

# Computer Science Principles

Career Cluster	Information Technology
Course Code	10052
Prerequisite(s)	Introduction to Information Technology (recommended) Computer Science Essentials (recommended) Computer Hardware and Software (recommended)
Credit	.5-1
Program of Study and Sequence	Computer Science Principles is required for the Programming Pathway and recommended for the Networking & Hardware Pathway
Student Organization	SkillsUSA, Future Business Leaders of America (FBLA), CyberPatriots
Coordinating Work-Based Learning	Guest Speakers, Tours, Job Shadowing, Personal Portfolio
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Information Technology Cluster Endorsement; Networking Systems & Information Support Pathway Endorsement; K-12 Educational Technology Endorsement; K-12 Classroom Technology Endorsement
Resources	

## Course Description:

Computer Science Principles is a course designed to build upon and investigate knowledge in computer science concepts. Topics covered in the class include computing systems, networks and the Internet, data and analysis, algorithms and programming, and the impacts of computing.

## Program of Study Application

Computer Science Principles is part of the Programming and Software Development Pathway

## Course Standards

<b>INDICATOR # CSP 1 Investigate computer systems and their functions.</b>		
<i>Webb Level</i>	<i>Sub-Indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	CSP 1.1 Compare and contrast how abstractions hide the underlying implementation details of computing systems embedded in everyday objects.	
Level 3: Strategic Thinking	CSP 1.2 Use concepts to compare levels of abstraction and interactions between application software, system software, and hardware layers.	
Level 2: Skill/Concept	CSP 1.3 Develop and implement guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.	
<b>INDICATOR # CSP 2 Investigate networks and the internet.</b>		
<i>Webb Level</i>	<i>Sub-Indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	CSP 2.1 Describe the issues that impact network functionality (e.g., bandwidth, load, delay, topology).	
Level 2: Skill/Concept	CSP 2.2 Give examples to illustrate how sensitive data can be affected by malware and other attacks.	
Level 3: Strategic Thinking	CSP 2.3 Recommend security measures to address various scenarios based on the CIA Triad (confidentiality, integrity, and availability).	

Level 3: Strategic Thinking	CSP 2.4 Recommend various security measures, considering tradeoffs between the usability and security of a computing system.	
<b>INDICATOR # CSP 3 Investigate data and analysis.</b>		
<i>Webb Level</i>	<i>Sub-Indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	CSP 3.1 Translate between different bit representations of real-world phenomena, such as characters, numbers, and images.	
Level 3: Strategic Thinking	CSP 3.2 Evaluate the tradeoffs in how data elements are organized and where data is stored.	
Level 4: Extended Thinking	CSP 3.3 Select and use data collection tools and techniques to generate data sets that support a claim or communicate information.	
<b>INDICATOR # CSP 4 Evaluate and construct algorithms and programming and how they are used in computing.</b>		
<i>Webb Level</i>	<i>Sub-Indicator</i>	<i>Integrated Content</i>
Level 3: Strategic Thinking	CSP 4.1 Use and evaluate algorithms in terms of their efficiency, correctness, and clarity.	
Level 2: Skill/Concept	CSP 4.2 Compare and contrast fundamental data structures and their uses.	

Level 3: Strategic Thinking	CSP 4.3 Recommend specific control structures and identify tradeoffs involving implementation, readability, and program performance.	
Level 3: Strategic Thinking	CSP 4.4 Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.	
Level 4: Extended Thinking	CSP 4.5 Construct solutions to problems based on user feedback.	
Level 3: Strategic Thinking	CSP 4.6 Plan and develop programs for broad audiences using a software life cycle process.	
Level 2: Skill/Concept	CSP 4.7 Investigate and compare multiple programming languages and discuss how their features make them suitable for solving different types of problems.	
<b>INDICATOR # CSP 5 Investigate impacts of computing.</b>		
<i>Webb Level</i>	<i>Sub-Indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	CSP 5.1 Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.	
Level 3: Strategic Thinking	CSP 5.2 Identify and critique bias, equity, access, and influence in existing computer programs.	
Level 2: Skill/Concept	CSP 5.3 Identify and use tools and methods for collaboration on a project to increase connectivity of people in different cultures and career fields.	

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Level 2: Skill/Concept	CSP 5.4 Debate laws and regulations that impact the development and use of software.	
Level 1: Recall	CSP 5.5 Explore careers in computer science.	