Integrating
Computer Science + Geography

Professional Fellowship

Session #5

Feb 20, 2024: 6:00-7:30 p.m.

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Session Agenda

- Spring enlivening

- Essential planning for July 15-17

- Individual sharing of ideas/goals
(anyone who hasn't shared and is ready)

- Meditation on Comp Sci Standards

Summer 2024 Workshop

July 15-17, 2024

Univ. of San Diego campus

> <u>Everyone</u> should complete this <u>form</u> to provide Stephanie with info about your travel plans

> On-campus accommodation for 7/14-17

> Airline tickets will be purchased by USD

> Travel and meal costs covered during travel to participate in workshop

Summer 2024 Workshop

July 15-17, 2024

Agenda

> Work time:
  Mon 8:30-4:00
  Tues 8:30-4:00
  Wed 8:30-12:00

> Group dinner / neighborhood
  exploration on Monday night in Little Italy

> Tuesday evening options

Questions?

Planning Your Fellowship Path

1. **Identify opportunities** to integrate something new into your instruction that advances your goals and connects with student interests while leveraging the power of CS + Geo.

2. **Document** your process and progress, **and periodically share** your work with the group.

3. Set your own **SMART objectives** for the fellowship, with regard to developing and piloting teaching and learning activities.
(SMART = specific, measurable, achievable, relevant, and time-specific; e.g., *By December 31, 2023 I will identify at least two opportunities to integrate or emphasize CS + Geo in my teaching related to a high-interest topic.*)

4. **Engage networks of collaboration and support** based on your needs

5. Add one or more objectives related to **sharing your work** and the value of CS + Geo.

Planning Your Fellowship Path

- **Planning document shared on Google Drive**

- **One document per fellow. Add note if you choose to work in pairs or groups**

- **Elements will be added to this planning document over time**

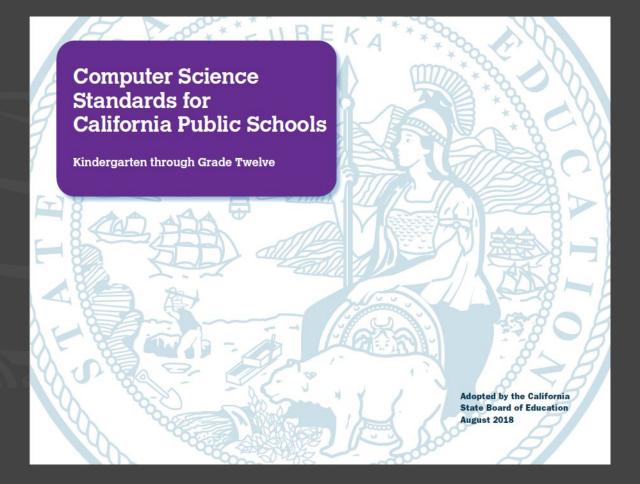 - What CS Standards are you addressing?

Click here to access

Name:

Grade level(s):

Subject(s):

Description of community location and context:

Opportunities I have identified for integrating CS + Geo
(at least 1 by Dec '23, 3 by Apr '24)

My fellowship objectives
(establish 2-3 SMART objectives by Apr '24, update progress on each as relevant)

Questions and/or needs I have in order to meet my objectives

Plans for sharing my work and the value of CS + Geo with colleagues and ed leaders
(at least 1 by Oct '24)

Notes

Links to Key Resources and Shareable Products

Questions?

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We are funded to work on integration of Computer Science instruction into other subjects.

Equity Issues

California schools house the largest, most diverse population of students in the United States (California Department of Education 2016). As such, it is imperative that all core subjects, including computer science, are not merely inclusionary, but that instruction uses practices that actively engage students and increase access for underserved populations. Equity in computer science education does not equate to preparing all students to major in computer science at the post-secondary level, or to pursue careers in software engineering or other areas of computing technologies. Rather, computer science education for all ensures that every student develops a foundation of conceptual knowledge and proficiency in computer science practices, which provides the skills to responsibly and productively participate in a world with broadly integrated digital technologies.

Equity is more than an availability of computer science classes—it requires leaders and educators to carefully consider the following: inclusive practices regarding how classes are taught, student recruitment and retention, instructional practices that guarantee universal access, and high expectations for all students. Computer science is not designed to be offered only to a select few, or as an elective for interested students. Equity in computer science calls for leaders and educators to guarantee computer science instruction for all students, as an essential core subject that is a necessary and valuable component of a comprehensive education.

