Florida Standards
Science – Computer Science Standards

GRADES: K-2

Body of Knowledge: COMPUTER SCIENCE - COMMUNICATION AND COLLABORATION	
Standard 1: Communication and collaboration	
BENCHMARK CODE	**BENCHMARK**
SC.K2.CS-CC.1.1	Identify a variety of digital tools used for communication and collaboration (e.g., online library catalogs and databases).
SC.K2.CS-CC.1.2	Conduct basic keyword searches, and exchange information and feedback with teachers and other students (e.g., e-mail and text messaging).
SC.K2.CS-CC.1.3	Collaborate and cooperate with peers, teachers, and others using technology to solve problems.
SC.K2.CS-CC.1.4	Provide and accept constructive criticism on a collaborative project.

Body of Knowledge: COMPUTER SCIENCE - COMMUNICATION SYSTEMS AND COMPUTING	
Standard 1: Modeling and simulations	
BENCHMARK CODE	**BENCHMARK**
SC.K2.CS-CS.1.1	Define simulation and identify the concepts illustrated by a simple simulation (e.g., growth, human health, and the butterfly life cycle).
SC.K2.CS-CS.1.2	Describe how models and simulations can be used to solve real-world issues in science and engineering.
SC.K2.CS-CS.1.3	Describe how models represent a real-life system (e.g., globe or map).
SC.K2.CS-CS.1.4	Solve questions individually and collaboratively using models.

Standard 2: Problem solving and algorithms	
BENCHMARK CODE	**BENCHMARK**
SC.K2.CS-CS.2.1	Arrange or sort information into useful order, such as sorting students by birth date, with or without technology.
SC.K2.CS-CS.2.2	Solve age-appropriate problems (e.g., puzzles and logical thinking programs) with or without technology (i.e., computational thinking).
SC.K2.CS-CS.2.3	Solve real life issues in science and engineering using computational thinking.
SC.K2.CS-CS.2.4	Define an algorithm as a sequence of defined steps.
SC.K2.CS-CS.2.5	Create a simple algorithm, individually and collaboratively, without using computers to complete the task (e.g., making a sandwich, getting ready for school).

SC.K2.CS-CS.2.6	Illustrate thoughts, ideas, and stories in a step-by-step manner using writing tools, digital cameras, and drawing tools.
SC.K2.CS-CS.2.7	Develop and present an algorithm using tangible materials.
SC.K2.CS-CS.2.8	Gather and organize information using concept-mapping tools.

Standard 3: Digital tools

BENCHMARK CODE	BENCHMARK
SC.K2.CS-CS.3.1	Create a digital artifact (independently and collaboratively) that clearly expresses thoughts and ideas.
SC.K2.CS-CS.3.2	Create, review, and revise artifacts that include text, images, and audio using digital tools.

Standard 4: Hardware and software

BENCHMARK CODE	BENCHMARK
SC.K2.CS-CS.4.1	Recognize different kinds of computing devices in the classroom and other places (e.g., laptops, tablets, smart phones, desktops, printers).
SC.K2.CS-CS.4.2	Recognize and operate different types of computers, applications and peripherals (e.g., use input/output devices such as a mouse, keyboard, or touch screen; find, navigate, launch a program).
SC.K2.CS-CS.4.3	Explain that a computer program is running when a program or command is executed.

Standard 6: Human – Computer interactions and Artificial Intelligence

BENCHMARK CODE	BENCHMARK
SC.K2.CS-CS.6.1	Identify tasks that are made easier because of computers.

Body of Knowledge: COMPUTER SCIENCE - COMPUTER PRACTICES AND PROGRAMMING

Standard 1: Data analysis

BENCHMARK CODE	BENCHMARK
SC.K2.CS-CP.1.1	Identify different kinds of data (e.g., text, charts, graphs, numbers, pictures, audio, video, and collections of objects).
SC.K2.CS-CP.1.2	Collect and manipulate data using a variety of computing methods (e.g., sorting, totaling, and averaging).
SC.K2.CS-CP.1.3	Propose a solution to a problem or question based on an analysis of the data and critical thinking, individually and collaboratively.
SC.K2.CS-CP.1.4	Create data visualizations (e.g., charts and infographics), individually and collaboratively.

Standard 2: Computer programming basics

BENCHMARK CODE	BENCHMARK
SC.K2.CS-CP.2.1	Define a computer program as a set of commands created by people to do something.
SC.K2.CS-CP.2.2	Perform a simple task (e.g., making a sandwich and brushing teeth) breaking it into small steps.
SC.K2.CS-CP.2.3	Explain that computers only follow the program's instructions.
SC.K2.CS-CP.2.4	Construct a simple program using tools that do not require a textual programming language (e.g. block-based programming language).

Standard 3: Programming applications	
BENCHMARK CODE	**BENCHMARK**
SC.K2.CS-CP.3.1	Create developmentally appropriate multimedia products with support from teachers, family members, or student partners.
SC.K2.CS-CP.3.2	Prepare a simple presentation of digital products and applications.

