CSforCA

COMPUTER SCIENCE FOR CALIFORNIA

MAKING COMPUTER SCIENCE COUNT IN CALIFORNIA

Access and engagement in rigorous computer science education can help students prepare for college, careers, and community participation.

CSforCA believes high quality computer science (CS) education should be available to all students. When computer science "counts" it is recognized as foundational learning, and will be prioritized and supported as a core academic subject. Making computer science count toward high school graduation and college eligibility will create important incentives for young people to take it. We are pleased to share here the many ways to count CS education in California, making it accessible to all students, regardless of their pathway.

Why is CS foundational learning?

Computer science is foundational knowledge for every student and should be prioritized in the K12 curriculum. Computer science education helps develop critical thinking, problem solving, and collaboration skills that will help prepare students to address challenges that are meaningful and relevant to their lives.

Making computer science "count" has been an explicit goal of CSforCA since its inception.[1] It helps provide incentives for more students to take it, and helps encourage more schools to offer it. These efforts date as far back as 2014 when legislation was passed in California (AB1764) that recognized computer science toward an advanced math credit and just last year, the University of California recognized computer science as an advanced science course.

DATA SPOTLIGHT:

Early exposure to CS has long-term effects and often influences students' future career and college choices.

Studies have found that students who take CS Principles in high school are more than **three times as likely** to major in computer science in college than similar students who did not take CS Principles (16.9% vs. 5.2%), and differences are even larger for female and Hispanic students.[2]

What is A-G and what does it have to do with making CS count?

California's sequence of high school courses, **A-G**, are the minimum college entrance requirements that students must complete (with a grade of C or better) to be eligible for admission to the University of California (UC) and California State University (CSU). While these A-G categories have traditionally focused on standard math, science, English, History/Social Studies, and the arts, there have been recent and substantive changes in course criteria and guidance for allowing computer science courses to "count" toward A-G requirements. By allowing CS to count in these different domains, new forms of access are being created for students who might not have considered CS in their already busy high school schedules.

For more information about area C and D course criteria and guidance, please see the **A-G Policy Resource Guide** from the University of California Office of the President (UCOP).

Photo Courtesy of Riverside Unified School District

[1] The Alliance for California Computing Education for Students and Schools (ACCESS), the predecessor to CSforCA, was formed in 2012.
[2] Wyatt, J., Feng, J., Ewing, M. (2020). AP Computer Science Principles and the STEM and Computer Science Pipelines. Retrieved from https://apcentral.collegeboard.org/pdf/ap-csp-and-stem-cs-pipelines.pdf?course=ap-computer-science-principles

There are many ways that computer science counts in California.

It could potentially count as a math, science, Career Technical Education course, or an elective. Ultimately, each LEA will make its own decision on how courses count in the local context.

■ CS can count as math.

As of October 2020, **UCOP revised mathematics (area C)** course criteria and guidelines CS courses that uses mathematical concepts, includes a mathematics prerequisite, substantially aligns with Common Core standards and are intended for 11th and/or 12th grade levels are also eligible for approval and may satisfy the required third year or recommended fourth year of the subject requirement if approved as an advanced mathematics course.

■ CS can count as science.

As of February 2019, **UCOP updated laboratory science (area D)** disciplines as well as course criteria so that a CS course, when it meets the revised area D course criteria, and receives approval from UC High School Articulation, can count toward a recommended third or later science course in area D for UC admissions. ACCESS developed a **FAQ for CS and science**.

■ CS can be career technical education (CTE).

CTE pathways integrate academic understanding with technical and occupational knowledge. Many schools choose to classify CS courses in the CTE pathway in order to be eligible for Perkins Funding to support a teacher with CTE/ICT authorization.

■ CS can be an elective.

To be University of California (UC) eligible, students are required to take one college prep elective. In this case, CS "counts" as a "G" elective and therefore, can be considered part of the "core" requirements for UC eligibility. A "G" elective reinforces the notion that CS is for everyone, regardless of math or science interest and aptitude. However, when CS is maintained as an elective, English Learners often don't have space in their schedules for an elective because their elective spaces are full with EL coursework.

Teacher Credentialing in Multiple Pathways

The way an individual district or school offers CS and how it is classified will also affect the teachers' credential requirement. Different teaching credentials are necessary depending on how CS is offered and categorized at both the local and state level. More information can be found on our **Teaching CS: Meeting The Demand In CA** infographic. Check with the **California Commission on Teacher Credentialing** and your local education authority, as they ultimately make these decisions.

CS Integration in Other Subjects

CS can be taught as a stand-alone course and it can also be integrated in other subjects such as math and science. The **Next Generation Science Standards** includes "using mathematics and computational thinking" (e.g., simulation and modeling) as part of its eight scientific practices. The math standards in the **Common Core State Standards** include the need for using technology "to explore and deepen their understanding of the concepts," facilitating CS to increasingly be integrated into existing curriculum, especially at the elementary level.

No matter how you decide to implement CS in your classrooms, teachers are encouraged to leverage the newly adopted **California CS State Standards**, as well as the **ICT Standards used in Career Technical Education**.

Whatever pathway you choose, teachers are encouraged to pursue ongoing professional development opportunities to help build their capacity to teach CS.

Additional Resources

- Learn about teacher professional development opportunities at **summerofcs.org** and **csteachers.org/PD**.

- California's statewide system of support is working to support computer science education through the California County Superintendents Educational Services Association's (CCSESA) **Curriculum and Instruction Steering Committee** (CISC). The California Department of Education also provides guidance on **Understanding the College/Career Readiness Measure** on the California School Dashboard. For additional support, see **makecscount.com**.

- To see a course listing and additional guidance on A-G, visit **UCOP doorways**.

- For further guidance on ways to align curriculum with math and science visit the **California Math Project** and **California Science Project**, and the statewide **California Subject Matter Projects** for integration with other disciplines, **CA4NGSS**, and the **CA STEM Network**.