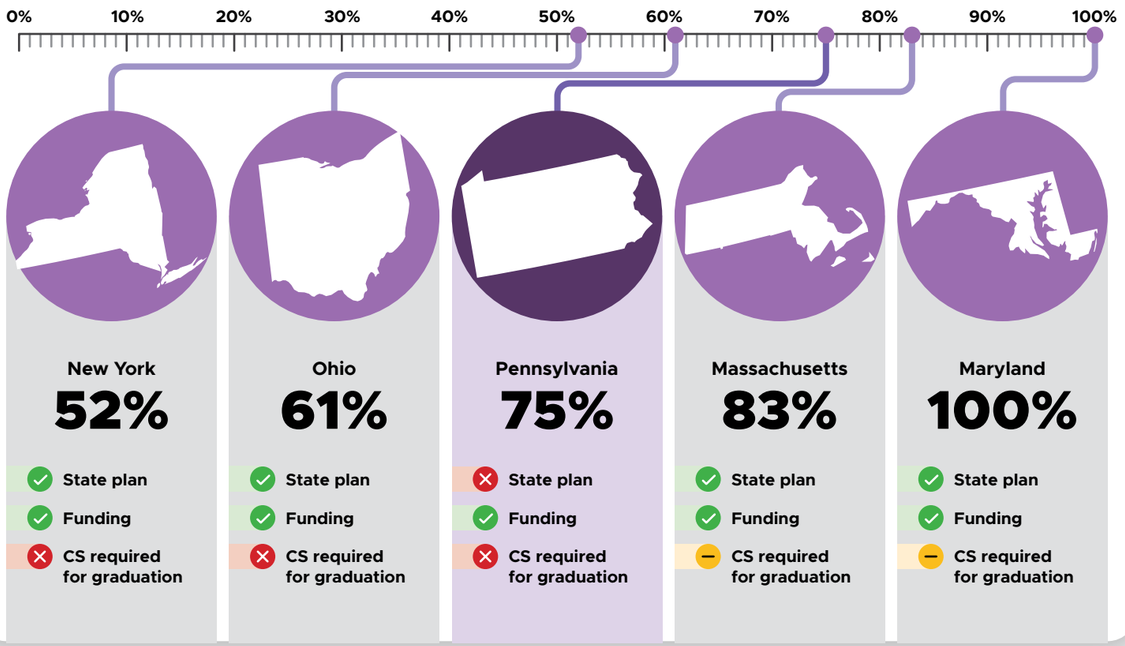


Policy Implementation

As of this report's publication, the Pennsylvania Legislature is considering a bill to ensure every high school offers computer science. We strongly encourage the state to pass legislation on this crucial policy.

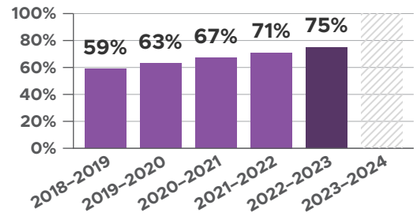
Since 2018, Pennsylvania's state budgets have dedicated $20M annually to PAsmart, a program established to expand STEM and computer science education, including teacher professional development. PAsmart grants prioritize proposals that boost participation in computer science education for historically underserved and underrepresented populations. In 2023, this was increased to $25M.

Comparative Access to Computer Science Courses (% of HS offering)

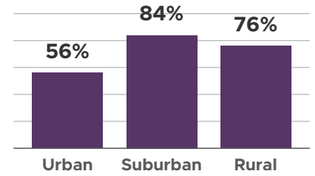


Percentage of Public High Schools Offering Foundational Computer Science

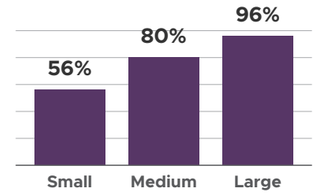
Access by School Year



Access by Geography*



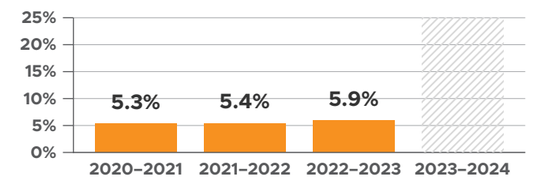
Access by School Size*



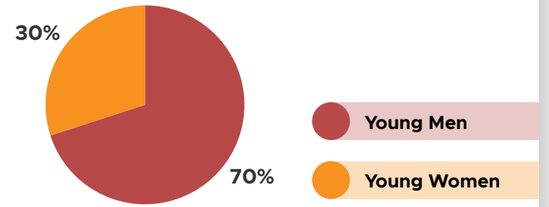
**Data is from the most recent data school year 2022–2023; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Students with 504 plans

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

13%* of elementary schools offer computer science.

Middle School Computer Science

28%** of middle schools offer computer science with 7% of students enrolled.

**This percentage is based on data received from 96% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*
***Pennsylvania reports data from all middle schools.*

RHODE ISLAND

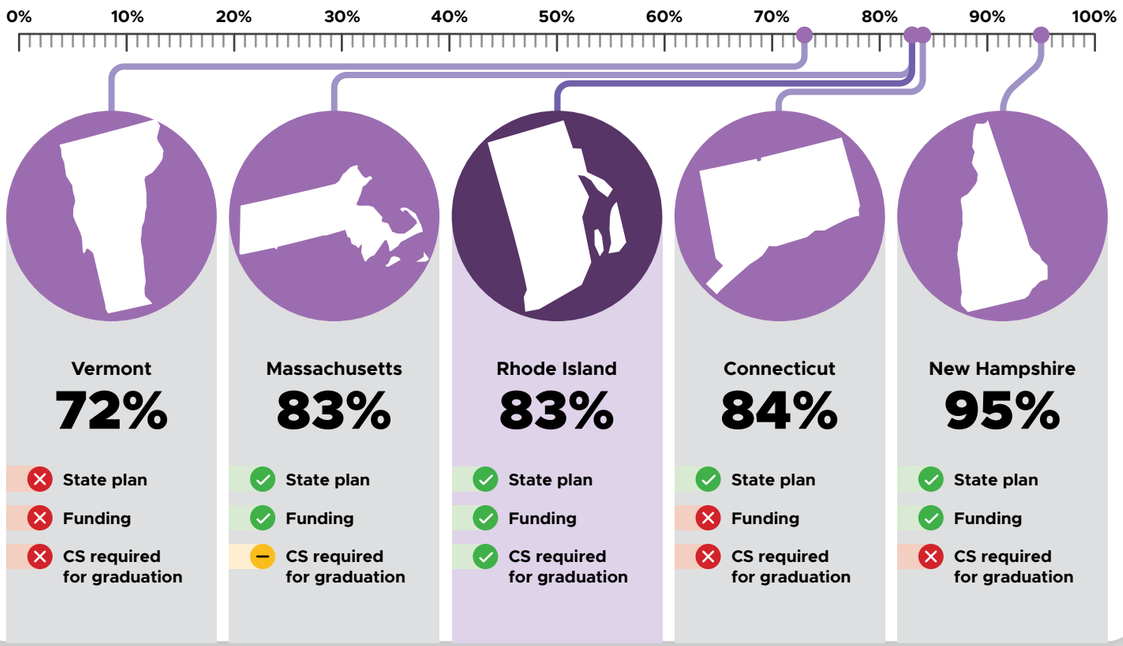
Ten Policies to Make Computer Science Foundational

Policy Implementation

In 2022, the Board of Education approved new secondary regulations, including that students must demonstrate proficiency in computer science, starting with the class of 2028. While most students will fulfill this requirement through a stand-alone course, alternative competency options will also be available.

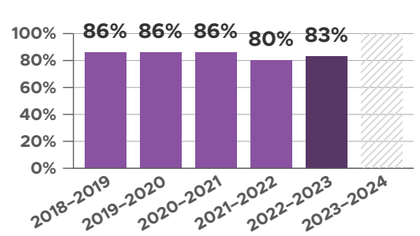
In 2019, CS4RI received a federal grant to support 20 Rhode Island high schools in establishing or enhancing computer science pathways, with a particular focus on work-based learning. In the next year, a formal evaluation of the grant's outcomes will be published.

Comparative Access to Computer Science Courses (% of HS offering)

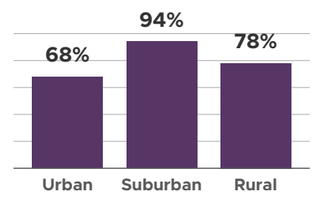


Percentage of Public High Schools Offering Foundational Computer Science

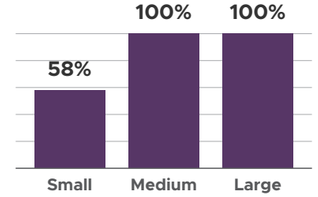
Access by School Year



Access by Geography*



Access by School Size*



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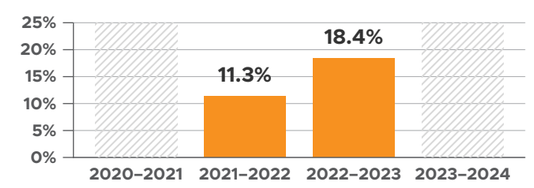
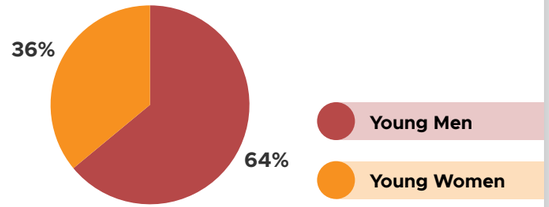
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, economically disadvantaged students, students with 504 plans, English language learners

Student Groups That Are Underrepresented

Young women, students with IEPs

We lack enough data on Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

The Coding As Another Language (CAL) Grant is being implemented in 13 Rhode Island elementary schools across 10 districts, focusing on K–2 students. To ensure sustainability, educators have been designated as Tech Leaders for their schools to help train more teachers.

Middle School Computer Science

50%* of middle schools offer computer science with 34% of students enrolled.

**This percentage is based on data received from 73% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

SOUTH CAROLINA

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
●	●	●	●	●

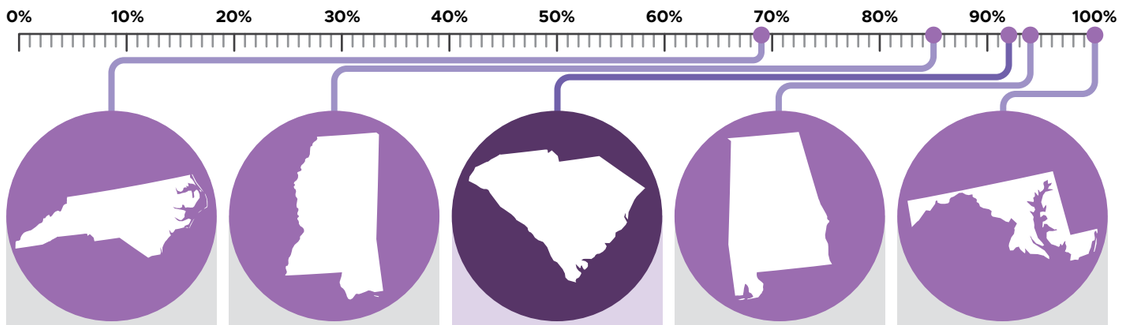
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement
●	●	●	●	●

Policy Implementation

The South Carolina Legislature continued to fund teacher professional development, appropriating $3.5M to the Department of Education in 2024. Over the last seven years, the state has appropriated over $10M to computer science education.

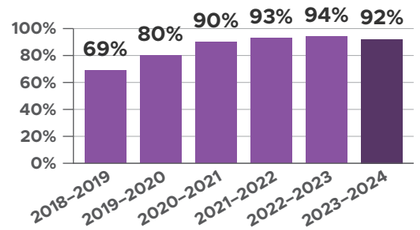
We strongly encourage South Carolina to develop a state plan for computer science; this policy is crucial for ensuring long-term success and sustainability.

