Computer Science Principles
Web Programming

Unit 0: Course Overview

AP CSP COURSE AND EXAM OVERVIEW

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Computer Science Principles

- **AP Computer Science Principles** offers a multidisciplinary approach to teaching the underlying principles of computation. The course will introduce students to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity concerns, and computing impacts. AP Computer Science Principles also gives students the opportunity to use current technologies to create computational artifacts for both self-expression and problem solving. Together, these aspects of the course make up a rigorous and rich curriculum that aims to broaden participation in computer science.

- In this course, we follow the course standard in AP Computer Science Principles standard with enhancement in Web/App Programming. Therefore, we will also go through **HTML**, **CSS** and **JavaScript** Programming lectures

AP Computer Science A and AP Computer Science Principles

AP Computer Science A isn't going anywhere. You'll have the option to take either one or both AP computer science courses. Check out the differences below.

	Computer Science A	Computer Science Principles
What it's about	The fundamentals of programming and problem solving using the JAVA language.	The fundamentals of computing, including problem solving, working with data, understanding the Internet, cybersecurity, and programming.
Goals	Developing skills for future study or a career in computer science or other STEM fields.	Broadening your understanding of computer science for use in a diversity of majors and careers.
The Exam	▶ One end-of-year exam: multiple choice and free response.	▶ Two projects during the course. ▶ One end-of-year exam: multiple choice.

Course Format

LECTURE 1

The AP Score for APCSP

- 16% -- a research artifact with written responses (EXPLORE Task)

- 24% -- a coding artifact with written responses (CREATE Task)

- 60% -- a multiple choice test – 2 hours – 74 questions
  - Pseudocode
  - Four answer choices
  - Single-select questions (66 of these on the practice exam)
  - Multiple-select questions – select two answers (8 of these)

https://apcentral.collegeboard.org/pdf/ap-computer-science-principles-course-and-exam-description.pdf?course=ap-computer-science-principles

1. Creativity
2. Abstraction
3. Data and Information
4. Algorithms
5. Programming
6. The Internet
7. Global Impact

Concepts Crosswalk with AP CS Principles

K–12 CS Framework Concepts	AP CSP Big Ideas
see the framework's practices	Creativity
Abstraction (crosscutting concept)	Abstraction
Networks and the Internet	Internet
Data and Analysis	Data
Impacts of Computing	Impacts
Algorithms and Programming	Algorithms
	Programming
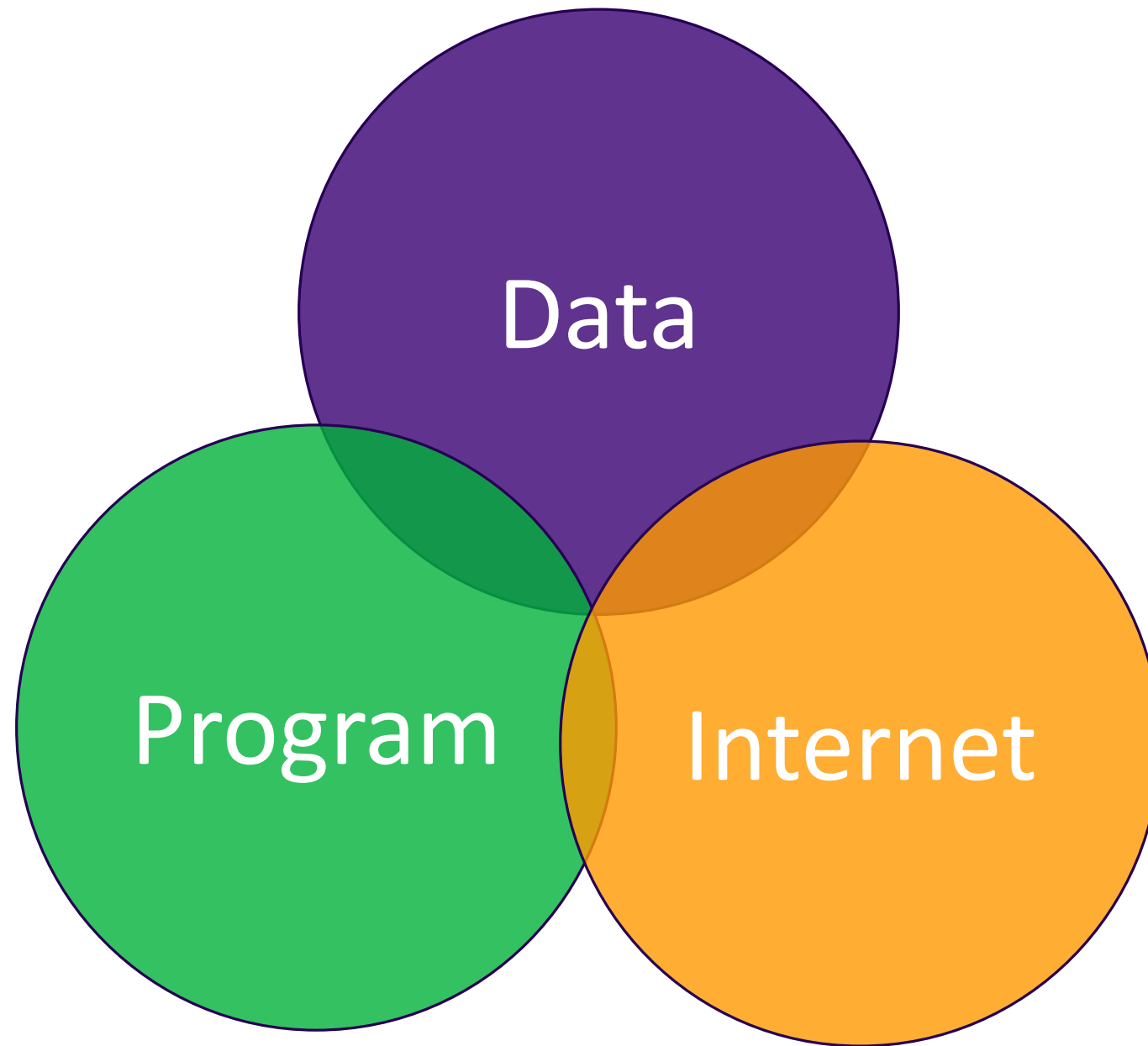
CORE PRACTICES
INCLUDING COMPUTATIONAL THINKING

