Computer Science

Effective December 2024
6A-1.09412, F.A.C.

Kindergarten Foundations of Computer Science (Request #3389)

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Aligned Standards

Name	Description
SC.K.CC.1.1:	Provide positive feedback. **Clarifications:** *Clarification 1:* The expectation is for students to provide specific compliments on peer projects.
SC.K.CO.1.1:	Recognize components of computing devices. **Clarifications:** *Clarification 1:* Instruction includes recognizing the differences between a laptop and a desk-top computer.
SC.K.CO.1.2:	Identify what types of computer components can be used with senses. **Clarifications:** *Clarification 1:* Instruction includes discussion on how headphones, screens and keyboards affect the five senses.
SC.K.CO.1.3:	Identify tools used for creative expression.
SC.K.CO.1.4:	Create a project that expresses thoughts and ideas.
SC.K.CO.1.5:	Explore the keyboard of a computer through Consonant-Vowel-Consonant (CVC) words.

	Clarifications: *Clarification 1:* Consonant-Vowel-Consonant (CVC) words include "cat" or "dog."
SC.K.CO.1.6:	Recognize that universal icons represent tools or information.
SC.K.CO.1.7:	Discuss proper care for electronic devices. **Clarifications:** *Clarification 1:* Proper care includes handling devices carefully, logging off or shutting down correctly and keeping devices away from food or drinks. *Clarification 2:* Instruction includes teaching keeping food and drinks away from computers and other hardware such as keyboards, screens, mice, printers and tablets. *Clarification 3:* Instruction includes teaching proper ways to carry and store computers or devices. *Clarification 4:* Instruction includes teaching to keep magnets away from computers and screens.
SC.K12.CTR.1.1:	**Actively participate in effortful learning both individually and collaboratively.** Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks.

	• Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:**

	Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills. • Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal:

	• Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow. • Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal: • Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.

SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking: • Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems. • Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.K.HS.1.1:	Determine the risks of Internet usage. **Clarifications:** *Clarification 1:* Students should be aware of the risks if they are interacting with other people online. *Clarification 2:* Students should know that unsafe practices include sharing their information like phone number, address and other identifying information with strangers.
SC.K.HS.1.2:	Explore the need for adult permission before using a network-capable device.

	Clarifications: *Clarification 1:* Instruction includes discussing how someone can have safe and unsafe interactions with others while online.
SC.K.HS.1.3:	Discuss that a password helps protect the privacy of information. **Clarifications:** *Clarification 1:* Instruction includes discussing the importance of not sharing a password with anyone other than a parent or guardian.
SC.K.HS.1.4:	Explain that some information is private and should not be shared online or in person. **Clarifications:** *Clarification 1:* Instruction includes discussing the importance of not sharing information with anyone other than a parent or guardian.
SC.K.HS.2.1:	Explore the impact that technology has on the senses. **Clarifications:** *Clarification 1:* Instruction includes discussion on how technology positively and negatively affects the five senses.
SC.K.HS.2.2:	Explore how to create a healthy balance between physical activity and time spent on a digital device. **Clarifications:** *Clarification 1:* Instruction includes discussing the balance between health and time spent on a digital device.
SC.K.PE.1.1:	Discuss how a computer program is a set of instructions made by people to show a computer how to complete a task.
SC.K.PE.1.2:	Develop a series of steps to complete a task. **Clarifications:** *Example:* Students brainstorm how to make a sandwich.
SC.K.PE.2.1:	Recognize different types of data.

	Clarifications: *Clarification 1:* Instruction includes defining data as a collection of information that can be used to sort and organize details.
SC.K.PE.2.2:	Use different data representations to make comparisons. **Clarifications:** *Clarification 1:* Types of data representations include tally marks or pictographs.
SC.K.PE.3.1:	Arrange or sort information.
SC.K.PE.3.2:	Solve problems involving logical order thinking or sequencing with or without technology. **Clarifications:** *Clarification 1:* Problem types include putting things in order or sequence, either with or without technology.
SC.K.PE.3.3:	Observe patterns of daily life and routines. **Clarifications:** *Clarification 1:* Instruction includes describing steps missing in scenarios for an intended outcome.
SC.K.PE.3.4:	Create and use repeating patterns using letters, numbers or symbols.
SC.K.TI.1.1:	Explore the use of technology in daily life.
SC.K.TI.2.1:	Introduce and state the importance of rules.
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks.

	• Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses.

	• Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency: • Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.** Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence.

	Clarifications: Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning. • Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.** Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. **Clarifications:** Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems. • Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

	Assess the reasonableness of solutions. Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context.
MA.K12.MTR.6.1:	**Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
	Apply mathematics to real-world contexts. Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency.
MA.K12.MTR.7.1:	**Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts: • Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation.

	• Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations. 4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently. **Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension. **Clarifications:** Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.

ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully. In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work. **Clarifications:** Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.
ELD.K12.ELL.SC.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs)

and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations' plan to meet individual needs and ensure equal access. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Foundations of Computer Science Kindergarten is designed to introduce young learners to essential computer science concepts in a fun and engaging manner. Intended for students who meet daily or frequently, this course focuses on building a solid foundation in digital literacy and problem-solving skills. Students will learn about digital citizenship and internet safety, ensuring they understand the basics of responsible technology use from an early age. The course also includes an introduction to what computers are and how they work, providing a simple yet comprehensive understanding of computer hardware and software.

Throughout the year, students will explore foundational concepts such as sequencing and patterns, which are crucial for developing logical thinking and problem-solving abilities. They

will engage in activities that involve recognizing and sorting data, fostering early data analysis and interpretation skills. By working on hands-on projects and interactive exercises, students will build a foundational knowledge of computer science that will serve as a stepping stone for future learning. The course is designed to be taught over a full year but can be adapted to a semester format if meeting more frequently.

General Information

Course Path: Request ID: 3389 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades PreK to 5 Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Course Year: 2025

Abbreviated Title: KDG CS FOUNDATIONS

Course Length: Year (Y)

Course Type: Elective Course

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

Grade 1 Foundations of Computer Science (Request #3390)

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Aligned Standards

Name	Description
	Actively participate in effortful learning both individually and collaboratively. Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.
SC.K12.CTR.1.1:	**Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity.

	• Develop students' ability to justify methods and compare their responses to the responses of their peers.
SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills.

	• Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
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	• Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal: • Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
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SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking:

	• Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems. • Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.1.CC.1.1:	Communicate and collaborate with teachers and other students with and without the use of technology.
SC.1.CO.1.1:	Recognize and operate different types of computer components. **Clarifications:** *Clarification 1:* Instruction includes using word processor and input/output devices such as a mouse, keyboard or touch screen.
SC.1.CO.1.2:	Create and review projects using digital tools.
SC.1.CO.1.3:	Identify tools that can be used for data collection.
SC.1.CO.1.4:	Identify tools that can be used for sharing information.

	Clarifications: *Clarification 1:* Tools include storyboards, posters, photos, journals, magazines or newspapers.
SC.1.CO.1.5:	Demonstrate how to complete a task using a digital device. **Clarifications:** *Clarification 1:* Instruction includes tasks such as completing practice tests, homework and surveys. *Clarification 2:* Instruction emphasizes the responsible use of completing tasks effectively.
SC.1.CO.1.6:	Discuss the importance of saving digital work. **Clarifications:** *Clarification 1:* Students should discuss reasons why it is important to save their work periodically instead of waiting until they complete it.
SC.1.CO.1.7:	Use the keyboard of a computer to write consonant-vowel-consonant (CVC) and consonant-vowel-consonant-e (CVCe) words. **Clarifications:** *Clarification 1:* Instruction includes the use of a keyboard or a printed version of a keyboard.
SC.1.CO.1.8:	Type a username and password accurately. **Clarifications:** *Clarification 1:* Instruction includes understanding the difference between typing capital and lowercase letters. *Clarification 2:* Passwords include the use of letters, numbers and symbols.
SC.1.CO.1.9:	Recognize and operate different types of computer applications. **Clarifications:** *Clarification 1:* Instruction includes demonstrating the correct use of logging into a computer and launching applications from the desktop.