Comparative Access to Computer Science Courses (% of HS offering)

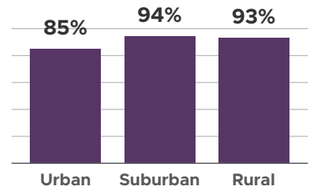


Percentage of Public High Schools Offering Foundational Computer Science

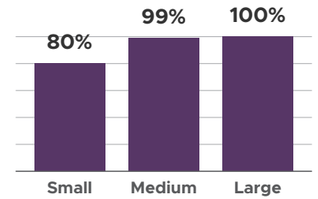
Access by School Year



Access by Geography*



Access by School Size*



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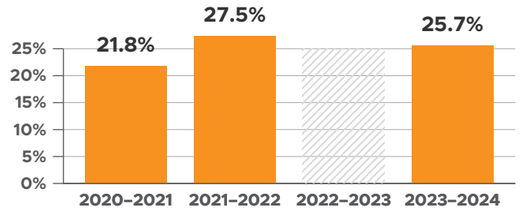
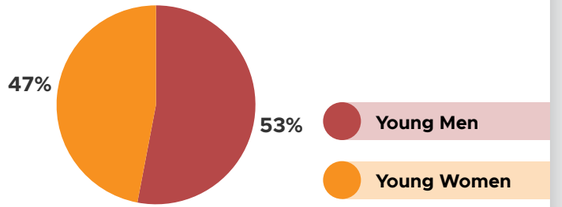
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, English language learners

Student Groups That Are Underrepresented

Young women, economically disadvantaged students, students with IEPs

We lack enough data on Native American students and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

13%* of elementary schools offer computer science with 8% of students enrolled.

Middle School Computer Science

64%** of middle schools offer computer science with 11% of students enrolled.

**This percentage is based on data received from 96% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*
***This percentage is based on data received from 97% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

SOUTH DAKOTA

Ten Policies to Make Computer Science Foundational

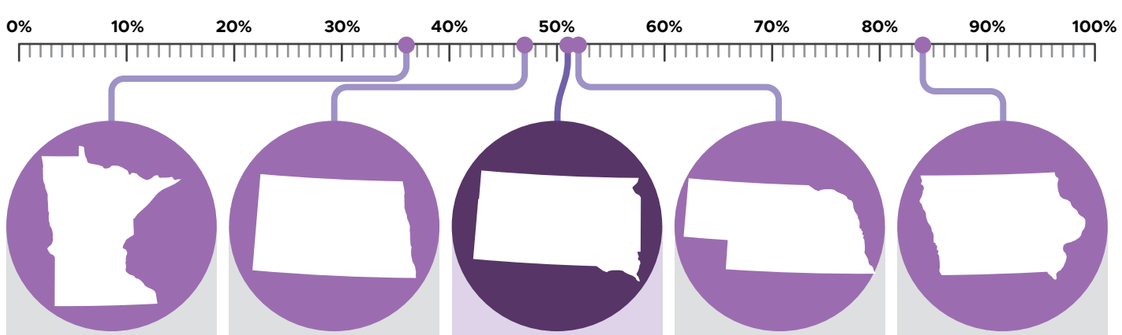
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

We are not aware of any updates in state-wide computer science education policies.

We encourage South Dakota to renew its focus on this crucial subject; creating a state plan and hiring a computer science supervisor will help to guide this work.

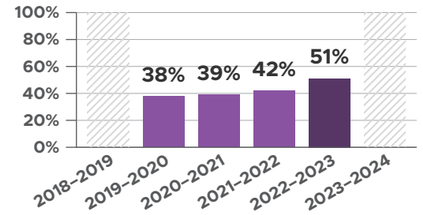
Comparative Access to Computer Science Courses (% of HS offering)



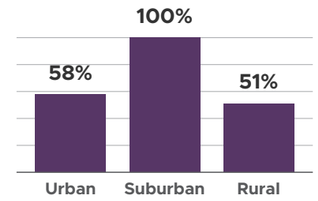
Minnesota	North Dakota	South Dakota	Nebraska	Iowa
36%	**47%**	**51%**	**52%**	**84%**
✓ State plan	✓ State plan	✗ State plan	✓ State plan	✓ State plan
✓ Funding	✗ Funding	✗ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

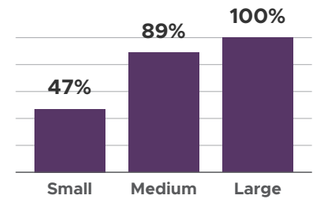
Access by School Year



Access by Geography*



Access by School Size*



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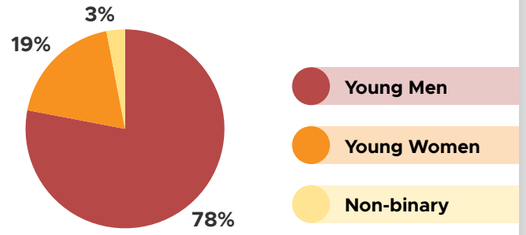
Participation in Foundational High School Computer Science*

Participation by School Year

South Dakota does not collect enrollment data for all foundational computer science courses. We used AP exam data from the College Board for participation statistics, but we know participation in all foundational computer science courses is broader than just AP. We encourage the state to begin collecting and reporting comprehensive course enrollment data.

Participation by Gender in AP Exams



Student Groups That Reached or Neared Parity in AP Exams

Black students

Student Groups That Are Underrepresented in AP Exams

Young women, Hispanic/Latino students, Native American students

We lack enough data on students with disabilities, English language learners, and economically disadvantaged students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Unfortunately, we have very little data from South Dakota on elementary and middle school computer science education. We encourage the state to collect and report on K–12 course offerings and enrollment.

TENNESSEE

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
●	●	●	●	●

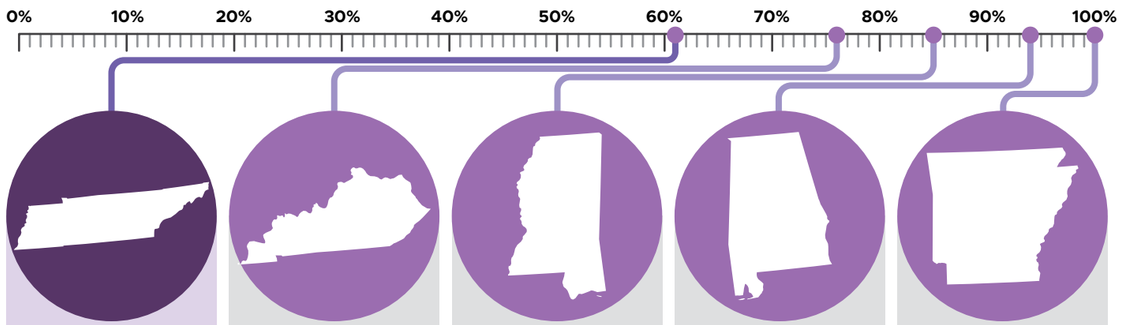
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement
●	●	●	●	●

Policy Implementation

In 2022, the Tennessee Legislature passed a requirement for all high school students, starting with the class of 2028, to earn a credit in computer science. Additionally, all middle school students must complete a grading period of computer science, and computer science must be integrated into core content for all elementary students.

In the next year, the Department of Education will focus on providing additional guidance, support, and training to teachers and schools to meet the requirements passed by the legislature.

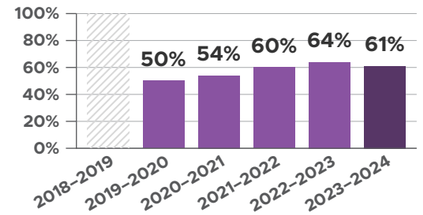
Comparative Access to Computer Science Courses (% of HS offering)



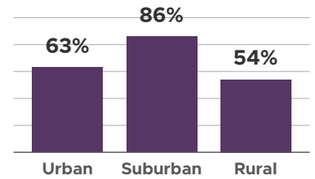
Tennessee	Kentucky	Mississippi	Alabama	Arkansas
61%	**76%**	**85%**	**94%**	**100%**
✓ State plan	✓ State plan	✓ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✓ Funding	✓ Funding	✓ Funding
✓ CS required for graduation	✗ CS required for graduation	− CS required for graduation	✓ CS required for graduation	✓ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

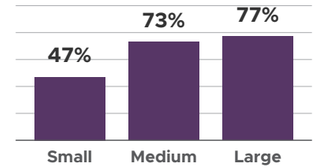
Access by School Year



Access by Geography*



Access by School Size*



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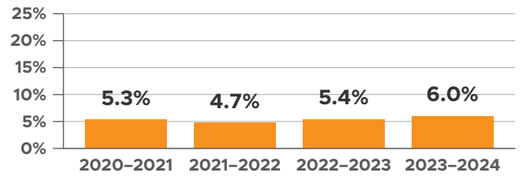
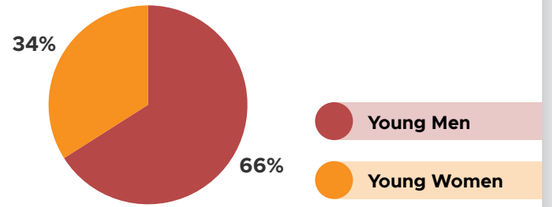
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, economically disadvantaged students, students with 504 plans, English language learners

Student Groups That Are Underrepresented

Young women

We lack enough data on Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

26%* of elementary schools offer computer science with 14% of students enrolled.

Middle School Computer Science

44%* of middle schools offer computer science with 18% of students enrolled.

**Tennessee reports data from nearly all middle and elementary schools.*

TEXAS

Ten Policies to Make Computer Science Foundational

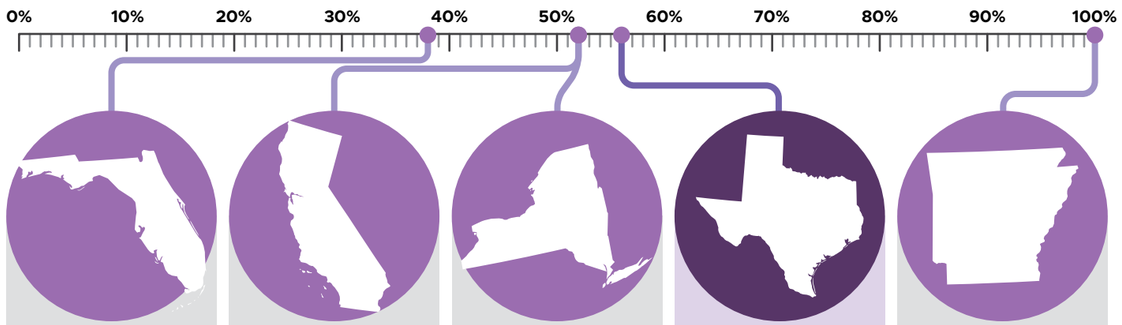
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

The Texas Legislature funded professional development for computer science education, appropriating $12M to state education agencies in 2023 for the next two years.

The newly updated Texas Essential Knowledge and Skills (TEKS) for K–8 were approved by the State Board of Education. These state standards now include computational thinking, programming and cybersecurity components and are required to be implemented in the 2024–25 school year. The University of Texas at Austin has created a site and resources with lessons aligned to the new standards.

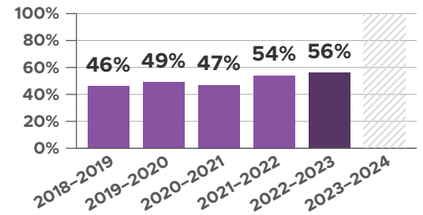
Comparative Access to Computer Science Courses (% of HS offering)



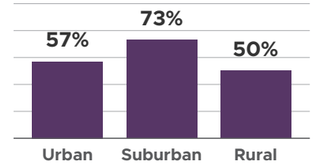
Florida	California	New York	Texas	Arkansas
38%	52%	52%	56%	100%
✗ State plan	✓ State plan	✓ State plan	✗ State plan	✓ State plan
✓ Funding	✓ Funding	✓ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

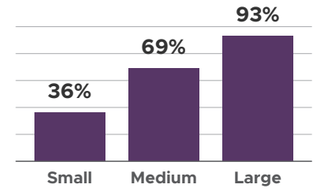
Access by School Year



Access by Geography*



Access by School Size*



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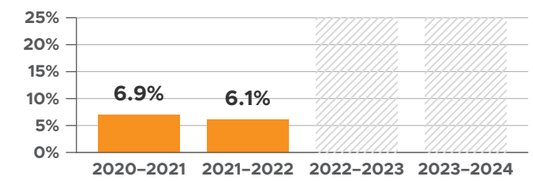
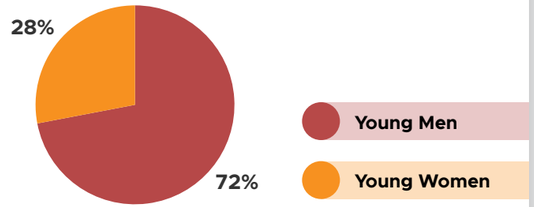
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Students with 504 plans

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

The Texas Computer Science Pipeline is funding Launch K–5 which train-the-trainer designed to support elementary teachers in TX to integrate the K–5 Technology Application TEKS into core academic instruction. Launch K–5 plans to train 4,000 elementary educators by 2026.

