Public Schools of North Carolina
State Board of Education | Department of Public Instruction

2020 North Carolina K12 Computer Science Standards with Descriptions.

This document is designed to help North Carolina educators teach the NC Standard Course of Study for Computer Science.

This document provides more detailed descriptions of each standard in the 2020 NC K12 Computer Science Standards which are based on the 2017 Computer Science Teachers Association Computer Science Standards.

Kindergarten through Second Grade

K2-CS-01	**Choose appropriate devices to perform a variety of classroom tasks.**	**Computing Systems** Devices
	People use computing devices to perform a variety of tasks accurately and quickly. Students should be able to select the appropriate device to use for tasks they are required to complete. For example, if students are asked to record video or audio, draw a picture, they should be able to identify devices with these capabilities.	
K2-CS-02	**Describe the function of common physical components of computing systems (hardware) with appropriate terminology.**	**Computing Systems** Hardware & Software
	A computing system is composed of hardware and software. Hardware consists of physical components. Students should be able to identify and describe the function of external hardware, such as desktop computers, laptop computers, tablet devices, monitors, keyboards, mice, and printers.	
K2-CS-03	**Operate appropriate software to perform a variety of tasks.**	**Computing Systems** Hardware & Software
	People use computing devices to perform a variety of tasks accurately and quickly. Students should be able to select the appropriate app/program to use for tasks they are required to complete. For example, if students are asked to draw a picture, they should be able to open and use a drawing app/program to complete this task, or if they are asked to create a presentation, they should be able to open and use presentation software.	
K2-CS-04	**Describe basic hardware and software problems with accurate terminology.**	**Computing Systems** Troubleshooting
	Problems with computing systems have different causes. Students at this level do not need to understand those causes, but they should be able to communicate a problem with accurate terminology (e.g., when an app or program is not working as expected, a device will not turn on, the sound does not work, etc.). Ideally, students would be able to use simple troubleshooting strategies, including turning a device off and on to reboot it, closing and reopening an app, turning on speakers, or plugging in headphones. These are, however, not specified in the standard, because these problems may not occur.	
K2-NI-01	**Illustrate how information is broken down into smaller pieces and can be reassembled.**	**Networks & the Internet** Network Communication & Organization

	When information is sent and received over physical or wireless paths, it is broken down into smaller pieces called packets, which are sent independently and reassembled at the destination. Students should demonstrate their understanding of this concept through an activity which has them act it out in some way, e.g. taking apart a puzzle and reassembling it.	
K2-NI-02	**Apply knowledge of what passwords are and why we use strong passwords to protect devices and information from unauthorized access.**	**Networks & the Internet** Cybersecurity
	Learning to protect one's device or information from unwanted use by others is an essential first step in learning about cybersecurity. Students are not required to use multiple strong passwords. They should appropriately use and protect the passwords they are required to use.	
K2-NI-03	**Discover your digital footprint and how personal information can be protected.**	**Networks & the Internet** Cybersecurity
	Information stored on a computer or the Internet needs protecting, just as we protect our personal property offline. Ways to protect our digital property can include backing up data to guard against loss, creating and not sharing strong passwords, or installing anti-virus software.	
K2-DA-01	**Store, copy, search, retrieve, modify, and delete information using a computing device.**	**Data & Analysis** Storage
	All information stored and processed by a computing device is referred to as data. Data can be images, text documents, audio files, software programs or apps, video files, etc. As students use software to complete tasks on a computing device, they will be manipulating data.	
K2-DA-02	**Define information stored on a computing device as data.**	**Data & Analysis** Storage
	All information stored and processed by a computing device is referred to as data. Data can be images, text documents, audio files, software programs or apps, video files, etc. As students use software to complete tasks on a computing device, they will be manipulating data.	
K2-DA-03	**Collect and present the same data in various visual formats.**	**Data & Analysis** Collection Visualization & Transformation
	The collection and use of data about the world around them is a routine part of life and influences how people live. Students could collect data on the weather, such as sunny days versus rainy days, the temperature at the beginning of the school day and end of the school day, or	