PRACTICES

1 FOSTERING AN INCLUSIVE COMPUTING CULTURE

2 COLLABORATING AROUND COMPUTING

3 RECOGNIZING AND DEFINING COMPUTATIONAL PROBLEMS

4 DEVELOPING AND USING ABSTRACTIONS

5 CREATING COMPUTATIONAL ARTIFACTS

6 TESTING AND REFINING COMPUTATIONAL ARTIFACTS

7 COMMUNICATING ABOUT COMPUTING

The EXPLORE Task (16%)

- 8 hours of in-class time - minimum

- Research a "computing innovation"

- Create a "computational artifact"

- No help from anyone

- Complete "written responses" to prompts
  - Impact on society, economy, or culture
  - Data – consumes, transforms, uses
  - Data storage, privacy, or security concerns
  - Three sources – 2 recent – three citations -- bibliography

The CREATE Task (24%)

- 12 hours of in-class time - minimum

- Collaboration encouraged – teacher cannot help*

- "solve problems, enable innovation, express personal interest"

- "iteratively design, implement, and test your program"

- **Submit:**
  - Video of the program running
  - Written responses
    - Algorithmic decomposition – an algorithm that is composed of two other algorithms
    - Abstraction that manages the complexity of your program
    - Mathematical or logical constructs
  - All program code (as a PDF)

The AP Digital Portfolio

Teachers
- Portfolio access linked to AP Audit account

The Multiple-Choice Exam (60%)