Middle School Computer Science

The WeTeach_CS Middle School AI Hub is supporting 22 middle school teachers in a year-long experience designed to educate, empower, and motivate teachers to promote AI literacy in their middle school classrooms.

UTAH

Ten Policies to Make Computer Science Foundational

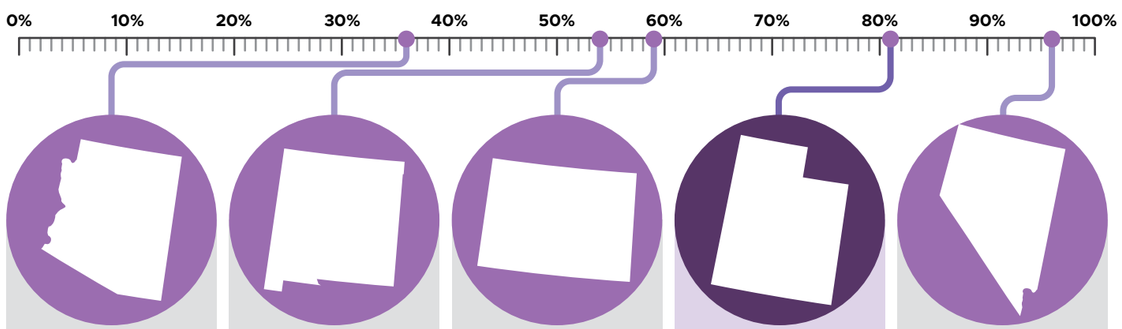
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

The Utah Legislature continued to fund computer science initiatives, appropriating $10.1M in 2024. Over the last eight years the state has appropriated more than $40M for computer science education.

We encourage Utah to consider amending their digital studies requirement to a computer science requirement to fully expand equitable participation to the subject.

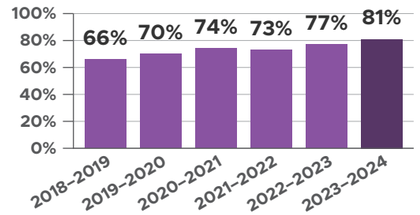
Comparative Access to Computer Science Courses (% of HS offering)



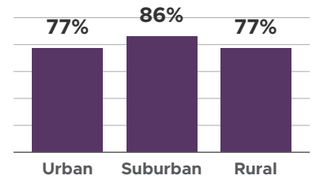
Arizona	New Mexico	Colorado	Utah	Nevada
43%	54%	59%	81%	96%
✗ State plan	✓ State plan	✗ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✓ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

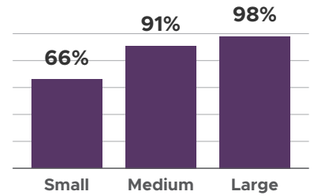
Access by School Year



Access by Geography*



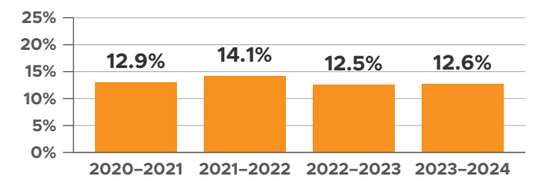
Access by School Size*



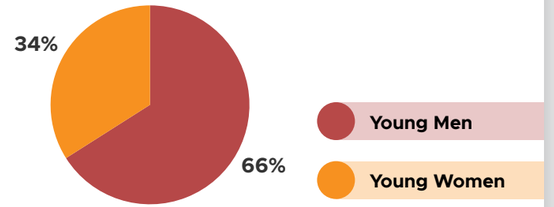
**Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Hispanic/Latino students, economically disadvantaged students, students with 504 plans, English language learners

Student Groups That Are Underrepresented

Young women, students with IEPs

We lack enough data on Native American students and Black students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

24%* of elementary schools offer computer science.

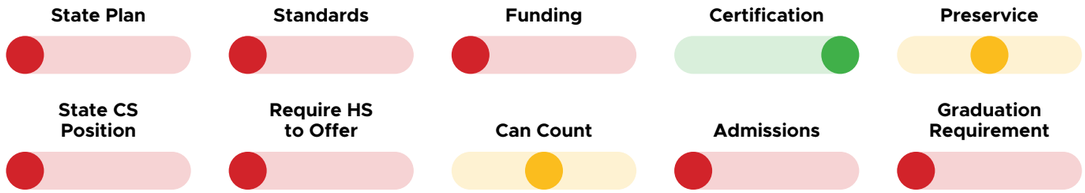
Middle School Computer Science

71%** of middle schools offer computer science with 8% of students enrolled.

**This percentage is based on data received from 34% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*
***This percentage is based on data received from 85% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

VERMONT

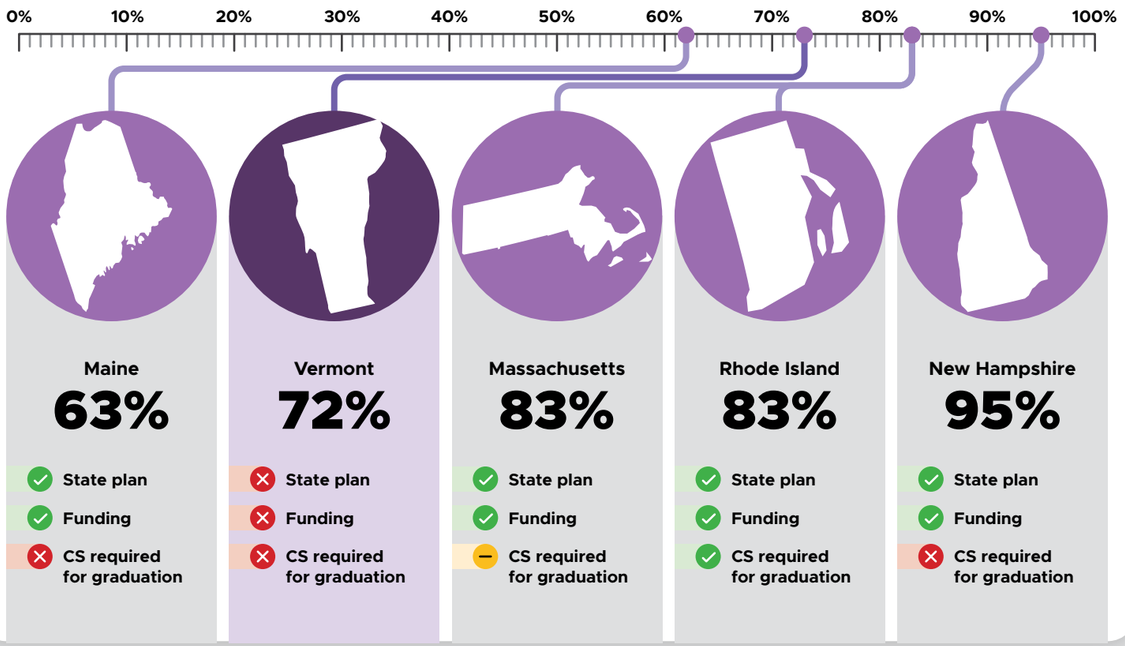
Ten Policies to Make Computer Science Foundational



Policy Implementation

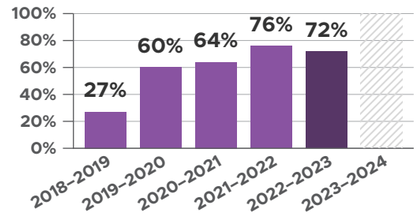
While Vermont does not meet our criteria for a dedicated state computer science position, the mathematics content specialist at the Vermont Agency of Education is involved in statewide computer science education. We encourage the state to establish a content specialist role specifically focused on computer science, with a clear title and job description.

Comparative Access to Computer Science Courses (% of HS offering)

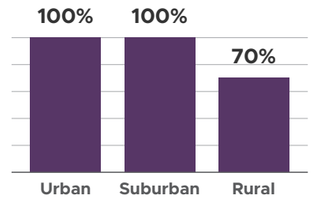


Percentage of Public High Schools Offering Foundational Computer Science

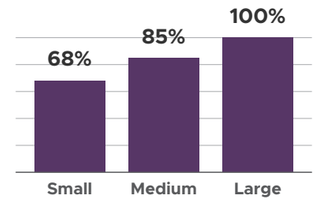
Access by School Year



Access by Geography*



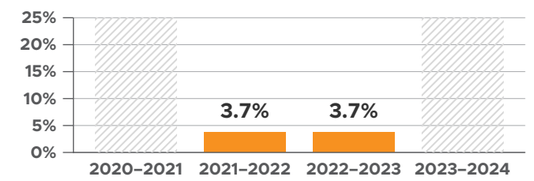
Access by School Size*



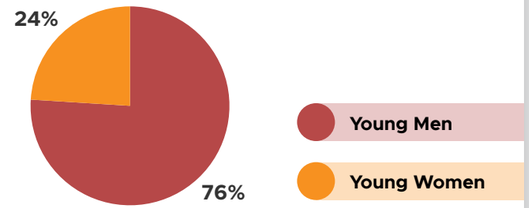
**Data is from the most recent data school year 2022–2023; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, students with 504 plans, English language learners

Student Groups That Are Underrepresented

Young women, economically disadvantaged students, students with IEPs

We lack enough data on Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Vermont schools participate in enrichment activities to encourage student interest and involvement in computer science. The Agency of Education surveys consistently show a majority of school districts annually participate in Hour of Code. A majority of school districts also report robotics activities from elementary through secondary grades. More than 50 percent of Vermont school districts also report hosting after school computer clubs, summer offerings, and other extended learning opportunities.

VIRGINIA

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

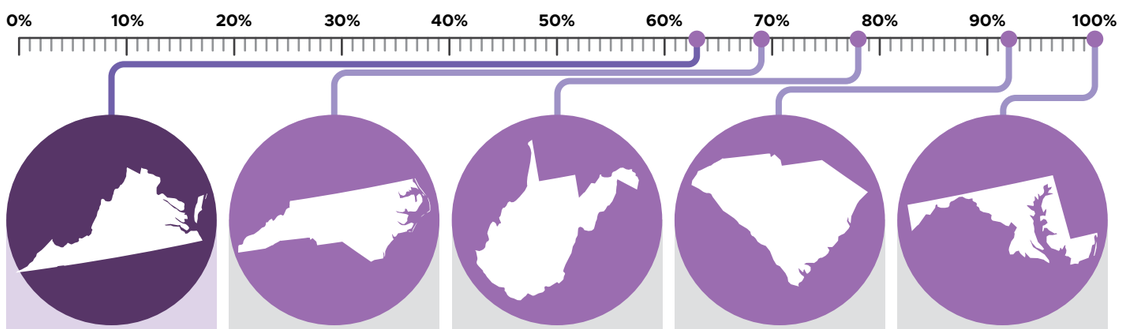
Policy Implementation

The Virginia General Assembly continued to fund computer science education and professional development, appropriating $3.8M towards initiatives in 2024. Over the last eight years, the state has appropriated over $16M to computer science education.

In 2024, the Virginia Department of Education updated the K–12 computer science standards.

We encourage Virginia to consider passing a computer science graduation requirement to fully expand equitable participation in the subject.

