Support K-12 Computer Science Education in Arizona

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 11% of bachelor's degrees are in Computer Science. We need to improve access for all students, including groups who have traditionally been underrepresented.

In Arizona, there are currently 10,343 open computing jobs with an average salary of $87,658.

Yet, there were only 1,014 graduates in computer science in 2018 and only 30% of all public high schools teach a foundational course.

Computer science in Arizona

- Only 1,788 exams were taken in AP Computer Science by high school students in Arizona in 2020 (659 took AP CS A and 1,129 took AP CSP).
- Only 27% were taken by female students (29% for AP CS A and 26% for AP CSP); only 391 exams were taken by Hispanic/Latino/Latina students (106 took AP CS A and 285 took AP CSP); only 52 exams were taken by Black/African American students (12 took AP CS A and 40 took AP CSP); only 16 exams were taken by Native American/Alaskan students (3 took AP CS A and 13 took AP CSP); only 2 exams were taken by Native Hawaiian/Pacific Islander students (0 took AP CS A and 2 took AP CSP).
- Only 104 schools in AZ (37% of AZ schools with AP programs) offered an AP Computer Science course in 2019-2020 (22% offered AP CS A and 28% offered AP CSP), which is 14 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 Arizona 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 AZ support expanding computer science education opportunities: 63% 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 Arizona?

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

- In Arizona, Code.org's curriculum is used in
  - 30% of elementary schools
  - 29% of middle schools
  - 14% of high schools
- There are 16,700 teacher accounts and 742,677 student accounts on Code.org in Arizona.
- Of students in Arizona using Code.org curriculum last school year,
  - 55% attend high needs schools
  - 15% are in rural schools
  - 43% are female students
  - 56% are students from marginalized racial and ethnic groups underrepresented in computer science (Black/African American, Hispanic/Latino/Latina, Native American/Alaskan, or Native Hawaiian/Pacific Islander)
- Code.org, its regional partner(s) Arizona Science Center, and 5 facilitators have provided professional learning in Arizona for
  - 3,267 teachers in CS Fundamentals (K-5)
  - 155 teachers in Exploring Computer Science or Computer Science Discoveries
  - 78 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** - Arizona has not yet created a state plan for K-12 computer science. A plan that articulates the goals for computer science, strategies for accomplishing the goals, and timelines for carrying out the strategies is important for making computer science a fundamental part of a state's education system.

- **K-12 Standards** - Arizona adopted K–12 computer science standards with a focus on equity in 2018. The state intends to close the access gap for underserved populations including students with disabilities, women, and students in underrepresented racial and ethnic groups. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.

- **Funding** - SB 1692 (FY 2021), HB 2302 (FY 2020), and HB 2663 (FY 2019) included $1M annually for the computer science professional development program, prioritizing schools that currently do not provide computer science instruction. The program requires a 50% match of state funding with private monies or in-kind donations. In addition, HB 2303 (FY 2019) prioritized rural schools and schools with at least 60% of the students eligible for free and reduced-price lunches. HB 2537 (FY 2018) allocated $200K to support standards and professional development. SB 1568 (FY 2017) allocated $500K, with a focus on Native American students.

- **Certification** - In Arizona, teachers with existing licensure can obtain the PreK–8 or 6–12 endorsement by completing a district-approved program or academic coursework in computer science content and teaching methods. The PreK–12 special subject endorsement requires completing academic coursework in computer science content and methods.

- **Pre-Service Programs** - Arizona 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** - Arizona 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** - Arizona 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 - Arizona passed a permissive and encouraging policy to allow computer science to count as a mathematics credit for graduation, but it is a district decision.

☐ IHE Admission - Arizona 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, Alexis Harrigan, at alexis@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.