SC.1.CO.1.10:	Create multimedia files. **Clarifications:** *Clarification 1:* Instruction includes clarifying that multimedia can be audio, video or both.
SC.1.CO.1.11:	Demonstrate proper care for electronic devices. **Clarifications:** *Clarification 1:* Instruction includes demonstrating how to properly shut down a computer.
SC.1.HS.1.1:	Define and recognize the risks of Internet usage.
SC.1.HS.1.2:	Explain the need for adult permission before using a network-capable device.
SC.1.HS.1.3:	Recognize why student identification is considered secure information.
SC.1.HS.2.1:	Define and discuss what makes a healthy balance between unplugged activities and time spent on a digital device. **Clarifications:** *Clarification 1:* Unplugged activities include reading a physical book, playing a sport, completing a puzzle or playing a game outside.
SC.1.PE.1.1:	Explain that a computer program can only follow a set of instructions made by people to complete a task.
SC.1.PE.2.1:	Determine what makes data important. **Clarifications:** *Clarification 1:* Instruction includes providing opportunities for students to discuss why data may be important to them. *Clarification 2:* Instruction includes understanding that depending on the person and the context and their justification, some data may be important to one person but not important to another person.
SC.1.PE.2.2:	Sort data using visual representation tools. **Clarifications:**

	Clarification 1: Representations include two-column charts, pictographs and tally marks. *Clarification 2:* When sorting, students can look for trends in the data. **Clarifications:** *Example:* Sort a bag of chocolate candies based on their color. After, compare your sorted candies with a partner.
SC.1.PE.2.3:	Recognize the type of data needed to be collected and use it to solve a specific problem using models.
SC.1.PE.3.1:	Create a pattern that can be repeated to complete a task. **Clarifications:** *Example:* What numbers can you repeatedly add to each other to get to 100?
SC.1.PE.3.2:	Extend a repeated pattern.
SC.1.PE.3.3:	Describe how data collected from models can be used to solve real-world problems.
SC.1.TI.1.1:	Discuss that individuals can use computing technology in the workplace or school to perform many important tasks and functions.
SC.1.TI.1.2:	Explore that individuals can use computing technology at home to perform many important tasks and functions.
SC.1.TI.1.3:	Explore Artificial Intelligence (AI)-powered devices. **Clarifications:** *Clarification 1:* Instruction includes introducing the concept of Artificial Intelligence (AI) by identifying smart toys.
SC.1.TI.2.1:	Identify why personal information should be kept private.
SC.1.TI.2.2:	Compare information from two different digital resources on the same topic to confirm accuracy.

MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose.

	Clarifications: Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency: • Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.**

	Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence. **Clarifications:** Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning. • Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.** Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations.

	Clarifications: Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems. • Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
	Assess the reasonableness of solutions. Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context.
MA.K12.MTR.6.1:	**Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
MA.K12.MTR.7.1:	**Apply mathematics to real-world contexts.** Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems.

	• Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency. **Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts: • Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation. • Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations. 4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently.

	Clarifications: See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension. **Clarifications:** Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.
ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully. In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work. **Clarifications:** Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our

	friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.
ELD.K12.ELL.SC.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations' plan to meet individual needs and ensure equal access. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their

needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Foundations of Computer Science Grade 1 is a course tailored for young learners, meeting daily or frequently to introduce them to essential computer science concepts. The course focuses on building a foundation in digital citizenship and internet safety, teaching students how to navigate the online world responsibly. It also covers basic computer hardware and software, helping students understand how computers work. Students will learn to organize and categorize information through activities centered on data recognition and sorting. The course includes an introduction to problem-solving and algorithms, laying the groundwork for logical thinking and basic coding concepts.

Additionally, students will be introduced to artificial intelligence, helping them grasp the basics of how AI impacts everyday life. Designed to be taught over an entire year, this course can be adapted to a semester format if the course meets more frequently. This comprehensive approach ensures that students understand foundational computer science principles while integrating them with their daily learning experiences.

General Information

Course Path: Request ID: 3390 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades PreK to 5 Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Course Year: 2025

Abbreviated Title: 1 CS FOUNDATIONS

Course Length: Year (Y)

Course Type: Elective Course

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

Grade 2 Foundations of Computer Science (Request #3391)

This document was generated on CPALMS - www.cpalms.org

Aligned Standards

Name	Description
	Actively participate in effortful learning both individually and collaboratively. Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.
SC.K12.CTR.1.1:	**Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity.

	• Develop students' ability to justify methods and compare their responses to the responses of their peers.
SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills.

	• Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow.

	• Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal: • Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking:

	• Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems. • Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.2.CC.1.1:	Identify a variety of digital tools used for communication. **Clarifications:** *Clarification 1:* Instruction includes identifying digital tools such as Internet applications, online catalogs and databases. *Clarification 2:* Instruction includes recognizing the Internet as a means of communication.
SC.2.CC.1.2:	Describe the similarities and differences among the Internet, websites and online applications. **Clarifications:** *Clarification 1:* Instruction includes understanding what the Internet is and how it works, and what websites and online applications are and how they work.

SC.2.CC.1.3:	Complete basic keyword searches. **Clarifications:** *Clarification 1:* Instruction includes child-friendly searches on a safe search engine or browser. *Clarification 2:* Instruction includes the connection to using a dictionary, glossary or encyclopedia.
SC.2.CC.1.4:	Identify concepts illustrated by a simple simulation. **Clarifications:** *Clarification 1:* Instruction includes concepts such as growth, human health and the butterfly life cycle.
SC.2.CO.1.1:	Identify the characteristics of hardware. **Clarifications:** *Clarification 1:* Instruction includes using input/output devices such as a mouse, speakers, printer, monitor, keyboard or touch screen to find, navigate and launch a program. *Clarification 2:* Students should understand that hardware is the physical component of a computer system.
SC.2.CO.1.2:	Demonstrate the proper handling of computers and devices. **Clarifications:** *Clarification 1:* Instruction includes teaching students to keep food and drinks away from computers and other hardware such as keyboards, screens, mice, printers and tablets. *Clarification 2:* Instruction includes teaching students proper ways to carry and store computers or devices. *Clarification 3:* Instruction includes teaching students to keep magnets away from computers and screens.
SC.2.CO.1.3:	Use the keyboard of a computer to write simple sentences.

	Clarifications: *Clarification 1:* Instruction includes the use of a keyboard or a printed version of a keyboard.
SC.2.CO.1.4:	Create an audio or video recording.
SC.2.CO.1.5:	Create and present a digital product.
SC.2.CO.1.6:	Explain that a computer program is running when a program or command is executed.
SC.2.CO.1.7:	Identify the characteristics of software. **Clarifications:** *Clarification 1:* Instruction includes the understanding that software is the actual programs that are running on a computer. *Clarification 2:* Instruction includes comparing the characteristics of hardware and software.
SC.2.CO.1.8:	Introduce network system tools and how to determine if they are connected to a network. **Clarifications:** *Clarification 1:* Students should be able to determine from the symbol whether or not they have a network connection. *Clarification 2:* Instruction includes recognizing a network system symbol on a computing device.
SC.2.CO.1.9:	Identify the strength of a network system from the symbol on a computing device. **Clarifications:** *Clarification 1:* Within this benchmark, the expectation is to look at the network system symbol to determine the strength of the network connection. **Clarifications:** *Example:* Mr. Thompson has his class count the bars on their tablets

	in the classroom to see the strength of the network signal. The class then takes their devices out to the playground and counts the bars again. What do you know about the signal strength between being in the classroom and on the playground?
SC.2.HS.1.1:	Identify examples of safe and unsafe online communications.
SC.2.HS.1.2:	Demonstrate why personal or family member login usernames, passcodes, passwords and secure logins should not be shared with other people. **Clarifications:** *Clarification 1:* Instruction includes teaching students to store passwords in a secure location.
SC.2.HS.1.3:	Discuss the difference between weak and strong passwords. **Clarifications:** *Clarification 1:* Instruction includes teaching what constitutes a strong password. **Clarifications:** *Example:* Alana is creating a password for her school account. She knows she must use 10 characters. These characters should include a number and a capital letter. Give an example of a strong password and a weak password.
SC.2.HS.1.4:	Recognize that digital content posted online should have the consent of the subject. **Clarifications:** *Clarification 1:* Instruction includes discussing how to respect others' privacy, as well as one's own privacy. *Clarification 2:* Digital content includes videos, pictures and audio (sound bites).