Body of Knowledge: COMPUTER SCIENCE - PERSONAL, COMMUNITY, GLOBAL, AND ETHICAL IMPACT	
Standard 1: Responsible use of technology and information	
BENCHMARK CODE	**BENCHMARK**
SC.K2.CS-PC.1.1	Demonstrate proper care for electronic devices (e.g., handling devices carefully, logging off or shutting down correctly, and keeping devices away from water/food).
SC.K2.CS-PC.1.2	Describe the attributes of a good digital citizen: one who protects private information, balances time online, reports cyberbullying, and recognizes inappropriate content/contact.
SC.K2.CS-PC.1.3	Identify safe and unsafe examples of online communications.
SC.K2.CS-PC.1.4	Explain that a password helps protect the privacy of information.

Standard 2: The impact of computing resources on local and global society	
BENCHMARK CODE	**BENCHMARK**
SC.K2.CS-PC.2.1	Identify and describe how people use many types of technologies in their daily work and personal lives.
SC.K2.CS-PC.2.2	Communicate about technology using developmentally appropriate terminology.
SC.K2.CS-PC.2.3	Recognize that people use computing technology in the workplace to perform many important tasks and functions.

Standard 4: Security, privacy, information sharing, ownership, licensure and copyright	
BENCHMARK CODE	**BENCHMARK**
SC.K2.CS-PC.4.1	Explain that some information is private and should not be shared online.

GRADES: 3-5

Body of Knowledge: COMPUTER SCIENCE - COMMUNICATION AND COLLABORATION	
Standard 1: Communication and collaboration	
BENCHMARK CODE	**BENCHMARK**
SC.35.CS-CC.1.1	Identify technology tools for individual and collaborative data collection, writing, communication, and publishing activities.
SC.35.CS-CC.1.2	Describe key ideas and details while working individually or collaboratively using digital tools and media-rich resources in a way that informs, persuades, and/or entertains.
SC.35.CS-CC.1.3	Identify ways that technology can foster teamwork, and collaboration can support problem solving and innovation.
SC.35.CS-CC.1.4	Describe how collaborating with others can be beneficial to a digital project.
SC.35.CS-CC.1.5	Explain that providing and receiving feedback from others can improve performance and outcomes for collaborative digital projects.

Body of Knowledge: COMPUTER SCIENCE - COMMUNICATION SYSTEMS AND COMPUTING

Standard 1: Modeling and simulations

BENCHMARK CODE	BENCHMARK
SC.35.CS-CS.1.1	Identify the concepts illustrated by a simulation (e.g., ecosystem, predator/prey, and invasive species).
SC.35.CS-CS.1.2	Describe how models and simulations can be used to solve real-world issues in science and engineering.
SC.35.CS-CS.1.3	Answer a question, individually and collaboratively, using data from a simulation.
SC.35.CS-CS.1.4	Create a simple model of a system (e.g., flower or solar system) and explain what the model shows and does not show.

Standard 2: Problem solving and Algorithms

BENCHMARK CODE	BENCHMARK
SC.35.CS-CS.2.1	Solve age-appropriate problems using information organized using digital graphic organizers (e.g., concept maps and Venn-diagrams).
SC.35.CS-CS.2.2	Describe how computational thinking can be used to solve real life issues in science and engineering.
SC.35.CS-CS.2.3	Explain the process of arranging or sorting information into useful order as well as the purpose for doing so.
SC.35.CS-CS.2.4	Solve real-world problems in science and engineering using computational thinking skills.
SC.35.CS-CS.2.5	Explain that there are several possible algorithms for searching within a dataset (such as finding a specific word in a word list or card in a deck of cards).
SC.35.CS-CS.2.6	Write an algorithm to solve a grade-level appropriate problem (e.g., move a character through a maze, instruct a character to draw a specific shape, have a character start, repeat or end activity as required or upon a specific event), individually or collaboratively.
SC.35.CS-CS.2.7	Identify and correct logical errors in algorithms; written, mapped, live action, or digital.
SC.35.CS-CS.2.8	Systematically test and identify logical errors in algorithms.
SC.35.CS-CS.2.9	Explain how to correct logical errors in algorithms; written, mapped, live action, or digital.

Standard 3: Digital tools

BENCHMARK CODE	BENCHMARK
SC.35.CS-CS.3.1	Manipulate and publish multimedia artifacts using digital tools (local and online).
SC.35.CS-CS.3.2	Create an artifact (independently and collaboratively) that answers a research question clearly communicating thoughts and ideas.