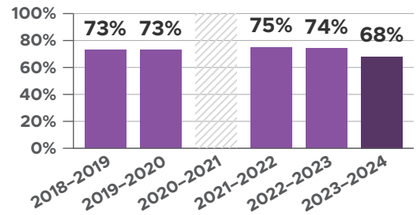
Comparative Access to Computer Science Courses (% of HS offering)



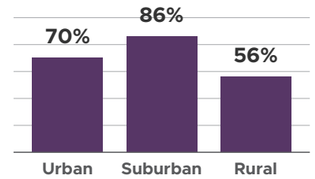
Virginia	North Carolina	West Virginia	South Carolina	Maryland
68%	**69%**	**78%**	**92%**	**100%**
✗ State plan	✓ State plan	✓ State plan	– State plan	✓ State plan
✓ Funding	✓ Funding	✗ Funding	✓ Funding	✓ Funding
✗ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation	– CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

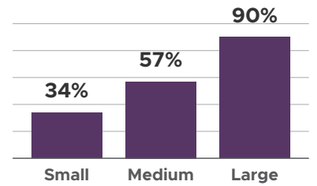
Access by School Year



Access by Geography*



Access by School Size*



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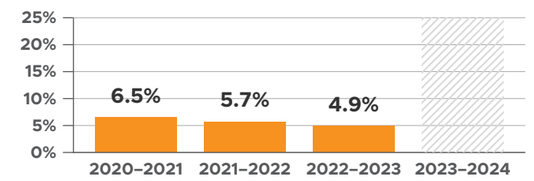
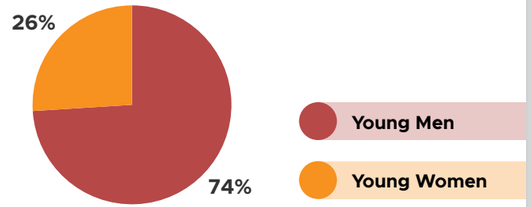
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Students with 504 plans

Student Groups That Are Underrepresented

Young women, Black students, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

17%* of elementary schools offer computer science.

Middle School Computer Science

30%** of middle schools offer computer science with 3% of students enrolled.

**This percentage is based on data received from 30% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*
***This percentage is based on data received from 89% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

WASHINGTON

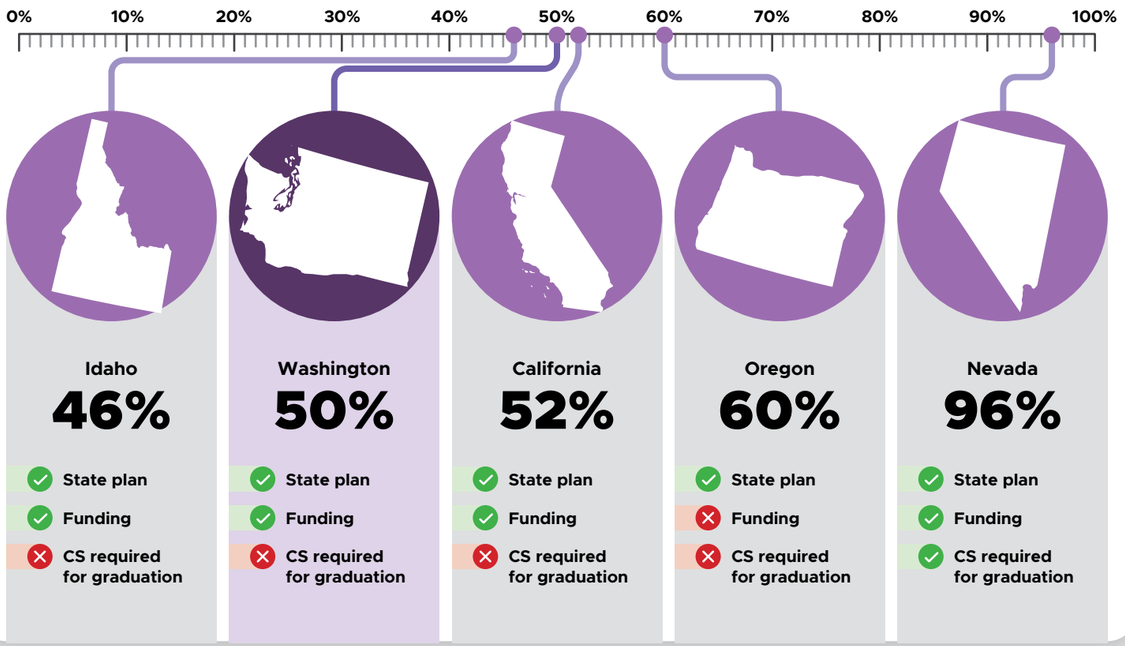
Ten Policies to Make Computer Science Foundational

Policy Implementation

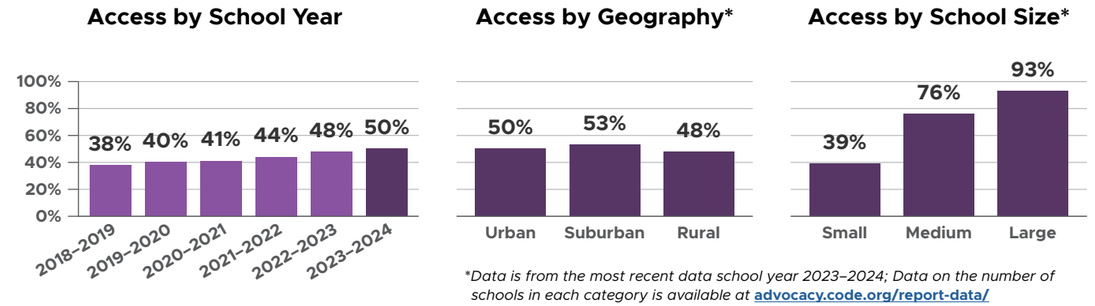
The Washington Legislature continued to fund the Computer Science Grant Program, appropriating $1M to the Office of Superintendent of Public Instruction in 2024. Over the last nine years, the state has appropriated $10M to computer science education.

The Legislature considered a computer science graduation requirement to be implemented for the class of 2029, but it ultimately did not pass. We strongly encourage the state to consider passing a computer science graduation requirement in the future to fully expand equitable participation to the subject.

Comparative Access to Computer Science Courses (% of HS offering)



Percentage of Public High Schools Offering Foundational Computer Science



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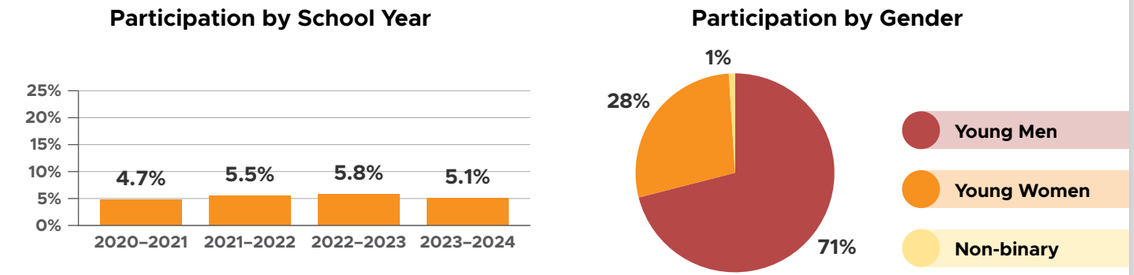
Participation in Foundational High School Computer Science*



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, students with 504 plans

Student Groups That Are Underrepresented

Young women, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

20%* of elementary schools offer computer science.

Middle School Computer Science

30%** of middle schools offer computer science with 3% of students enrolled.

**This percentage is based on data received from 53% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*
***Washington reports data from nearly all middle schools.*

WEST VIRGINIA

Ten Policies to Make Computer Science Foundational

State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

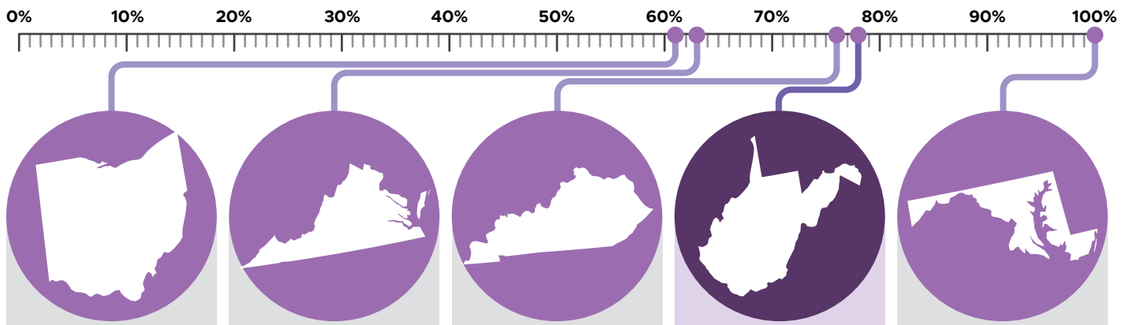
Policy Implementation

This coming year, the West Virginia Department of Education is planning to work closely with institutions of higher education to support computer science teacher preparation.

We encourage West Virginia to consider passing a computer science graduation requirement to more fully expand equitable participation to the subject.

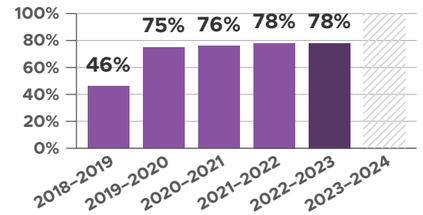
Although West Virginia qualifies as having funding on our rubric due to its historical funding, it did not allocate state funds for the subject in 2024. We encourage the Legislature to allocate funding in order to continue to support computer science capacity in small schools.

Comparative Access to Computer Science Courses (% of HS offering)

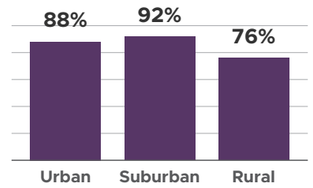


Percentage of Public High Schools Offering Foundational Computer Science

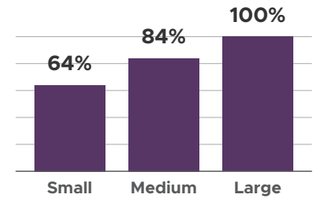
Access by School Year



Access by Geography*



Access by School Size*



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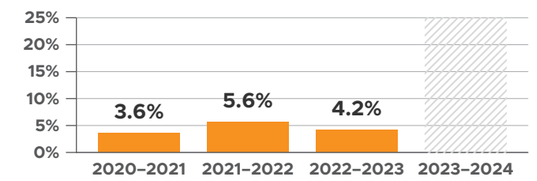
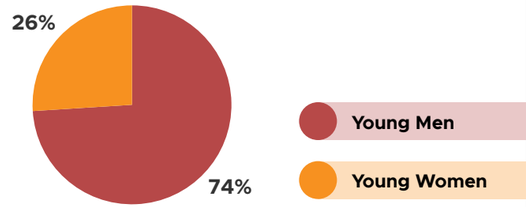
We are working closely with the state to get updated data for next year

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students, Hispanic/Latino students, students with 504 plans

Student Groups That Are Underrepresented

Young women, economically disadvantaged students, students with IEPs

We lack enough data on Native American students and English language learners to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

The West Virginia Board of Education has required all elementary schools to integrate computer science since the 2022–23 school year.

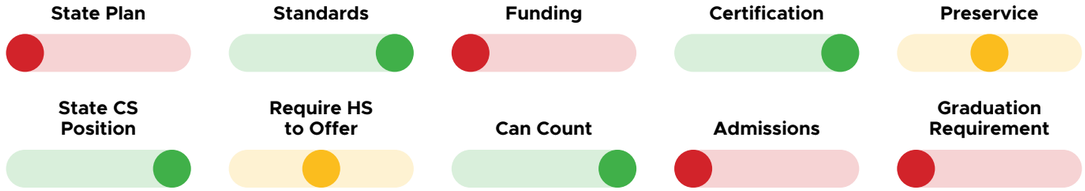
Middle School Computer Science

37%* of middle schools offer computer science with 21% of students enrolled.