	Clarifications: *Example:* Wes took a photo of his friend and posted it online without asking. Discuss why this is inappropriate.
	Identify healthy digital use habits. **Clarifications:** *Clarification 1:* Instruction includes the use of an application, stopwatch, timer or clock to determine the number of minutes on an electronic device.
SC.2.HS.2.1:	**Clarifications:** *Example:* Record the number of minutes you spend on an electronic device every day for two weeks. Compare the number of minutes from each week. What are some ways you could reduce your amount of screen time? *Example:* Record the number of minutes you spend on an electronic device every day for two weeks. Categorize the number of minutes by how you spent time on the electronic device. Create a bar graph to represent your screen time.
SC.2.HS.2.2:	Identify if there is a need to reduce screen time and how that can be done. **Clarifications:** *Clarification 1:* Instruction includes creating a list of activities that could be done in place of the use of technology.
SC.2.PE.1.1:	Construct code segments using tools that do not require a textual programming language. **Clarifications:** *Example:* Poppy is writing directions to help her puppy to the food bowl. Poppy will be using a block-based program to demonstrate to her puppy how to get to the food bowl. Can you help Poppy write part of the code to tell the puppy how many steps to take and when to turn?
SC.2.PE.2.1:	Collect data using a variety of computing methods.

	Clarifications: *Clarification 1:* Instruction includes sorting and totaling as a collection tool.
SC.2.PE.2.2:	Explore dividing a collection of data or objects into like groups.
SC.2.PE.2.3:	Create data visualizations. **Clarifications:** *Clarification 1:* Instruction includes creating bar graphs, pictographs, tables or infographics as data visualizations.
SC.2.PE.3.1:	Create a repeatable pattern, with or without technology, to solve a problem. **Clarifications:** *Clarification 1:* Patterns can be created using manipulatives, building bricks, visuals, numbers, music or technology. *Clarification 2:* Students discussing and creating repeated patterns will build the foundation for loops and algorithms in later courses. **Clarifications:** *Example:* Use a word processor to create a repeated pattern using letters.
SC.2.PE.3.2:	Develop a plan that could be used to create a story. **Clarifications:** *Clarification 1:* Instruction emphasizes creating a story in a step-by-step manner. *Clarification 2:* Instruction makes the connection to developing an algorithm. *Clarification 3:* When developing a plan, students can use graphic organizers, storyboards or flowcharts.
SC.2.PE.3.3:	Demonstrate the use of conditional logic.

	Clarifications: *Clarification 1:* Instruction includes using conditional logic: if-then statements and while loops.
	Clarifications: *Example:* If it is raining, then students cannot go outside for recess.
SC.2.PE.3.4:	Solve questions using models, simulations or data. **Clarifications:** *Clarification 1:* Simulations include growth, human health, weather patterns, soil development and the butterfly life cycle. *Clarification 2:* When solving questions, students may need to create a visual representation.
	Clarifications: *Example:* Guide students to make a model of decomposition of plants and weathering rocks.
SC.2.TI.1.1:	Recognize that people use computing technology in the workplace or school to perform many important tasks and functions. **Clarifications:** *Clarification 1:* Instruction includes teacher explanations about how technology is used in the classroom.
	Clarifications: *Example:* Interview family members to determine how they use technology in their work environment.
SC.2.TI.1.2:	Recognize that people use computing technology at home to perform many important tasks and functions.
SC.2.TI.1.3:	Identify and compare Artificial Intelligence (AI) devices to other devices.

SC.2.TI.2.1:	Evaluate if given information (written or visual) is accurate. **Clarifications:** *Clarification 1:* Instruction includes teaching that images can be digitally manipulated, and information can be falsified. **Clarifications:** *Example:* Teacher shares an image of a jackalope and asks students to discuss if it is fake or not fake.
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.

MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency:

	• Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.** Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence. **Clarifications:** Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning. • Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.**

	Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. **Clarifications:** Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems. • Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
MA.K12.MTR.6.1:	**Assess the reasonableness of solutions.** Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?"

	• Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
	Apply mathematics to real-world contexts. Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency.
MA.K12.MTR.7.1:	**Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts: • Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation. • Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations.

	4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently. **Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension. **Clarifications:** Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.
ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully. In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work.

	Clarifications: Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.
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This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates

performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations' plan to meet individual needs and ensure equal access. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Foundations of Computer Science Grade 2 is designed for students who meet daily or frequently, providing a thorough introduction to essential computer science concepts. The course focuses on enhancing communication skills through digital tools, ensuring students can effectively use technology to express and share ideas. Emphasis is also placed on digital citizenship and internet safety, teaching students how to navigate the online world responsibly. The curriculum covers basic computer hardware and software, helping students understand the foundational components of technology.

Students will engage in problem-solving activities and learn introductory concepts of conditional logic, which are critical for understanding basic programming and decision-making processes. The course includes hands-on experiences with models and simulations, allowing students to visualize and interact with abstract concepts. Data analysis will be introduced, helping students develop skills to organize and interpret information. Additionally, students will recognize artificial intelligence (AI) and its applications in everyday life. Intended to be taught over an entire year, this course can be adapted to a semester format, depending on meeting frequency.

General Information

Course Path: Request ID: 3391 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades PreK to 5 Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Course Year: 2025

Abbreviated Title: 2 CS FOUNDATIONS

Course Length: Year (Y)

Course Type: Elective Course

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

Grade 3 Foundations of Computer Science (Request #3392)

This document was generated on CPALMS - www.cpalms.org

Aligned Standards

Name	Description
	Actively participate in effortful learning both individually and collaboratively. Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.
SC.K12.CTR.1.1:	**Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity.

	• Develop students' ability to justify methods and compare their responses to the responses of their peers.
SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills.

	• Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow.

	• Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal: • Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking:

	• Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems. • Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.3.CC.1.1:	Describe how collaborating with others can be beneficial to a project. **Clarifications:** *Clarification 1:* Instruction includes understanding how collaborating includes brainstorming or sharing ideas with one another.
SC.3.CC.1.2:	Use feedback from peers to make revisions using technology. **Clarifications:** *Clarification 1:* Instruction includes asking questions of self and others on their work. *Clarification 2:* Feedback should be constructive.
SC.3.CC.1.3:	Explain that searches may be enhanced by key terms.

	Clarifications: *Example:* Students use a shoe brand website to find a particular type of shoe, then they narrow their search by typing more descriptive words into the search bar like size and color. Finally, they add a sport to the search to see more specific results. Students compare the results from each search.
SC.3.CC.1.4:	Describe how computer simulations can help communicate ideas in concepts or problem-solving. **Clarifications:** *Example:* Describe how a computer simulation can model the water cycle.
SC.3.CC.2.1:	Identify uses of technology when sending communication over the Internet. **Clarifications:** *Clarification 1:* Instruction includes Netiquette depending on the audience and type of communication. *Clarification 2:* Instruction includes email, texting, uploads, surveys and screen shots.
SC.3.CC.2.2:	Describe responsible uses of modern communication media and devices. **Clarifications:** *Clarification 1:* Instruction includes safe practices that include making sure your personal information is protected. Examples might be your information or your family's information, real names, addresses, phone numbers, credit card numbers and photographs. *Clarification 2:* Instruction includes respecting the personal information of others.
SC.3.CO.1.1:	Classify hardware as input, output, both or neither.
SC.3.CO.1.2:	Use the keyboard of a computer to write short paragraphs or short stories. **Clarifications:** *Clarification 1:* Instruction includes the correct use of punctuation and capitalization.

