

Oklahoma CS Standards Alignment with CodeX Curriculum

	Unit 1	Unit 2	Unit 3
Computing Systems			
5.CS.HS.01 Model that information is translated into bits in order to transmit and process between software to accomplish tasks.			
5.CS.T.01 Identify, using accurate terminology, simple hardware and software problems that may occur during everyday use. Discuss problems with peers and adults, apply strategies for solving these problems and explain why the strategy should work.			
Networks & the Internet			
5.NI.NCO.01 Model how information is broken down into packets, transmitted through multiple computing devices over networks and the internet and reassembled at the destination.			
5.NI.C.01 Discuss cybersecurity problems caused by information that is published for different reasons (e.g., inform, advertise, persuade, harm).			
Data and Analysis			
5.DA.S.01 Evaluate trade-offs, including availability and quality, based on the type of file, storage requirements (e.g., file size, availability, available memory) and sharing requirements.			
5.DA.CVT.01 Organize and present collected data to highlight comparisons and support a claim.			
5.DA.IM.01 Use reliable data to highlight or propose cause and effect relationships, predict outcomes or communicate an idea.			
Algorithms and Programming			
5.APA.01 Compare and simplify multiple algorithms (sets of step-by-step instructions) for accomplishing the same task verbally and kinesthetically, with robot devices or a programming language, then determine which is the most efficient.			
5.AP.V.01 Create programs that use variables to store and modify grade level appropriate data.	[1]		
5.APC.01 Create a program using control structures (e.g., sequence, conditionals, interactive-looping), event handlers and variables to solve a problem or express ideas both independently and collaboratively.	[2]		
5.APM.01 Decompose (break down) large problems into smaller, manageable sub-problems and then into a precise sequence of instructions.	[3]		
5.APM.02 With grade appropriate complexity, modify, remix or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.	[4]		
5.AP.PD.01 Use an iterative and collaborative process to plan the development of a program that includes other perspectives and user preferences while solving simple problems.			
5.AP.PD.02 Observe intellectual property rights and give appropriate attribution when creating or remixing programs.			
5.AP.PD.03 Analyze, examine, create and debug a program that includes sequencing, repetition, conditionals and variables in a programming language	[5]		
5.AP.PD.04 Communicate and explain your program development using comments, presentations and interactive demonstrations.	[6]		
Impacts of Computing			
5.IC.C.01 Give examples and explain how computing technologies have changed the world and express how computing technologies influence, and are influenced by, cultural practices.			
5.IC.C.02 Develop, test and refine digital artifacts to improve accessibility and usability.			
5.IC.SI.01 Develop a code of conduct, explain, and practice grade-level appropriate behavior and responsibilities while participating in an online community. Identify and report inappropriate behavior.			
5.IC.SI.02 As a team, collaborate with outside resources (other grade levels, online collaborative spaces) to include diverse perspectives to improve computational products.			
5.IC.SLE.01 Observe intellectual property rights and give appropriate credit when using resources.			

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6.CS.D.01 Evaluate existing computing devices and recommend improvements to design based on analysis of personal interaction with the device	[7]		
6.CS.HS.01 Identify ways that hardware and software are combined to collect and exchange data.	[8]		
6.CS.T.01 Identify increasingly complex software and hardware problems with computing devices and their components.			
Networks & the Internet			
6.NI.NCO.01 Model a simple protocol for transferring information using packets.			
6.NI.C.01 Identify existing cybersecurity concerns with the Internet and systems it uses.			
6.NI.C.02 Explain the importance of secured websites and describe how one method of encryption works.			
Data and Analysis			
6.DA.S.01 Identify how the same data can be represented in multiple ways.			
6.DA.CVT.01 Collect data using computational tools and transform the data to make it more useful.			
6.DA.IM.01 Use models and simulations to formulate, refine, and test hypotheses.			
Algorithms and Programming			
6.APA.01 Use an existing algorithm in natural language or pseudocode to solve complex problems.	[9]		
6.APC.01 Develop programs that utilize combinations of repetition, conditionals, and the manipulation of variables representing different data types.	[10]		
6.APM.01 Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.	[11]		
6.APPD.01 Seek and incorporate feedback from team members to refine a solution to a problem.			
6.APPD.02 Incorporate existing code, media, and libraries into original programs and give attribution.	[12]		
6.APPD.03 Test and refine programs using teacher provided inputs.			
6.APPD.04 Break down tasks and follow an individual timeline when developing a computational artifact.			
6.APPD.05 Document text-based programs in order to make them easier to follow, test, and debug.	[13]		
Impacts of Computing			
6.IC.C.01 Explain how computing impacts people's' everyday activities.			
6.IC.C.02 Identify and discuss the technology proficiencies needed in the classroom and the workplace, and how to meet the needs of diverse users.			
6.IC.SI.01 Individually and collaboratively develop and conduct an online survey that seeks input from a broad audience. Describe and use safe, appropriate, and responsible practices (netiquette) when participating in online communities (e.g., discussion groups, blogs, social networking sites).			
6.IC.SLE.01 Differentiate between appropriate and inappropriate content on the Internet, and identify unethical and illegal online behavior.			

