2021 State of Computer Science Education

Nationally, just 51% of high schools offer computer science, up from 35% in 2018. This represents tremendous progress by teachers, school leaders, policymakers, and other advocates. But given the significance of computing in today's society, it is not enough for half of schools to lack even a single course. New data reveals disparities in who has access to and who participates in computer science education.

Over the past year, U.S. students, teachers, and families faced unprecedented challenges, making it more important than ever that computer science becomes a sustained part of the education system. Computer science supports the development of problem solving, creativity, metacognition, spatial skills, reasoning skills, and improvements in reading, writing, mathematics, and science test scores. Increasingly, computer science is recognized as a core literacy for students.

Students who attend rural schools, urban schools, or schools with higher percentages of economically disadvantaged students are less likely to have access to computer science.

States are working to broaden access and participation in computer science with policies to make computer science a fundamental part of the K–12 education system.
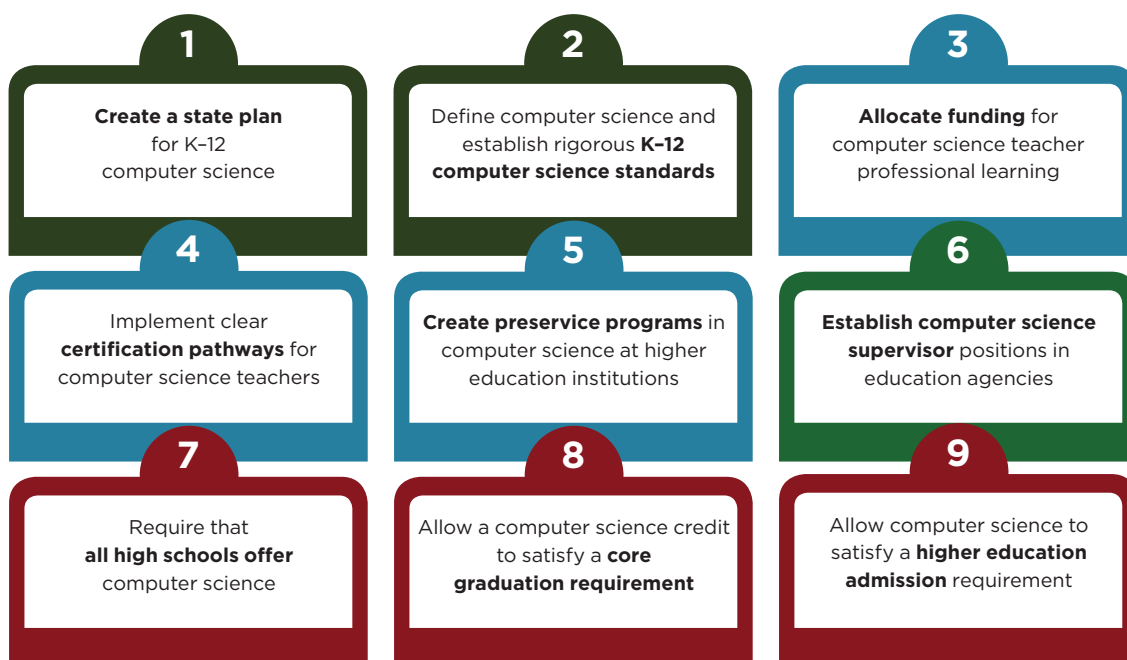
States that adopt **more of the nine policies** shown below have a greater percentage of high schools offering computer science.

Female students make up 49% of the elementary students enrolled in computer science, **44% of the middle school students, and only 31% of high school students.**

Although 78% of U.S. high school students attend a school that offers foundational computer science, **only 4.7% of students are enrolled in a course**.

Pursuing policies that expand access to K–12 computer science provides policymakers a rare opportunity to address equity, workforce, and education issues on a bipartisan basis.

Nine Policies to Make Computer Science Fundamental

1 **Create a state plan** for K–12 computer science

2 Define computer science and establish rigorous **K–12 computer science standards**

3 **Allocate funding** for computer science teacher professional learning

4 Implement clear **certification pathways** for computer science teachers

5 **Create preservice programs** in computer science at higher education institutions

6 **Establish computer science supervisor** positions in education agencies

7 Require that **all high schools offer** computer science

8 Allow a computer science credit to satisfy a **core graduation requirement**

9 Allow computer science to satisfy a **higher education admission** requirement

Policy Principles

- Clarity
- Capacity
- Leadership
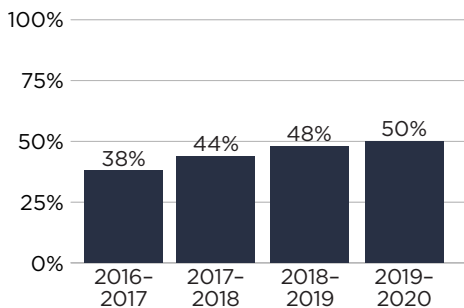- Sustainability
- Equity and Diversity*

