



PENNSYLVANIA

2023 State of Computer Science Education

The rapid pace of technological advancement, as seen with the widespread integration of generative artificial intelligence (AI), underscores the need for foundational knowledge in computer science for all students. This report calls upon advocates to embrace the urgency of this matter and revamp school curricula to align with the demands of the 21st century, including requiring that all students learn computer science.

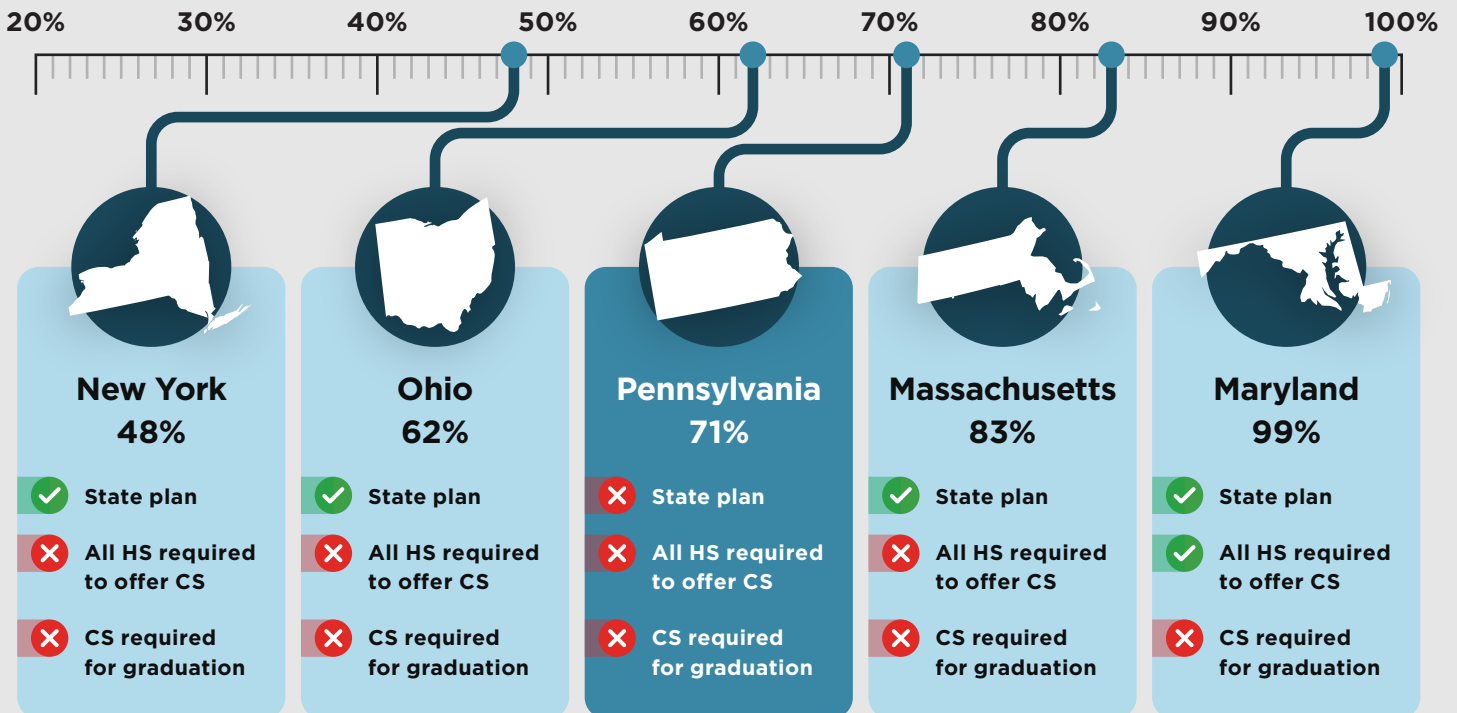
Currently, 57.5% of public high schools in the United States (U.S.) offer a foundational computer science class—an achievement marking the largest percentage growth in the last five years. Across the 35 states* where data is available, 5.8% of high school students are enrolled in foundational computer science. Even with growing access this growth, large disparities still exist, and we must continue to focus on eliminating participation gaps.

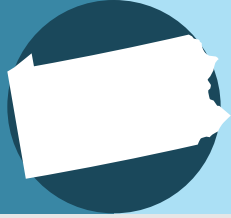
13,087
In 2023, PA averaged 13,087 open computing jobs each month

\$101,047
These jobs have an average salary of \$101,047

*AL, AR, AZ, CT, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MA, MD, MS, NC, ND, NE, NJ, NM, NV, NY, OK, OR, PA, RI, TN, TX, UT, VA, VT, WV, WI

Comparative Access to Computer Science Courses (percentage of high schools offering)





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Ten Policies to Make Computer Science Foundational

1.

Create a **statewide plan** for K-12 computer science



2.

Define computer science and establish standards for K-12 computer science



3.

Allocate funding for rigorous computer science teacher professional learning



4.

Implement **clear certification pathways** for computer science teachers at elementary and secondary levels



5.

Create university programs to **encourage all preservice teachers** to gain exposure to computer science



6.