Oklahoma CS Standards Alignment with CodeX Curriculum

	Unit 1	Unit 2	Unit 3
Computing Systems			
7.CS.D.01 Evaluate existing computing devices and recommend improvements to design based on analysis of how other users interact with the device.			
7.CS.HS.01 Evaluate and recommend improvements to software and hardware combinations used to collect and exchange data.			
7.CS.T.01 Identify and fix increasingly complex software and hardware problems with computing devices and their components.	[14]		
Networks & the Internet			
7.NI.NCO.01 Explain how a system responds when a packet is lost and the effect it has on the transferred information.			
7.NI.C.01 Explain how to protect electronic information, both physical (e.g. hard drive) and digital, identify cybersecurity concerns and options to address issues with the Internet and the systems it uses.			
7.NI.C.02 Identify and explain two or more methods of encryption used to ensure and secure the transmission of information.			
Data and Analysis			
7.DA.S.01 Create multiple representations of data.			
7.DA.CVT.01 Collect data using computational tools and transform the data to make it more useful and reliable.			
7.DA.IM.01 Discuss the correctness of a model representing a system by comparing the model's generated results with observed data from the modeled system.			
Algorithms and Programming			
7.APA.01 Select and modify an existing algorithm in natural language or pseudocode to solve complex problems.	[15]		
7.APC.01 Develop programs that utilize combinations of repetition, compound conditionals, and the manipulation of variables representing different data types.	[16]		
7.APM.01 Decompose problems into parts to facilitate the design, implementation, and review of increasingly complex programs.	[17]		
7.APPD.01 Seek and incorporate feedback from team members and users to refine a solution to a problem.			
7.APPD.02 Incorporate existing code, media, and libraries into original programs of increasing complexity and give attribution.	[18]		
7.APPD.03 Test and refine programs using a variety of student created inputs.			
7.APPD.04 Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.			
7.APPD.05 Document text-based programs of increasing complexity in order to make them easier to follow, test, and debug.	[19]		
Impacts of Computing			
7.IC.C.01 Explain how computing impacts innovation in other fields.			
7.IC.C.02 Relate the distribution of computing resources in a global society to issues of equity, access, and power.			
7.IC.SI.01 Individually and collaboratively use advanced tools to design and create online content (e.g., digital portfolio, multimedia, blog, web page). Describe and use safe, appropriate, and responsible practices (netiquette) when participating in online communities (e.g., discussion groups, blogs, social networking sites).			
7.IC.SLE.01 Explain the connection between the longevity of data on the Internet, personal online identity, and personal privacy.			

