CompuScholar, Inc.

Alignment to Utah

"Computer Science Principles" Course Standards

Utah Course Details:

Course Name:	Computer Science Principles
Primary Cluster:	CTE / IT
Course Code(s):	35.02.00.00.035
Credit:	0.5
Grade Level:	9 - 12
State Standards Link:	Computer Science Principles Strands and Standards

CompuScholar Course Details:

Course Title:	Computer Science Foundations
Course ISBN:	978-1-946113-02-3
Course Year:	2022

1-Semester Schedule

The **Computer Science Foundations** course contains enough core and optional material for an entire school year (180 days). Districts on a 1-semester (90-hour) schedule can meet all requirements by covering the resources listed below. Where specific lessons are cited, complete only those lessons and quizzes but skip the chapter tests and activities. Where chapters are cited, all chapter lessons, quizzes, tests, and activities are included.

Chapter 1, Lessons 2, 3
Chapters 2, 3, 4, 5, 6, 7, 8, 9
Chapter 10, Lessons 2, 3, 4
Chapter 11, Lessons 1, 2
Chapter 12, Lessons 1, 2
Chapter 14
Chapter 15, Lessons 1, 2
Chapter 17, Lesson 4
Chapter 18, Lessons 1, 2
Chapter 19, 20, 23
Chapter 24, Lesson 1

Utah Course Description

Computer Science Principles introduces students to the breadth of the field of computer science. In this course, students will learn to design and evaluate solutions and to apply computer science to solve problems through the development of algorithms and programs. They will use data to discover new knowledge. Students will also explain how computing innovations and computing systems, including the Internet, work, explore their potential impacts, and contribute to a computing culture that is collaborative and ethical.

Utah Course Standards

Note 1: Citation(s) listed may represent a subset of the instances where objectives are met throughout the course.

Note 2: Citation(s) for a "Lesson" refer to the "Lesson Text" elements and associated "Activities" within the course, unless otherwise noted. The "Instructional Video" components are supplements designed to introduce or re-enforce the main lesson concepts, and the Lesson Text contains full details.

STRAND 1: Creative Development	CITATION(S)
Standard 1: Collaboration	
• Explain how collaboration affects the development of a solution.	Chapter 14
• Collaborate in the development of solutions.	Chapter 14
Standard 2: Program Function and Purpose	
• Investigate the situation, context, or task.	Chapter 15, Lessons 1, 2
• Investigate the purpose of a program.	Chapter 15, Lessons 1, 2
• Understand how to break down program specifications into smaller tasks using top-down design and pseudocode.	Chapter 15, Lessons 1, 2
• Generalize data sources through variables.	Chapter 4
• Understand the uses of different data types (examples: integer, float/double, characters/strings, boolean, etc.)	Chapter 4
• Explain how a code segment or program functions.	Chapter 3 Chapter 7, Lesson 2
Standard 3: Identifying and Correcting Errors	
• Identify and correct errors in algorithms and programs, including error discovery through testing.	Chapter 7, Lessons 2, 3
• Identify different types of errors such as logic, run-time, and syntax errors.	Chapter 7, Lesson 1

STRAND 2: Computing and Data	CITATION(S)
Standard 1: Hardware/Software	
• Explain the differences between hardware and software and how they relate to input, storage, processing, and output.	Chapter 1, Lessons 2, 3

• Understand the different file sizes (bit, byte, kilobyte, megabyte, gigabyte, terabyte, and petabyte).	Chapter 10, Lesson 4
Standard 2: Binary Numbers	
• Calculate the binary (base 2) equivalent of a positive integer (base 10) and vice versa.	Chapter 10, Lesson 4
• Compare and order binary numbers.	Chapter 10, Lesson 4
Standard 3: Data Compression	
• Compare and order binary numbers.	Chapter 10, Lesson 4
• Lossy - reduce the number of bit stored while still being able to reconstruction the original data.	Chapter 17, Lesson 4
• Lossless - reduce the number of bits stored but is only able to reconstruction an approximation of the original data - maintains quality.	Chapter 17, Lesson 4

