The State of Computer Science
OUR VISION

every student
in every school
has the opportunity
to learn computer science
Promote State and National Policy
Computer Science is Fundamental
Computer science is fundamental for every student’s success

Seven studies show: Children who study computer science...

- perform better in other subjects
- excel at problem solving
- are 17% more likely to attend college

New meta-analysis of 440 studies showed that students who learn programming do better on tests for creativity, mathematical skills, metacognition, spatial skills, and reasoning skills.

Solving the diversity problem begins in K-12

Women who try AP Computer Science in high school are ten times more likely to major in it, and Black and Latinx students are seven times more likely.
Computing jobs are the #1 source of new wages in the US

400,000 current openings

These jobs are in every industry and every state, and they’re projected to grow at twice the rate of all other jobs.
The value of a computer science education

$.58M
lifetime earnings of a high school graduate*

$1.19M
lifetime earnings of a college graduate*

$1.67M
lifetime earnings of a computer science major*

A computer science major can earn 40% more than the college average.

*Net present value today
The “STEM” problem is in computer science

- 67% of all new jobs in STEM are in computing
- 11% of STEM bachelor's degrees are in Computer Science
2020 State of Computer Science Education Education
Illuminating Disparities

Highlights
Since the last report, low
requirement for all high
school courses.
States have adopted pilot
programs to offer computer
science courses.
Georgia is currently piloting
the 2022-2023 school year
in each local school.
Science courses and new
exploratory computer science
school by at least 50.

Access and Participation
diversity, student demographics

Hispanic/Latinx students are
3 times less than their
offering.

Stories from the Field
Looking to re-engage stakeholders committed to advancing computer
science education for all students in North Carolina, a group of leaders from
K-12, higher education, and nonprofit organizations such as the
Fridley Institute launched plans for a fully virtual statewide computer
science education summit. The 2020 summit will help CS4NC maintain computer science advocacy
and policy momentum while addressing challenges brought on during the COVID-19 pandemic.
With great uncertainty in the current situation, CS4NC hopes to provide stakeholders with a clearer understanding
of how they can continue to provide computer science education in their schools and implement the new NC K-12 Computer Science Standards.

Computer Science for California (CS4CA) is a statewide coalition of
educators, industry leaders, parents, and higher education
institutions advocating for a
high-quality teacher and
learning opportunities.
Advocacy has been instrumental
in science policy and programs.

The Connecticut Department of
Education, demonstrated that
Connecticut can address the
challenge.

During the 2020 legislative session,
the Department of Education
launched a campaign to support
a bill for computer science
by the 2022-2023 school year.

OrmusForCA, a leading
organization, is working with
the legislature in support of
the bill.

Washington has a lot of ground to cover. Although the CSTA
chapters in Spokane and Puget Sound areas support CWCS in
their regions, a significant area of the state lacks coordination.
Supported by an ECEP co-sponsorship, the CSTAs have
met at the CSTA chapter leaders and eventually
the Office of the
State Superintendent of Public Instruction to build a public policy
and movement of computer science education data and develop a K-12 Computer Science Education guidelines.
In the last 12 months, 28 states have adopted a total of 42 policies.

Policy Movement
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 rigorous computer science teacher professional learning and course support
4. Implement clear certification pathways for computer science teachers
5. Create programs at institutions of higher education to offer computer science to preservice teachers
6. Establish dedicated computer science positions in state and local education agencies
7. Require that all secondary schools offer computer science with appropriate implementation timelines
8. Allow computer science to satisfy a core graduation requirement
9. Allow computer science to satisfy an admission requirement at institutions of higher education

Policy Principles
- Clarity
- Capacity
- Leadership
- Sustainability
- Equity and Diversity

*Equity and Diversity is incorporated in each of the nine policies.
Policy Principles
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- Capacity
- Leadership
- Sustainability
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There continues to be a **strong connection** between the adoption of policies and the percentage of high schools teaching computer science in a state.
Effect of Policies

States that require schools to offer CS have a higher percentage of schools teaching CS.
Nine Policies and Schools Teaching Computer Science

- State Plan and Access to Computer Science
  - Percent of High Schools Teaching CS: Yes 57%, No 44%

- K-12 Standards and Access to Computer Science
  - Percent of High Schools Teaching CS: Yes 49%, No 42%

- Preservice Teacher Preparation Programs and Access to Computer Science
  - Percent of High Schools Teaching CS: Yes 54%, No 41%

