

Utah Standards Alignment with CodeX Curriculum

By the end of grade 5, ALL students will be able to...	Unit 1	Unit 2	Unit 3
Computing Systems			
Describe how computing devices connect to other components to form a system.	[1]		
Demonstrate how computer hardware and software work together as a system to accomplish tasks.			
Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies.	[2]		
Networks & the Internet			
Model how information is broken down into smaller pieces, transmitted as packets through multiple devices over networks and the Internet, and reassembled at the destination.			
Describe physical and digital security measures for protecting personal information.			
Create patterns to protect information from unauthorized access.			
Data and Analysis			
Explain that the amount of space required to store data differs based on the type of data and/or level of detail.			
Organize and present collected data visually to highlight relationships and support a claim.			
Use data to highlight and/or propose relationships, predict outcomes, or communicate ideas.			
Algorithms and Programming			
Compare and refine multiple algorithms for the same task and determine which is the most appropriate.			
Create programs that use variables to store and modify data.	[3]		
Create programs that include sequences, events, loops, and conditionals.	[4]		
Decompose problems into smaller, manageable subproblems to facilitate the program development process.			
Create programs by incorporating smaller portions of existing programs, to develop something new or add more advanced features.	[5]		
Use an iterative process to plan the development of a program by including others' perspectives and considering user preferences.			
Observe intellectual property rights and give appropriate attribution when creating or remixing programs.			
Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.	[6]		
Perform different roles when collaborating with peers during the design, implementation, and review stages of program development.			
Describe choices made during program development using code comments, presentations, and demonstrations.	[7]		
Impacts of Computing			
Discuss computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.			
Propose ways to improve the accessibility and usability of technology products for the diverse needs and wants of users.			
Seek and explain the impact of diverse perspectives for the purpose of improving computational artifacts.			
Describe reasons creators might limit the use of their work.			

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<i>By the end of grade 8, ALL students will be able to...</i>	Unit 1	Unit 2	Unit 3
Computing Systems			
Design modifications to computing devices in order to improve the ways users interact with the devices.			
Design projects that combine hardware and software components to collect and exchange data.			
Systematically identify and fix problems with computing devices and their components.	[8]		
Networks & the Internet			
Model the role of protocols in transmitting data across networks and the Internet.			
Explain potential security threats and security measures to mitigate threats.			
Apply multiple methods of information protection to model the secure transmission of information.			
Data and Analysis			
Represent data in multiple ways.			
Collect data using computational tools and transform the data to make it more useful.			
Test and analyze the effects of changing variables while using computational models.			
Algorithms and Programming			
Use flowcharts and/or pseudocode to design and illustrate algorithms that solve complex problems.	[9]		
Create clearly named variables that store data, and perform operations on their contents.	[10]		
Design and iteratively develop programs that combine control structures and use compound conditions.	[11]		
Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.			
Create procedures with parameters to organize code and make it easier to reuse.			[12]
Seek and incorporate feedback from team members and users to refine a solution that meets user needs.			
Incorporate existing code, media, and libraries into original programs, and give attribution.	[13]		
Systematically test and refine programs using a range of test cases.			
Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.			
Document programs in order to make them easier to follow, test, and debug.	[14]		
Impacts of Computing			
Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.			
Discuss issues of bias and accessibility in the design of existing technologies.			
Collaborate with many contributors through strategies such as crowdsourcing or surveys when creating a computational artifact.			
Describe tradeoffs between allowing information to be public and keeping information private and secure.			

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By the end of grade 12, ALL students will be able to...	Unit 1	Unit 2	Unit 3
Computing Systems			
Illustrate ways computing systems implement logic through hardware components.			
Categorize and describe the different functions of operating system software.			
Develop guidelines that convey systematic troubleshooting strategies that others can use to identify and fix errors.	[15]		
Networks & the Internet			
Examine the scalability and reliability of networks, by describing the relationship between routers, switches, servers, topology, and addressing.			
Explain how the characteristics of the Internet influence the systems developed on it.			
Develop solutions to security threats.			
Analyze cryptographic techniques to model the secure transmission of information.			
Data and Analysis			
Translate between different bit representations of real-world phenomena, such as characters, numbers, and images.			
Describe the tradeoffs in how data elements are organized and where data is stored.			
Select and use data collection tools and techniques to generate data sets.			
Use data analysis tools and techniques to identify patterns in data representing complex systems.			
Evaluate the ability of models and simulations to test and support the refinement of hypotheses.			
Algorithms and Programming			
Describe how artificial intelligence drives many software and physical systems.			
Implement an algorithm that uses artificial intelligence to overcome a simple challenge.			
Implement searching and sorting algorithms to solve computational problems.			
Evaluate algorithms in terms of their efficiency.			
Compare and contrast fundamental data structures and their uses.			
Demonstrate the flow of execution of a recursive algorithm.		[16]	
Analyze a large-scale computational problem and identify generalizable patterns or problem components that can be applied to a solution.			
Construct solutions to problems using student-created components, such as procedures, modules, and/or objects.			
Demonstrate code reuse by creating programming solutions using libraries and APIs.	[17]		
Plan and develop programs for broad audiences using a specific software life cycle process.			
Develop programs for multiple computing platforms.			
Identify and fix security issues that might compromise computer programs.			
Develop and use a series of test cases to verify that a program performs according to its design specifications.			
Modify an existing program to add additional functionality and discuss intended and unintended implications.	[18]		
Evaluate key qualities of a program through a process such as a code review.		[19]	
Use version control systems, integrated development environments (IDEs), and collaborative tools and practices (e.g., code documentation) while developing software within a group			
Compare multiple programming languages, and discuss how their features make them suitable for solving different types of problems.			
Impacts of Computing			
Evaluate computational artifacts with regard to improving their beneficial effects and reducing harmful effects on society.			
Evaluate how computational innovations that have revolutionized aspects of our culture might evolve.			
Evaluate the impact of equity, access, and influence on the distribution of computing resources in a global society.			
Use collaboration tools and methods to increase connectivity with people of different cultures and careers.			
Debate laws and regulations that impact the development and use of software.			

- [1] Mission 2 begins teaching this
- [2] Mission 2 and the teachers' manual discuss troubleshooting techniques
- [3] 3.8 begins the use of variables
- [4] Mission 4 begins the use of all of these
- [5] These are the remixes that begin in Mission 4
- [6] 3.5 introduces the debugger
- [7] 5.5 introduces the use of comments
- [8] Troubleshooting is taught in Mission 2 and the teachers' manual
- [9] Flowcharts and pseudocodes are introduced in the teachers' manual
- [10] 3.8 begins the use of variables
5.5 discusses descriptive naming of variables
- [11] Mission 6 begins the use of nested loops but does not describe them
Mission 9 begins the use of compound conditionals
- [12] 9.3 begins the technique of creating your own functions
Mission 10 discusses organizing code for reuse
- [13] All missions use libraries and every time a new one is introduced, they are explained.
- [14] 5.5 introduces the use of comments
- [15] Code Tracing Charts can accomplish this and they are introduced in the teachers' manual
- [16] This is done with the flowcharts of a recursive algorithm like Mission 7
- [17] All missions use libraries and every time a new one is introduced, they are explained.
- [18] These are the remixes that begin in Mission 4
- [19] Code Tracing Charts are introduced in the teachers' manual