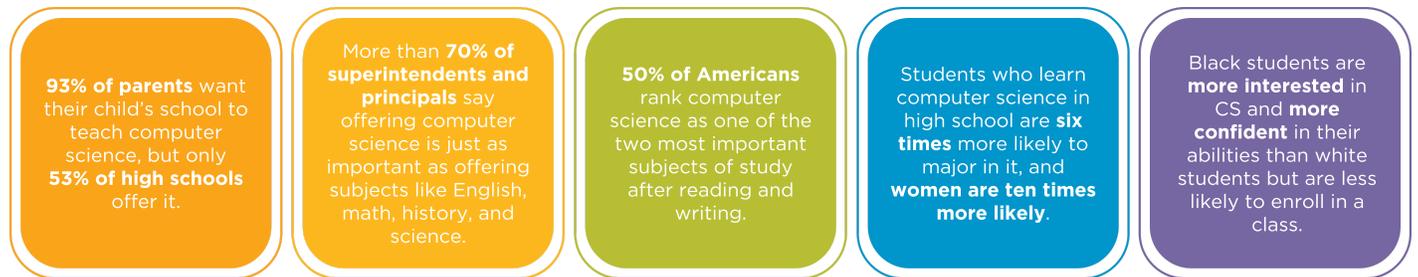# Support K-12 Computer Science Education in Maine

Computer science drives job growth and innovation throughout our economy and society. Computing occupations are the **number 1 source of all new wages in the U.S.** and make up over half of all projected new jobs in STEM fields, making Computer Science one of the most in-demand college degrees. And computing is used all around us and in virtually every field. It's foundational knowledge that all students need. But computer science is marginalized throughout education. Only 57.5% of U.S. high schools teach any computer science courses and only 4% of bachelor's degrees are in Computer Science. We need to improve access for all students, including groups who have traditionally been underrepresented.

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93% of parents want their child's school to teach computer science, but only **53% of high schools** offer it.

More than **70% of superintendents and principals** say offering computer science is just as important as offering subjects like English, math, history, and science.

50% of Americans rank computer science as one of the two most important subjects of study after reading and writing.

Students who learn computer science in high school are **six times** more likely to major in it, and **women are ten times more likely**.

Black students are **more interested** in CS and **more confident** in their abilities than white students but are less likely to enroll in a class.

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Yet, there were only 159 graduates in computer science in 2020 and only 66% of all public high schools teach a foundational computer science course.

Computer science in Maine

- Only **298 exams were taken in AP Computer Science by high school students in** Maine in 2020 (119 took AP CS A and 179 took AP CSP).
- Only 30% were taken by female students (22% for AP CS A and 35% for AP CSP); only 12 exams were taken by Hispanic/Latino/Latina students (5 took AP CS A and 7 took AP CSP); only 3 exams were taken by Black/African American students (2 took AP CS A and 1 took AP CSP); only 1 exam was taken by Native American/Alaskan students (0 took AP CS A and 1 took AP CSP); no exams were taken by Native Hawaiian/Pacific Islander students.
- Only **34 schools** in ME (27% of ME schools with AP programs) offered an AP Computer Science course in 2019-2020 (15% offered AP CS A and 22% offered AP CSP). There are fewer AP exams taken in computer science than in any other STEM subject area.
- Teacher preparation programs in Maine did not graduate a single new teacher prepared to teach computer science in 2018.
- According to a representative survey from Google/Gallup, school administrators in ME support expanding computer science education opportunities: 73% of principals surveyed think CS is just as or more important than required core classes. And their biggest barrier to offering computer science is the lack of funds for hiring and training teachers.

What can you do to support K-12 CS education in Maine?

- Send a letter to your school/district asking them to expand computer science offerings at every grade level: %a{href:"https://code.org/promote/letter"} www.code.org/promote/letter
- Find out if your school teaches computer science or submit information about your school's offerings at **www.code.org/yourschool**.
- Visit **www.code.org/educate/3rdparty** to find out about courses and curriculum from a variety of providers, including Code.org.

