



AP Computer Science Principles byDesign At-A-Glance

Intended Audience: Grades 9-12

Course Length: 36 weeks

The **Computer Science Principles byDesign™** course was developed to introduce students to fundamental computer science principles as well as prepare students to take the AP CSP Exam. The course is organized using the College Board AP Computer Science Big Ideas and Computational Thinking Practices. In this course, students program using the Snap programming language, learn some of the most powerful ideas of computer science, demonstrate creativity, and discuss the social implications of computing, thinking deeply about how they can be personally active in promoting and reducing the possible harms.

- **Introduction to Programming:** an introduction to foundational concepts of programming.
 - Click Alonzo Game
 - Gossip and Greet
 - Modern Art with Polygons
 - Protecting Your Privacy
 - Follow the Leader
- **Abstraction:** an investigation into data structures and program control structures.
 - Improving Games by Using Variables
 - Making Art by Using Data Structures
 - Making Decisions by Using Predicates
 - Dealing with Complexity
 - Copyrights
- **Data Processing and Lists:** a focus on lists, abstraction, and higher order functions.
 - Contact Lists
 - Tic-Tac-Toe
 - Robots and Artificial Intelligence
 - Building Data Visualization Tools
 - Big Data
 - Optional Projects
- **How the Internet Works:** addresses network protocols and cybersecurity
 - Reliable Communication
 - Communication Protocols
 - Cybersecurity
 - Community and Online Interactions
 - AP CSP Explore Task
- **Algorithms and Simulations:** use several types of analysis to solve problems.
 - Search Algorithms
 - Models and Simulations
 - Timing Experiments
 - Unsolvable and Undecidable Problems
 - Computing in War
 - AP CSP Create Task
- **How Computers Work:** an overview of the history of computers, software, hardware, number bases, and binary data.
 - Computer Abstraction Hierarchy
 - Data Representation and Compression
 - A Brief History and Impact of Computers



For More Information

Contact Us At

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