STRAND 3: Algorithms and Programming	**CITATION(S)**
Standard 1: Variables and Assignments	
• Use variables of different data types (examples: integer, float/double, characters/strings, boolean, etc.)	Chapter 4
• Convert data types to other data types.	Chapter 5, Lessons 1, 2
• Determine the value of a variable as a result of an assignment.	Chapter 4, Lesson 3
Standard 2: Mathematical Expressions	
• Implement arithmetic operators (=, +, -, *, /, and MOD) and order of operations (PEMDAS).	Chapter 4, Lesson 3
Standard 3: Input / Output	
• Receive and store user input.	Chapter 5, Lesson 2
• Print to console	Chapter 5, Lesson 1
Standard 4: Strings	
• Evaluate expressions that manipulate strings.	Chapter 4, Lesson 4 Chapter 5, Lesson 3
• String concatenation joins together two or more strings end-to-end to make a new string.	Chapter 4, Lesson 4

Standard 5: Boolean Expressions	
• Write and evaluate expressions using relational operators (==, ?, >, <, =, and =).	Chapter 6, Lessons 1, 2
• Write and evaluate expressions using logical operators (AND, OR, NOT).	Chapter 6, Lessons 3, 4
Standard 6: Conditionals	
• Write conditional statements, such as IF statements and ELSE IF statements.	Chapter 6, Lessons 2, 3
• Determine the result of conditional statements.	Chapter 6, Lessons 2, 3, 4
Standard 7: Iteration/Looping	
• Write iteration statements, such as for loops and while loops.	Chapter 8
• Determine the result of iteration statements.	Chapter 8
Standard 8: Calling and Developing Procedures/Functions/Methods	
• Write statements to call Procedures/Functions/Methods	Chapter 12, Lessons 1, 2 and throughout the course
• Determine the result of a Procedures/Functions/Methods	Chapter 12, Lessons 1, 2 and throughout the course

STRAND 4: The Internet	**CITATION(S)**
Standard 1: The Internet	
• Explain how computing devices work together in a network (Network, Path, Routing, Packets, Bandwidth).	Chapter 2, Lessons 1, 2
• Explain how the Internet works (Fault Tolerance, Protocols, HTTP, HTTPS).	Chapter 2, Lessons 2, 3
• Understand the difference between the Internet and the World Wide Web.	Chapter 2, Lesson 2
Standard 2: Web Development	
• Students will code the foundation for a basic webpage including the element tags <!DOCTYPE html>, <html>, <head>, <title>, and <body>.	Chapter 23
• Students will create pages with tags and attributes at the inline level. (<!DOCTYPE html>, <html>, <head>, <title>, <body>, <h1>, <h2>, <h6>, <p>, , etc.)	Chapter 24, Lesson 1

STRAND 5: Impact of Computing	CITATION(S)
Standard 1: Beneficial and Harmful Effects	
• Explore how an effect of a computing innovation can be both beneficial and harmful.	Chapter 18, Lesson 2
• Explore advances in computing that have generated and increased creativity in other fields, such as medicine, engineering, communications, and the arts.	Chapter 18, Lesson 2
Standard 2: Digital Divide and Computing Bias	
• Explore issues that contribute to the digital divide (demographics, geographics, socioeconomic, equity, access, influence).	Chapter 18, Lesson 1
• Explore how bias exists in computing innovations.	Chapter 18, Lesson 1
Standard 3: Legal and Ethical Concerns	
• Explain how the use of computing can raise legal and ethical concerns.	Chapter 19, Lessons 1, 2
• Understand how ease of access and distribution of digitized information raises intellectual property concerns regarding ownership, value, and use.	Chapter 19, Lesson 3
• Understand the differences between Copyright, Creative Commons, Public Domain, & Trademark	Chapter 19, Lessons 2, 3
Standard 4: Safe Computing	
• Describe the risks to privacy from collecting and storing personal data on a computer system.	Chapter 20, Lesson 1
• Explain how computing resources can be protected (password strength) and can be misused.	Chapter 20, Lesson 2
• Explain how unauthorized access to computing resources is gained.	Chapter 20, Lessons 2, 3

• Understand essential cybersecurity concepts.
  • Malware (adware, trojan horse, virus, ransomware, etc.)
  • Social Engineering (phishing, etc.)
	Chapter 20, Lesson 2
	Chapter 20, Lesson 3