**Year-long BP41 / BP42 (Pilot)**

**AP Computer Science Principles 1 & 2**

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# **Welcome to Computer Science Principles**

***Computer Science Principles (CS Principles) curriculum is a full-year, rigorous, entry-level course that introduces high school students to the foundations of modern computing.*** The course covers a broad range of foundational topics such as programming, algorithms, the internet, big data, digital privacy and security, and the societal impacts of computing.

**Curriculum Overview and Goals**

Computing affects almost all aspects of modern life, and all students deserve an education that prepares them to pursue the wide array of intellectual and career opportunities that computing has made possible. This course seeks to provide foundational knowledge and skills to meaningfully participate in our increasingly digital society, economy, and culture.

**Course Description**

Hours of Instruction: 135 (block)

Prerequisite: None

The AP Exam will be taken in May of the Spring semester.

This is a ***college-level introductory course*** in computer science. Because the design and implementation of computer programs to solve problems involve skills that are fundamental to the study of computer science, a large part of the course is built around the development of computer programs that correctly solve a given problem. These programs should be understandable, adaptable, and when appropriate, reusable.

At the same time, the design and implementation of computer programs is used as a context for introducing other important aspects of computer science, including the development and analysis of algorithms, the development and use of fundamental data structures, the study of standard algorithms and typical applications, and the use of logic and formal methods. In addition, the responsible use of these systems is an integral part of the course.

The course is designed to be the equivalent of a first-semester college course in computer science. Mathematics is reinforced.

\*Class enrollment limited to 20 due to the technology-intense nature of instruction.

[**Unit 1 - The Internet**](https://curriculum.code.org/csp-19/unit1/)

What can be represented with a single bit and how do we get a single bit of information from one place to another? In this unit students learn how computers represent all kinds of information and how the Internet allows that information to be shared with millions of people.

[**Unit 2 - Digital Information**](https://curriculum.code.org/csp-19/unit2/)

This unit explores the way large and complex pieces of digital information are stored in computers and the associated challenges. Through a mix of online research and interactive widgets, students learn about foundational topics like compression, image representation, and the advantages and disadvantages of different file formats. To conclude the unit, students research the history and characteristics of a real-world file format.

[**Unit 3 - Intro to Programming**](https://curriculum.code.org/csp-19/unit3/)

This unit introduces the foundational concepts of computer programming, which unlocks the ability to make rich, interactive apps. In Unit 3, students explore the fundamental topics of programming, algorithms, and abstraction as they learn to programmatically draw pictures in App Lab.

[**Unit 4 - Big Data and Privacy**](https://curriculum.code.org/csp-19/unit4/)

The data rich world we live in also introduces many complex questions related to public policy, law, ethics and societal impact. In this unit students explore the technical, legal, and ethical questions that arise from computers enabling the collection and analysis of enormous amounts of data.

[**Unit 5 - Building Apps**](https://curriculum.code.org/csp-19/unit5/)

This unit continues to develop students’ ability to program in the JavaScript language, using Code.org’s App Lab environment to create a series of small applications (apps).

[**AP Explore PT Prep**](https://curriculum.code.org/csp-19/csp-explore/)

This short unit prepares students to complete the AP® Explore Performance Task (PT). Students will have learned the skills and concepts necessary to complete the task in previous units and will even have seen components of the task itself. This unit fully explains all components of the task and walks students through completing and submitting it.

[**AP Create PT Prep**](https://curriculum.code.org/csp-19/csp-create/)

This short unit prepares students to complete the AP® Create Performance Task (PT). Students will have learned the skills and concepts necessary to complete the task in previous units and will even have seen components of the task itself. This unit fully explains all components of the task and walks students through completing and submitting it.

[**Post AP**](https://curriculum.code.org/csp-19/post-ap/)

In this unit students develop skills interpreting visual data and using spreadsheet and visualization tools to create their own digital artifacts. Through an ongoing project - the “class data tracker” - students learn how to collect and clean data, and to use a few common tools for computing aggregations and creating visualizations.