	the inches of rain over the course of a storm. Students could count the number of pieces of each color of candy in a bag of candy, such as Skittles or M&Ms. Students could create surveys of things that interest them, such as favorite foods, pets, or TV shows, and collect answers to their surveys from their peers and others. The data collected could then be organized into two or more visualizations, such as a bar graph, pie chart, or pictograph.	
K2-DA-04	**Make predictions with patterns in data visualizations.**	**Data & Analysis** Inference & Models
	Data can be used to make inferences or predictions about the world. Students could analyze a graph or pie chart of the colors in a bag of candy or the averages for colors in multiple bags of candy, identify the patterns for which colors are most and least represented, and then make a prediction as to which colors will have most and least in a new bag of candy. Students could analyze graphs of temperatures taken at the beginning of the school day and end of the school day, identify the patterns of when temperatures rise and fall, and predict if they think the temperature will rise or fall at a particular time of the day, based on the pattern observed.	
K2-AP-01	**Model daily processes with algorithms to complete tasks.**	**Algorithms & Programming** Algorithms
	Composition is the combination of smaller tasks into more complex tasks. Students could create and follow algorithms for making simple foods, brushing their teeth, getting ready for school, participating in clean-up time.	
K2-AP-02	**Demonstrate how programs store and manipulate data by using numbers or other symbols to represent information.**	**Algorithms & Programming** Variables
	Information in the real world can be represented in computer programs. Students could use thumbs up/down as representations of yes/no, use arrows when writing algorithms to represent direction, or encode and decode words using numbers, pictographs, or other symbols to represent letters or words.	
K2-AP-03	**Develop programs with sequences and simple loops to express ideas or address a problem.**	**Algorithms & Programming** Control
	Programming is used as a tool to create products that reflect a wide range of interests. Control structures specify the order in which instructions are executed within a program. Sequences are the order of instructions in a program. For example, if dialogue is not sequenced correctly when programming a simple animated story, the story will not make sense. If the commands to program a robot are not in the correct order, the robot will not complete the task desired. Loops allow for the repetition of a sequence of code multiple times. For example, in a program to show the life cycle of a butterfly, a loop could be combined with move commands to allow continual but controlled movement of the character.	

K2-AP-04	**Decompose the steps needed to solve a problem into a precise sequence of instructions.**	**Algorithms & Programming** Modularity
	Decomposition is the act of breaking down tasks into simpler tasks. Students could break down the steps needed to make a peanut butter and jelly sandwich, to brush their teeth, to draw a shape, to move a character across the screen, or to solve a level of a coding app.	
K2-AP-05	**Develop plans that describe a program's sequence of events, goals, and expected outcomes.**	**Algorithms & Programming** Program Development
	Creating a plan for what a program will do clarifies the steps that will be needed to create a program and can be used to check if a program is correct. Students could create a planning document, such as a story map, a storyboard, or a sequential graphic organizer, to illustrate what their program will do. Students at this stage may complete the planning process with help from their teachers.	
K2-AP-06	**Give attribution when using the ideas and creations of others while developing programs.**	**Algorithms & Programming** Program Development
	Using computers comes with a level of responsibility. Students should credit artifacts that were created by others, such as pictures, music, and code. Credit could be given orally, if presenting their work to the class, or in writing or orally, if sharing work on a class blog or website. Proper attribution at this stage does not require a formal citation, such as in a bibliography or works cited document.	
K2-AP-07	**Identify and debug errors in an algorithm or program that includes sequences and simple loops.**	**Algorithms & Programming** Program Development
	Algorithms or programs may not always work correctly. Students should be able to use various strategies, such as changing the sequence of the steps, following the algorithm in a step-by-step manner, or trial and error to fix problems in algorithms and programs.	
K2-AP-08	**Using correct terminology, describe steps taken and choices made during the iterative process of program development**	**Algorithms & Programming** Program Development
	At this stage, students should be able to talk or write about the goals and expected outcomes of the programs they create and the choices that they made when creating programs. This could be done using coding journals, discussions with a teacher, class presentations, or blogs.	
K2-IC-01	**Compare how people live and work before and after the implementation or adoption of new computing technology.**	**Impacts of Computing** Culture
	Computing technology has positively and negatively changed the way people live and work. In the past, if students wanted to read about a topic, they needed access to a library to find a book about it. Today, students can view and read information on the Internet about a topic or	

	they can download e-books about it directly to a device. Such information may be available in more than one language and could be read to a student, allowing for great accessibility.	
K2-IC-02	**Select software that meets the diverse needs and preferences for the technology individuals use in the classroom.**	**Computing Systems** Culture
	People use computing devices to perform a variety of tasks accurately and quickly. With teacher guidance, students should compare and discuss preferences for software with the same primary functionality. Students could compare different web browsers or word processing, presentation, or drawing programs.	
K2-IC-03	**Work respectfully and responsibly with others online.**	**Impacts of Computing** Social Interactions
	Online communication facilitates positive interactions, such as sharing ideas with many people, but the public and anonymous nature of online communication also allows intimidating and inappropriate behavior in the form of cyberbullying. Students could share their work on blogs or in other collaborative spaces online, taking care to avoid sharing information that is inappropriate or that could personally identify them to others. Students could provide feedback to others on their work in a kind and respectful manner and could tell an adult if others are sharing things they should not share or are treating others in an unkind or disrespectful manner on online collaborative spaces.	
K2-IC-04	**Model responsible login and logoff procedures on all devices.**	**Impacts of Computing** Safety Law & Ethics
	Protecting our information online is a very important part of being a citizen of the digital world. We have a role in protecting our information and identity online. We should realize that the process of logging on and off a device is a critical step in this process.	