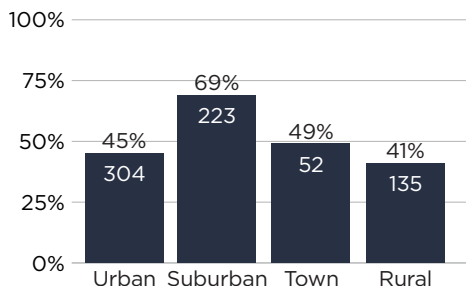*Equity and Diversity should be incorporated in each of the nine policies.*

New York

Percentage of Public High Schools Offering Foundational Computer Science
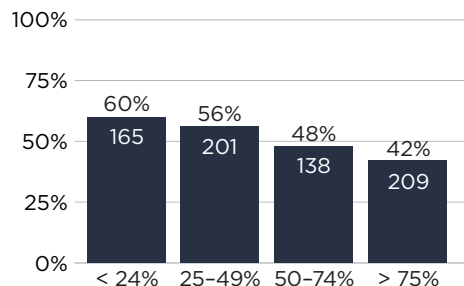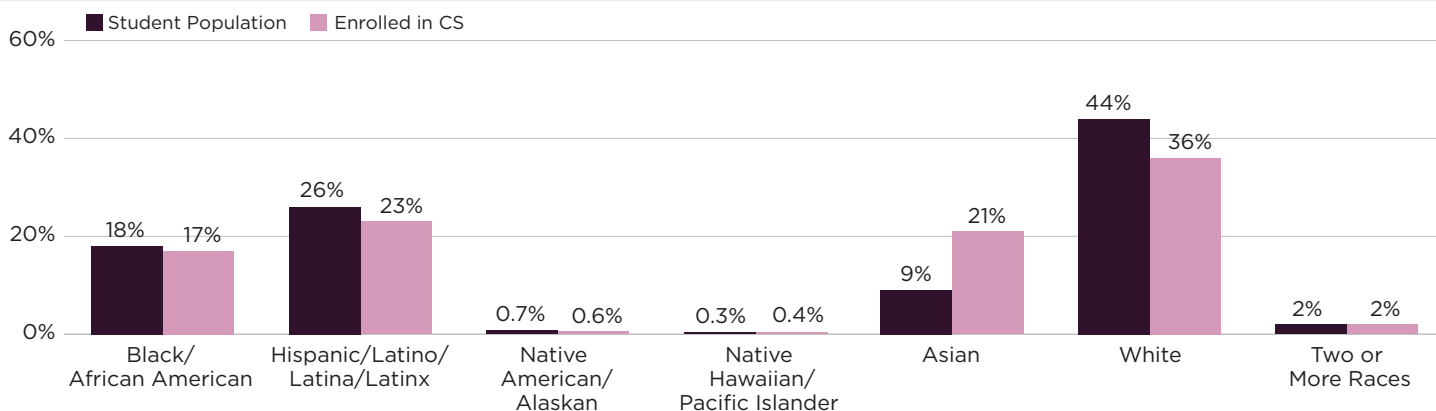
Access by School Year

Year	Percentage
2016–2017	38%
2017–2018	44%
2018–2019	48%
2019–2020	50%

Access by Geography

Geography	Percentage	Number
Urban	45%	304
Suburban	69%	223
Town	49%	52
Rural	41%	135

Access by % FRL in the School

% FRL	Percentage	Number
< 24%	60%	165
25–49%	56%	201
50–74%	48%	138
> 75%	42%	209

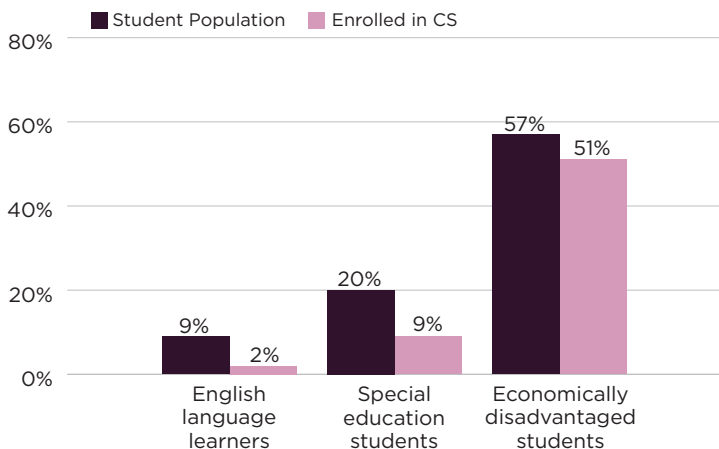## Participation in Foundational High School Computer Science Courses by Demographic

