

Survey of Computer Science

Overview

This course introduces the basics of computing using fun and engaging activities instead of formally describing the concepts. It follows the framework of Seven Big Ideas adopted in the AP Computer Science Principles course, but it has more emphasis on exploration and experimentation, and less emphasis on problem-solving and formal analysis than a regular CSP course. To prepare students for the rigors of other courses in the Pathway, this course models ways to adopt a productive disposition that fosters creativity and perseverance. In addition, career exploration lessons are threaded throughout the course, with a focus on developing students' interest in computing and identification with the computing professions.

Objectives

- Demonstrate how to use technology to create computing artifacts.
- Explain the Big Ideas in Computing.
- Describe how computers work, and how to use them effectively.
- Analyze how the Big Ideas in Computing are relevant in daily life.
- Describe careers related to computing and the requisites for each.
- Communicate computing ideas using appropriate terminology
- Collaborate with other students to develop computing artifacts, algorithms or protocols.

Assessment

Formative assessment includes worksheets and several practice activities for each lesson, and unit quizzes. Summative assessment includes projects and/or tests at the end of each unit.

Course Essentials

Equipment	Cost/Unit
Classroom set of computers	\$0 if you already have some, \$500-600 per computer if you need to purchase

Outline:

Unit 1: Creativity	This unit is an overview of the creative development process and its use for creating computational artifacts. Students will complete 2 projects to express themselves using technology.
Unit 2: Abstraction	By exploring simple models and simulations, students learn to identify patterns in natural phenomena and reason about them using suitable abstractions.
Unit 3: Data and Information	Students work with data using different tools and techniques to better understand how data transforms into information used by society.
Unit 4: Algorithms	Students develop and express original algorithms, implement algorithms and analyze them.
Unit 5: Programming	Students are introduced to concepts and techniques used in writing programs, developing software, and using software effectively. They learn the distinction between algorithms and programs by comparing different implementations of the same algorithm in several programming languages.
Unit 6: The Internet	Students learn how the Internet operates, study the characteristics of the Internet and the systems that are built on it, and analyze important concerns related to the Internet, such as cybersecurity.
Unit 7: Societal impact of computing	Students become familiar with many of the ways computing enables innovation. They will also analyze the potential benefits and harmful effects of computing in several contexts.