**West Virginia reports data from nearly all middle schools.*

WISCONSIN

Ten Policies to Make Computer Science Foundational

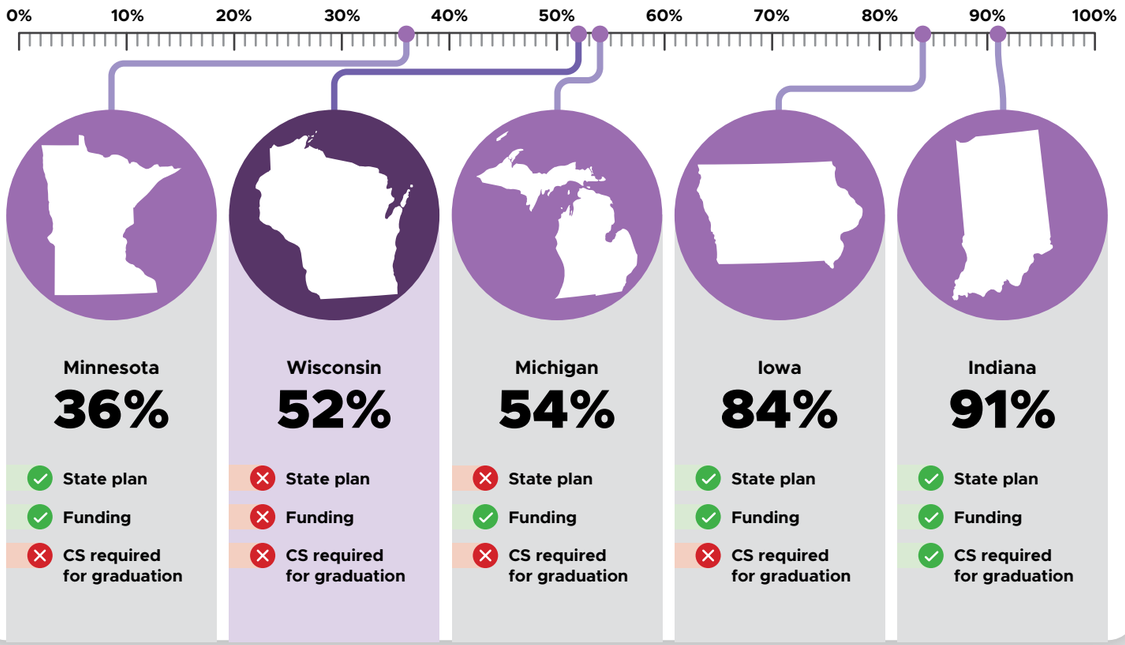


Policy Implementation

The Wisconsin Department of Public Instruction has begun planning to update Wisconsin's State Computer Science Strategic Plan from 2022. The updated plan is expected to be finalized by the summer of 2025.

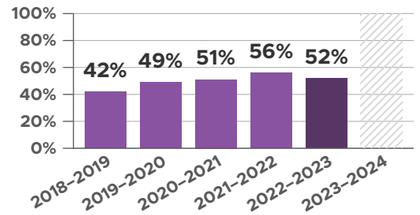
We encourage the state to pass dedicated funding for computer science professional development; this will help more schools be able to offer this crucial subject.

Comparative Access to Computer Science Courses (% of HS offering)

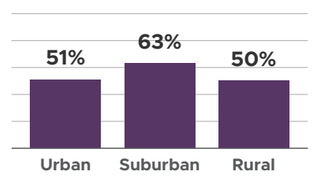


Percentage of Public High Schools Offering Foundational Computer Science

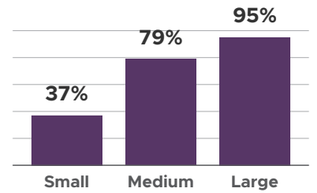
Access by School Year



Access by Geography*



Access by School Size*



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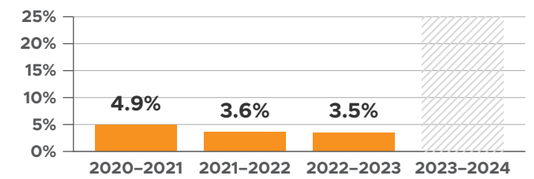
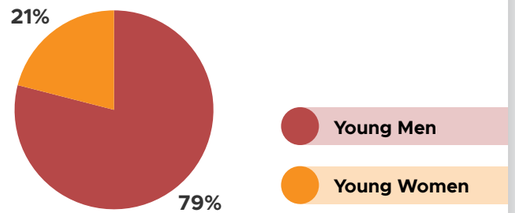
Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Black students

Student Groups That Are Underrepresented

Young women, Hispanic/Latino students, economically disadvantaged students, students with IEPs, English language learners

We lack enough data on Native American students and students with 504 plans to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

While we do not have statewide updates from Wisconsin, we have district updates. Milwaukee Public Schools has trained 156 teachers in the Computer Science Discoveries curriculum through the NSF PUMP-CS grant. Teachers receive classroom support, including coaching, planning, modeling and co-teaching. There are also two ongoing projects that integrate computer science into math and science at the middle school level. There is a 6-8 grade level Professional Learning Community that builds community among computer science teachers and supports planning, implementation, pedagogy and collaboration. This year, PLC is focusing on physical computing to support robots ordered through ESSER Funds. Students in grades 6-8 have presented at city, state and national conferences.

WYOMING

Ten Policies to Make Computer Science Foundational

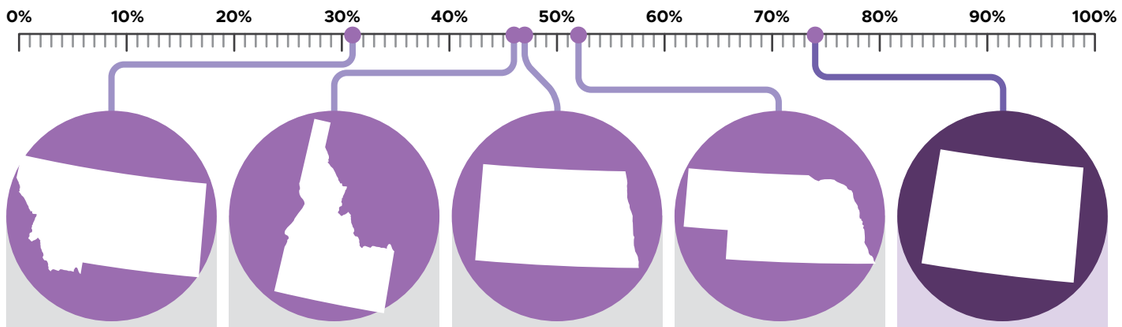
State Plan	Standards	Funding	Certification	Preservice
State CS Position	Require HS to Offer	Can Count	Admissions	Graduation Requirement

Policy Implementation

We are not aware of any updates in statewide computer science education policies.

We encourage the state to continue their focus on this crucial subject by ensuring passing a graduation requirement to ensure all students receive computer science education.

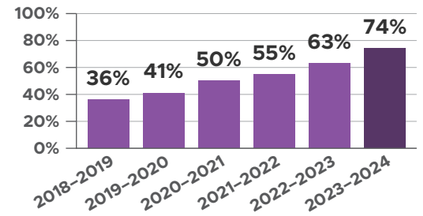
Comparative Access to Computer Science Courses (% of HS offering)



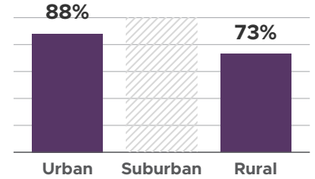
Montana	Idaho	North Dakota	Nebraska	Wyoming
31%	**46%**	**47%**	**52%**	**74%**
✗ State plan	✓ State plan	✓ State plan	✓ State plan	✓ State plan
✓ Funding	✓ Funding	✗ Funding	✓ Funding	✗ Funding
✗ CS required for graduation	✗ CS required for graduation	✓ CS required for graduation	✓ CS required for graduation	✗ CS required for graduation

Percentage of Public High Schools Offering Foundational Computer Science

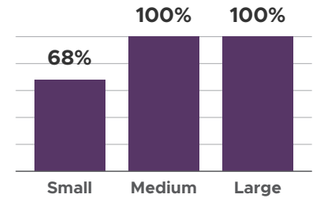
Access by School Year



Access by Geography*



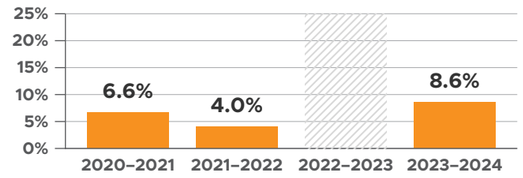
Access by School Size*



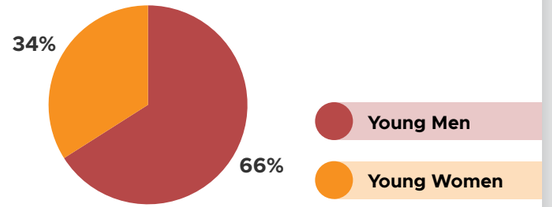
**Data is from the most recent data school year 2023–2024; Data on the number of schools in each category is available at advocacy.code.org/report-data/*

Participation in Foundational High School Computer Science*

Participation by School Year



Participation by Gender



Student Groups That Reached or Neared Parity

Economically disadvantaged students, students with 504 plans

Student Groups That Are Underrepresented

Young women, Hispanic/Latino students, Native American students, students with IEPs, English language learners

We lack enough data on Black students to determine representation.

**Detailed data on student participation is available at advocacy.code.org*

Computer Science Prior to High School

Elementary School Computer Science

38%* of elementary schools offer computer science.

Middle School Computer Science

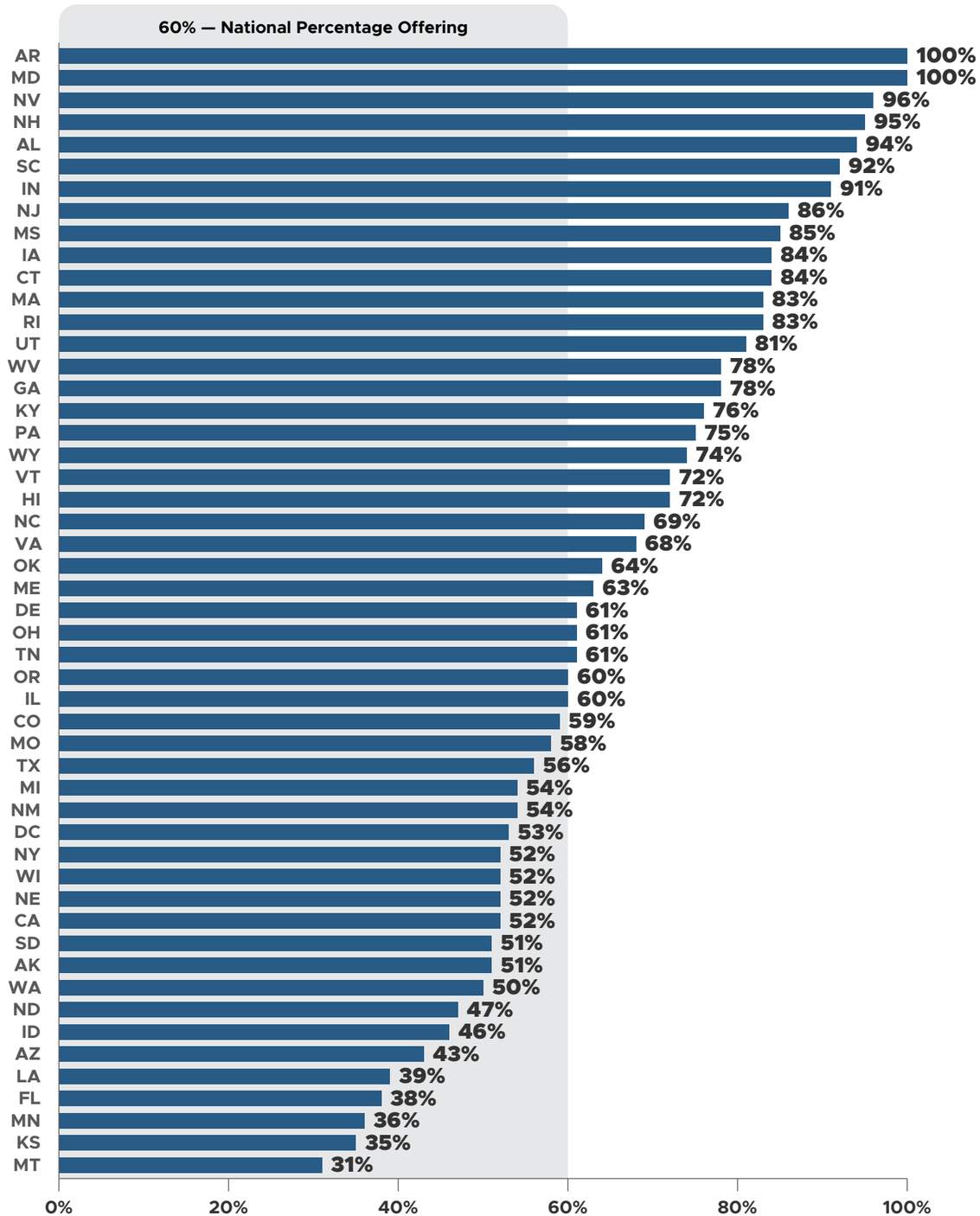
60%** of middle schools offer computer science with 6% of students enrolled.

