K12 CS FRAMEWORK

K12 COMPUTER SCIENCE FRAMEWORK
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THEMES

• **Equity** — Engage all students in the **Concepts** and **Practices** of computer science that are progressive from early grades through the higher grades.

• **Powerful ideas** — Gain knowledge and skills that can be used to solve real-world problems and make connections across disciplines.

• **Computational thinking** — Ability to formulate problems so that their solutions can be represented by abstraction, modeling, and decomposition.

• **Breadth of application** — Computer science is more than coding. Involves physical systems and networks; the collection, storage, cyber security and analysis of data; and the impact of computing on society (sub concepts).
K-12 COMPUTER SCIENCE CONCEPTS

The Framework defines computer science as 5 core concepts (what students should know).

• Computing Systems
• Network & The Internet
• Data & Analysis
• Algorithms & Programming
• Impacts of Computing
There are 7 core practices that specify what students should be able to do.

- Fostering an Inclusive Computing Culture
- Collaborating Around Computing
- Recognizing and Defining Computational Problems
- Developing and Using Abstractions
- Creating Computational Artifacts
- Testing and Refining Computational Artifacts
- Communicating About Computing
CONCEPT + PRACTICE = STANDARD

**Concept**

**Networks & the Internet**
By the end of 8th grade...

Computers send and receive information based on a set of rules called protocols. Protocols define how messages between computers are structured and sent...

**Practice**

**Developing and Using Abstractions**

Model phenomena and processes and simulate systems to understand and evaluate potential outcomes.

**Standard**

**Networks & the Internet**
(6-8.NI.4)

Model the role of protocols in transmitting data across networks and the Internet.
• Developed by educators
• Aligned to the National K12 Computer Science Framework Concepts and Practices.
• Designed to be accessible by every student in CA
• Connected to Common Core Content Standards
• Serve as guides for teachers, curriculum developers, administrators to provide quality computer science instruction to all students
• Each standard includes a description and examples for classroom application
The CA Computer Science standards are referred to as core and are designed in developmentally appropriate grade spans:

- K-2
- 3-5
- 6-8
- 9-12*
SPECIALTY STANDARDS FOR 9-12

• Options for extending a pathway in computer science
• Content containing increased complexity and depth
Computer Science more than just coding. It is about **LOGIC, PROBLEM SOLVING, CREATIVITY and PROCESS**

- **NOT Need Technology to teach Computer Science.**
- **Standards connection to WRITING**
  - **K-2. AP.13** Decompose the steps needed to solve a problem into a sequence of instructions
  - **3-5. AP.12** Create Programs that include events, loops, and conditionals.
  - **6-8. AP.15** Seek and incorporate feedback from team members and users to refine a solution that meets user's needs.
  - **9-12. AP.22** Document decisions made during the design process using text, graphics, presentations, and/or demonstrations in the development of a complex program.
• Framework for:
  • Identifying challenges
  • Empathizing
  • Gathering information
  • Generating potential solutions
  • Refining ideas
  • Testing solutions.
ACTIVITY

1. Using the Standards Progression, select a CS standard.
2. Create an unplugged and/or coding activity for students in that grade level.
3. Share the standards and idea to this Padlet
4. Be prepared to share your ideas with the whole group.
• Code.org Courses
  • CS Fundamentals (K-5)
  • CS Discoveries (6-10)
  • CS Principles (9-12)
  • Computer Science Principles applied to Science, Algebra and more.
• Free Teacher summer camps available (Brochure)
• AppLab—block-based and JavaScript
• Code.org Workshop @ LACOE, Saturday, June 8
• CS Principles Curriculum Guide 2018 - 2019
CA COMPUTER SCIENCE RESOURCES

- California K-12 CS Standards
- K-12 Computer Science Framework
- More information of California CS Standards
- CDE’s California Computer Science Standards Page
- CA Computer Science Standards Progression Chart (Google Sheet)