Standard 4: Hardware and software

BENCHMARK CODE	BENCHMARK
SC.35.CS-CS.4.1	Identify the basic components of a computer (e.g., monitor, keyboard, mouse, controller, speakers).
SC.35.CS-CS.4.2	Describe the function and purpose of various input/output devices and peripherals (e.g., monitor, screen, keyboard, controller, speakers).
SC.35.CS-CS.4.3	Compare and contrast hardware and software.
SC.35.CS-CS.4.4	Identify and solve simple hardware and software problems that may occur during everyday use (e.g., power, connections, application window or toolbar).

Standard 6: Human – Computer interactions and Artificial Intelligence	
BENCHMARK CODE	**BENCHMARK**
SC.35.CS-CS.6.1	Describe how hardware applications (e.g., Global Positioning System (GPS) navigation for driving directions, text-to-speech translation, and language translation) can enable everyone to do things they could not do otherwise.
SC.35.CS-CS.6.2	Compare and contrast human and computer performance on similar tasks (e.g., sorting alphabetically or finding a path across a cluttered room) to understand which is best suited to the task.
SC.35.CS-CS.6.3	Explain that computers model intelligent behavior (as found in robotics, speech and language recognition, and computer animation).

Body of Knowledge: COMPUTER SCIENCE - COMPUTER PRACTICES AND PROGRAMMING	
Standard 1: Data analysis	
BENCHMARK CODE	**BENCHMARK**
SC.35.CS-CP.1.1	Explain that searches may be enhanced by using Boolean logic (e.g., using “not”, “or”, “and”).
SC.35.CS-CP.1.2	Identify and describe examples of databases from everyday life (e.g., library catalogs, school records, telephone directories, and contact lists).
SC.35.CS-CP.1.3	Identify, research, and collect a data set on a topic, issue, problem, or question using age-appropriate technologies.
SC.35.CS-CP.1.4	Collect, organize, graph, and analyze data to answer a question using a database or spreadsheet.

Standard 2: Computer programming basics	
BENCHMARK CODE	**BENCHMARK**
SC.35.CS-CP.2.1	Perform keyboarding skills for communication and the input of data and information.
SC.35.CS-CP.2.2	Create, test, and modify a program in a graphical environment (e.g., block-based visual programming language), individually and collaboratively.
SC.35.CS-CP.2.3	Create a program using arithmetic operators, conditionals, and repetition in programs.
SC.35.CS-CP.2.4	Explain that programs need known initial conditions (e.g., set initial score to zero in a game, initialize variables, or initial values set by hardware input).
SC.35.CS-CP.2.5	Detect and correct program errors, including those involving arithmetic operators, conditionals, and repetition, using interactive debugging.

Standard 3: Programming applications	
BENCHMARK CODE	**BENCHMARK**
SC.35.CS-CP.3.1	Write, communicate and publish activities using technology tools.
SC.35.CS-CP.3.2	Present digitally created products, either individually and collaboratively, where a topic, concept, or skill is carefully analyzed or thoughtfully explored.

Body of Knowledge: COMPUTER SCIENCE - PERSONAL, COMMUNITY, GLOBAL, AND ETHICAL IMPACT	
Standard 1: Responsible use of technology and information	
BENCHMARK CODE	**BENCHMARK**
SC.35.CS-PC.1.1	Identify appropriate and inappropriate uses of technology when posting to social media, sending e-mail, and browsing the Internet.
SC.35.CS-PC.1.2	Describe responsible uses of modern communication media and devices.

SC.35.CS-PC.1.3	Explain the proper use and operation of security technologies (e.g., passwords, virus protection software, spam filters, pop-up blockers, and cookies).
SC.35.CS-PC.1.4	Define plagiarism and understand the impacts of plagiarized materials.

Standard 2: The impact of computing resources on local and global society	
BENCHMARK CODE	**BENCHMARK**
SC.35.CS-PC.2.1	Explain how computers and computing devices are used to communicate with others on a daily basis.
SC.35.CS-PC.2.2	Describe types of cyberbullying and explain what actions should be taken if students are either victims or witnesses of these behaviors.
SC.35.CS-PC.2.3	Identify the legal and social consequences of cyberbullying/harassment in social media.
SC.35.CS-PC.2.4	Explain how access to technology helps empower individuals and groups (e.g., gives them access to information, the ability to communicate with others around the world, and allows them to buy and sell things).
SC.35.CS-PC.2.5	Identify ways in which people with special needs access and use adaptive technology.
SC.35.CS-PC.2.6	Communicate about technology using appropriate terminology.
SC.35.CS-PC.2.7	Identify and describe how computing knowledge is essential to performing important tasks and functions.

Standard 3: Evaluation of digital information resources	
BENCHMARK CODE	**BENCHMARK**
SC.35.CS-PC.3.1	Identify digital information resources used to answer research questions (e.g., online library catalog, online encyclopedias, databases, and websites).
SC.35.CS-PC.3.2	Gather, organize, and analyze information from digital resources.
SC.35.CS-PC.3.3	Compare digital resources for accuracy, relevancy, and appropriateness.

