Oklahoma Academic Standards for Computer Science {Grades 3-5}

Concept	Subconcept	3rd Grade	4th Grade	5th Grade
Computing Systems	Hardware & Software	3.CS.HS.01 Model how information flows through hardware and software to accomplish tasks.	4.CS.HS.01 Model that information is translated, transmitted, and processed in order to flow through hardware and software.	5.CS.HS.01 Model that information is translated into bits in order to transmit and process between software to accomplish tasks.
	Troubleshooting	3.CS.T.01 Identify, using accurate terminology, simple hardware and software problems that may occur during everyday use, discuss problems with peers and adults, and apply strategies for solving these problems (e.g., refresh the screen, closing and reopening an application or file, unmuting or adjusting the volume on headphones).	4.CS.T.01 Identify, using accurate terminology, simple hardware and software problems that may occur during everyday use, discuss p roblems with peers and adults, and apply strategies for solving these problems (e.g., rebooting the device, checking the power, force shut down of an application).	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	Network Communication & Organization	3.NI.NCO.01 Recognize that information is sent and received over physical or wireless paths.	4.NI.NCO.01 Explain how information is sent and received across physical or wireless paths. (It is broken down into smaller pieces called packets and transmitted from one location to another.)	5.NI.NCO.01 Model how information is broken down into packets (smaller pieces) and transmitted through multiple devices over networks and the Internet, and reassembled at the destination.
	Cybersecurity	3.NI.C.01 Identify problems that relate to inappropriate use of computing devices and networks.	4.NI.C.01 Identify and explain issues related to responsible use of technology and information, and describe personal consequences of inappropriate use.	5.NI.C.01 Discuss real-world cybersecurity problems and identify strategies for how personal information can be protected.
Data Analysis	Storage	3.DA.S.01 Recognize that different types of information are stored in different formats that have associated programs (i.e., documents open in a word processor) and varied storage requirements.	4.DA.S.01 Choose different storage locations (physical, shared, or cloud) based on the type of file, storage requirements (file size, availability, available memory), and sharing requirements.	5.DA.S.01 Evaluate trade-offs, including availability and quality, based on the type of file, storage requirements (file size, availability, available memory), and sharing requirements.
	Collection, Visualization, & Transformation	3.DA.CVT.01 Collect and organize data in various visual formats.	4.DA.CVT.01 Organize and present collected data visually to highlight comparisons.	5.DA.CVT.01 Organize and present collected data to highlight comparisons and support a claim.
	Inference & Models	3.DA.IM.01 With guidance, utilize data to make predictions and discuss whether there is adequate data to make reliable predictions.	4.DA.IM.01 Determine how the accuracy of conclusions are influenced by the amount of data collected.	5.DA.IM.01 Use data to highlight or propose cause and effect relationships, predict outcomes, or communicate an idea.

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Algorithms & Programming	Algorithms	3.AP.A.01 Compare multiple algorithms for the same task.	4.AP.A.01 Compare and refine multiple algorithms for the same task.	5.AP.A.01 Compare and refine multiple algorithms for the same task and determine which is the most efficient.
	Variables	3.A.V.01 Create programs that use variables to store and modify grade level appropriate data.	4.AP.V.01 Create programs that use variables to store and modify grade level appropriate data.	5.AP.V.01 Create programs that use variables to store and modify grade level appropriate data.
	Control	3.AP.C.01 Create programs using a programming language that utilize sequencing, repetition, conditionals, and variables to solve a problem or express ideas both independently and collaboratively.	4.AP.C.01 Create programs using a programming language that utilize sequencing, repetition, conditionals and variables using math operations manipulate values to solve a problem or express ideas both independently and collaboratively.	5.AP.C.01 Create programs using a programming language that utilize sequencing, repetition, conditionals, event handlers and variables using math operations to manipulate values to solve a problem or express ideas both independently and collaboratively.
	Modularity	3.AP.M.01 Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.	4.AP.M.01 Decompose (break down) large problems into smaller, manageable subproblems to facilitate the program development process.	5.AP.M.01 Decompose (break down) large problems into smaller, manageable subproblems and then into a precise sequence of instructions.
		3.AP.M.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.AP.M.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.	5.AP.M.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.
	Program Development	3.AP.PD.01 Use an iterative process to plan the development of a program while solving simple problems.	4.AP.PD.01 Use an iterative process to plan the development of a program that includes user preferences while solving simple problems.	5.AP.PD.01 Use an iterative process to plan the development of a program that includes others' perspectives and user preferences while solving simple problems.
		3.AP.PD.02 Observe intellectual property rights and give appropriate credit when creating or remixing programs.	4.AP.PD.02 Observe intellectual property rights and give appropriate credit when creating or remixing programs.	5.AP.PD.02 Observe intellectual property rights and give appropriate credit when creating or remixing programs.
		3.AP.PD.03 Analyze and debug a program that includes sequencing, repetition and variables in a programming language.	4.AP.PD.03 Analyze, create, and debug a program that includes sequencing, repetition, conditionals and variables in a programming language.	5.AP.PD.03 Analyze, create, and debug a program that includes sequencing, repetition, conditionals and variables in a programming language.

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		3.AP.PD.04 Communicate and explain your program development using comments, presentations and demonstrations.	4.AP.PD.04 Communicate and explain your program development using comments, presentations and demonstrations.	5.AP.PD.04 Communicate and explain your program development using comments, presentations and demonstrations.
Impacts of Computing	Culture	3.IC.C.01 Identify computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.	4.IC.C.01 Give examples of computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.	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.
		3.IC.C.02 Identify possible problems and how computing devices have built in features for increasing accessibility to all users.	4.IC.C.02 Brainstorm problems and ways to improve computing devices to increase accessibility to all users.	5.IC.C.02 Develop, test and refine digital artifacts to improve accessibility and usability.
	Social Interactions	3.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.	4.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.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.
		3.IC.SI.02 Identify how computational products may be, or have been, improved to incorporate diverse perspectives.	4.IC.SI.02 As a team, consider each others perspectives on improving a computational product.	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.
	Safety, Law, & Ethics	3.IC.SLE.01 Identify types of digital data that may have intellectual property rights that prevent copying or require attribution.	4.IC.SLE.01 Discuss the social impact of violating intellectual property rights.	5.IC.SLE.01 Observe intellectual property rights and give appropriate credit when using resources.