**This percentage is based on data received from 42% of elementary schools in the state, therefore the actual number of schools teaching may be higher.*
***This percentage is based on data received from 65% of middle schools in the state, therefore the actual number of schools teaching may be higher.*

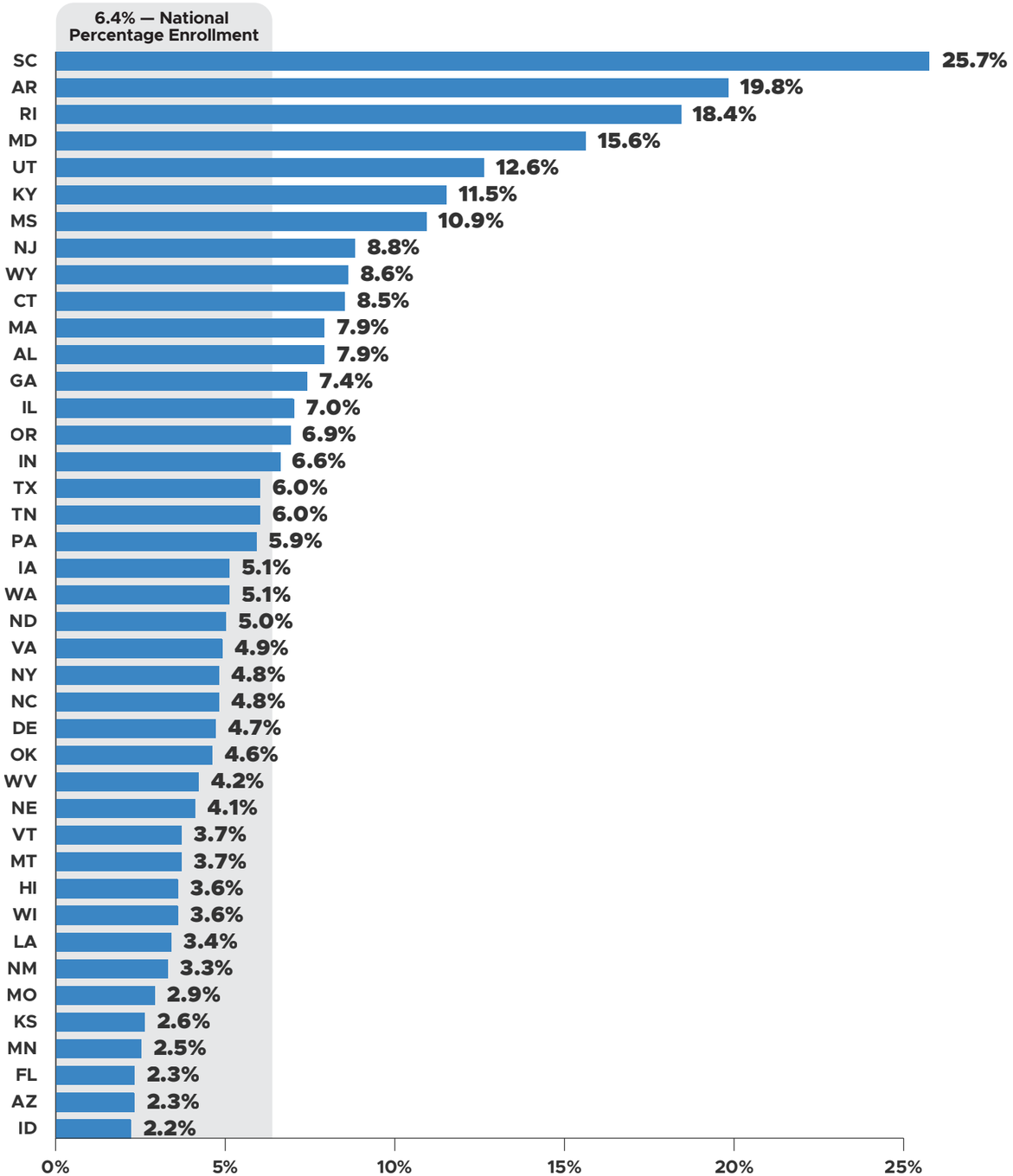
State-by-State Policy Adoption

STATE	STATE PLAN	STANDARDS	FUNDING	CERTIFICATION	PRESERVICE	STATE CS SUPERVISOR	REQUIRE HS TO OFFER	CAN COUNT	ADMISSIONS	GRADUATION REQUIREMENT
AL	Yes	Yes	Yes	Yes	Incentives	Yes	Yes	Yes	Yes	Yes
AK	Yes	Yes	No	Yes	No	Yes	No	District decision	No	No
AZ	No	Yes	Yes	Yes	No	Yes	No	District decision	No	No
AR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Graduation requirement	Yes	Yes
CA	Yes	Yes	Yes	Yes	No	Yes	No	District decision	Yes	No
CO	No	Yes	Yes	Yes	No	Yes	No	District decision	Yes	No
CT	Yes	Yes	No	Yes	Yes	Yes	Yes	District decision	No	No
DE	No	Yes	No	No	No	No	Yes	Yes	No	No
DC	No	No	No	Yes	No	No	No	Yes	No	No
FL	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
GA	Yes	Yes	Yes	Yes	Incentives	Yes	Yes	Yes	Yes	No
HI	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
ID	Yes	Yes	Yes	Yes	Incentives	Yes	Yes	Yes	Yes	No
IL	In progress	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
IN	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Graduation requirement	Yes	Yes
IA	Yes	Yes	Yes	Yes	No	Yes	Yes	District decision	Yes	No
KS	No	Yes	Yes	In Progress	Incentives	Yes	Yes	District decision	No	No
KY	Yes	Yes	Yes	Yes	No	Yes	No	District decision	Yes	No
LA	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Graduation requirement	Yes	Yes
ME	Yes	No	Yes	No	No	Yes	No	District decision	No	No
MD	Yes	Yes	Yes	Yes	Incentives	No	Yes	Yes	Yes	Other
MA	Yes	Yes	Yes	Yes	Incentives	Yes	No	Yes	Yes	Other
MI	No	Yes	Yes	No	No	Yes	No	Yes	No	No
MN	Yes	No	Yes	No	No	Yes	No	Yes	No	No
MS	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Other
MO	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
MT	No	Yes	Yes	Yes	Incentives	No	No	District decision	No	No
NE	Yes	In progress	Yes	No	No	Yes	Yes	Graduation requirement	No	Yes
NV	Yes	Yes	Yes	Yes	Incentives	Yes	Yes	Graduation requirement	Yes	Yes
NH	Yes	Yes	Yes	Yes	Yes	Yes	Yes	District decision	No	No
NJ	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
NM	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
NY	Yes	Yes	Yes	Yes	Incentives	Yes	No	District decision	No	No
NC	Yes	Yes	Yes	Yes	No	Yes	Yes	Graduation requirement	No	Yes
ND	Yes	Yes	No	Yes	No	No	Yes	Graduation requirement	No	Yes
OH	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
OK	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No
OR	Yes	No	No	No	No	Yes	No	District decision	No	No
PA	No	Yes	Yes	Yes	Incentives	Yes	No	Yes	No	No
RI	Yes	Yes	Yes	Yes	Incentives	Yes	Yes	Graduation requirement	No	Yes
SC	In progress	Yes	Yes	Yes	No	Yes	Yes	Graduation requirement	Yes	Yes
SD	No	No	No	Yes	No	No	No	Yes	No	No
TN	Yes	Yes	Yes	Yes	Incentives	Yes	Yes	Graduation requirement	No	Yes
TX	No	Yes	Yes	Yes	Incentives	No	Yes	Yes	Yes	No
UT	Yes	Yes	Yes	Yes	Incentives	Yes	No	Yes	No	No
VT	No	No	No	Yes	Incentives	No	No	District decision	No	No
VA	No	Yes	Yes	Yes	Incentives	Yes	Yes	Yes	No	No
WA	Yes	Yes	Yes	Yes	Incentives	Yes	Yes	Yes	Yes	No
WV	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
WI	No	Yes	No	Yes	Incentives	Yes	Other	Yes	No	No
WY	Yes	Yes	Other	Yes	No	Yes	Yes	Yes	Yes	No

States Ranked by Percentage of High Schools Offering Computer Science

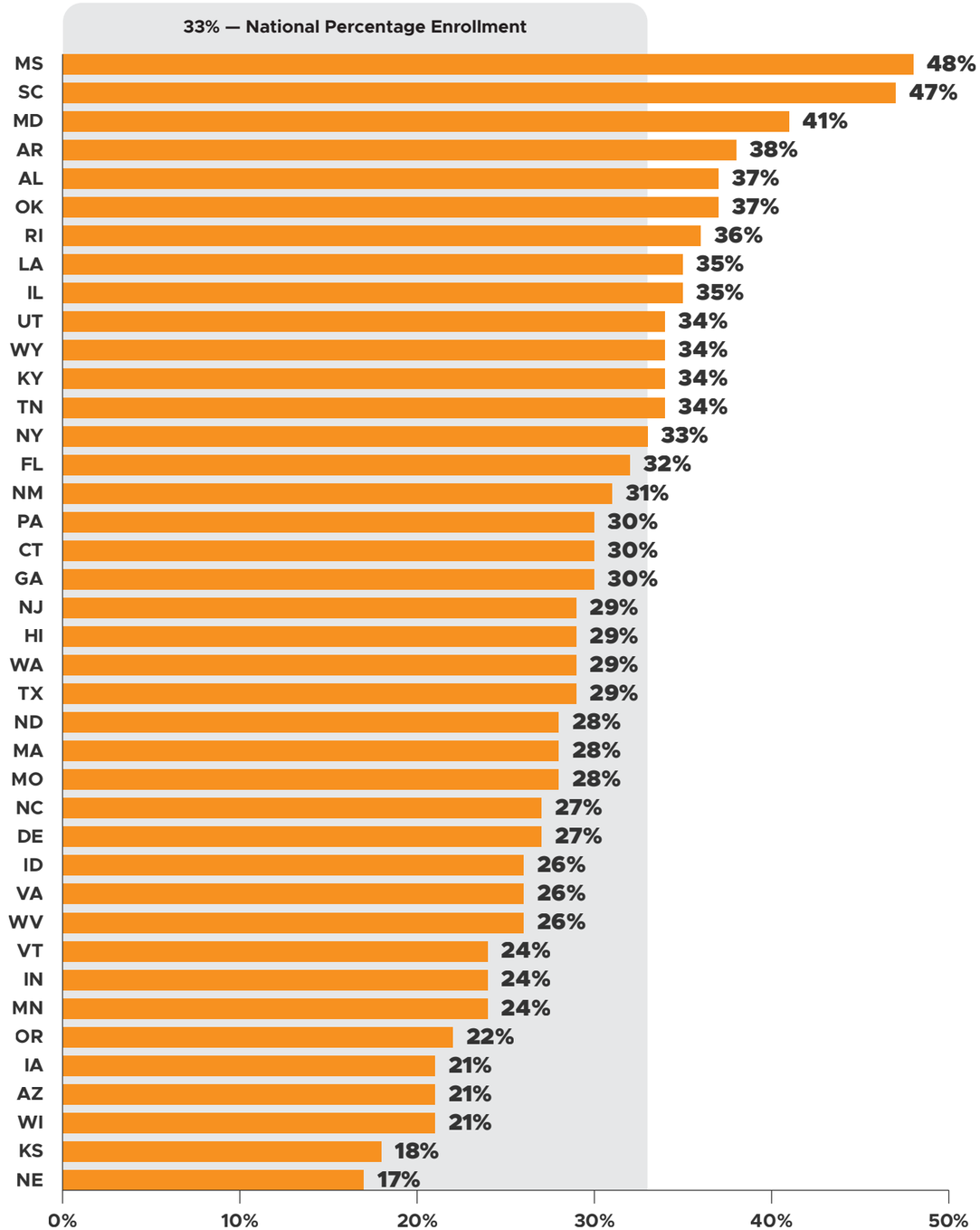


States Ranked by Percentage of Participation in Foundational High School Computer Science*



*only 41 states have provided participation data

Percentage of Female Students Enrolled in Foundational High School Computer Science by State



APPENDIX 1: POLICY RUBRICS

1 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 of the following criteria:

- Be specifically focused on computer science education;
- Include timelines, goals, and strategies for achieving these goals, and a schedule for how often it will be revisited and updated; and
- Be publicly available.