Standard 4: Security, privacy, information sharing, ownership, licensure and copyright	
BENCHMARK CODE	**BENCHMARK**
SC.35.CS-PC.4.1	Describe the difference between digital artifacts that are open or free and those that are protected by copyright.
SC.35.CS-PC.4.2	Explain fair use for using copyrighted materials (e.g., images, music, video, and text).
SC.35.CS-PC.4.3	Describe the purpose of copyright and the possible consequences for inappropriate use of digital materials that are protected by copyright.
SC.35.CS-PC.4.4	Describe the threats to safe and efficient use of devices (e.g., SPAM, spyware, phishing, and viruses) associated with various forms of technology use (e.g., downloading and executing software programs, following hyperlinks, and opening files).

GRADES: 6-8

Body of Knowledge: COMPUTER SCIENCE - COMMUNICATION AND COLLABORATION	
Standard 1: Communication and collaboration	
BENCHMARK CODE	**BENCHMARK**
SC.68.CS-CC.1.1	Demonstrate an ability to communicate appropriately through various online tools.
SC.68.CS-CC.1.2	Apply productivity and or multimedia tools for local and global group collaboration.
SC.68.CS-CC.1.3	Design, develop, and publish a collaborative digital product using a variety of digital tools and media-rich resources that demonstrate and communicate concepts to inform, persuade, and/or entertain.

Body of Knowledge: COMPUTER SCIENCE - COMMUNICATION SYSTEMS AND COMPUTING

Standard 1: Modeling and simulations

BENCHMARK CODE	BENCHMARK
SC.68.CS-CS.1.1	Examine connections between elements of mathematics and computer science including binary numbers, logic, sets, and functions.
SC.68.CS-CS.1.2	Create or modify and use a simulation to analyze and illustrate a concept in depth (i.e., use a simulation to illustrate a genetic variation), individually and collaboratively.
SC.68.CS-CS.1.3	Evaluate what kinds of real-world problems can be solved using modeling and simulation.
SC.68.CS-CS.1.4	Interact with content-specific models and simulations to support learning, research and problem solving (e.g., immigration, international trade, invasive species).

Standard 2: Problem solving and Algorithms

BENCHMARK CODE	BENCHMARK
SC.68.CS-CS.2.1	Create, modify, and use a database (e.g., define field formats, adding new records, manipulate data) to analyze data and propose solutions for a task/problem, individually and collaboratively.
SC.68.CS-CS.2.10	Recognize that more than one algorithm can solve a given problem.
SC.68.CS-CS.2.11	Predict outputs while showing an understanding of inputs.
SC.68.CS-CS.2.12	Select the 'best' algorithm based on a given criteria (e.g., time, resource, and accessibility) to solve a problem, individually and collaboratively.
SC.68.CS-CS.2.13	Explore a problem domain using iterative development and debugging.
SC.68.CS-CS.2.14	Perform program tracing to predict the behavior of programs.
SC.68.CS-CS.2.2	Solve real-life issues in science and engineering (i.e., generalize a solution to open-ended problems) using computational thinking skills.
SC.68.CS-CS.2.3	Perform a variety of operations such as sorting, filtering, and searching in a database.
SC.68.CS-CS.2.4	Organize and display information in a variety of ways such as number formats (e.g., scientific notation, percentages, and exponents), charts, tables and graphs.
SC.68.CS-CS.2.5	Decompose a problem and create a function for one of its parts at a time (e.g., video game, robot obstacle course, making dinner), individually and collaboratively.
SC.68.CS-CS.2.6	Create a program that implements an algorithm to achieve a given goal, individually and collaboratively.
SC.68.CS-CS.2.7	Design solutions that use repetition and two-way selection (e.g., for, while, if/else).
SC.68.CS-CS.2.8	Recognize that boundaries need to be taken into account for an algorithm to produce correct results.
SC.68.CS-CS.2.9	Identify simple data types and data structures.

Standard 3: Digital tools

BENCHMARK CODE	BENCHMARK
SC.68.CS-CS.3.1	Explain why different file types exist (e.g., formats for word processing, images, music, and three-dimensional drawings).
SC.68.CS-CS.3.2	Identify the kinds of content associated with different file types.
SC.68.CS-CS.3.3	Integrate information from multiple file formats into a single artifact.

Standard 4: Hardware and software

BENCHMARK CODE	BENCHMARK
SC.68.CS-CS.4.1	Identify and describe the function of the main internal parts of a basic computing device (e.g., motherboard, hard drive, Central Processing Unit -CPU).

SC.68.CS-CS.4.2	Describe the main functions of an operating system and explain how an operating system provides user and system services (e.g., user interface, IO device management, task management).
SC.68.CS-CS.4.3	Describe the relationships between hardware and software (e.g., BIOS, operating systems and firmware).
SC.68.CS-CS.4.4	Identify and describe the use of sensors, actuators, and control systems in an embodied system (e.g., a robot, an e-textile, installation art, and a smart room).
SC.68.CS-CS.4.5	Evaluate a hardware or software problem and construct the steps involved in diagnosing and solving the problem (e.g., power, connections, application window or toolbar, cables, ports, network resources, video, and sound).
SC.68.CS-CS.4.6	Describe the essential characteristics of a software artifact.
SC.68.CS-CS.4.7	Describe the major components and functions of computer systems and networks.
SC.68.CS-CS.4.8	Identify software used to support specialized forms of human-computer interaction.