SC.3.CO.1.3:	Identify digital tools used for writing activities. **Clarifications:** *Clarification 1:* Instruction includes using digital tools such as word processing, emails and text messages.
SC.3.CO.1.4:	Identify digital tools for data collection. **Clarifications:** *Clarification 1:* Instruction includes using digital tools such as tables, cameras and online forms or surveys.
SC.3.CO.1.5:	Use digital tools for sharing information. **Clarifications:** *Clarification 1:* Instruction includes using digital tools such as slideshows, presentation software or storyboards. *Clarification 2:* Instruction includes explaining why one might select that specific tool.
SC.3.CO.1.6:	Apply self-editing practices to improve accuracy. **Clarifications:** *Clarification 1:* Instruction includes accuracy within any activity, such as writing a prompt or creating a digital project. *Clarification 2:* Instruction includes the use of built-in tools for grammar and spelling within software.
SC.3.CO.1.7:	Categorize software based on its main purpose. **Clarifications:** *Clarification 1:* Instruction includes discussion of different software products and their primary purpose. *Clarification 2:* Instruction includes discussion of productivity, entertainment, communication, presentation, collaboration and organization.

	Introduce how network systems are part of a global communication network.
SC.3.CO.1.8:	**Clarifications:** *Clarification 1:* Instruction includes how anyone can access a website from anywhere at any time.
SC.3.HS.1.1:	Discuss the need for parental control settings on network- capable devices. **Clarifications:** *Clarification 1:* Instruction includes reasons that some sites and devices have parental control settings.
SC.3.HS.1.2:	Discuss why some sites or games have age requirements. **Clarifications:** *Clarification 1:* Instruction includes age ratings on games and videos, and age requirements to certain websites. **Clarifications:** *Example:* Johnny tries to get on a website to play a new video game. The website asks for his age. When he inputs his age, the website says that he is not allowed to enter. Discuss reasons his age would prevent him from playing the game.
SC.3.HS.1.3:	Explain what actions should be taken if students are either victims or witnesses of cyberbullying or harassment. **Clarifications:** *Clarification 1:* Instruction includes providing information or evidence to authority figures or Fortify Florida to show authority figures, recordings, emails or photos. *Clarification 2:* Students should understand that they should not engage with the cyberbully and block or mute all communication.
SC.3.HS.2.1:	Explore ways to balance movement and screen time. **Clarifications:**

	Clarification 1: Instruction includes that for every 20 minutes of screen time, students look at an object 20 feet away for 20 seconds. *Clarification 2:* Instruction includes identifying ways to incorporate physical movement.
SC.3.HS.2.2:	Demonstrate the use of healthy digital habits.
SC.3.PE.1.1:	Explore using graphics, blocks or visual cues to design a program. **Clarifications:** *Clarification 1:* Instruction includes using graphics or visual cues to represent a list of directions.
SC.3.PE.1.2:	Create a program that includes user choices based on defined conditions. **Clarifications:** *Example:* Create an algorithm that describes your daily routine for getting ready based on the weather.
SC.3.PE.2.1:	Collect data using a digital tool.
SC.3.PE.2.2:	Compile data collected and draw conclusions based on trends. **Clarifications:** *Clarification 1:* Instruction includes analyzing charts, graphs or tables to answer questions and draw conclusions.
SC.3.PE.2.3:	Analyze data for trends.
SC.3.PE.3.1:	Create a repeatable pattern to solve a problem.
SC.3.PE.3.2:	Demonstrate how programs written differently can have the same outcome. **Clarifications:** *Clarification 1:* Instruction includes identifying or explaining how multiple approaches can lead to a desired outcome or goal.
SC.3.PE.3.3:	Use graphical programming or visual cues to represent a set of instructions (algorithm) that includes repetition.

	Clarifications: *Example:* Create an algorithm that describes your daily routine before you go to bed. Use words, phrases, pictures or symbols to create your algorithm.
SC.3.PE.3.4:	Create a model or a simulation of a system and explain what the model shows. **Clarifications:** *Clarification 1:* Instruction includes models such as plant growth, solar systems and changes in matter. **Clarifications:** *Example:* Create a model that shows the role of water and nutrient transport within plants.
SC.3.PE.3.5:	Explain the process of sorting information into a useful order.
SC.3.TI.1.1:	Summarize how different types of computing devices are used to communicate with others on a daily basis. **Clarifications:** *Clarification 1:* Instruction includes devices such as cell phones, tablets and similar electronic communication devices.
SC.3.TI.1.2:	Identify adaptive technology and discuss how it has changed over time. **Clarifications:** *Clarification 1:* Instruction includes understanding that using adaptive technology can be a benefit to everyone. *Clarification 2:* Adaptive technology includes screen readers, oversized keyboards, text-to-speech, highlighters, masking, subtitles, braille displays and language translators. *Clarification 3:* Instruction includes discussing ways in which people with varying needs access adaptive technology.
SC.3.TI.1.3:	Discuss the uses of Artificial Intelligence (AI) in daily life.

SC.3.TI.2.1:	Demonstrate awareness of copyright laws to show respect for the ideas of others when using digital artifacts. **Clarifications:** *Clarification 1:* Instruction includes understanding that some digital artifacts are free to use while others are not. *Clarification 2:* Instruction includes digital artifacts referring to text sources, images, videos and files.
SC.3.TI.2.2:	Identify various digital artifacts and whether they are copyrighted or trademarked.
SC.3.TI.2.3:	Cite evidence using direct and indirect citations. **Clarifications:** *Clarification 1:* Instruction includes using relevant textual evidence in written and oral communication. *Clarification 2:* Instruction includes students naming the text or source.
SC.3.TI.2.4:	Identify digital information resources used to answer research questions. **Clarifications:** *Clarification 1:* Instruction includes resources such as online library catalog, encyclopedias, databases, search engines and websites. *Clarification 2:* Instruction includes making sure that students are using reliable resources.
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task.

	• Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts.

	• Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency: • Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.** Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes.

	• Construct possible arguments based on evidence. **Clarifications:** Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning. • Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.** Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. **Clarifications:** Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems.

	• Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
	Assess the reasonableness of solutions. Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context.
MA.K12.MTR.6.1:	**Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
MA.K12.MTR.7.1:	**Apply mathematics to real-world contexts.** Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency.
	Clarifications: Teachers who encourage students to apply mathematics to real-world contexts:

	• Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation. • Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations. 4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently. **Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension.

	Clarifications: Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.
ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully. In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work. **Clarifications:** Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

ELD.K12.ELL.SC.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations' plan to meet individual needs and ensure equal access. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Foundations of Computer Science Grade 3 is designed for students meeting daily or frequently and offers a comprehensive introduction to core computer science concepts. The course emphasizes effective communication and collaboration through digital tools, ensuring students can collaborate and share ideas using technology. Key topics include digital citizenship and

internet safety, helping students navigate the online environment responsibly. Students will gain a foundational understanding of computer hardware and software, explore introductory algorithms and coding concepts, and develop problem-solving skills.

The course also covers adaptive technology, showing students how technology can assist and enhance learning and daily tasks. An exploration of artificial intelligence in daily life will help students understand the impact of AI on their world. Copyright awareness is included to educate students about respecting intellectual property, while models and simulations provide hands-on experience with abstract concepts. Additionally, students will learn how to perform online searches and access digital resources effectively. This course is intended for a full-year duration but can be adapted to a semester format if meeting more frequently.

General Information

Course Path: Request ID: 3392 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades PreK to 5 Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Course Year: 2025

Abbreviated Title: 3 CS FOUNDATIONS

Course Length: Year (Y)

Course Type: Elective Course

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

Grade 4 Foundations of Computer Science (Request #3393)

This document was generated on CPALMS - www.cpalms.org

Aligned Standards

Name	Description
	Actively participate in effortful learning both individually and collaboratively. Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.
SC.K12.CTR.1.1:	**Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity.

	• Develop students' ability to justify methods and compare their responses to the responses of their peers.
SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills.

	• Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow.

	• Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal: • Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking:

	• Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems. • Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.4.CC.1.1:	Demonstrate ways that technology can foster teamwork. **Clarifications:** *Clarification 1:* Instruction includes discussing how technology can foster teamwork including shared documents, applications or presentations. **Clarifications:** *Example:* Students can collaborate on geometric software to explore angle measures.
SC.4.CC.1.2:	Demonstrate collaboration and problem-solving.

