Support K-12 Computer Science Education in North Dakota

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.

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.

Yet, there were only 177 graduates in computer science in 2020 and only 59% of all public high schools teach a foundational computer science course.

Computer science in North Dakota

- Only **111 exams were taken in AP Computer Science by high school students in** North Dakota in 2020 (38 took AP CS A and 73 took AP CSP).
- Only 23% were taken by female students (18% for AP CS A and 25% for AP CSP); only 3 exams were taken by Hispanic/Latino/Latina students (1 took AP CS A and 2 took AP CSP); only 3 exams were taken by Black/African American students (1 took AP CS A and 2 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 **15 schools** in ND (27% of ND schools with AP programs) offered an AP Computer Science course in 2019-2020 (18% offered AP CS A and 16% offered AP CSP), which is 4 more than the previous year.
- Teacher preparation programs in North Dakota did not graduate a single new teacher prepared to teach computer science in 2018.

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

- 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 North Dakota

- In North Dakota, Code.org's curriculum is used in
  - 31% of elementary schools

- 25% of middle schools
- 24% of high schools
- There are 2,762 teacher accounts and 123,999 student accounts on Code.org in North Dakota.
- Of students in North Dakota using Code.org curriculum last school year,
    - 10% attend high needs schools
    - 39% are in rural schools
    - 45% are female students
    - 6% are Black/African American students
    - 5% are Hispanic/Latino/Latina students
    - 3% are Native American/Alaskan students
    - 1% are Native Hawaiian/Pacific Islander students
    - 72% are white students
    - 2% are Asian students
    - 3% are students who identify as two or more races
- Code.org, its regional partner(s) EduTech, and 5 facilitators have provided professional learning in North Dakota for
    - 425 teachers in CS Fundamentals (K-5)
    - 55 teachers in Exploring Computer Science or Computer Science Discoveries
    - 27 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 North Dakota Department of Public Instruction developed a plan for K–12 computer science education.

 K-12 Standards - North Dakota adopted K–12 computer science and cybersecurity standards in 2019, becoming the first state to create K–12 cybersecurity standards.

 Funding - North Dakota **does not yet** provide dedicated funding for rigorous computer science professional development and course support. Although funds may be available via broader programs, the state can strengthen its computer science programs by creating specific opportunities to bring computer science to school districts, such as matching fund programs.

 Certification - In North Dakota, teachers with existing licensure can obtain a grade level corresponding credential through academic coursework. Teachers are eligible to teach specific computer science courses for five years after earning a Level I (200 hours), Level II (40 hours), or Level III (15 hours) Computer Science and Cybersecurity Credential (effective April 1, 2020). Teachers can renew the credential by completing 30 hours of academic work during the five year period.

 Pre-Service Programs - North Dakota **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 - North Dakota **does not yet** have dedicated computer science positions in state or local education agencies. Creating a statewide computer science leadership position within the state education agency can help expand state-level implementation of computer science education initiatives. Similar positions at the local level could support districts' expansion of course offerings and professional development.

 Require High Schools to Offer - HB 1398 (2023) requires that every public and nonpublic high school must provide at least one unit of study in computer science or cybersecurity to every student. It also requires that every public and nonpublic elementary and middle school provide instruction (amount not specified) in computer science or cybersecurity.

 Count Towards Graduation - In North Dakota, every high school student must take at least one unit of study in computer science or cybersecurity to graduate HB 1398 (2023).

 IHE Admission - North Dakota **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 - HB 1398 (2023) requires that every public and nonpublic high school must provide at least one unit of study in computer science or cybersecurity to every student. Elementary and middle schools are also required to offer instruction in computer science/cybersecurity. Students can fulfill this requirment through an integration plan at the discretion of their local school board.

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, Maggie Glennon, at maggie@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.