Computer Science Enrollment by Race/Ethnicity

Legend: Student Population, Enrolled in CS

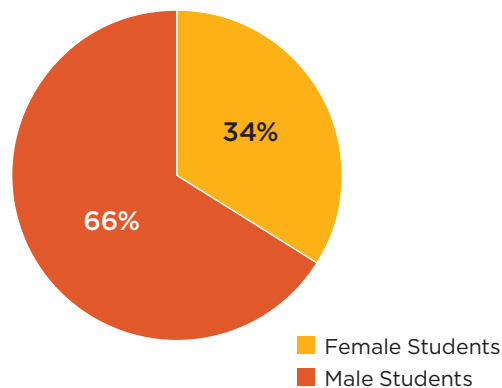| Race/Ethnicity	Student Population	Enrolled in CS
Black/African American	18%	17%
Hispanic/Latino/Latina/Latinx	26%	23%
Native American/Alaskan	0.7%	0.6%
Native Hawaiian/Pacific Islander	0.3%	0.4%
Asian	9%	21%
White	44%	36%
Two or More Races	2%	2%

66% of NY high school students attend a school that offers computer science, but only 4.3% of students are enrolled in a foundational computer science course. 34% of students enrolled in computer science courses are female. Black/African American students are 1.3 times less likely than their white and Asian peers to attend a school that offers computer science. Only 41% of schools in rural areas and 45% of schools in urban areas offer computer science, compared to 69% in suburban areas.

CS Enrollment by Subgroup

Legend: Student Population, Enrolled in CS

Subgroup	Student Population	Enrolled in CS
English language learners	9%	2%
Special education students	20%	9%
Economically disadvantaged students	57%	51%

Computer Science Enrollment by Gender

Gender	Percentage
Female Students	34%
Male Students	66%

Data provided primarily by the State Department of Education, based on 1,428 schools with high school grades. Numbers inside the bars represent the total number of public high schools offering computer science in that category.
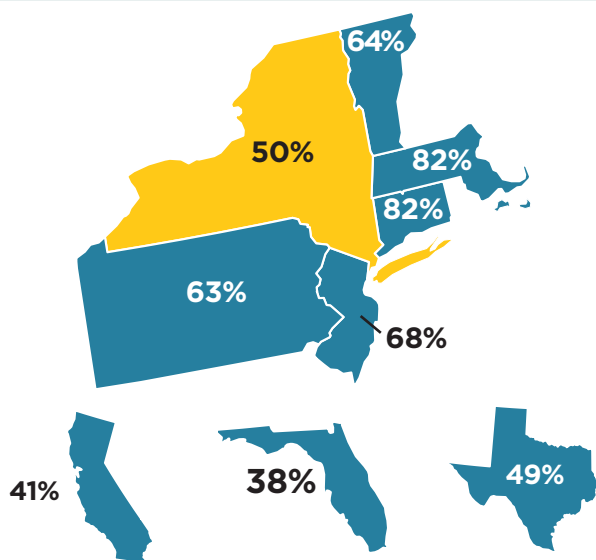
New York

State policy should provide clarity, school and state capacity, leadership, sustainability of computer science initiatives, and promote access to and equity within rigorous and engaging computer science courses.

Regional Comparison of Computer Science Education Policy Adoption

POLICY	NY	CT	MA	NJ	PA	VT	CA	FL	TX
State CS Plan		✓	✓	✓			✓		
K–12 CS Standards	✓	✓	✓	✓	✓		✓	✓	
Funding for Teacher PD	$24M		$3.14M	$4.8M	$56M		$20M	$30M	$2.6M
Teacher Certification	✓	✓	✓	✓	✓	✓	✓	✓	✓
Preservice Programs	✓	✓	✓		✓	✓			✓
State CS Supervisor		✓	✓	✓	✓			✓	
All High Schools Offer		✓		✓				✓	✓
Graduation Credit	✓	✓	✓	✓	✓	✓	✓	✓	✓
Higher Ed Admission			✓				✓		✓