	Clarifications: *Clarification 1:* Instruction includes collaborating with or without the use of technology.
SC.4.CC.1.3:	Discuss ways that collaboration can lead to innovation. **Clarifications:** *Example:* Students can read a text about a recent innovation and then discuss ways that collaboration was essential to the innovation process.
SC.4.CC.1.4:	Explain why providing and receiving feedback from others can improve performance for projects. **Clarifications:** *Clarification 1:* Projects include ones completed both individually and collaboratively.
SC.4.CC.1.5:	Compare different communication technologies.
SC.4.CC.2.1:	Gather information from a variety of digital resources.
SC.4.CC.2.2:	Organize information from digital resources.
SC.4.CO.1.1:	Demonstrate keyboarding skills for communication.
SC.4.CO.1.2:	Create and edit multimedia artifacts using digital tools.
SC.4.CO.1.3:	Publish multimedia artifacts using digital tools based on feedback. **Clarifications:** *Clarification 1:* Publication includes various publications (local and online). *Clarification 2:* Feedback can be from teacher or peers.
SC.4.CO.1.4:	Determine whether software can be described as a system or application software. **Clarifications:** *Clarification 1:* System software includes various operating systems

	while application software is what is used to perform tasks and solve problems.
SC.4.CO.1.5:	Troubleshoot digital problems that may occur during daily use. **Clarifications:** *Clarification 1:* Instruction includes common problems such as powering on devices, checking cable connections and checking settings.
SC.4.CO.1.6:	Discuss ways computers connect. **Clarifications:** *Clarification 1:* Ways that computers can connect include through USB, a wired network, wireless network and through Bluetooth.
SC.4.CO.1.7:	Compare hardware and software. **Clarifications:** *Clarification 1:* Instruction includes defining examples of hardware such as keyboard, laptop, tablet, mouse and monitors. *Clarification 2:* Instruction includes defining examples of software such as applications, word processing programs, spreadsheets, presentation tools and electronic games. *Clarification 3:* Instruction includes comparing similarities and differences of hardware and software.
SC.4.HS.1.1:	Discuss what makes websites and applications appropriate for use at school.
SC.4.HS.1.2:	Discuss how websites and applications can be utilized for different purposes. **Clarifications:** *Clarification 1:* Instruction includes understanding that websites and applications can foster one's education and personal growth.
SC.4.HS.1.3:	Evaluate the permanence of content posted online.
SC.4.HS.1.4:	Identify the legal and social consequences of cyberbullying.

SC.4.HS.2.1:	Identify the impact of digital device usage on behavior.
SC.4.PE.1.1:	Explain that when writing programs, a specific initial program environment is necessary. **Clarifications:** *Clarification 1:* Initial program environment can include initial score, character position or program variables set to zero. *Clarification 2:* Instruction includes activities that are digital or unplugged. **Clarifications:** *Example:* If the game has a character, like a dog, who advances on the screen when it eats a bone, then the dog may need to go in another direction when it gets to the end of the screen.
SC.4.PE.1.2:	Create a condition that will modify a situation or value in the program. **Clarifications:** *Clarification 1:* In programs that award points, points will not be less than zero. **Clarifications:** *Example:* Use tally marks in a game to designate points and add or subtract tally marks based on the given condition of the game.
SC.4.PE.2.1:	Collect, organize and graph data. **Clarifications:** *Clarification 1:* The collection, organization and graphing of data can be done with and without the use of technology. *Clarification 2:* Graphical representations are limited to tables, stem-and-leaf plots, line plots, bar graphs or pictographs.

	Clarifications: *Example:* Survey the class to determine the median number of siblings in their house. Organize the data in a way that you can create a graphical representation of the data collected.
SC.4.PE.2.2:	Analyze a graphical representation of data. **Clarifications:** *Example:* When a student is analyzing a graph, they will reference the collected data.
SC.4.PE.3.1:	Describe how computational thinking can be used to solve real-world issues in science and engineering.
SC.4.PE.3.2:	Create a list of steps (algorithm) to solve a real-world problem.
SC.4.TI.1.1:	Explain how over time digital literacy has been used to simplify tasks and functions.
SC.4.TI.1.2:	Explore and identify the functions of adaptive technologies and how they have changed over time.
SC.4.TI.1.3:	Explain how Artificial Intelligence (AI) affects our ability to access, create and modify content.
SC.4.TI.1.4:	Compare human and computer performance on similar tasks.
SC.4.TI.2.1:	Define plagiarism and explore the impacts of plagiarized materials. **Clarifications:** *Clarification 1:* Instruction includes the connection to text-based evidence.
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks.

	• Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses.

	• Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency: • Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.** Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence.

	Clarifications: Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning. • Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.** Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. **Clarifications:** Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems. • Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

	Assess the reasonableness of solutions. Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context.
MA.K12.MTR.6.1:	**Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
	Apply mathematics to real-world contexts. Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency.
MA.K12.MTR.7.1:	**Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts: • Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation.

	• Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations. 4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently. **Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension. **Clarifications:** Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.

ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully. In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work. **Clarifications:** Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.
ELD.K12.ELL.SC.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations' plan to meet individual needs and ensure equal access. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Foundations of Computer Science Grade 4 is designed for students meeting daily or frequently and offers a comprehensive introduction to essential computer science concepts. The course focuses on developing communication and collaboration skills through digital tools, emphasizing digital citizenship and internet safety to ensure responsible online behavior. Students will build foundational computer literacy skills, understand computer hardware and software, and learn to write basic computer programs. Problem-solving using algorithms is a key component, fostering students' ability to approach and solve complex problems.

Additionally, the course explores adaptive technology and its applications, introduces the role of artificial intelligence, and covers the consequences of plagiarism to promote ethical use of digital content. Students will also proficiently use digital resources to support their learning and projects. Intended to be taught over an entire year, the course can be adjusted to a semester format if meeting more frequently, providing a flexible structure to accommodate different scheduling needs.

General Information

Course Path: Request ID: 3393 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades PreK to 5 Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Course Year: 2025

Abbreviated Title: 4 CS FOUNDATIONS

Course Length: Year (Y)

Course Type: Elective Course

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

Grade 5 Foundations of Computer Science (Request #3394)

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Aligned Standards

Name	Description
	Actively participate in effortful learning both individually and collaboratively. Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.
SC.K12.CTR.1.1:	**Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity.

	• Develop students' ability to justify methods and compare their responses to the responses of their peers.
SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills.

	• Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow.

	• Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal: • Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking:

	• Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems. • Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.5.CC.1.1:	Identify appropriate and inappropriate uses of technology for communication with others.
SC.5.CC.1.2:	Demonstrate ways with or without technology that collaborating with others can support problem solving.
SC.5.CC.1.3:	Revise and refine thinking based on peer feedback.
SC.5.CC.2.1:	Research and use information gathered from digital resources.
SC.5.CC.2.2:	Support ideas using collected evidence through research.
SC.5.CO.1.1:	Describe the function and purpose of various input/output devices. **Clarifications:**

	Clarification 1: Input devices include: keyboards, controllers, microphones and other devices. *Clarification 2:* Output devices include: speakers, monitors, printers and other devices.
SC.5.CO.1.2:	Create a digital project that answers a research question, clearly communicating thoughts and ideas. **Clarifications:** *Clarification 1:* Instruction includes both collaboratively and independently.
SC.5.CO.1.3:	Explore the use of keyboard shortcuts. **Clarifications:** *Clarification 1:* Instruction includes the use of an actual keyboard and a printed version of a keyboard. *Clarification 2:* Instruction includes the understanding that not all computers have the same shortcuts. *Clarification 3:* Shortcut functions include copy, paste, cut, print, select all, zoom in and out, underline, bold, italics, find and undo.
SC.5.CO.1.4:	Explore the use of the keyboard with proper finger placement for all rows. **Clarifications:** *Clarification 1:* Instruction includes the use of an actual keyboard and a printed version of a keyboard.
SC.5.CO.1.5:	Explain how computers access a network and how to effectively troubleshoot.
SC.5.CO.1.6:	Explain how computers can communicate to transfer data.
SC.5.CO.2.1:	Identify hardware components in the computation cycle as input, processing, output and storage. **Clarifications:** *Clarification 1:* Instruction includes what system components have

