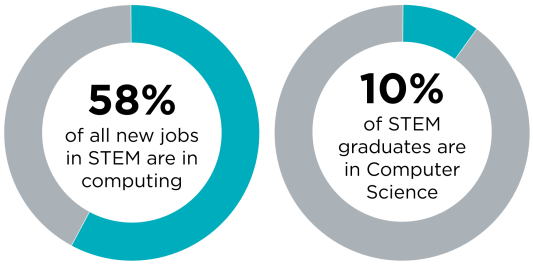
Support K-12 Computer Science Education in Pennsylvania

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 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.

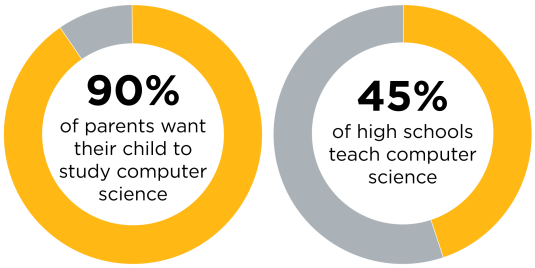
Students who learn computer science in high school are 6 times more likely to major in it, and women are 10 times more likely.

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

Computer science in Pennsylvania

- Pennsylvania currently has **18,212 open computing jobs** (2.9 times the average demand rate in Pennsylvania).
- The average salary for a computing occupation in PA is **$87,822,** which is significantly higher than the average salary in the state ($48,760). The existing open jobs alone represent a **$1,599,408,436 opportunity** in terms of annual salaries.
- Pennsylvania had only **3,769 computer science graduates** in 2017; only **22**% were female.
- In Pennsylvania, only **56% of all public high schools teach computer science.**
- Only **4,010 exams were taken in AP Computer Science by high school students in** Pennsylvania in 2018 (2,150 took AP CS A and 1,860 took AP CSP).
- Only 23% were female (19% for AP CS A and 28% for AP CSP); only 194 exams were taken by Hispanic or Latino students (105 took AP CS A and 89 took AP CSP); only 103 exams were taken by Black students (50 took AP CS A and 53 took AP CSP); only 7 exams were taken by American Indian or Alaska Native students (2 took AP CS A and 5 took AP CSP); only 5 exams were taken by Native Hawaiian or Pacific Islander students (2 took AP CS A and 3 took AP CSP).
- Only **240 schools** in PA (30% of PA schools with AP programs) offered an AP Computer Science course in 2017-2018 (23% offered AP CS A and 17% offered AP CSP), which is 34 more than the previous year.
- Universities in Pennsylvania only graduated 1 new teacher prepared to teach computer science in 2017.
- According to a representative survey from Google/Gallup, school administrators in PA support expanding computer science education opportunities: 71% 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 Pennsylvania?



1. Nominate a teacher for a professional learning scholarship: **www.code.org/nominate**
2. 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 Pennsylvania: **www.votervoice.net/Code/campaigns/58463/respond**
3. Find out if your school teaches computer science or submit information about your school's offerings at **www.code.org/yourschool**.
4. Visit **www.code.org/educate/3rdparty** to find out about courses and curriculum from a variety of providers, including Code.org.
5. Visit **www.code.org/promote/PA** to learn more about supporting computer science in your state.

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, Katie Hendrickson, at katie@code.org.

Code.org's impact in Pennsylvania

- In Pennsylvania, Code.org's curriculum is used in
    - 20% of elementary schools
    - 17% of middle schools
    - 20% of high schools
- There are 17,896 teacher accounts and 962,710 student accounts on Code.org in Pennsylvania.
- Of students in Pennsylvania using Code.org curriculum last school year,
    - 29% attend high needs schools
    - 23% are in rural schools
    - 47% are female students
    - 34% are underrepresented minority students (Black/African American, Hispanic/Latino, American Indian, or Hawaiian)
- Code.org, its regional partner(s) Allegheny Intermediate Unit 3 and Delaware County Intermediate Unit, and 28 facilitators have provided professional learning in Pennsylvania for
    - 3,811 teachers in CS Fundamentals (K-5)
    - 236 teachers in Exploring Computer Science or Computer Science Discoveries
    - 144 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**.

☐ 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 has established K-12 computer science standards.

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

☐ 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 established programs at institutions of higher education to offer computer science to preservice teachers.

☑ Pennsylvania has a dedicated computer science position in the state education agency.

☐ 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 allows computer science to count for a core graduation requirement. Find out how Pennsylvania allows computer science to count towards graduation at **http://bit.ly/9policies**.

☐ 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 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.