- State Supervisor and Access to Computer Science
  - Percent of High Schools Teaching CS: Yes 48%, No 45%

- Funding and Access to Computer Science
  - Percent of High Schools Teaching CS: Yes 52%, No 40%

- Certification and Access to Computer Science
  - Percent of High Schools Teaching CS: Yes 49%, No 38%

- Computer Science Satisfying a Higher Education Admission Requirement and Access to Computer Science
  - Percent of High Schools Teaching CS: Yes 49%, No 46%

- Computer Science Satisfying a Core Grad Requirement and Access to Computer Science
  - Percent of High Schools Teaching CS: Yes 47%, No 42%
State Plan for K–12 CS

18 states

Yes

No

[Map of the United States showing 18 states in blue, indicating they have a State Plan for K–12 CS.]
State Funding for K-12 CS

29 states
CS Teacher Certification

40 states + DC
Preservice Teacher Preparation

20 states
State CS Supervisor

29 states

Yes
No
All High Schools Offer CS

20 states

Yes

No
Core Graduation Credit

48 states + DC

Yes
District decision
No
Higher Education Admission

20 states
Ongoing Challenges
The majority of schools don’t teach computer science

90% of parents want their child to study computer science

47% of high schools teach computer science
K-12 Access

Only 47% of high schools teach computer science.
Access by Income Level and Community

Income Level and Access to Computer Science

Percent of High Schools Teaching CS

<table>
<thead>
<tr>
<th>Percent of Economically Disadvantaged Students In the School</th>
<th>Percent of High Schools Teaching CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-24%</td>
<td>55%</td>
</tr>
<tr>
<td>25%-49%</td>
<td>56%</td>
</tr>
<tr>
<td>50%-74%</td>
<td>45%</td>
</tr>
<tr>
<td>75%-100%</td>
<td>34%</td>
</tr>
</tbody>
</table>

Percent of High Schools Teaching Computer Science by Community Type

<table>
<thead>
<tr>
<th>Community Type</th>
<th>Percent of High Schools Teaching CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>44%</td>
</tr>
<tr>
<td>Suburban</td>
<td>57%</td>
</tr>
<tr>
<td>Town</td>
<td>41%</td>
</tr>
<tr>
<td>Rural</td>
<td>43%</td>
</tr>
</tbody>
</table>
AP CS Access by Race/Ethnicity

Race/Ethnicity and Access to Computer Science

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>% Students Who Attend a School That Teaches CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native Alaskan</td>
<td>53%</td>
</tr>
<tr>
<td>Black/African American</td>
<td>66%</td>
</tr>
<tr>
<td>Hispanic/Latina</td>
<td>71%</td>
</tr>
<tr>
<td>White</td>
<td>74%</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>75%</td>
</tr>
<tr>
<td>Asian</td>
<td>85%</td>
</tr>
</tbody>
</table>
Participation by Race/Ethnicity

Students from marginalized racial and ethnic groups are underrepresented in taking AP computer science exams, even when they attend a school that teaches it.
AP CS Participation by Gender

AP Computer Science Exam Participation by Gender

* Includes both public and private schools
National AP CS Participation by Race/Ethnicity and Gender

Female Students

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black/African American</td>
<td>18%</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>0.1%</td>
</tr>
<tr>
<td>Hispanic/Latino/Latina</td>
<td>0.2%</td>
</tr>
<tr>
<td>Native American/Alaskan</td>
<td>7%</td>
</tr>
<tr>
<td>White</td>
<td>38%</td>
</tr>
<tr>
<td>Asian</td>
<td>30%</td>
</tr>
<tr>
<td>2+ Races/Other</td>
<td>7%</td>
</tr>
</tbody>
</table>

Male Students

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black/African American</td>
<td>16%</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>0.1%</td>
</tr>
<tr>
<td>Hispanic/Latino/Latina</td>
<td>0.2%</td>
</tr>
<tr>
<td>Native American/Alaskan</td>
<td>7%</td>
</tr>
<tr>
<td>White</td>
<td>47%</td>
</tr>
<tr>
<td>Asian</td>
<td>25%</td>
</tr>
<tr>
<td>2+ Races/Other</td>
<td>7%</td>
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</tbody>
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Total Number of CS Exams Taken
See up-to-date policy and advocacy resources: advocacy.code.org

Download the report: advocacy.code.org/stateofcs
Thank you for coming!
amy.roberts@code.org