	one purpose or multiple purposes such as input, output, storage and processing. **Clarifications:** *Example:* As Oscar is playing a game he saved from the previous day, he steers his car with the remote control. He could see the car turn on the screen, but he crashed into the wall and his remote vibrated. Identify the input devices and the output devices. What system components are saving his game and processing information while he plays?
SC.5.CO.2.2:	Troubleshoot hardware problems that may occur during everyday use. **Clarifications:** *Clarification 1:* Within this benchmark, common problems include powering on devices, checking cable connections and checking settings.
SC.5.CO.3.1:	Identify software components in the computation cycle as input, processing, output and storage.
SC.5.CO.3.2:	Troubleshoot software problems that may occur during everyday use. **Clarifications:** *Clarification 1:* Within this benchmark, common tasks include refreshing the screen, closing out and reopening the application, completely rebooting, checking compatibility and updating software.
SC.5.HS.1.1:	Discuss the importance of a search engine's safe-search feature.
SC.5.HS.1.2:	Describe the role that parental digital monitoring programs play in Internet safety.
SC.5.HS.1.3:	Describe threats to safe and efficient use of electronic devices.
SC.5.HS.2.1:	Define the 20-20-20 rule for technology. **Clarifications:** *Clarification 1:* For instruction of this benchmark, the 20-20-20 rule is defined as for every 20 minutes of screen time, look at an object 20 feet away for 20 seconds.

	Discuss ways to counteract digital fatigue. **Clarifications:** *Clarification 1:* Counteraction methods include blue light glasses, rest, digital detachment and more.
SC.5.HS.2.2:	
SC.5.HS.3.1:	Explain the impact of digital media, communication and the consequences of cyberbullying and harassment.
SC.5.PE.1.1:	Explain how computers model intelligent behavior.
SC.5.PE.1.2:	Create a program in a graphical environment. **Clarifications:** *Clarification 1:* Graphical environments include block-based and visual coding environments.
SC.5.PE.1.3:	Create a program using arithmetic operators, conditionals and repetition in programs.
SC.5.PE.1.4:	Detect and correct program errors.
SC.5.PE.2.1:	Describe examples of databases from everyday life. **Clarifications:** *Clarification 1:* Instruction includes: barcode categories, school records, telephone directories and contact lists.
SC.5.PE.2.2:	Identify data types and data structures.
SC.5.PE.2.3:	Analyze the data from a given scenario. **Clarifications:** *Clarification 1:* Scenarios should make the connection to science or math.
	Clarifications: *Example:* Kysha observed the moon for a month and kept a journal describing the moon, including its apparent shape and size. She

	will analyze her journal to draw conclusions about the moon for that month. *Example:* Courtney's class has conducted an experiment tracking the spread of Virginia creeper. Students will collect the data and then analyze the data for the spread to create a hypothesis about the plant's growth.
SC.5.PE.3.1:	Identify the concepts illustrated by a simulation that offers problems and solutions. **Clarifications:** *Clarification 1:* Instruction includes simulations such as ecosystem, predator/prey and invasive species.
SC.5.PE.3.2:	Solve problems using digital graphic organizers. **Clarifications:** *Clarification 1:* Instruction includes concept maps and Venn diagrams.
SC.5.PE.3.3:	Explain that there are several possible algorithms for searching within a dataset. **Clarifications:** *Clarification 1:* Possible algorithms could be a specific word in a word list or a card in a deck of cards.
SC.5.PE.3.4:	Explain how to identify and correct logical errors in algorithms. **Clarifications:** *Clarification 1:* Logical errors include written, mapped live action or digital.
SC.5.TI.1.1:	Explain how access to technology helps empower individuals and groups. **Clarifications:** *Clarification 1:* Empowerment includes access to information, worldwide communication and e-commerce.
SC.5.TI.1.2:	Explore various technology-related career paths.

SC.5.TI.1.3:	Evaluate audio and video technologies and their impact on communication.
SC.5.TI.2.1:	Compare digital resources. **Clarifications:** *Clarification 1:* Comparisons include accuracy, relevancy and appropriateness.
SC.5.TI.2.2:	Describe the purpose of copyright. **Clarifications:** *Clarification 1:* Instruction includes recognizing the symbol that represents copyright.
SC.5.TI.2.3:	Describe the possible consequences for improper use of digital materials that are protected by copyright.
SC.5.TI.2.4:	Verify information from digital resources. **Clarifications:** *Clarification 1:* Instruction includes verifying information from research conducted independently.
SC.5.TI.2.5:	Demonstrate how to cite sources.
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.

	Clarifications: Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency:

	• Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency: • Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.** Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence. **Clarifications:** Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning.

	• Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.** Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. **Clarifications:** Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems. • Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
MA.K12.MTR.6.1:	**Assess the reasonableness of solutions.** Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems.

	• Verify possible solutions by explaining the methods used. • Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
MA.K12.MTR.7.1:	**Apply mathematics to real-world contexts.** Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency. **Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts: • Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation. • Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning.

	Clarifications: K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations. 4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently. **Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension. **Clarifications:** Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.
ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully.

	In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work. **Clarifications:** Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.
ELD.K12.ELL.SC.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations' plan to meet individual needs and ensure equal access. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

In Grade 5 Foundations of Computer Science, students will engage with fundamental computer science and mathematics concepts. The course covers essential skills, including communication and collaboration using digital tools, understanding digital citizenship and internet safety, and addressing cyberbullying. Students will gain hands-on experience with computer hardware and software, develop keyboarding skills, and explore programming and program debugging. Emphasis will be placed on problem-solving and data analysis, with opportunities to understand technology's role in empowering careers and navigating digital resources while respecting copyright.

The course is designed for students who meet daily or frequently, allowing for a deep dive into each topic. It is intended to be taught over a full year but can be adjusted to a semester length if sessions are less frequent. By integrating these focus areas, the course aims to build a strong foundation in computer science while reinforcing critical thinking and technological fluency.

General Information

Course Path: Request ID: 3394 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades PreK to 5 Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Course Year: 2025

Abbreviated Title: 5 CS FOUNDATIONS

Course Length: Year (Y)

Course Type: Elective Course

Request Justification:

New courses due to standards revision.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

Grades 3-5 Unplugged Computer Science (Request #3387)

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Aligned Standards

Name	Description
	Actively participate in effortful learning both individually and collaboratively. Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.
SC.K12.CTR.1.1:	**Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity.

	• Develop students' ability to justify methods and compare their responses to the responses of their peers.
SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills.

	• Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow.

	• Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal: • Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking:

	• Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems. • Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.3.CC.1.1:	Describe how collaborating with others can be beneficial to a project. **Clarifications:** *Clarification 1:* Instruction includes understanding how collaborating includes brainstorming or sharing ideas with one another.
SC.3.CC.1.2:	Use feedback from peers to make revisions using technology. **Clarifications:** *Clarification 1:* Instruction includes asking questions of self and others on their work. *Clarification 2:* Feedback should be constructive.
SC.3.CC.1.3:	Explain that searches may be enhanced by key terms.

	Clarifications: *Example:* Students use a shoe brand website to find a particular type of shoe, then they narrow their search by typing more descriptive words into the search bar like size and color. Finally, they add a sport to the search to see more specific results. Students compare the results from each search.
SC.3.CC.1.4:	Describe how computer simulations can help communicate ideas in concepts or problem-solving. **Clarifications:** *Example:* Describe how a computer simulation can model the water cycle.
SC.3.CC.2.1:	Identify uses of technology when sending communication over the Internet. **Clarifications:** *Clarification 1:* Instruction includes Netiquette depending on the audience and type of communication. *Clarification 2:* Instruction includes email, texting, uploads, surveys and screen shots.
SC.3.CC.2.2:	Describe responsible uses of modern communication media and devices. **Clarifications:** *Clarification 1:* Instruction includes safe practices that include making sure your personal information is protected. Examples might be your information or your family's information, real names, addresses, phone numbers, credit card numbers and photographs. *Clarification 2:* Instruction includes respecting the personal information of others.
SC.3.CO.1.1:	Classify hardware as input, output, both or neither.
SC.3.CO.1.3:	Identify digital tools used for writing activities. **Clarifications:** *Clarification 1:* Instruction includes using digital tools such as word processing, emails and text messages.