Code.org's impact in Maine

- In Maine, Code.org's curriculum is used in
  - 21% of elementary schools
  - 21% of middle schools
  - 23% of high schools
- There are 3,998 teacher accounts and 164,161 student accounts on Code.org in Maine.
- Of students in Maine using Code.org curriculum last school year,
  - 24% attend high needs schools
  - 59% are in rural schools
  - 46% are female students
  - 7% are Black/African American students
  - 2% are Hispanic/Latino/Latina students
  - 1% are Native American/Alaskan students
  - 1% are Native Hawaiian/Pacific Islander students
  - 78% are white students
  - 3% are Asian students
  - 4% are students who identify as two or more races
- Code.org, its regional partner(s) Educate Maine and Maine Mathematics & Science Alliance, and 7 facilitators have provided professional learning in Maine for
  - 386 teachers in CS Fundamentals (K-5)
  - 80 teachers in Exploring Computer Science or Computer Science Discoveries
  - 56 teachers in Computer Science Principles

What can your state do to improve computer science education?

States and local school districts need to adopt a broad policy framework to provide all students with access to computer science. The following ten recommendations are a menu of best practices that states can choose from to support and expand computer science. Not all states will be in a position to adopt all of the policies. Read more about these 10 policy ideas at **https://advocacy.code.org/2023_making_cs_foundational.pdf** and see our rubric for describing state policies at **http://bit.ly/9policiesrubric**.

 State Plan - The Maine Department of Education developed a state plan for computer science in January 2020 as required by LD 1382. Previously, a task force established by LD 398 (2017) presented recommendations to recognize computer science in the path to proficiency.

 K-12 Standards - Maine **does not yet** have rigorous computer science standards publicly available across K-12. Computer science has often been confused with broader technology education in schools. The state could strengthen its computer science programs by publicly adopting discrete standards for computer science focused on both the creation and use of software and computing technologies at all levels of K-12 education. These standards can be guided by the concepts, practices, and recommendations in the K-12 Computer Science Framework, found at **http://www.k12cs.org**.

 Funding - LD 127 (FY 2022 and 2023) allocated $50K annually to establish a pilot program to provide professional development grants for computer science instruction. The grants prioritize applicants that serve socioeconomically disadvantaged school districts or prioritize student populations traditionally underrepresented in computer science.

 Certification - Maine **does not yet** have clear certification pathways for computer science teachers. The expansion of K-12 computer science education is hampered by the lack of qualified computer science teachers. We can grow their ranks by creating clear, navigable, and rewarding professional paths for computer science teachers.

 Pre-Service Programs - Maine **has not yet** established programs at institutions of higher education to offer computer science to preservice teachers. The computer science teacher shortage can be addressed by exposing more preservice teachers to computer science during their required coursework or by creating specific pathways for computer science teachers.

 Dedicated State Position - The Maine Department of Education has a Secondary Digital Learning and Computer Science Specialist.

 Require High Schools to Offer - Maine **does not yet** require that all secondary schools offer computer science. The state can support the expansion of computer science courses by adopting policies that require schools to offer a computer science course based on rigorous standards, with appropriate implementation timelines and allowing for remote and/or in-person courses.

 Count Towards Graduation - The Maine Department of Education published guidance in 2019 on a previously established policy that allows districts to decide whether to count computer science as a credit for graduation.

IHE Admission - Maine **does not yet** allow computer science to count as a core admission requirement at institutions of higher education. Admission policies that do not include rigorous computer science courses as meeting a core entrance requirement, such as in mathematics or science, discourage students from taking such courses in secondary education. State leaders can work with institutions of higher education to ensure credit and articulation policies align with secondary school graduation requirements.

 Graduation Requirement - Maine **does not yet** require students to take computer science to earn a high school diploma. Graduation requirements ensure that all students get exposure to computer science.

Follow us!

Join our efforts to give every student in every school the opportunity to learn computer science. Learn more at **code.org**, or follow us on **Facebook** and **Twitter**.

Launched in 2013, Code.org® is a nonprofit dedicated to expanding access to computer science, and increasing participation by women and underrepresented youth. Our vision is that every student in every school should have the opportunity to learn computer science.

Who can you connect with locally to talk about K-12 CS education policy?

- You can reach Code.org's policy contact for your state, Hannah Weissman, at hannah.weissman@code.org.

Data is from the Conference Board for job demand, the Bureau of Labor Statistics for state salary and national job projections data, the College Board for AP exam data, the National Center for Education Statistics for university graduate data, the Gallup and Google research study Education Trends in the State of Computer Science in U.S. K-12 Schools for parent demand, the 2018 Computer Science Access Report for schools that offer computer science, and Code.org for its own courses, professional learning programs, and participation data.