Percent of High Schools Offering CS by Region

64%
50%
82%
82%
63%
68%
41%
38%
49%

New York has averaged
31,293
open computing jobs each month

These open jobs have an average salary of
$105,768

Yet there were only
6,043
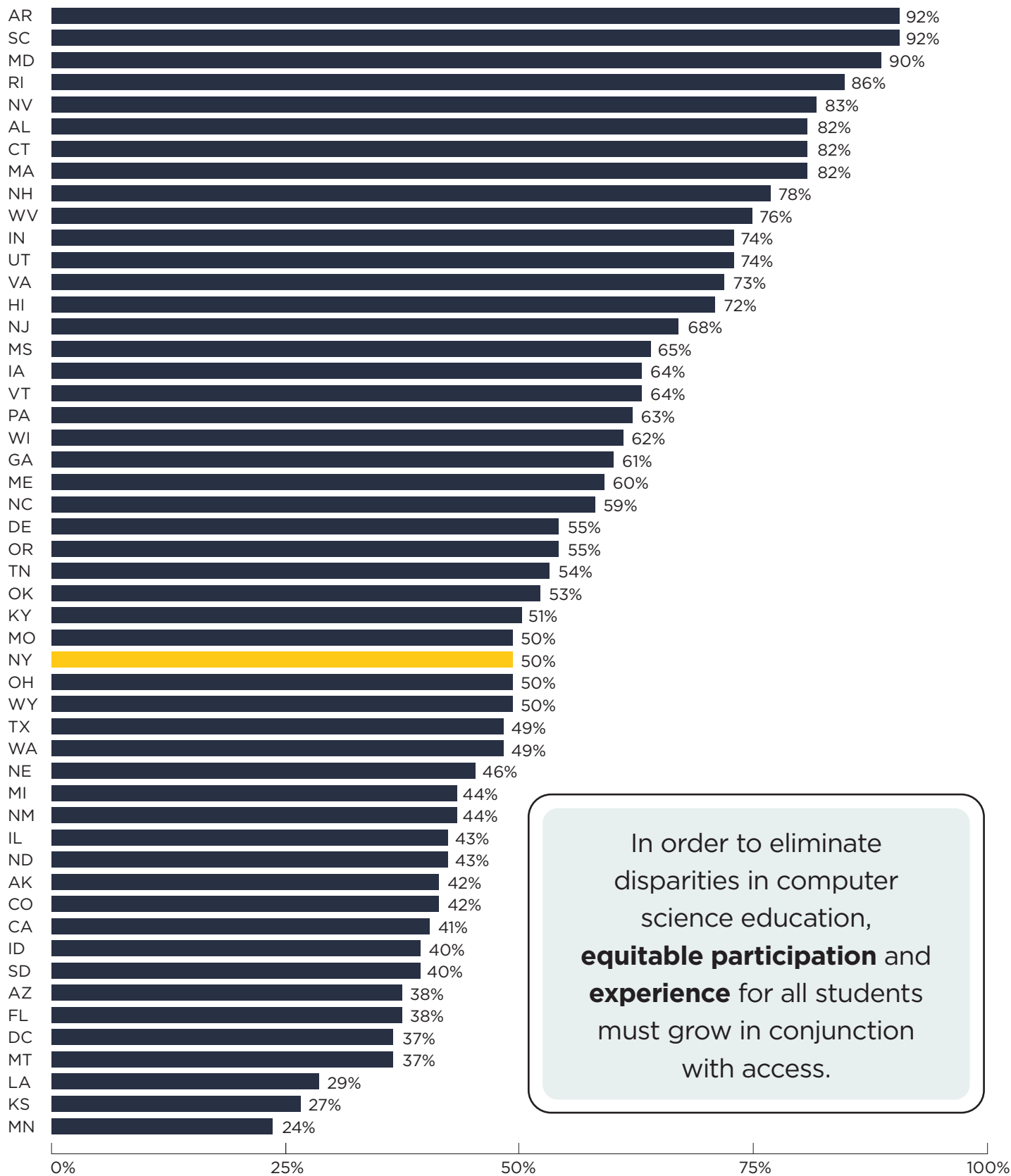graduates in computer science in 2018

Did you know... 66% of NY high school students attend a school that offers computer science, but only 4.3% of students are enrolled in a foundational computer science course.

High Schools Offering Computer Science by State

State	%
AR	92%
SC	92%
MD	90%
RI	86%
NV	83%
AL	82%
CT	82%
MA	82%
NH	78%
WV	76%
IN	74%
UT	74%
VA	73%
HI	72%
NJ	68%
MS	65%
IA	64%
VT	64%
PA	63%
WI	62%
GA	61%
ME	60%
NC	59%
DE	55%
OR	55%
TN	54%
OK	53%
KY	51%
MO	50%
NY	50%
OH	50%
WY	50%
TX	49%
WA	49%
NE	46%
MI	44%
NM	44%
IL	43%
ND	43%
AK	42%
CO	42%
CA	41%
ID	40%
SD	40%
AZ	38%
FL	38%
DC	37%
MT	37%
LA	29%
KS	27%
MN	24%

In order to eliminate disparities in computer science education, **equitable participation** and **experience** for all students must grow in conjunction with access.

For more details on policy, access, and participation, see the full 2021 State of Computer Science Education report at advocacy.code.org/stateofcs

CODE Advocacy Coalition

CSTA

ECEP Expanding Computing Education Pathways