2 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; and
- Publicly accessible on the state's website.

3 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 all three of the following criteria:

- Funds are allocated via the approved state budget or state legislation;
- A description of the funds is publicly accessible; and
- The state allocated funds to computer science during the last two fiscal years*.

**If the state has not allocated funds within the last two years but previously allocated funds, and over 75% of its high schools offer computer science, the state is considered to meet the rubric.*

4 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 named "computer science" or has a related name (e.g., computer programming); and
- Enables a teacher to teach computer science courses.

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

A state is considered to have incentives for 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; or
- The state approves programs at institutions of higher education that prepare preservice teachers to teach computer science and lists those programs publicly.

Each of the above involves a state-led effort; individual programs led by universities are not sufficient to meet this state policy. **Next year, our rubric will only count this policy if all preservice teachers are required to receive computer science exposure.**

6 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; and
- Clearly able to develop state policy/regulations and create programs around computer science.

7 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; and
- A description of the requirement is publicly accessible.

We are moving towards a policy that requires all K–12 schools to offer computer science

8 Computer Science Can Satisfy a Core High School Graduation Credit

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

- Allows computer science to satisfy a core graduation requirement (not an elective) for a subject such as mathematics, science, technology, or language other than English; and
- A description of the policy is publicly accessible.

9 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); and
- A description of the policy is publicly accessible.

10 A Requirement for All Students to Take Computer Science to Earn a High School Diploma

A state is considered to have computer science graduation requirement if the policy meets the following criteria:

- Requires all students to earn a credit named "computer science" or a related name that includes "computer science" to receive a standard diploma for high school graduation;
- List of courses or standards that satisfy the requirement, all of which must include computer science topics and standards; this list must be available before the graduation requirement goes into effect; and
- Description of the requirement is publicly accessible.

APPENDIX 2: ACCESS REPORT METHODOLOGY

High School Data

The high school data set includes 100% of all public and public charter high schools from every state and DC. We currently do not include the U.S. territories but hope to report on this data in the future. Based on this data, 14,777 public high schools in the U.S. offer foundational computer science, out of 24,602 total public high schools in the nation. Data was collected between spring and summer 2024 for the most recent school year with available data from each state. To see data on specific schools, visit **advocacy.code.org/report-data/**. We strive to be as accurate as possible. If you disagree with how we classified a school, please fill out a survey so we can update this school for our next report: **code.org/yourschool**.

The majority of high school data was collected directly from state education agencies. For states that could not provide this information, we collected data for each school through a combination of approaches: searching school course catalogs, data from other providers, and teacher surveys. The main source(s) of high school data for each state are on **page 199**. We worked closely with states to identify schools that do not meet our criteria to include in this report, such as credit recovery centers or closed schools.

School IDs were cross-referenced with data from the U.S. Department of Education to determine each school's geography (urban, suburban, or rural), the percentage of students from each race or ethnicity, 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 percentage of students qualifying for special education services under the Individuals with Disabilities Education Act (IDEA) or section 504 of the Rehabilitation Act, and the percentage of English Language Learners.

Middle and Elementary School Data

The middle school data set includes 68% of all public and public charter middle schools from every state and DC. Based on this data, we know that 12,211 middle schools offer foundational computer science, out of 32,931 public middle schools in the nation. As we do not have data from all middle schools in the country, the number of schools offering foundational computer science is likely higher.

The elementary school data set includes 47% of all public and public charter elementary schools from every state and DC. Based on this data, we know that 12,735 offer foundational computer science, out of 61,609 public elementary schools in the nation. As we do not have data from all elementary schools in the country and it is challenging to capture integrated computer science, the number of schools offering foundational computer science is likely much higher.

Data was collected between spring and summer 2024 for the most recent school year with available data from each state. To see data on specific schools, visit **advocacy.code.org/report-data/**. Most middle and elementary school data is collected using surveys from code.org/yourschool, as most states cannot yet collect comprehensive data. Therefore, this data should be considered preliminary. If you disagree with how we classified a school, please fill out a survey so we can update this school for our following report: **code.org/yourschool**. If a school is classified as "unknown", we have not received any data for this school; if you have information about this school, please fill out the survey.

Data	Source
Total schools in the U.S. (elementary, middle, and high school)	NCES Common Core of Data (CCD) Public Elementary/ Secondary School (Survey 2022–23, generated from the **EISi Table Generator**) with input from State Education Agencies
School characteristics (grades offered, school enrollment, geography, percentage of students who qualify for free and reduced-price meals programs)	
Total students in the U.S. (elementary, middle, and high school)	Total Elementary School Students **2022–23** Summed K–5th grade Total Middle School Students **2022–23** Summed 6th–8th grade Total High School Students **2022–23** Summed 9th–12th grade NCES **Digest of Education Statistics Table 203.04 fall 2022**
Percentage of students who qualify for services under IDEA	NCES **Digest of Education Statistics Table 204.70 (2022–23)**
Percentage of students who qualify for services under Section 504 of the Rehabilitation Act	Civil Rights Data Collection **School-Level Data (2017–18)**
Percentage of students identified as English Language Learners	NCES **Digest of Education Statistics Table 204.20 (2021–22)**
Percentage of students who qualify for free and reduced-price meals programs	NCES **Digest of Education Statistics Table 204.10 (2022–23)**
Course codes	School Courses for the Exchange of Data (SCED), state education agency course catalogs, and local course catalogs
Course offerings per school	• State education agencies; • National and state-specific organizations (College Board, Computer Science Teachers Association, and the University of Texas - Austin); • District/school course catalogs; and • Survey responses from teachers and administrators at **code.org/yourschool**
Course enrollment, including demographics	State education agencies College Board (only for AP data)
AP exam results	College Board

Courses

The Access Report describes the percentage of schools offering foundational computer science, a subset of all computing courses. The definition of foundational computer science aligns with the broadly accepted definition of computer science: Computer science is the study of computers and algorithms, including their principles, their hardware and software designs, their implementation, and their impact on society. Courses must occur during the school day; extracurricular activities are not included in this report. In addition to the requirement for a course to align with the framework, it must include 20 hours of programming at the high school level and 10 hours at the elementary and middle school level. Although computer science is broader than programming, some direct programming experience is integral to learning the fundamental concepts.

In consultation with state education agencies, we examined the SCED and state-level course catalogs for the current year to identify courses (including CTE courses) that met the definition of foundational computer science. If the course title does not explicitly include "computer science," then the course descriptions must include instruction in the fundamentals of programming.

The lists of courses vary slightly from year to year, as new courses are added to or deleted from course catalogs, new state course descriptions fit the definition, or individual schools identify local courses as meeting the definition. Course lists differ for each state based on state course descriptions (e.g., for some states, robotics course descriptions include programming). Virtual offerings only count if listed on a school's course catalog. The list of courses is available at **advocacy.code.org/report-data**.

Data Carryover

We strive for all schools in every state to have new data every year, but this is not always possible. If we do not receive data for a school, we carry over data from the previous year. Data is only carried over for a maximum of one year before we replace it with new data.

Changes to the Methodology This Year

We aim to improve our data collection methods each year while maintaining consistency. This year, we streamlined the process for state education agencies to provide feedback. Each state received a detailed spreadsheet listing all schools and indicating whether they offer foundational computer science. We received feedback from the majority of states, increasing our confidence in the accuracy of the data. We encourage all states to collaborate with us to ensure the data we report is both comprehensive and robust.

We also revised our approach to calculating statistics related to student participation. We now use total student enrollment for each grade level as published by the Digest of Education Statistics. This publicly available data makes our methodology easier to replicate. However, this count includes students attending schools not part of our report, though the impact on results is minimal. Previously, we summed student enrollments only from schools included in our access report, which posed challenges for schools spanning multiple grade levels. This approach resulted in significant overcounts in some states without the ability to separate high school students. After reviewing our methodology, we found that the revised approach better reflects the true number of high school students.

Lastly, for national student statistics, we now calculate the percentage of students in each group across all states. Previously, we only included states that provided computer science enrollment data. Since we do not receive data from the same states every year, this made year-over-year comparisons more challenging. Additionally, as we hope to eventually gather data from all states, this change enables a more consistent benchmark for future analyses.

Disparity Index Methodology

A disparity index[18] is used to quantify the difference in participation for student groups historically underrepresented in computer science compared with groups that are historically overrepresented. An example of a disparity index formula for Black student participation is:

$$\left[\frac{\text{Percentage of students enrolled in computer science who are white and Asian}}{\text{Percentage of students who are white and Asian in the state population}}\right] \div \left[\frac{\text{Percentage of students enrolled in computer science who are Black}}{\text{Percentage of students who are Black in the state population}}\right]$$

- If the value of this formula is equal to 1, it means Black students are just as likely to enroll in computer science as their white and Asian peers.
- If the value of this formula is less than 1, it means Black students are actually more likely to enroll in computer science as their white and Asian peers.
- If the value of this formula is more than 1, it means Black students are less likely to enroll in computer science as their white and Asian peers.

In a given state, if this formula results in a value of 1.5, Black students are 1.5 times less likely to enroll in computer science than their white and Asian peers. On the state pages, we have classified any race/ethnicity with a disparity index greater than 1.3 as underrepresented. Otherwise, this student group is considered near parity based on this formula. However, this is just one way to think about student representation, and we encourage states to examine their data closely to ensure all students can participate in computer science. For states with Bureau of Indian Education schools, please note these schools and their students count in all national numbers but do not contribute to student participation numbers on state pages. To see the raw data, visit **advocacy.code.org/report-data**. If a state does not have foundational computer science enrollment, we used the percentage of students enrolled in AP computer science.

Representation Ratio Methodology

For student groups other than gender and race, we use a representation ratio. An example of the representation ratio formula for English language learners is:

$$\left[\text{Percentage of students enrolled in computer science who are English language learners}\right] \div \left[\text{Percentage of English language learners in the state population}\right]$$

- If the value of this formula is equal to 1, it means English language learners are proportionally represented in computer science.
- If the value of this formula is less than 1, it means English language learners are underrepresented in computer science.
- If the value of this formula is greater than 1, it means English language learners are overrepresented in computer science.

On the state pages, we have classified any student group with a representation ratio less than 0.95 as underrepresented; otherwise, this student group is considered to have reached parity based on this formula. However, this is just one way to think about student representation, and we encourage states to examine their data closely to ensure no students are being left out. To see the raw data, visit **advocacy.code.org/stateofcs/**.

Limitations

- **Data Collection:** Given the size and scope of our data set, there is a margin of error. This is particularly true because the data relies on thousands of school districts accurately assigning their classes to state course codes, a process that can be complex and prone to inconsistencies. When states do not collect their own data and we use course catalogs there is even more of a margin of error as it can be very difficult to verify course offerings for individual schools.
- **Different Definitions:** While we ask every state for the same data, states have different methodologies and definitions for their data. For example, in some states, all students must fill out their race/ethnicity, and others allow students to say “no response.”
- **Differing Years:** We use the most recent data from every state to calculate the national statistics. However, states are not all on the same timeline, meaning the national number combines different school years.
- **Data Verification:** Although we provide states the opportunity to review and verify their data, not all states have the personnel to help us. In these cases, we spot-check the data, but this process is not as thorough as verification by state employees who have detailed knowledge of their schools and course offerings.
- **Data Granular:** Ideally, we would have data for each grade level for every student demographic group, but that data is not currently available on the national level.