Establish **dedicated computer science** positions in a state education agency



7.

Require that all schools offer computer science with appropriate implementation timelines



8.

Allow computer science to count toward a core graduation requirement



9.

Allow **computer science to satisfy an admission requirement** at higher education institutions



10.

Require that all students take computer science to earn a high school diploma



What Has Pennsylvania Done to Advance Computer Science Education?

Pennsylvania has dedicated \$20M annually to PAsmart since 2019, a program established to expand STEM and computer science education, including teacher professional development.

Pennsylvania adopted the CSTA K-12 standards in 2018. Standards within each grade band address algorithmic bias, accessible technology, and inclusivity.

How Can Pennsylvania Increase Opportunities for Students?

Pennsylvania should create a state plan to establish strategies and goals for computer science education statewide.

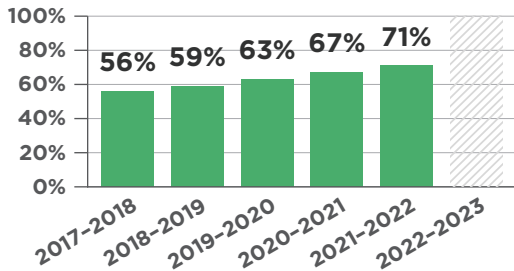
Pennsylvania should require all high schools to offer at least one computer science course.



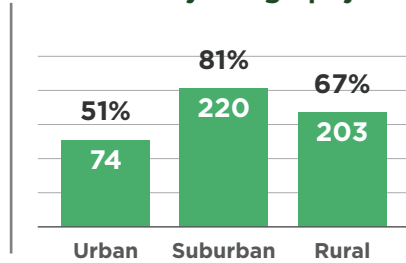
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Percentage of Public High Schools Offering Foundational Computer Science

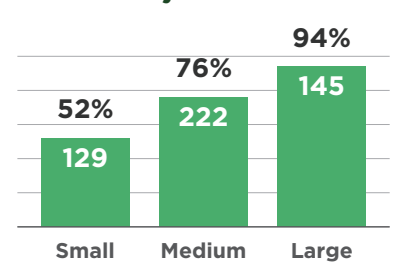
Access by School Year*



Access by Geography**



Access by School Size**



*Previously reported numbers were inaccurate and we have worked closely with the state with this to correct the data.

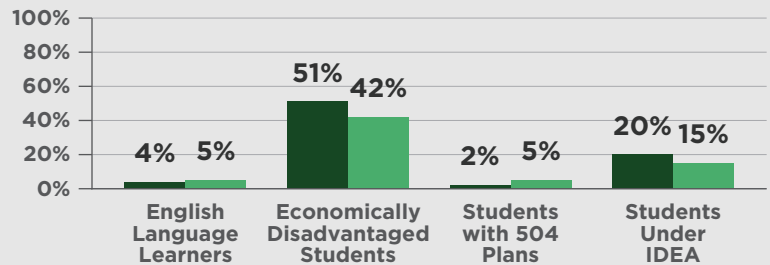
**Data is from the most recent data school year 2021-2022

Participation in Foundational High School Computer Science by Student Demographics

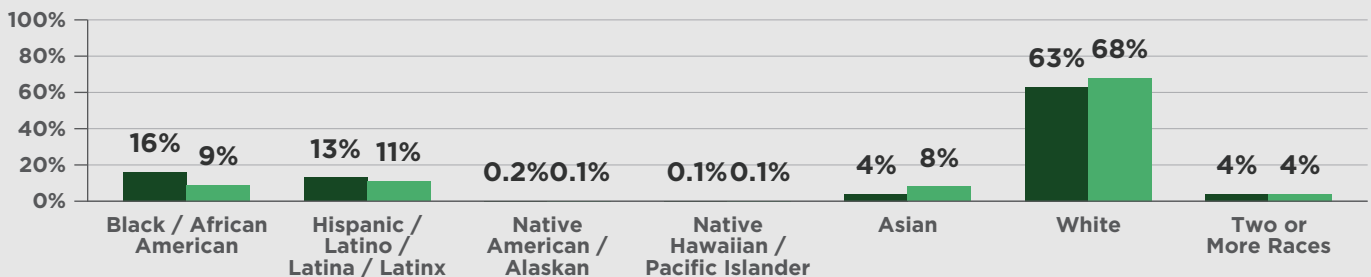
10% of high school students took foundational computer science in 2021-2022

40% of students who took foundational computer science were female

Enrollment by Subgroup



Enrollment by Race / Ethnicity



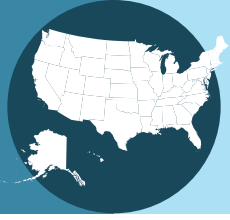
Black students are 1.4 times less likely to take foundational computer science than their white and Asian peers

- Student Demographics 9-12
- Participation in Foundational Courses

K-12 Access and Participation in Computer Science

46% of middle schools*** are teaching foundational computer science education, with an enrollment of 17,965.

***62% of middle schools reported course offerings and among those schools 46% reported teaching foundational computer science



UNITED STATES

Percentage of Public High Schools Offering Foundational Computer Science Nationally