- Show Exam Reference Materials
- Show College Board Sample Questions – edited for the public
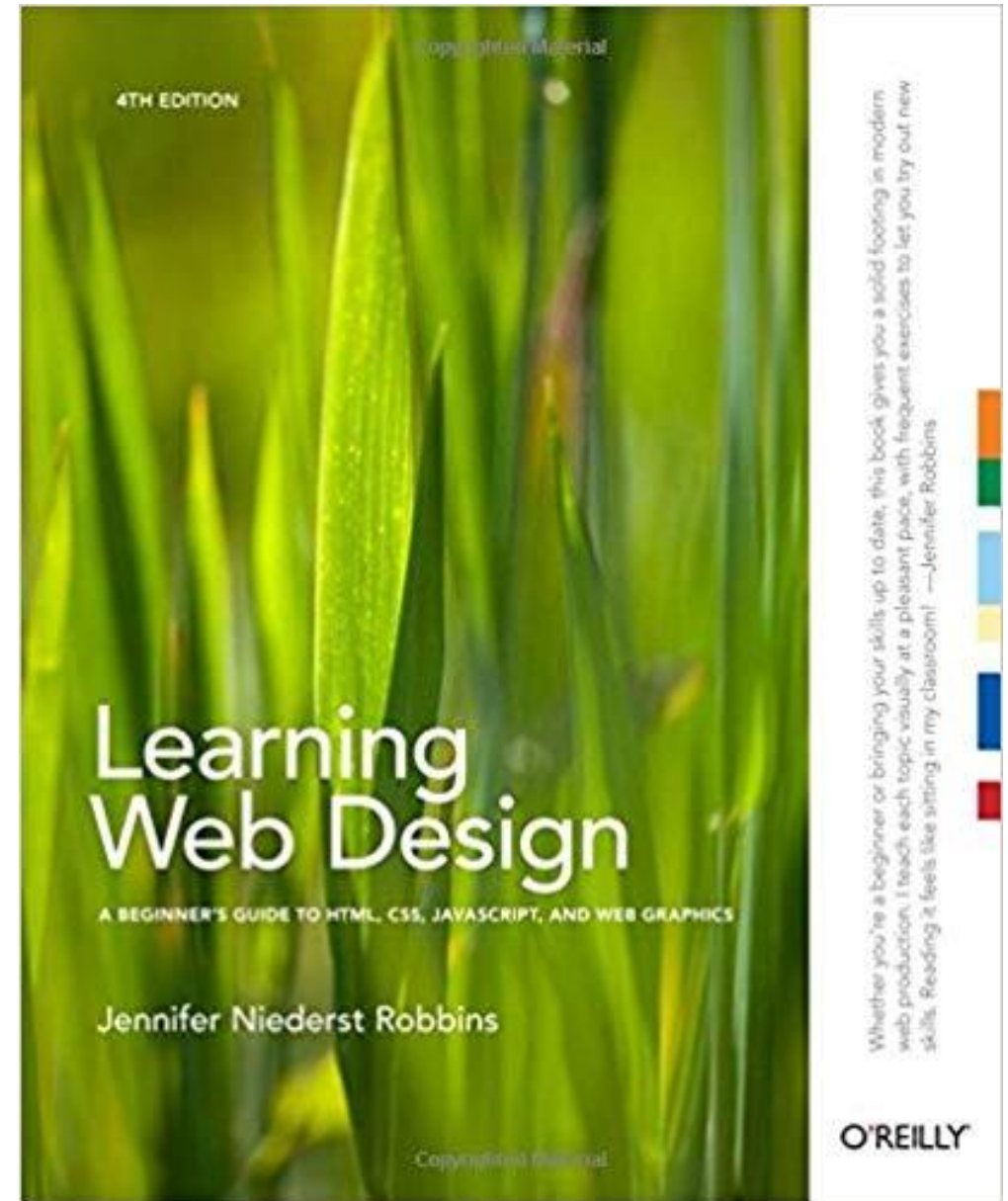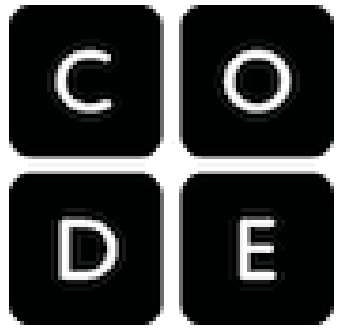
AP Score Distributions from 2017 (Worldwide)

Exam Score	Computer Science A		Computer Science Principles	
	N	% At	N	% At
5	14,623	24.2	6,115	13.8
4	12,650	20.9	9,607	21.7
3	13,271	21.9	17,320	39.1
2	6,970	11.5	8,101	18.3
1	13,005	21.5	3,187	7.2
Number of Students	60,519		44,330	
3 or Higher / %	40,544	67.0	33,042	74.5
Mean Score	3.15		3.17	
Standard Deviation	1.46		1.10	

Course Materials

LECTURE 1

Code.Org

- Constructivist activities
  - Explore concepts through group activities
  - Learn by doing
  - Minimal reading
  - Variety of assessment types
- **Javascript** projects
- Good framework

Code.Org

Unit 1: The Internet

Unit 2: Digital Information

Unit 3: Intro to Programming

Unit 4: Big Data and Privacy

Unit 5: Building Apps

Post-AP: Databases, using data

APCSP – Pros and Cons

PROS
- Lots of time
- Student-directed
- Big Concepts
- Real Life
- Accessible
- Modern pedagogy
- Digital Literacy
- Socially important
- Creative

CONS
- Shallow grading
  - Easily gamed
- Literacy, not "advanced"

Sources

https://apcentral.collegeboard.org/courses/ap-computer-science-principles/course

https://apstudent.collegeboard.org/apcourse/ap-computer-science-principles

https://apcentral.collegeboard.org/pdf/ap-computer-science-principles-course-and-exam-description.pdf?course=ap-computer-science-principles

https://apcentral.collegeboard.org/pdf/ap-csp-student-task-directions.pdf?course=ap-computer-science-principles