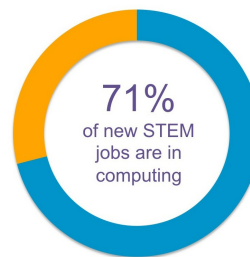


# Support K-12 Computer Science Education in Pennsylvania

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 two-thirds 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 Pennsylvania

- Pennsylvania currently has **17,392 open computing jobs** (3.2 times the average demand rate in Pennsylvania).
- The average salary for a computing occupation in PA is **\$83,233**, which is significantly higher than the average salary in the state (\$46,550). The existing open jobs alone represent a **\$1,447,588,336 opportunity** in terms of annual salaries.
- Pennsylvania had only **2,820 computer science graduates** in 2014; only **20%** were female.
- Only **1,891 high school students** in Pennsylvania took the AP Computer Science exam in 2016; only 16% were female; only 83 students were Hispanic or Latino; only 51 students were Black; no students were Native American or Alaska Native; only 1 student was Native Hawaiian or Pacific Islander.
- Only **169 schools** in PA (22% of PA schools with AP programs) offered the AP Computer Science course in 2015-2016. There are fewer AP exams taken in computer science than in any other STEM subject area.



## 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](http://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/PA](http://www.code.org/promote/PA) to learn more about supporting computer science in your state.
5. Sign the petition at [www.change.org/computerscience](http://www.change.org/computerscience) to join 100,000 Americans asking Congress to support computer science.

## Code.org's Impact in Pennsylvania

There are 6,443 teacher accounts and 289,013 student accounts in Code Studio in Pennsylvania.

Code.org, its regional partner(s) Delaware County Intermediate Unit, and 4 facilitators have provided professional learning for 1,664 teachers in CS Fundamentals (K-5) and 4 teachers in Computer Science Principles in Pennsylvania.

**“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 the federal government do to support computer science in grades K-12?

Access to computer science courses is a bipartisan issue that can be addressed without adding to the Federal budget. Tell your representatives in Washington, D.C. that you support funding to expand access to this foundational 21st-century subject in your community that will America remain secure and globally competitive. Over 100,000 Americans, CEOs of the largest companies in every major industry, 29 governors, and major K-12 education leaders have all joined forces to call on Congress to support this idea. You can see their open letter (and add your name in support) at [www.change.org/computerscience](http://www.change.org/computerscience).

## 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](https://code.org/files/Making_CS_Fundamental.pdf) and see our rubric for describing state policies at <http://bit.ly/9policiesrubric>.

☐ Pennsylvania **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.

☐ Pennsylvania **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>.

☐ Pennsylvania **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.

☐ Pennsylvania **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.

☐ Pennsylvania **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.

☐ Pennsylvania **does not yet** have dedicated computer science positions in state or local education authorities. Creating a statewide computer science leadership position within the state education authority 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.

☐ Pennsylvania **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.

☒ Pennsylvania 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 Pennsylvania allows computer science to count towards graduation at <http://bit.ly/1ls6YXS>.

☐ Pennsylvania **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 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.