Historically, computer science has been inaccessible to the majority of K–12 students. Approximately 65 percent of high schools in California offer no computing classes (Level Playing Field Institute 2016, 7). Computer science education rates at the K–8 level are even more dismal. While 59 percent of California's student population is Latinx or African American, these students comprise only 11 percent of students taking AP Computer Science A and 9 percent of [students taking the AP Computer Science] Playing Field Institu[te ...] percent of the popu[...] AP Computer Scien[ce ...] Field Institute 2016[...] districts face a digit[al ...] science education. [...] rural school districts[...] will have a job in th[...] science, and 92 pe[rcent ...] science, principals [from these schools are 4 percent less likely] to indicate that computer science is a priority, when compared to principals from suburban and large city school districts (Google and Gallup 2017).

The standards are designed for all students, including underserved populations: girls, low-income students, homeless students, rural students, African-American and Latinx students, students
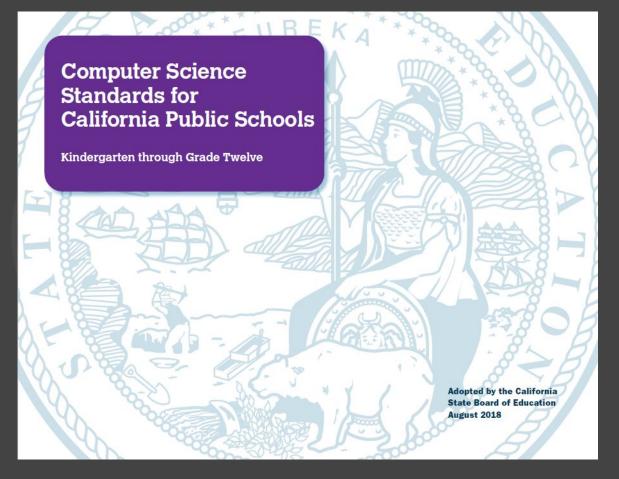
California Department of Education

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Computer Science Standards for California Public Schools

Kindergarten through Grade Twelve

Adopted by the California State Board of Education August 2018

Core Practices

Core Concepts

Subconcepts

Interdisciplinary Connections

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Problem Solving and the Four Cs

Colleges and careers of the future will require students to problem solve and demonstrate the Four Cs: collaboration, critical thinking, creativity, and communication. These skills are echoed throughout the California Common Core State Standards for many subjects. The California computer science standards similarly emphasize these skills.

As a field, computer science itself incorporates problem solving, communication, critical thinking, creativity, and collaboration into its work. The following is a representation of the California computer science core practices and their alignment to equity, problem solving, and the Four Cs.

Core Practice 1: Equity
Fostering an Inclusive Computing Culture

Core Practice 2: Collaboration
Collaborating Around Computing

Core Practice 3: Problem Solving
Recognizing and Defining Computational Problems

Core Practice 4: Critical Thinking
Developing and Using Abstractions

Core Practice 5: Creativity
Creating Computational Artifacts

Core Practice 6: Creativity
Testing and Refining Computational Artifacts

Core Practice 7: Communication
Communicating About Computing

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CORE CONCEPTS & SUBCONCEPTS

Computing Systems	*Devices*	*Hardware & Software*	*Troubleshooting*		
Network & The Internet	*Network Communication & Organization*	*Cybersecurity*			
Data & Analysis	*Storage*	*Collection, Visualization, & Transformation*	*Inference & Models*		
Algorithms & Programming	*Algorithms*	*Variables*	*Control*	*Modularity*	*Program Development*
Impacts of Computing	*Culture*	*Social Interactions*	*Safety, Law, & Ethics*		

Where do our projects fit in?

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Integrating
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Next meeting:
Mar 19, 2024: 6:00-7:30 p.m.

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Source Docs: Geography

- CA K-12 History-Social Science Framework adopted Aug 2016 (link)

- *Geography for Life* standards (link)

Source Docs: Computer Science

- CA K-12 Standards adopted Aug 2018 (link)

- Other CDE info and Computer Science Focus Group Report from 2018 (link)

- Computer Science Teachers Assn Standards (link)