SC.3.CO.1.4:	Identify digital tools for data collection. **Clarifications:** *Clarification 1:* Instruction includes using digital tools such as tables, cameras and online forms or surveys.
SC.3.CO.1.6:	Apply self-editing practices to improve accuracy. **Clarifications:** *Clarification 1:* Instruction includes accuracy within any activity, such as writing a prompt or creating a digital project. *Clarification 2:* Instruction includes the use of built-in tools for grammar and spelling within software.
SC.3.CO.1.7:	Categorize software based on its main purpose. **Clarifications:** *Clarification 1:* Instruction includes discussion of different software products and their primary purpose. *Clarification 2:* Instruction includes discussion of productivity, entertainment, communication, presentation, collaboration and organization.
SC.3.CO.1.8:	Introduce how network systems are part of a global communication network. **Clarifications:** *Clarification 1:* Instruction includes how anyone can access a website from anywhere at any time.
SC.3.HS.1.1:	Discuss the need for parental control settings on network- capable devices. **Clarifications:** *Clarification 1:* Instruction includes reasons that some sites and devices have parental control settings.
SC.3.HS.1.2:	Discuss why some sites or games have age requirements.

	Clarifications: *Clarification 1:* Instruction includes age ratings on games and videos, and age requirements to certain websites.
	Clarifications: *Example:* Johnny tries to get on a website to play a new video game. The website asks for his age. When he inputs his age, the website says that he is not allowed to enter. Discuss reasons his age would prevent him from playing the game.
SC.3.HS.1.3:	Explain what actions should be taken if students are either victims or witnesses of cyberbullying or harassment. **Clarifications:** *Clarification 1:* Instruction includes providing information or evidence to authority figures or Fortify Florida to show authority figures, recordings, emails or photos. *Clarification 2:* Students should understand that they should not engage with the cyberbully and block or mute all communication.
SC.3.HS.2.1:	Explore ways to balance movement and screen time. **Clarifications:** *Clarification 1:* Instruction includes that for every 20 minutes of screen time, students look at an object 20 feet away for 20 seconds. *Clarification 2:* Instruction includes identifying ways to incorporate physical movement.
SC.3.HS.2.2:	Demonstrate the use of healthy digital habits.
SC.3.PE.1.1:	Explore using graphics, blocks or visual cues to design a program. **Clarifications:** *Clarification 1:* Instruction includes using graphics or visual cues to represent a list of directions.
SC.3.PE.2.2:	Compile data collected and draw conclusions based on trends.

	Clarifications: *Clarification 1:* Instruction includes analyzing charts, graphs or tables to answer questions and draw conclusions.
SC.3.PE.2.3:	Analyze data for trends.
SC.3.PE.3.1:	Create a repeatable pattern to solve a problem.
SC.3.PE.3.4:	Create a model or a simulation of a system and explain what the model shows. **Clarifications:** *Clarification 1:* Instruction includes models such as plant growth, solar systems and changes in matter. **Clarifications:** *Example:* Create a model that shows the role of water and nutrient transport within plants.
SC.3.PE.3.5:	Explain the process of sorting information into a useful order.
SC.3.TI.1.1:	Summarize how different types of computing devices are used to communicate with others on a daily basis. **Clarifications:** *Clarification 1:* Instruction includes devices such as cell phones, tablets and similar electronic communication devices.
SC.3.TI.1.2:	Identify adaptive technology and discuss how it has changed over time. **Clarifications:** *Clarification 1:* Instruction includes understanding that using adaptive technology can be a benefit to everyone. *Clarification 2:* Adaptive technology includes screen readers, oversized keyboards, text-to-speech, highlighters, masking, subtitles, braille displays and language translators. *Clarification 3:* Instruction includes discussing ways in which people with varying needs access adaptive technology.

SC.3.TI.1.3:	Discuss the uses of Artificial Intelligence (AI) in daily life.
SC.3.TI.2.1:	Demonstrate awareness of copyright laws to show respect for the ideas of others when using digital artifacts. **Clarifications:** *Clarification 1:* Instruction includes understanding that some digital artifacts are free to use while others are not. *Clarification 2:* Instruction includes digital artifacts referring to text sources, images, videos and files.
SC.3.TI.2.2:	Identify various digital artifacts and whether they are copyrighted or trademarked.
SC.3.TI.2.3:	Cite evidence using direct and indirect citations. **Clarifications:** *Clarification 1:* Instruction includes using relevant textual evidence in written and oral communication. *Clarification 2:* Instruction includes students naming the text or source.
SC.3.TI.2.4:	Identify digital information resources used to answer research questions. **Clarifications:** *Clarification 1:* Instruction includes resources such as online library catalog, encyclopedias, databases, search engines and websites. *Clarification 2:* Instruction includes making sure that students are using reliable resources.
SC.4.CC.1.1:	Demonstrate ways that technology can foster teamwork. **Clarifications:** *Clarification 1:* Instruction includes discussing how technology can foster teamwork including shared documents, applications or presentations.

	Clarifications: *Example:* Students can collaborate on geometric software to explore angle measures.
SC.4.CC.1.2:	Demonstrate collaboration and problem-solving. **Clarifications:** *Clarification 1:* Instruction includes collaborating with or without the use of technology.
SC.4.CC.1.3:	Discuss ways that collaboration can lead to innovation. **Clarifications:** *Example:* Students can read a text about a recent innovation and then discuss ways that collaboration was essential to the innovation process.
SC.4.CC.1.4:	Explain why providing and receiving feedback from others can improve performance for projects. **Clarifications:** *Clarification 1:* Projects include ones completed both individually and collaboratively.
SC.4.CC.1.5:	Compare different communication technologies.
SC.4.CO.1.4:	Determine whether software can be described as a system or application software. **Clarifications:** *Clarification 1:* System software includes various operating systems while application software is what is used to perform tasks and solve problems.
SC.4.CO.1.6:	Discuss ways computers connect. **Clarifications:** *Clarification 1:* Ways that computers can connect include through USB, a wired network, wireless network and through Bluetooth.
SC.4.CO.1.7:	Compare hardware and software.

	Clarifications: *Clarification 1:* Instruction includes defining examples of hardware such as keyboard, laptop, tablet, mouse and monitors. *Clarification 2:* Instruction includes defining examples of software such as applications, word processing programs, spreadsheets, presentation tools and electronic games. *Clarification 3:* Instruction includes comparing similarities and differences of hardware and software.
SC.4.HS.1.1:	Discuss what makes websites and applications appropriate for use at school.
SC.4.HS.1.2:	Discuss how websites and applications can be utilized for different purposes. **Clarifications:** *Clarification 1:* Instruction includes understanding that websites and applications can foster one's education and personal growth.
SC.4.HS.1.3:	Evaluate the permanence of content posted online.
SC.4.HS.1.4:	Identify the legal and social consequences of cyberbullying.
SC.4.HS.2.1:	Identify the impact of digital device usage on behavior.
SC.4.PE.2.1:	Collect, organize and graph data. **Clarifications:** *Clarification 1:* The collection, organization and graphing of data can be done with and without the use of technology. *Clarification 2:* Graphical representations are limited to tables, stem-and-leaf plots, line plots, bar graphs or pictographs. **Clarifications:** *Example:* Survey the class to determine the median number of siblings in their house. Organize the data in a way that you can create a graphical representation of the data collected.