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	Unit 1	Unit 2	Unit 3
Computing Systems			
8.CS.D.01 Develop and implement a process to evaluate existing computing devices and recommend improvements to design based on analysis of how other users interact with the device.			
8.CS.HS.01 Design and refine projects that combine hardware and software components to collect and exchange data.	[20]		
8.CS.T.01 Systematically identify, fix, and document increasingly complex software and hardware problems with computing devices and their components.	[21]		
Networks & the Internet			
8.NI.NCO.01 Explain protocols and their importance to data transmission; model how packets are broken down into smaller pieces and how they are delivered.			
8.NI.C.01 Evaluate physical and digital procedures that could be implemented to protect electronic data/information; explain the impacts of hacking, ransomware, scams, fake scans, and ethical/legal concerns.			
8.NI.C.02 Compare the advantages and disadvantages of multiple methods of encryption to model the secure transmission of information.			
Data and Analysis			
8.DA.S.01 Analyze multiple methods of representing data and choose the most appropriate method for representing data.			
8.DA.CVT.01 Develop, implement, and refine a process that utilizes computational tools to collect and transform data to make it more useful and reliable.			
8.DA.IM.01 Refine computational models based on the data generated by the models.			
Algorithms and Programming			
8.APA.01 Design algorithms in natural language, flow and control diagrams, comments within code, and/or pseudocode to solve complex problems.	[22]		
8.APC.01 Develop programs that utilize combinations of nested repetition, compound conditionals, procedures without parameters, and the manipulation of variables representing different data types.	[23]		
8.APM.01 Decompose problems and subproblems into parts to facilitate the design, implementation, and review of complex programs.	[24]		
8.APPD.01 Seek and incorporate feedback from team members and users to refine a solution to a problem that meets the needs of diverse users.			
8.APPD.02 Incorporate existing code, media, and libraries into original programs of increasing complexity and give attribution.	[25]		
8.APPD.03 Systematically test and refine programs using a range of student created inputs.			
8.APPD.04 Explain how effective communication between participants is required for successful collaboration when developing computational artifacts.			
8.APPD.05 Document text-based programs of increasing complexity in order to make them easier to follow, test, and debug.	[26]		
Impacts of Computing			
8.IC.C.01 Describe the trade-offs associated with computing technologies (e.g. automation), explaining their effects on economies and global societies, and explore careers related to the field of computer science.			
8.IC.C.02 Evaluate and improve the design of existing technologies to meet the needs of diverse users and increase accessibility and usability. Evaluate how technology can be used to distort, exaggerate, and misrepresent information.			
8.IC.SI.01 Communicate and publish key ideas and details individually or collaboratively in a way that informs, persuades, and/or entertains using a variety of digital tools and media-rich resources. Describe and use safe, appropriate, and responsible practices (netiquette) when participating in online communities (e.g., discussion groups, blogs, social networking sites).			
8.IC.SLE.01 Discuss the social impacts and ethical considerations associated with cybersecurity, including the positive and malicious purposes of hacking.			

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By the end of 10th Grade	Unit 1	Unit 2	Unit 3
Computing Systems			
L1.CS.D.01 Explain how abstractions hide the underlying implementation details of computing systems embedded in everyday objects.			
L1.CS.HS.01 Explain the interactions between application software, system software and hardware.			
L1.CS.T.01 Develop and apply criteria for systematic discovery of errors and systematic strategies for correction of errors in computing systems.	[27]		
Networks & the Internet			
L1.NI.NCO.01 Evaluate the scalability and reliability of networks by identifying and illustrating the basic components of computer networks (e.g., routers, switches, servers) and network protocols (e.g., IP, DNS).			
L1.NI.NCO.02 Describe the issues that impact network functionality (e.g., bandwidth, load, delay, topology).			
L1.NI.C.01 Compare physical and cybersecurity measures by evaluating trade-offs between the usability and security of a computing system.			
L1.NI.C.02 Illustrate how sensitive data can be affected by attacks.			
L1.NI.C.03 Recommend security measures to address various scenarios based on information security principles.			
L1.NI.C.04 Explain trade-offs when selecting and implementing cybersecurity recommendations from multiple perspectives such as the user, enterprise and government.			
Data and Analysis			
L1.DA.S.01 Translate and compare different bit representations of data types, such as characters, numbers and images.			
L1.DA.S.02 Evaluate the trade-offs in how data is organized and stored digitally.			
L1.DA.CVT.01 Create data visualizations to help others better understand real-world phenomena.			
L1.DA.IM.01 Show the relationships between collected data elements using computational models.			
Algorithms and Programming			
L1.APA.01 Create a prototype that uses algorithms (e.g., searching, sorting, finding shortest distance) to provide a possible solution for a real-world problem.	[28]		
L1.APV.01 Demonstrate the use of lists (e.g., arrays) to simplify solutions, generalizing computational problems instead of repeatedly using primitive variables.		[29]	
L1.APC.01 Justify the selection of specific control structures (e.g., sequence, conditionals, repetition, procedures) considering program efficiencies such as readability, performance, and memory usage.			
L1.APM.01 Break down a solution into procedures using systematic analysis and design utilizing functional abstraction.			
L1.APM.02 Create computational artifacts (file, graphic, video, audio) by systematically organizing, manipulating and/or processing data.			
L1.APPD.01 Create software by analyzing a problem and/or process, developing and documenting a solution, testing outcomes, and adapting the program for a variety of users.			
L1.APPD.02 Define and classify a variety of software licensing schemes (e.g., open source, freeware, commercial) and discuss the advantages and disadvantages of each scheme in software development.			
L1.APPD.03 While working in a team, develop, test, and refine event-based programs that solve practical problems or allow self expression.			
L1.APPD.04 Using visual aids and documentation, illustrate the design elements and data flow (e.g., flowcharts, pseudocode) of the development of a complex program.		[30]	
L1.APPD.05 Evaluate and refine computational artifacts to make them more user-friendly, efficient and/or accessible.	[31]		
Impacts of Computing			
L1.IC.C.01 Evaluate the ways computing impacts personal, ethical, social, economic, and cultural practices.			
L1.IC.C.02 Test and refine computational artifacts to reduce bias and equity deficits.			
L1.IC.C.03 Demonstrate ways a given algorithm applies to problems across disciplines.			
L1.IC.SI.01 Demonstrate how computing increases connectivity among people of various cultures.			
L1.IC.SLE.01 Explain the beneficial and harmful effects that intellectual property laws can have on innovation.			
L1.IC.SLE.02 Explain the privacy concerns related to the large-scale collection and analysis of information about individuals (e.g., how businesses, social media, and the government collects and uses data) that may not be evident to users.			
L1.IC.SLE.03 Evaluate the social and economic consequences of how law and ethics interact with digital aspects of privacy, data, property, information and identity.			

