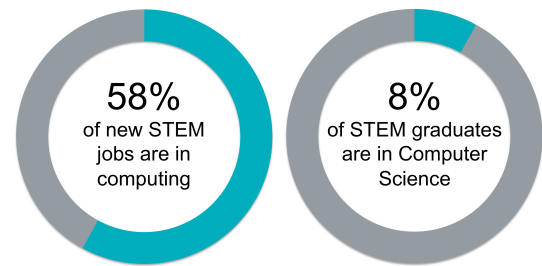


Support K-12 Computer Science Education in Colorado

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. Fewer than half of U.S. schools offer any computer science courses and only 8% 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 40% of schools teach it.

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.

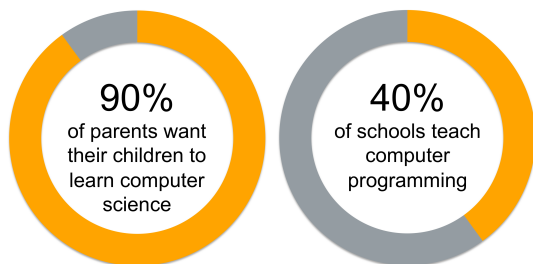
50% of Americans rank computer science as one of the two most important subjects of study after reading and writing.

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

Computer science in Colorado

- Colorado currently has **16,183 open computing jobs** (3.2 times the average demand rate in Colorado).
- The average salary for a computing occupation in CO is **\$98,597**, which is significantly higher than the average salary in the state (\$52,710). The existing open jobs alone represent a **\$1,595,595,251 opportunity** in terms of annual salaries.
- Colorado had only **785 computer science graduates** in 2015; only **15%** were female.
- Only **1,437 exams were taken in AP Computer Science by high school students** in Colorado in 2017 (860 took AP CS A and 577 took AP CSP).
- Only 19% were female (18% for AP CS A and 21% for AP CSP); only 219 exams were taken by Hispanic or Latino students (114 took AP CS A and 105 took AP CSP); only 30 exams were taken by Black students (12 took AP CS A and 18 took AP CSP); only 7 exams were taken by American Indian or Alaska Native students (3 took AP CS A and 4 took AP CSP); only 3 exams were taken by Native Hawaiian or Pacific Islander students (0 took AP CS A and 3 took AP CSP).
- Only **96 schools** in CO (26% of CO schools with AP programs) offered an AP Computer Science course in 2016-2017 (16% offered AP CS A and 15% offered AP CSP), which is 43 more than the previous year. There are fewer AP exams taken in computer science than in any other STEM subject area.
- Universities in Colorado only graduated 3 new teachers prepared to teach computer science in 2016.
- According to a representative survey from Google/Gallup, school administrators in CO support expanding

computer science education opportunities: 61% 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 improve K-12 CS education?

1. Call on your school to expand computer science offerings at every grade level.
2. Ask your local school district to allow computer science courses to satisfy a core math or science requirement.
3. Visit www.code.org/educate/3rdparty to find out about courses and curriculum from a variety of third parties, including Code.org.
4. Visit www.code.org/promote/CO to learn more about supporting computer science in your state.
5. Sign the petition at www.change.org/computerscience to join 100,000 Americans asking Congress to support computer science.

Code.org's Impact in Colorado

There are 5,556 teacher accounts and 308,143 student accounts on Code.org in Colorado.

Code.org, its regional partner(s) mindSpark Learning, and 4 facilitators have provided professional learning for 413 teachers in CS Fundamentals (K-5) , 26 teachers in Exploring Computer Science or Computer Science Discoveries, and 42 teachers in Computer Science Principles in Colorado.

“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>.

Colorado **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.

Colorado **does not yet** have rigorous computer science standards publicly available across K-12. Computer science has often been confused with broader technology education in schools. The state could strengthen its computer science programs by publicly adopting discrete standards for computer science focused on both the creation and use of software and computing technologies at all levels of K-12 education. These standards can be guided by the concepts, practices, and recommendations in the K-12 Computer Science Framework, found at <http://www.k12cs.org>.

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

Colorado **does not yet** have clear certification pathways for computer science teachers. The expansion of K-12 computer science education is hampered by the lack of qualified computer science teachers. We can grow their ranks by creating clear, navigable, and rewarding professional paths for computer science teachers.

Colorado **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.

Colorado **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.

Colorado **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.

Colorado 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 Colorado allows computer science to count towards graduation at <http://bit.ly/9policies>.

Colorado 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 non-profit 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 schools that offer computer science and parent demand, and Code.org for its own courses, professional learning programs, and participation data.