Standard 5: Network systems

BENCHMARK CODE	BENCHMARK
SC.68.CS-CS.5.1	Describe how information, both text and non-text, is translated and communicated between digital computers over a computer network.
SC.68.CS-CS.5.2	Explain the difference between physical (wired), local area wireless, and mobile networks
SC.68.CS-CS.5.3	Identify the major components of a network.

Standard 6: Human – Computer interactions and Artificial Intelligence

BENCHMARK CODE	BENCHMARK
SC.68.CS-CS.6.1	Explain why some tasks can be accomplished more easily by computers.
SC.68.CS-CS.6.2	Describe how humans and machines interact to accomplish tasks that cannot be accomplished by either alone.
SC.68.CS-CS.6.3	Identify novel ways humans interact with computers, including software, probes, sensors, and handheld devices.
SC.68.CS-CS.6.4	Describe ways in which computers use models of intelligent behavior (e.g., robot motion, speech and language understanding, and computer vision).
SC.68.CS-CS.6.5	Identify factors that distinguish humans from machines.
SC.68.CS-CS.6.6	Design and demonstrate the use of a device (e.g., robot, e-textile) to accomplish a task, individually and collaboratively.

Body of Knowledge: COMPUTER SCIENCE - COMPUTER PRACTICES AND PROGRAMMING

Standard 1: Data analysis

BENCHMARK CODE	BENCHMARK
SC.68.CS-CP.1.1	Define parameters for individual and collaborative projects using Boolean logic (e.g., using “not”, “or”, “and”).
SC.68.CS-CP.1.2	Select and use data-collection technology (e.g., probes, handheld devices, geographic mapping systems and output from multiple runs of a computer program) to gather, view, organize, analyze, and report results for content-related problems, individually and collaboratively.

Standard 2: Computer programming basics

BENCHMARK CODE	BENCHMARK
SC.68.CS-CP.2.1	Develop problem solutions using visual representations of problem states, structures and data.

SC.68.CS-CP.2.2	Evaluate the logical flow of a step-by-step program by acting it out through computer-free activities.
SC.68.CS-CP.2.3	Develop problem solutions using a block programming language, including all of the following: looping behavior, conditional statements, expressions, variables, and functions.
SC.68.CS-CP.2.4	Develop problem solutions using a programming language, including all of the following: looping behavior, conditional statements, expressions, variables, and functions.

Standard 3: Programming applications

BENCHMARK CODE	BENCHMARK
SC.68.CS-CP.3.1	Select appropriate tools and technology resources to accomplish a variety of tasks and solve problems.
SC.68.CS-CP.3.2	Create online content (e.g., webpage, blog, digital portfolio, multimedia), using advanced design tools.
SC.68.CS-CP.3.3	Create an artifact (independently and collaboratively) that answers a research question and communicates results and conclusions.

Body of Knowledge: COMPUTER SCIENCE - PERSONAL, COMMUNITY, GLOBAL, AND ETHICAL IMPACT

Standard 1: Responsible use of technology and information

BENCHMARK CODE	BENCHMARK
SC.68.CS-PC.1.1	Recognize and describe legal and ethical behaviors when using information and technology and describe the consequences of misuse.
SC.68.CS-PC.1.2	Describe and use safe and appropriate practices when participating in online communities (e.g., discussion groups, blogs, and social networking sites).
SC.68.CS-PC.1.3	Evaluate the proper use and operation of security technologies (e.g., passwords, virus protection software, spam filters, pop-up blockers, and cookies).
SC.68.CS-PC.1.4	Recognize the impacts and consequences of plagiarism on the development of creative works, projects, publications and online content.

Standard 2: The impact of computing resources on local and global society

BENCHMARK CODE	BENCHMARK
SC.68.CS-PC.2.1	Analyze the positive and negative impacts of computing, social networking and web technologies on human culture.
SC.68.CS-PC.2.2	Explain the possible consequences of cyberbullying and inappropriate use of social media on personal life and society.
SC.68.CS-PC.2.3	Describe the influence of access to information technologies over time and the effects those changes have had on education, the workplace, and the global society.
SC.68.CS-PC.2.4	Describe how the unequal net-neutrality and distribution of computing resources in a global economy raises issues of equity, access, and power.
SC.68.CS-PC.2.5	Describe ways in which adaptive technologies can assist users with special needs to function in their daily lives.
SC.68.CS-PC.2.6	Identify and discuss the technology skills needed in the workplace.
SC.68.CS-PC.2.7	Interpret writings and/or communications which use developmentally appropriate terminology.
SC.68.CS-PC.2.8	Identify interdisciplinary careers that are enhanced by computer science.