Percentage of High School Offering Foundational Computer Science

State	School Year	Number of High School Offering CS	Total Number of High School	Percent of High School Offering CS	Primary Data Source
National*	Combined Years	14777	24602	60%	State Education Agencies, School Course Catalogs, and Teacher Surveys
AL	2023-2024	357	379	94%	State Education Agency
AK	2021-2022	138	272	51%	School Course Catalogs and Teacher Surveys
AZ	2023-2024	252	584	43%	State Education Agency
AR	2023-2024	302	302	100%	State Education Agency
CA	2023-2024	1223	2348	52%	School Course Catalogs and Teacher Surveys
CO	2022-2023	306	519	59%	State Education Agency
CT	2022-2023	173	206	84%	State Education Agency
DE	2023-2024	35	57	61%	School Course Catalogs and Teacher Surveys
DC	2023-2024	23	43	53%	School Course Catalogs and Teacher Surveys
FL	2023-2024	459	1196	38%	State Education Agency
GA	2023-2024	400	511	78%	State Education Agency
HI	2023-2024	48	67	72%	State Education Agency and School Catalogs
ID	2023-2024	120	262	46%	State Education Agency
IL	2022-2023	434	727	60%	State Education Agency
IN	2022-2023	374	413	91%	State Education Agency
IA	2023-2024	302	358	84%	State Education Agency
KS	2022-2023	141	404	35%	State Education Agency
KY	2023-2024	271	357	76%	State Education Agency
LA	2023-2024	146	376	39%	State Education Agency
ME	2023-2024	79	126	63%	State Education Agency
MD	2023-2024	219	219	100%	State Education Agency
MA	2021-2022	328	395	83%	State Education Agency
MI	2023-2024	674	1252	54%	State Education Agency and School Catalogs
MN	2022-2023	296	812	36%	State Education Agency and School Catalogs
MS	2023-2024	202	238	85%	State Education Agency
MO	2022-2023	318	551	58%	State Education Agency
MT	2023-2024	54	172	31%	State Education Agency
NE	2022-2023	142	272	52%	State Education Agency
NV	2022-2023	145	152	95%	State Education Agency
NH	2023-2024	91	96	95%	School Course Catalogs and Teacher Surveys
NJ	2022-2023	378	440	86%	State Education Agency
NM	2023-2024	125	233	54%	State Education Agency
NY	2022-2023	708	1354	52%	State Education Agency
NC	2023-2024	501	726	69%	State Education Agency
ND	2022-2023	83	176	47%	State Education Agency
OH	2022-2023	653	1066	61%	State Education Agency and School Catalogs
OK	2021-2022	298	467	64%	State Education Agency
OR	2022-2023	212	352	60%	State Education Agency
PA	2022-2023	513	684	75%	State Education Agency
RI	2022-2023	52	63	83%	State Education Agency
SC	2023-2024	286	312	92%	State Education Agency
SD	2022-2023	93	181	51%	State Education Agency
TN	2023-2024	281	462	61%	State Education Agency
TX	2022-2023	1194	2127	56%	State Education Agency and School Catalogs
UT	2023-2024	178	221	81%	State Education Agency
VT	2022-2023	41	57	72%	State Education Agency and School Catalogs
VA	2023-2024	229	335	68%	State Education Agency
WA	2023-2024	410	817	50%	State Education Agency
WV	2022-2023	90	115	78%	State Education Agency
WI	2022-2023	310	593	52%	State Education Agency
WY	2023-2024	70	94	74%	State Education Agency

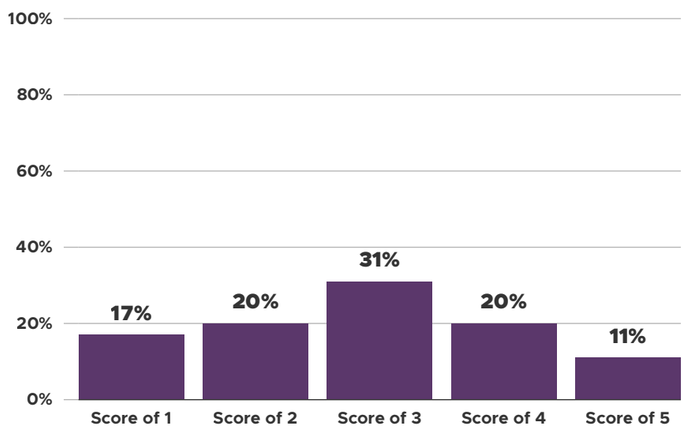
AP Computer Science P Course and Exam

AP Computer Science Principles (AP CSP), launched in the 2016–17 school year, covers the big ideas of computer science and computational thinking, including algorithms and programming. This course was designed with support from the NSF to explicitly engage students from populations traditionally underrepresented in computer science. AP CSP is language agnostic, meaning it is not tied to a specific programming language.

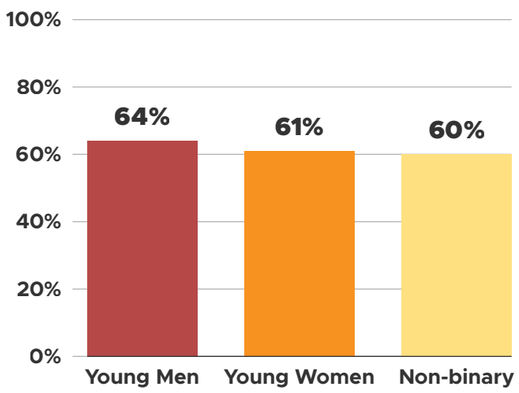
In 2023, 158,555 students took the AP CSP exam. The 2023 AP CSP exam consisted of two parts: 70 multiple-choice questions and a Create Performance Task. The multiple choice questions account for 70% of the exam score with the Create Task accounting for the other 30%. Scores are reported on a scale of 1 to 5, with scores of 3 and above generally considered qualifying scores for advanced placement at postsecondary institutions. In 2023, 62% of students earned qualifying scores.

Young men, young women, and non-binary students demonstrate similar achievement levels. However, young women participate at significantly lower levels, with young women comprising only 34% of all AP CSP test takers. This number has remained stagnant since the 2018 exam, even though the overall number of test takers has increased. The data clearly illustrate an achievement gap between races/ethnicities. A significantly lower percentage of Black, Native Hawaiian, Hispanic/Latino, and Native American students earn qualifying scores when compared with their white, Asian, and multiracial peers.

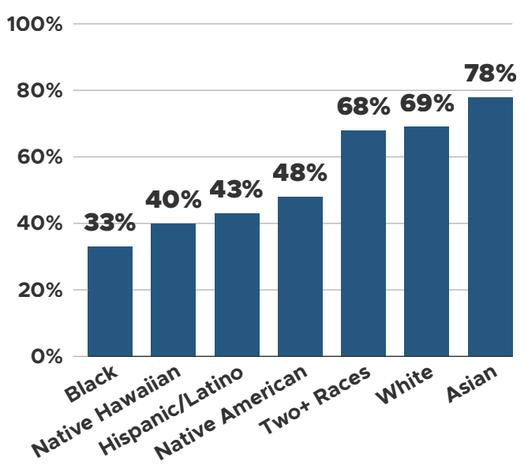
Score Distribution in AP CSP



Percentage of Students Who Earn a Qualifying Score in AP CSP by Gender



Percentage of Students Who Earn a Qualifying Score in AP CSP by Race/Ethnicity



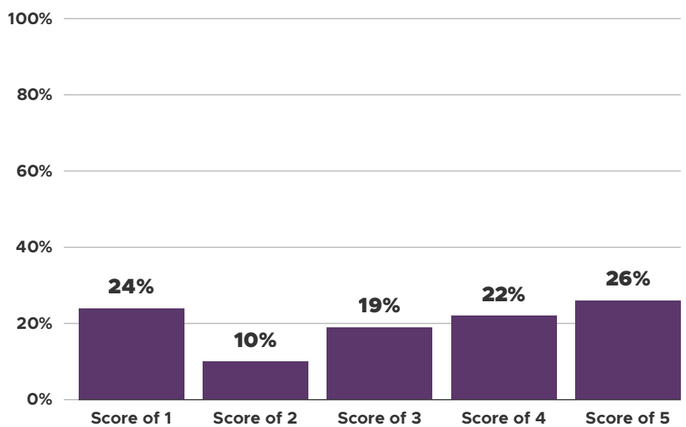
AP Computer Science A Course and Exam

AP Computer Science A (AP CSA) focuses on problem-solving and object-oriented programming using the Java programming language. The AP CSA exam was first offered in 1984 with Pascal as the programming language before switching to Java in 2003. In 2014, the exam was revamped to no longer include case studies. A further change to the AP CSA exam was implemented in the 2019–20 school year to change the nature of the free-response questions to be more specific in the skills being assessed.

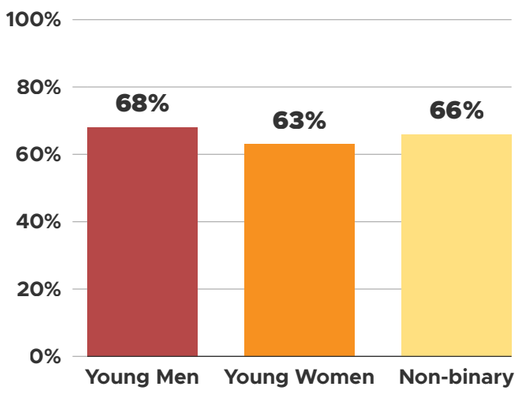
In 2023, 84,625 students took the AP CSA exam. The AP CSA exam for 2023 consisted of two parts: 40 multiple-choice questions and four free-response code-writing questions. The two parts of the exam are equally weighted in determining the final score. Scores are reported on a scale of 1 to 5, with scores of 3 and above generally considered qualifying scores for advanced placement at postsecondary institutions. In 2023, 67% of students earned qualifying scores.

The achievement gap between genders is slightly more pronounced than the gaps for the AP CSP exam. In AP CSA, 63% of young women earn qualifying scores, compared to 68% of young men, while in AP CSP, there is only a 3% gap between genders. The participation gap between young men and young women is much larger with 74% of AP CSA and 65% of AP CSP exam participants being young men. Additionally, the data clearly illustrate an achievement gap between races/ethnicities. A significantly lower percentage of Black, Native Hawaiian, Hispanic/Latino, and Native American students earn qualifying scores when compared with their white, Asian, and multiracial peers.

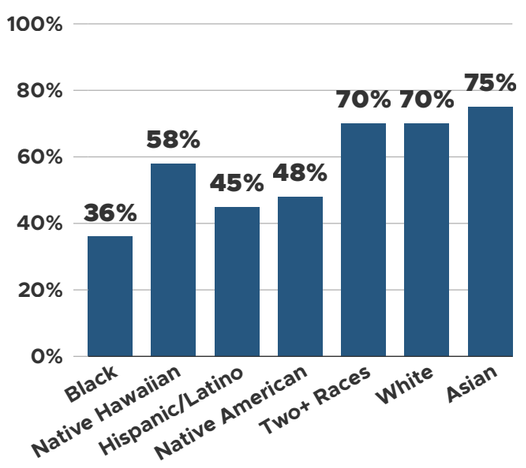
Score Distribution in AP CSA



Percentage of Students Who Earn a Qualifying Score in AP CSP by Gender



Percentage of Students Who Earn a Qualifying Score in AP CSP by Race/Ethnicity



The data in these charts is available to download from advocacy.code.org/stateofcs. For more state-specific data, see our interactive dashboard: code.org/ap

APPENDIX 4: REFERENCES

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To view additional resources including state handouts, slides, and data sets, visit advocacy.code.org/stateofcs

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

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

For more information about ECEP, visit ecepalliance.org

About the Code.org Advocacy Coalition

Bringing together more than 100 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 Computer Science Teachers Association

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 Expanding Computing Education Pathways Alliance

The Expanding Computing Education Pathways (ECEP) Alliance is an NSF-funded Broadening Participation in Computing Alliance (NSF-CNS-1822011). ECEP seeks to increase the number and diversity of students in computing and computing-intensive degrees by promoting statelevel computer science education reform. Working with the collective impact model, ECEP supports an alliance of 30 states and Puerto Rico to identify and develop effective educational interventions, and expand state-level infrastructure to drive educational policy change.

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