Support K-12 Computer Science Education in Ohio

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. superintendents and principals say offering computer science is just as mportant 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 1,827 graduates in computer science in 2020 and only 62% of all public high schools teach a foundational computer science course.

Computer science in Ohio

- Only **3,540 exams were taken in AP Computer Science by high school students in** Ohio in 2020 (1,453 took AP CS A and 2,087 took AP CSP).
- Only 26% were taken by female students (22% for AP CS A and 29% for AP CSP); only 166 exams were taken by Hispanic/Latino/Latina students (51 took AP CS A and 115 took AP CSP); only 232 exams were taken by Black/African American students (61 took AP CS A and 171 took AP CSP); only 19 exams were taken by Native American/Alaskan students (9 took AP CS A and 10 took AP CSP); only 1 exam was taken by Native Hawaiian/Pacific Islander students (1 took AP CS A and 0 took AP CSP).
- Only **206 schools** in OH (28% of OH schools with AP programs) offered an AP Computer Science course in 2019-2020 (15% offered AP CS A and 21% offered AP CSP), which is 28 more than the previous year.
- Teacher preparation programs in Ohio 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 OH support expanding computer science education opportunities: 65% of principals surveyed think CS is just as or more important than required core classes.

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

- 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 Ohio

- In Ohio, Code.org's curriculum is used in
 - 19% of elementary schools

- 23% of middle schools
- 21% of high schools
- There are 23,482 teacher accounts and 1,467,917 student accounts on Code.org in Ohio.
- Of students in Ohio using Code.org curriculum last school year,
 - 17% attend high needs schools
 - 33% are in rural schools
 - 45% are female students
 - 19% are Black/African American students
 - 5% are Hispanic/Latino/Latina students
 - 1% are Native American/Alaskan students
 - 0% are Native Hawaiian/Pacific Islander students
 - 58% are white students
 - 4% are Asian students
 - $\circ \quad$ 5% are students who identify as two or more races
- Code.org, its regional partner(s) Battelle Education, and 11 facilitators have provided professional learning in Ohio for
 - 1,936 teachers in CS Fundamentals (K-5)
 - 199 teachers in Exploring Computer Science or Computer Science Discoveries
 - 135 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 Ohio Department of Education and Department of Higher Education developed and released a state plan for K-12 computer science.

K-12 Standards - Ohio adopted K–12 computer science standards and a model curriculum in 2018. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity. These standards will be updated by September 2022, as required by HB 110 (2021).

Funding - HB 33 (FY 2024-25) allocated \$8M to establish the "Teach CS" grant program to support the increasing number of existing teachers who qualify to teach computer science. Priority for grants may be given to education consortia that include economically disadvantaged schools in which there are limited computer science courses offered or where there is an unmet need for teachers credentialed to teach computer science courses. HB 166 (FY 2020) appropriated \$1.5M for teachers to become credentialed in computer science. Awards prioritized educators assigned to schools with greater than 50% of students classified as economically disadvantaged.

© **Certification** - In Ohio, teachers with existing licensure can obtain a K–12 supplemental teaching license through passing the state content exam; teachers can also earn an initial license in computer science. Temporary revisions to teaching requirements allow licensed 7–12 teachers who completed approved professional development to teach computer science until 2023. The state provided dedicated funding in FY 2020–2021 to offset the cost of computer science certification.

Dere-Service Programs - The Ohio Department of Higher Education has approved teacher preparation programs leading to certification in computer science and lists these programs publicly. HB 110 (2021) required each educator preparation program and each educator licensure candidate to receive instruction in computer science and computational thinking.

Dedicated State Position - The Ohio Department of Education has a Computer Science Education Program Specialist.

Require High Schools to Offer - Ohio **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 Ohio, a computer science course that addresses high school mathematics standards and focuses on algorithms for problem-solving can count as a mathematics credit for graduation. One credit of advanced computer science can also satisfy the requirement for one unit of algebra 2/math 3 or equivalent or one unit of advanced science (excluding biology or life sciences), and a coding course can satisfy foreign (world) language credit in schools that require it for graduation.

I Higher Ed Admission - An advanced computer science course can count towards the mathematics, science, or elective admission requirements, and a unit of computer coding can count towards foreign language requirements at state universities if the student applied the course towards their high school graduation requirements.

Graduation Requirement - Ohio 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, Julia Wynn, at julia.wynn@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 Debbie K Jackson at d.jackson1@csuohio.edu.

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.