Standard 3: Evaluation of digital information resources

BENCHMARK CODE	BENCHMARK
SC.68.CS-PC.3.1	Answer research questions using digital information resources.

SC.68.CS-PC.3.2	Analyze how media and technology can be used to distort, exaggerate, or misrepresent information.
SC.68.CS-PC.3.3	Describe strategies for determining the reliability of resources or information on the Internet.
SC.68.CS-PC.3.4	Identify peer reviewed resources and understand the need for peer review.
SC.68.CS-PC.3.5	Identify resources such as city, state, and federal government websites and explain that these resources can be used for communication between citizens and government.

Standard 4: Security, privacy, information sharing, ownership, licensure and copyright	
BENCHMARK CODE	**BENCHMARK**
SC.68.CS-PC.4.1	Explain the guidelines for the fair use of downloading, sharing or modifying of digital materials.
SC.68.CS-PC.4.2	Explain how copyright law and licensing protect the owner of intellectual properties.
SC.68.CS-PC.4.3	Explain the possible consequences of violating intellectual property law.
SC.68.CS-PC.4.4	Identify threats and actions that protect devices from viruses, intrusion, vandalism, and other malicious activities.
SC.68.CS-PC.4.5	Demonstrate compliance with the school's Acceptable Use Policy.
SC.68.CS-PC.4.6	Generate text and non-text citations using digital citation tool.

GRADES: 9-12

Body of Knowledge: COMPUTER SCIENCE - COMMUNICATION AND COLLABORATION	
Standard 1: Communication and collaboration	
BENCHMARK CODE	**BENCHMARK**
SC.912.CS-CC.1.1	Evaluate modes of communication and collaboration.
SC.912.CS-CC.1.2	Select appropriate tools within a project environment to communicate with project team members.
SC.912.CS-CC.1.3	Collect, analyze, and present information using a variety of computing devices (e.g., probes, sensors, and handheld devices).
SC.912.CS-CC.1.4	Develop a collaborative digital product using collaboration tools (e.g., version control systems and integrated development environments).
SC.912.CS-CC.1.5	Communicate and publish key ideas and details to a variety of audiences using digital tools and media-rich resources.
SC.912.CS-CC.1.6	Identify how collaboration influences the design and development of software artifacts.
SC.912.CS-CC.1.7	Evaluate program designs and implementations written by others for readability and usability.

Body of Knowledge: COMPUTER SCIENCE - COMMUNICATION SYSTEMS AND COMPUTING	
Standard 1: Modeling and simulations	
BENCHMARK CODE	**BENCHMARK**
SC.912.CS-CS.1.1	Analyze data and identify real-world patterns through modeling and simulation.
SC.912.CS-CS.1.2	Formulate, refine, and test scientific hypotheses using models and simulations.
SC.912.CS-CS.1.3	Explain how data analysis is used to enhance the understanding of complex natural and human systems.
SC.912.CS-CS.1.4	Compare techniques for analyzing massive data collections.
SC.912.CS-CS.1.5	Represent and understand natural phenomena using modeling and simulation.

Standard 2: Problem solving and Algorithms	
BENCHMARK CODE	**BENCHMARK**
SC.912.CS-CS.2.1	Explain intractable problems and understand that problems exists that are computationally unsolvable (e.g., classic intractable problems include the Towers of Hanoi and the Traveling Salesman Problem -TSP).
SC.912.CS-CS.2.10	Design and implement a simple simulation algorithm to analyze, represent, and understand natural phenomena.
SC.912.CS-CS.2.11	Evaluate algorithms by their efficiency, correctness, and clarity (e.g., by analyzing and comparing execution times, testing with multiple inputs or data sets, and by debugging).
SC.912.CS-CS.2.12	Compare and contrast simple data structures and their uses.
SC.912.CS-CS.2.13	Explain how automated software testing can reduce the cost of the testing effort.
SC.912.CS-CS.2.14	Explain what tools are applied to provide automated testing environments.
SC.912.CS-CS.2.2	Describe the concept of parallel processing as a strategy to solve large problems.
SC.912.CS-CS.2.3	Demonstrate concurrency by separating processes into threads of execution and dividing data into parallel streams.
SC.912.CS-CS.2.4	Divide a complex problem into simpler parts by using the principle of abstraction to manage complexity (i.e., by using searching and sorting as abstractions) using predefined functions and parameters, classes, and methods.
SC.912.CS-CS.2.5	Evaluate a classical algorithms and implement an original algorithm.
SC.912.CS-CS.2.6	Evaluate various data types and data structures.
SC.912.CS-CS.2.7	Explain how sequence, selection, iteration, and recursion are building blocks of algorithms.
SC.912.CS-CS.2.8	Decompose a problem by defining new functions and classes.
SC.912.CS-CS.2.9	Evaluate ways to characterize how well algorithms perform and that two algorithms can perform differently for the same task.

