Support K-12 Computer Science Education in California

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 45% of U.S. high schools teach any computer science courses and only 10% of STEM graduates study it. 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 45% of high schools teach it.

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

75% of Americans believe computer science is cool in a way it wasn’t 10 years ago.

67% of parents and 56% of teachers believe students should be required to learn computer science.

Students who learn computer science in high school are 6 times more likely to major in it, and women are 10 times more likely.

Computer science in California

- California currently has 94,162 open computing jobs (3.2 times the average demand rate in California).
- The average salary for a computing occupation in CA is $115,754, which is significantly higher than the average salary in the state ($59,150). The existing open jobs alone represent a $10,899,586,256 opportunity in terms of annual salaries.
- California had only 6,236 computer science graduates in 2017; only 18% were female.
- In California, only 47% of all public high schools teach computer science.
- Only 29,047 exams were taken in AP Computer Science by high school students in California in 2019 (12,423 took AP CS A and 16,624 took AP CSP).
- Only 31% were female (27% for AP CS A and 34% for AP CSP); only 7,268 exams were taken by Hispanic or Latino students (1,935 took AP CS A and 5,333 took AP CSP); only 561 exams were taken by Black students (169 took AP CS A and 392 took AP CSP); only 44 exams were taken by American Indian or Alaska Native students (15 took AP CS A and 29 took AP CSP); only 69 exams were taken by Native Hawaiian or Pacific Islander students (26 took AP CS A and 43 took AP CSP).
- Only 685 schools in CA (28% of CA schools with AP programs) offered an AP Computer Science course in 2017-2018 (20% offered AP CS A and 20% offered AP CSP), which is 105 more than the previous year.
- Universities in California only graduated 2 new teachers prepared to teach computer science in 2017.
- According to a representative survey from Google/Gallup, school administrators in CA support expanding computer science education opportunities: 70% of principals surveyed think CS is just as or more important than required core classes. And one of their biggest barriers 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 California?

- Nominate a teacher for professional learning: www.code.org/nominate
- 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 California: 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.

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, Alexis Harrigan, at alexis@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 reform. 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 Debra Richardson at djr@ics.uci.edu or Julie Flapan at flapan@gseis.ucla.edu and see your state ECEP project at http://access-ca.org/.

Code.org's impact in California

- In California, Code.org’s curriculum is used in
  - 27% of elementary schools
  - 22% of middle schools
  - 15% of high schools
- There are 86,012 teacher accounts and 3,289,983 student accounts on Code.org in California.
- Of students in California using Code.org curriculum last school year,
  - 62% attend high needs schools
  - 7% are in rural schools
  - 43% are female students
  - 59% are underrepresented minority students (Black/African American, Hispanic/Latino, American Indian, or Hawaiian)
- Code.org, its regional partner(s) Contra Costa County Office of Education, Fresno County Superintendent of Schools, Los Angeles Unified School District, Riverside County Office of Education, Sacramento County Office of Education, Silicon Valley Education Foundation, University of California San Diego CREATE, and USC Viterbi School of Engineering, and 59 facilitators have provided professional learning in California for
• 11,275 teachers in CS Fundamentals (K-5)
• 759 teachers in Exploring Computer Science or Computer Science Discoveries
• 530 teachers in Computer Science Principles

“Computer Science is a liberal art: it’s something that everybody should be exposed to and everyone should have a mastery of to some extent.”
— Steve Jobs

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.

California has created a state plan for K-12 computer science.

California has established K-12 computer science standards.

California has allocated funding for rigorous computer science professional development and course support.

California has clear certification pathways for computer science teachers.

California 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.

California 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.

California 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.

California has passed policy that is permissive and encouraging for schools to allow computer science to count for a core graduation requirement, but it is not a requirement for schools. Find out how California allows computer science to count towards graduation at http://bit.ly/9policies.

California allows computer science to count as a core admission requirement at institutions of higher education.

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 students of color. Our vision is that every student in every school should have the opportunity to learn computer science.
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.