Reimagining CS Pathways
High School and Beyond

In a world increasingly powered by computing, students of all identities and chosen career paths need quality computer science (CS) education to become informed citizens and confident creators. To realize this vision, we must reimagine CS education.

What do all students need to learn about computer science?

The foundation defines essential computer science learning outcomes for all high school students, which may be used to articulate the courses or experiences satisfying a high school graduation requirement. Content is organized into Topic Areas and Pillars, which lead to fostering a prioritized set of Dispositions.
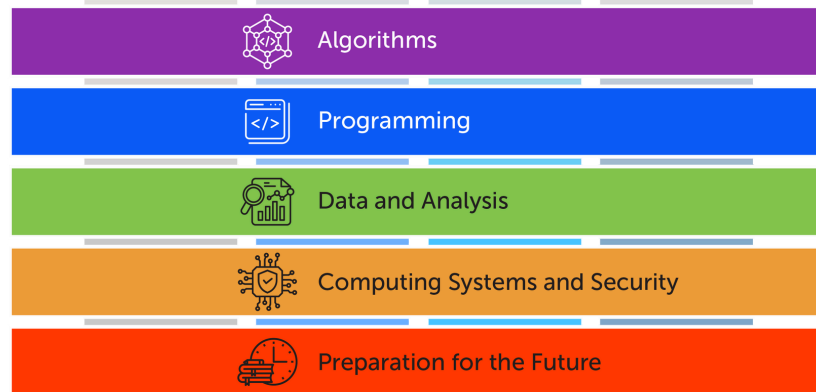
Dispositions
broad-based habits of mind that are positively correlated with learning outcomes

Creativity	Sense of Belonging in CS	Critical Thinking	Persistence	Reflectiveness	Resourcefulness	Curiosity

Topic Areas
key concepts used to organize learning outcomes

- Algorithms
- Programming
- Data and Analysis
- Computing Systems and Security
- Preparation for the Future

Pillars
practices, methods, and approaches that are an integral part of each Topic Area

Impacts and Ethics	Inclusive Collaboration	Computational Thinking	Human-Centered Design

Access the full report and additional resources:

ReimaginingCS.org

What are possible pathways for learning computer science?

There are many possible pathways to learn CS, ranging from artificial intelligence (A) and cybersecurity to X + CS (integration with another subject). We defined content progressions for several specialty areas, plus aligned, example course pathways. We do not expect that high schools could offer all of these pathways; rather they are meant to serve as a menu of options. These pathways recognize that most students will not major in computing in college and offer schools a variety of options based on student interests, community needs, and available resources.

Pathways diagram

Computer Science Foundations

AP CS Principles or CS 0 *supplemented with foundational content*

- **Programming the Future**
  - AI and ML Programming → AI Capstone
  - Information and Network Security → Cybersecurity Capstone
  - Data Science and Analysis → Data Science Capstone
  - Application Development → Programming Capstone
  - Software Development (or AP CSA or CS1) → Programming Capstone
- **Game Design & Digital Innovation**
  - Game Development → Game and Interactive Media Design Capstone
- **Physical Computing**
  - Robotic Systems → Physical Computing Capstone
- **Ethics of Computing**

+

- Intro to Humanities ⇢ Digital Humanities → Humanities + CS Capstone
- Intro to Journalism ⇢ Computational Journalism → Journalism + CS Capstone
- Intro to 2D Art ⇢ Computational Art → Art + CS Capstone
- Biology ⇢ Computational Biology → Biology + CS Capstone

Legend:
- ◯ Non-CS courses
- ◯ Integrated courses
- ◯ CS courses

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