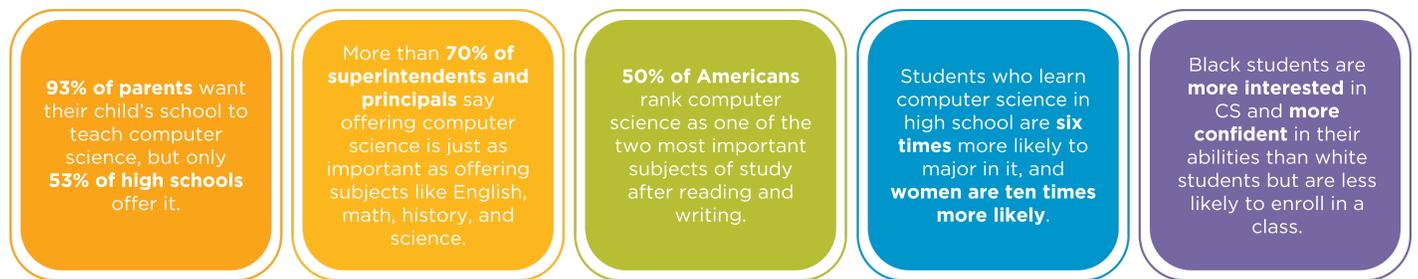


# Support K-12 Computer Science Education in Virginia

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 57.5% of U.S. high schools teach any computer science courses and only 4% of bachelor's degrees are in Computer Science. We need to improve access for all students, including groups who have traditionally been underrepresented.



Yet, there were only 2,679 graduates in computer science in 2020 and only 74% of all public high schools teach a foundational computer science course.

## Computer science in Virginia

- Only **5,662 exams were taken in AP Computer Science by high school students in Virginia** in 2020 (3,344 took AP CS A and 2,318 took AP CSP).
- Only 29% were taken by female students (29% for AP CS A and 30% for AP CSP); only 441 exams were taken by Hispanic/Latino/Latina students (236 took AP CS A and 205 took AP CSP); only 353 exams were taken by Black/African American students (173 took AP CS A and 180 took AP CSP); only 17 exams were taken by Native American/Alaskan students (7 took AP CS A and 10 took AP CSP); only 3 exams were taken by Native Hawaiian/Pacific Islander students (1 took AP CS A and 2 took AP CSP).
- Only **184 schools** in VA (40% of VA schools with AP programs) offered an AP Computer Science course in 2019-2020 (29% offered AP CS A and 26% offered AP CSP), which is 17 more than the previous year.
- Teacher preparation programs in Virginia 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 VA support expanding computer science education opportunities: 64% of principals surveyed think CS is just as or more important than required core classes.

## What can you do to support K-12 CS education in Virginia?

- Send a letter to your school/district asking them to expand computer science offerings at every grade level: [www.code.org/promote/letter](https://code.org/promote/letter)
- Find out if your school teaches computer science or submit information about your school's offerings at [www.code.org/yourschool](https://www.code.org/yourschool).
- Visit [www.code.org/educate/3rdparty](https://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 Virginia

- In Virginia, Code.org's curriculum is used in
  - 17% of elementary schools
  - 22% of middle schools
  - 17% of high schools
- There are 28,453 teacher accounts and 1,167,510 student accounts on Code.org in Virginia.
- Of students in Virginia using Code.org curriculum last school year,
  - 35% attend high needs schools
  - 36% are in rural schools
  - 41% are female students
  - 21% are Black/African American students
  - 8% are Hispanic/Latino/Latina students
  - 0% are Native American/Alaskan students
  - 0% are Native Hawaiian/Pacific Islander students
  - 44% are white students
  - 11% are Asian students
  - 5% are students who identify as two or more races
- Code.org, its regional partner(s) CodeVA, and 7 facilitators have provided professional learning in Virginia for
  - 1,344 teachers in CS Fundamentals (K-5)
  - 258 teachers in Exploring Computer Science or Computer Science Discoveries
  - 134 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 ten 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 10 policy ideas at [https://advocacy.code.org/2023\\_making\\_cs\\_foundational.pdf](https://advocacy.code.org/2023_making_cs_foundational.pdf) and see our rubric for describing state policies at <http://bit.ly/9policiesrubric>.

▣ **State Plan** - Virginia **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** - Virginia added mandatory K-12 computer science standards to the state Standards of Learning in 2017, effectively requiring all K-12 schools to offer instruction in computer science. Standards within each grade band address concepts of equity, such as bias, accessible technology, and inclusivity.

▣ **Funding** - HB 30 (FY 2023-2024) allocated \$4.05M to support computer science education and implementation of the standards, including professional development. HB 30 (FY 2021 and 2022), HB 1700 (FY 2019 and 2020), and HB 1500 (FY 2017 and 2018) also allocated \$550K annually for K-12 computer science professional development with CodeVA.

▣ **Certification** - In Virginia, teachers with existing licensure can obtain an endorsement through academic coursework or passing the Praxis CS exam. An initial license in computer science requires completing a state-approved program or academic coursework. The Department of Education convened a workgroup on micro-credentials for certification in subjects including computer science and is now developing recommendations as authorized by HB 836 (2020).

▣ **Pre-Service Programs** - The Virginia Department of Education has approved teacher preparation programs leading to certification in computer science and lists these programs publicly.

▣ **Dedicated State Position** - The Virginia Department of Education has a Computer Science Coordinator.

▣ **Require High Schools to Offer** - HB 831 (2016) added computer science into the Virginia K-12 Standards of Learning, which all schools must implement.

▣ **Count Towards Graduation** - Virginia has two diploma options an advanced ([https://www.doe.virginia.gov/instruction/graduation/advanced\\_studies.shtml](https://www.doe.virginia.gov/instruction/graduation/advanced_studies.shtml)) and a standard (<https://www.doe.virginia.gov/instruction/graduation/standard.shtml>). Under the advanced a CS course can count as math or science or meet one of their requirements under the "Fine Arts or CTE" course requirement row, but it can not meet the World Languages requirement. Under the Standard Diploma

program "World Language, Fine Arts OR CTE" have been combined to one requirement set and CS can meet the CTE requirement under this section. So any student with a standard diploma could take a CTE course and a CS (as an additional CTE) and meet these 2 required credits (therefore eliminating the requirement for a fine arts or world language ... only for a standard diploma though). The courses below may be used as part of a CTE sequence\* to meet graduation requirements Programming – 10152, Advanced Programming – 10152, AP Computer Science A – 10157, AP Computer Science Principles – 10019

▣ **IHE Admission** - Virginia **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.

▣ **Graduation Requirement** - Virginia **does not yet** require students to take computer science to earn a high school diploma. Graduation requirements ensure that all students get exposure to computer science.

## Follow us!

Join our efforts to give every student in every school the opportunity to learn computer science. Learn more at [code.org](https://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.

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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, Maggie Glennon, at [maggie@code.org](mailto:maggie@code.org).
- The Expanding Computing Education Pathways (ECEP) Alliance ([www.ecepalliance.org](http://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. 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 Chris Dovi at [cdovi@codevirginia.org](mailto:cdovi@codevirginia.org) or Rebecca Dovi at [rebeccadovi@codevirginia.org](mailto:rebeccadovi@codevirginia.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.