Standard 3: Digital tools	
BENCHMARK CODE	**BENCHMARK**
SC.912.CS-CS.3.1	Describe digital tools or resources to use for a real-world task based on their efficiency and effectiveness.
SC.912.CS-CS.3.2	Evaluate different file types for different purposes (e.g., word processing, images, music, and three-dimensional drawings).

Standard 4: Hardware and software	
BENCHMARK CODE	**BENCHMARK**
SC.912.CS-CS.4.1	Describe a software development process that is used to solve problems at different software development stages (e.g., design, coding, testing, and verification).
SC.912.CS-CS.4.2	Describe the organization of a computer and identify its principal components by name, function, and the flow of instructions and data between components (e.g., storage devices, memory, CPU, graphics processors, IO and network ports).
SC.912.CS-CS.4.3	Differentiate between multiple levels of hardware and software (such as CPU hardware, operating system, translation, and interpretation) that support program execution.
SC.912.CS-CS.4.4	Evaluate various forms of input and output (e.g., IO and storage devices and digital media).
SC.912.CS-CS.4.5	Develop and evaluate criteria for purchasing or upgrading computer system hardware (e.g., Wi-Fi, mobile devices, home and office machines).
SC.912.CS-CS.4.6	Develop criteria for selecting appropriate hardware and software when solving a specific real-world problem (such as business, educational, personal).
SC.912.CS-CS.4.7	Develop a software artifact (independently and collaboratively) in phases (or stages) according to a common software development methodology (e.g., Waterfall or Spiral model).
SC.912.CS-CS.4.8	Evaluate the basic components of computer networks.

SC.912.CS-CS.4.9	Analyze historical trends in hardware and software to assess implications on computing devices for the future (e.g., upgrades for power/energy, computation capacity, speed, size, ease of use).

Standard 5: Network systems	
BENCHMARK CODE	**BENCHMARK**
SC.912.CS-CS.5.1	Identify and select the most appropriate file format based on trade-offs (e.g., open file formats, text, proprietary and binary formats, compression and encryption formats).
SC.912.CS-CS.5.2	Describe the issues that impact network functionality (e.g., latency, bandwidth, firewalls and server capability).
SC.912.CS-CS.5.3	Describe common network protocols, such as IP, TCP, SMTP, HTTP, and FTP, and how these are applied by client-server and peer-to-peer networks.

Standard 6: Human – Computer interactions and Artificial Intelligence	
BENCHMARK CODE	**BENCHMARK**
SC.912.CS-CS.6.1	Describe the unique features of computers embedded in mobile devices and vehicles.
SC.912.CS-CS.6.2	Describe the common physical and cognitive challenges faced by users when learning to use software and hardware.
SC.912.CS-CS.6.3	Describe the process of designing software to support specialized forms of human-computer interaction.
SC.912.CS-CS.6.4	Explain the notion of intelligent behavior through computer modeling and robotics.
SC.912.CS-CS.6.5	Describe common measurements of machine intelligence (e.g., Turing test).
SC.912.CS-CS.6.6	Describe a few of the major branches of artificial intelligence (e.g., expert systems, natural language processing, machine perception, machine learning).
SC.912.CS-CS.6.7	Describe major applications of artificial intelligence and robotics, including, but not limited to, the medical, space, and automotive fields.

Body of Knowledge: COMPUTER SCIENCE - COMPUTER PRACTICES AND PROGRAMMING

Standard 1: Data analysis	
BENCHMARK CODE	**BENCHMARK**
SC.912.CS-CP.1.1	Evaluate effective uses of Boolean logic (e.g., using “not”, “or”, “and”) to refine searches for individual and collaborative projects.
SC.912.CS-CP.1.2	Perform advanced searches to locate information and/or design a data-collection approach to gather original data (e.g., qualitative interviews, surveys, prototypes, and simulations).
SC.912.CS-CP.1.3	Analyze and manipulate data collected by a variety of data collection techniques to support a hypothesis.
SC.912.CS-CP.1.4	Collect real-time data from sources such as simulations, scientific and robotic sensors, and device emulators, using this data to formulate strategies or algorithms to solve advanced problems.

Standard 2: Computer programming basics	
BENCHMARK CODE	**BENCHMARK**
SC.912.CS-CP.2.1	Explain the program execution process (by an interpreter and in CPU hardware).
SC.912.CS-CP.2.2	Design and implement a program using global and local scope.
SC.912.CS-CP.2.3	Implement a program using an industrial-strength integrated development environment.
SC.912.CS-CP.2.4	Facilitate programming solutions using application programming interfaces (APIs) and libraries.
SC.912.CS-CP.2.5	Explain the role of an API in the development of applications and the distinction between a programming language’s syntax and the API.

