Support K-12 Computer Science Education in North Carolina

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 51% of U.S. high schools teach any computer science courses and only 11% of bachelor's degrees are in Computer Science. We need to improve access for all students, including groups who have traditionally been underrepresented.

93% of parents want their child's school to teach computer science, but only **51% 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.

In North Carolina, there are currently 22,785 open computing jobs with an average salary of $92,273.

Yet, there were only 2,332 graduates in computer science in 2019 and only 59% of all public high schools teach a foundational course.

Computer science in North Carolina

- Only **5,352 exams were taken in AP Computer Science by high school students in** North Carolina in 2020 (1,357 took AP CS A and 3,995 took AP CSP).
- Only 32% were taken by female students (24% for AP CS A and 34% for AP CSP); only 489 exams were taken by Hispanic/Latino/Latina students (97 took AP CS A and 392 took AP CSP); only 477 exams were taken by Black/African American students (58 took AP CS A and 419 took AP CSP); only 22 exams were taken by Native American/Alaskan students (2 took AP CS A and 20 took AP CSP); only 3 exams were taken by Native Hawaiian/Pacific Islander students (0 took AP CS A and 3 took AP CSP).
- Only **199 schools** in NC (33% of NC schools with AP programs) offered an AP Computer Science course in 2019-2020 (15% offered AP CS A and 29% offered AP CSP), which is 51 more than the previous year. There are fewer AP exams taken in computer science than in any other STEM subject area.
- Teacher preparation programs in North Carolina 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 NC support expanding computer science education opportunities: 69% 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 North Carolina?

- Send a letter:
  - To your school/district asking them to expand computer science offerings at every grade level: **www.code.org/promote/letter**
  - To your elected officials asking them to support computer science education policy in North Carolina: **www.votervoice.net/Code/campaigns/58463/respond**
- 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 North Carolina

- In North Carolina, Code.org's curriculum is used in
    - 20% of elementary schools
    - 32% of middle schools
    - 18% of high schools
- There are 19,473 teacher accounts and 848,999 student accounts on Code.org in North Carolina.
- Of students in North Carolina using Code.org curriculum last school year,
    - 52% attend high needs schools
    - 40% are in rural schools
    - 42% are female students
    - 23% are Black/African American students
    - 12% are Hispanic/Latino/Latina students
    - 1% are Native American/Alaskan students
    - 0% are Native Hawaiian/Pacific Islander students
    - 41% are white students
    - 5% are Asian students
    - 5% are students who identify as two or more races
- Code.org, its regional partner(s) The Friday Institute, and 15 facilitators have provided professional learning in North Carolina for
    - 2,905 teachers in CS Fundamentals (K-5)
    - 318 teachers in Exploring Computer Science or Computer Science Discoveries
    - 92 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 nine 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 9 policy ideas at **https://code.org/files/Making_CS_Fundamental.pdf** and see our rubric for describing state policies at **http://bit.ly/9policiesrubric**.

☑ **State Plan -** The North Carolina Department of Public Instruction developed—and presented to the legislature—a state plan for expanding computer science in 2018. The plan includes strategies to engage students from marginalized racial and ethnic groups underrepresented in computer science, female students, and low-income students.

☑ **K-12 Standards -** North Carolina adopted K–12 computer science standards in August 2020, as required by HB 155 (2017). Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.

☑ **Funding -** SB 105 (FY 2022 and FY 2023) allocated $3.6M (FY 2022) and $1.1M (FY 2023) to support regional computer science consultants and to provide training for K-12 computer science teachers. SL 2018-5 (FY 2019, continued in FY 2020) allocated $500K annually for implementation of the Computer Science Education Plan, which focuses on increasing participation for underrepresented student groups, including female students, low-income students, and students from marginalized racial and ethnic groups. Additionally, SL 2017-57 allocated $400K for FY 2018 and $800K for the following years (FY 2019, FY 2020) for the Coding and Mobile Application Grant Program, which could be used for teacher professional development in computer science.

☑ **Certification -** In North Carolina, teachers with existing CTE licensure can obtain a 9–12 CTE computer programming endorsement through academic coursework.

☐ **Pre-Service Programs -** North Carolina **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 North Carolina Department of Public Instruction has a Director of Computer Science and Technology.

☐ **Require High Schools to Offer -** North Carolina **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 -** In North Carolina, computer science can count as the fourth mathematics credit for graduation in the Future-Ready Core track.

☐ **IHE Admission -** North Carolina **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.

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, Amy Roberts, at amy.roberts@code.org.
- The Expanding Computing Education Pathways (ECEP) Alliance (**www.ecepalliance.org**), an NSF funded Broadening Participation in Computing Alliance, seeks to increase the number and diversity of students in computing and computing-intensive degrees by promoting state-level computer science education. ECEP supports 22 states and the territory of Puerto Rico to develop effective and replicable interventions to broaden participation in computing and to create state-level infrastructure to foster equitable computing education policies. You can reach your ECEP point of contact Deborah Seehorn at deborah.seehorn@outlook.com.

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.