- [1] 3.8 introduces the use of variables
- [2] These would be the remixes that begin in Mission 4
- [3] Pseudocodes are introduced in the teachers' manual
- [4] Remixes are introduced in Mission 4
- [5] 3.8 introduces the use of variables
Mission 4 begins the use of conditionals, repetition and sequencing
- [6] 5.5 introduces the use of comments
- [7] These are the remixes that are introduced in Mission 4
- [8] This begins in Mission 2 and continues any time a new button or sensor is introduced
- [9] All of our missions use an existing algorithm
- [10] 3.8 introduces the use of variables
4.2 introduces the use of data types
Mission 4 introduce the use of repetition and conditionals
- [11] Code Tracing charts are introduced in the teachers' manual as are pseudocodes and flowcharts which combined accomplish this objective
- [12] All missions use libraries and any time a new one is introduced it is explained
- [13] 5.5 introduces the use of comments in the code
- [14] 3.5 introduces the debugger
Code Tracing charts are introduced in the teachers' manual as are troubleshooting techniques
- [15] These are the remixes introduced in Mission 4
- [16] 3.8 introduces the use of variables
4.2 introduces the use of data types
Mission 4 introduce the use of repetition and conditionals
- [17] Code Tracing charts are introduced in the teachers' manual as are pseudocodes and flowcharts which combined accomplish this objective
- [18] All missions use libraries and any time a new one is introduced it is explained

[19] 5.5 introduces the use of comments in the code

[20] All of our missions combine hardware and software data exchange

[21] 3.5 introduces the debugger

Code Tracing charts are introduced in the teachers' manual as are troubleshooting techniques

[22] These are the remixes introduced in Mission 4

5.5 introduces the use of comments

flowcharts and pseudocodes are introduced in the teachers' manual

[23] 3.8 introduces the use of variables

4.2 introduces the use of data types

Mission 4 introduce the use of repetition and conditionals

Mission 6 introduces nested loops but does not discuss them.

Mission 9 introduces compound conditionals

[24] Code Tracing charts are introduced in the teachers' manual as are pseudocodes and flowcharts which combined accomplish this objective

[25] All missions use libraries and any time a new one is introduced it is explained

[26] 5.5 introduces the use of comments in the code

[27] 3.5 introduces the debugger

Code Tracing charts are introduced in the teachers' manual as are troubleshooting techniques

[28] This would be the remixes that are introduced beginning in Mission 4

[29] 7.5 begins the use of lists

[30] Flowcharts and pseudocodes are introduced in the teachers' manual

[31] 5.5 introduces the use of comments

7.6 discusses readability and maintenance of code as does 10.6