SC.912.CS-CP.2.6	Describe a variety of commonly used programming languages.
SC.912.CS-CP.2.7	Classify programming languages by paradigm and application domain (e.g., imperative, functional, and logic languages) and evaluate their application to domains such as web programming, symbolic processing and data/numerical processing.

Standard 3: Programming applications

BENCHMARK CODE	BENCHMARK
SC.912.CS-CP.3.1	Create a computational artifact, individually and collaboratively, followed by reflection, analysis, and iteration (e.g., data-set analysis program for science and engineering fair, capstone project that includes a program, term research project based on program data).
SC.912.CS-CP.3.2	Create mobile computing applications and/or dynamic web pages through the use of a variety of design and development tools, programming languages, and mobile devices/emulators.

Body of Knowledge: COMPUTER SCIENCE - PERSONAL, COMMUNITY, GLOBAL, AND ETHICAL IMPACT

Standard 1: Responsible use of technology and information

BENCHMARK CODE	BENCHMARK
SC.912.CS-PC.1.1	Compare and contrast appropriate and inappropriate social networking behaviors.
SC.912.CS-PC.1.2	Describe and demonstrate ethical and responsible use of modern communication media and devices.
SC.912.CS-PC.1.3	Evaluate the impacts of irresponsible use of information (e.g., plagiarism and falsification of data) on collaborative projects.
SC.912.CS-PC.1.4	Explain the principles of cryptography by examining encryption, digital signatures, and authentication methods (e.g., explain why and how certificates are used with “https” for authentication and encryption).
SC.912.CS-PC.1.5	Implement an encryption, digital signature, or authentication method.
SC.912.CS-PC.1.6	Describe computer security vulnerabilities and methods of attack, and evaluate their social and economic impact on computer systems and people.

Standard 2: The impact of computing resources on local and global society

BENCHMARK CODE	BENCHMARK
SC.912.CS-PC.2.1	Describe how the Internet facilitates global communication.
SC.912.CS-PC.2.10	Describe and evaluate the challenges (e.g., political, social, and economic) in providing equal access and distribution of technology in a global society.
SC.912.CS-PC.2.11	Construct writings and/or communications using developmentally appropriate terminology.
SC.912.CS-PC.2.12	Explore a variety of careers to which computing is central.
SC.912.CS-PC.2.13	Predict future careers and the technologies that may exist based on current technology trends.
SC.912.CS-PC.2.2	Identify ways to use technology to support lifelong learning.
SC.912.CS-PC.2.3	Discuss and analyze the impact of values and points of view that are presented in media messages (e.g., racial, gender, and political).
SC.912.CS-PC.2.4	Analyze the positive and negative impacts of technology on popular culture and personal life.
SC.912.CS-PC.2.5	Construct strategies to combat cyberbullying or online harassment.
SC.912.CS-PC.2.6	Describe the impact of computing on business and commerce (e.g., automated inventory processing, financial transactions, e-commerce, virtualization, and cloud computing).
SC.912.CS-PC.2.7	Describe how technology has changed the way people build and manage organizations and how technology impacts personal life.

SC.912.CS-PC.2.8	Evaluate ways in which adaptive technologies may assist users with special needs.
SC.912.CS-PC.2.9	Explain how societal and economic factors are affected by access to critical information.

Standard 3: Evaluation of digital information resources	
BENCHMARK CODE	**BENCHMARK**
SC.912.CS-PC.3.1	Evaluate the quality of digital resources for reliability (i.e., currency, relevancy, authority, accuracy, and purpose of digital information).
SC.912.CS-PC.3.2	Evaluate the accuracy, relevance, comprehensiveness, appropriateness, and bias of electronic information resources.
SC.912.CS-PC.3.3	Conduct research using peer reviewed articles, newspapers, magazine articles, and online books.
SC.912.CS-PC.3.4	Analyze and evaluate public/government resources and describe how using these resources for communication can affect change.

Standard 4: Security, privacy, information sharing, ownership, licensure and copyright	
BENCHMARK CODE	**BENCHMARK**
SC.912.CS-PC.4.1	Describe how different types of software licenses (e.g., open source and proprietary licenses) can be used to share and protect intellectual property.
SC.912.CS-PC.4.2	Explain how access to information may not include the right to distribute the information.
SC.912.CS-PC.4.3	Describe differences between open source, freeware, and proprietary software licenses, and how they apply to different types of software.
SC.912.CS-PC.4.4	Describe security and privacy issues that relate to computer networks.
SC.912.CS-PC.4.5	Identify computer-related laws and analyze their impact on digital privacy, security, intellectual property, network access, contracts, and harassment.
SC.912.CS-PC.4.6	Describe security and privacy issues that relate to computer networks including the permanency of data on the Internet, online identity, and privacy.
SC.912.CS-PC.4.7	Evaluate and use digital citation tools to cite sources.
SC.912.CS-PC.4.8	Describe the impact of government regulation on privacy and security.