SC.4.PE.2.2:	Analyze a graphical representation of data. **Clarifications:** *Example:* When a student is analyzing a graph, they will reference the collected data.
SC.4.PE.3.1:	Describe how computational thinking can be used to solve real-world issues in science and engineering.
SC.4.PE.3.2:	Create a list of steps (algorithm) to solve a real-world problem.
SC.4.TI.1.1:	Explain how over time digital literacy has been used to simplify tasks and functions.
SC.4.TI.1.2:	Explore and identify the functions of adaptive technologies and how they have changed over time.
SC.4.TI.1.3:	Explain how Artificial Intelligence (AI) affects our ability to access, create and modify content.
SC.4.TI.1.4:	Compare human and computer performance on similar tasks.
SC.4.TI.2.1:	Define plagiarism and explore the impacts of plagiarized materials. **Clarifications:** *Clarification 1:* Instruction includes the connection to text-based evidence.
SC.5.CC.1.1:	Identify appropriate and inappropriate uses of technology for communication with others.
SC.5.CC.1.2:	Demonstrate ways with or without technology that collaborating with others can support problem solving.
SC.5.CC.1.3:	Revise and refine thinking based on peer feedback.
SC.5.CO.1.1:	Describe the function and purpose of various input/output devices. **Clarifications:** *Clarification 1:* Input devices include: keyboards, controllers, microphones and other devices. *Clarification 2:* Output devices include: speakers, monitors, printers and other devices.

SC.5.CO.1.3:	Explore the use of keyboard shortcuts. **Clarifications:** *Clarification 1:* Instruction includes the use of an actual keyboard and a printed version of a keyboard. *Clarification 2:* Instruction includes the understanding that not all computers have the same shortcuts. *Clarification 3:* Shortcut functions include copy, paste, cut, print, select all, zoom in and out, underline, bold, italics, find and undo.
SC.5.CO.1.4:	Explore the use of the keyboard with proper finger placement for all rows. **Clarifications:** *Clarification 1:* Instruction includes the use of an actual keyboard and a printed version of a keyboard.
SC.5.CO.1.5:	Explain how computers access a network and how to effectively troubleshoot.
SC.5.CO.1.6:	Explain how computers can communicate to transfer data.
SC.5.CO.2.1:	Identify hardware components in the computation cycle as input, processing, output and storage. **Clarifications:** *Clarification 1:* Instruction includes what system components have one purpose or multiple purposes such as input, output, storage and processing. **Clarifications:** *Example:* As Oscar is playing a game he saved from the previous day, he steers his car with the remote control. He could see the car turn on the screen, but he crashed into the wall and his remote vibrated. Identify the input devices and the output devices. What system components are saving his game and processing information while he plays?
SC.5.CO.2.2:	Troubleshoot hardware problems that may occur during everyday use.

	Clarifications: *Clarification 1:* Within this benchmark, common problems include powering on devices, checking cable connections and checking settings.
SC.5.CO.3.1:	Identify software components in the computation cycle as input, processing, output and storage.
SC.5.CO.3.2:	Troubleshoot software problems that may occur during everyday use. **Clarifications:** *Clarification 1:* Within this benchmark, common tasks include refreshing the screen, closing out and reopening the application, completely rebooting, checking compatibility and updating software.
SC.5.HS.1.1:	Discuss the importance of a search engine's safe-search feature.
SC.5.HS.1.2:	Describe the role that parental digital monitoring programs play in Internet safety.
SC.5.HS.1.3:	Describe threats to safe and efficient use of electronic devices.
SC.5.HS.2.1:	Define the 20-20-20 rule for technology. **Clarifications:** *Clarification 1:* For instruction of this benchmark, the 20-20-20 rule is defined as for every 20 minutes of screen time, look at an object 20 feet away for 20 seconds.
SC.5.HS.2.2:	Discuss ways to counteract digital fatigue. **Clarifications:** *Clarification 1:* Counteraction methods include blue light glasses, rest, digital detachment and more.
SC.5.HS.3.1:	Explain the impact of digital media, communication and the consequences of cyberbullying and harassment.
SC.5.PE.1.1:	Explain how computers model intelligent behavior.
SC.5.PE.2.1:	Describe examples of databases from everyday life.

	Clarifications: *Clarification 1:* Instruction includes: barcode categories, school records, telephone directories and contact lists.
SC.5.TI.1.1:	Explain how access to technology helps empower individuals and groups. **Clarifications:** *Clarification 1:* Empowerment includes access to information, worldwide communication and e-commerce.
SC.5.TI.1.2:	Explore various technology-related career paths.
SC.5.TI.1.3:	Evaluate audio and video technologies and their impact on communication.
SC.5.TI.2.2:	Describe the purpose of copyright. **Clarifications:** *Clarification 1:* Instruction includes recognizing the symbol that represents copyright.
SC.5.TI.2.3:	Describe the possible consequences for improper use of digital materials that are protected by copyright.
SC.5.TI.2.5:	Demonstrate how to cite sources.
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.

	Clarifications: Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency:

	• Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency: • Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.** Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence. **Clarifications:** Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning.

	• Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.** Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. **Clarifications:** Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems. • Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
MA.K12.MTR.6.1:	**Assess the reasonableness of solutions.** Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems.

	• Verify possible solutions by explaining the methods used. • Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
MA.K12.MTR.7.1:	**Apply mathematics to real-world contexts.** Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency. **Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts: • Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation. • Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning.

	Clarifications: K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations. 4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently. **Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension. **Clarifications:** Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.
ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully.

	In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work. **Clarifications:** Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.LA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Language Arts.
ELD.K12.ELL.SC.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Science.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations' plan to meet individual needs and ensure equal access. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Unplugged Computer Science for Grades 3-5 is designed to provide students with a comprehensive introduction to key concepts in computer science with limited technology use. The course emphasizes communication and collaboration, encouraging students to collaborate on various activities and projects. Students will explore digital citizenship and internet safety principles, understand the basics of computer hardware and software, and learn about algorithms and coding concepts through hands-on, unplugged activities. Problem-solving skills will be developed as students engage in exercises that involve data analysis and explore the role of artificial intelligence in everyday life.

Throughout the course, students will gain awareness of copyright issues and learn to use models and simulations to understand complex ideas. They will practice online searches and utilize digital resources to enhance their learning experience. The course is structured to be taught over a semester but can be extended to a full year if meeting less frequently, such as once per week.

This approach allows for a flexible and in-depth exploration of computer science fundamentals in an engaging and accessible manner.

General Information

Course Path: Request ID: 3387 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades PreK to 5 Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Course Year: 2025

Abbreviated Title: 3-5 UNPLUGGED CS

Course Length: Year (Y)

Course Type: Elective Course

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

M/J Grade 6 Digital Discoveries (Request #3371)

This document was generated on CPALMS - www.cpalms.org

Aligned Standards

Name	Description
SC.K12.CTR.1.1:	**Actively participate in effortful learning both individually and collaboratively.** Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity. • Develop students' ability to justify methods and compare their responses to the responses of their peers.

SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills. • Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow. • Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal:

	• Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking: • Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems.

	• Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.6.CC.1.1:	Demonstrate an ability to communicate through various online tools.
SC.6.CC.2.1:	Create a digital product individually and collaboratively. **Clarifications:** *Clarification 1:* When creating a product, students should be able to design and publish the product. *Clarification 2:* Products include those that can inform, persuade or entertain.
SC.6.CO.1.1:	Identify multiple file format types. **Clarifications:** *Clarification 1:* Within this benchmark, file types include formats for word processing, images, music and three-dimensional drawings. *Clarification 2:* Instruction includes explaining why different file types exist.
SC.6.CO.1.2:	Identify applications that have different desktop and online versions.

	Clarifications: *Clarification 1:* Instruction includes desktop versions and online subscription services.
SC.6.CS.1.1:	Define the states of data. **Clarifications:** *Clarification 1:* States of data include data at rest, data in motion and data in use.
SC.6.CS.1.2:	Illustrate the concept of access control and how to limit access to authorized users.
SC.6.CS.1.3:	Discuss the importance of cybersecurity.
SC.6.CS.1.4:	Determine information that should remain confidential.
SC.6.CS.1.5:	Identify the need for encryption.
SC.6.CS.1.6:	Recognize the importance of digital identity.
SC.6.CS.2.1:	Identify the need for security safeguards on personal devices.
SC.6.ET.1.1:	Identify technology used to support specialized forms of human-computer interaction (HCI). **Clarifications:** *Clarification 1:* Technologies may include augmented reality (AR), virtual reality (VR) and others.
SC.6.ET.1.2:	Identify technology skills needed in the workplace.
SC.6.ET.2.1:	Identify the characteristics of Artificial Intelligence (AI).
SC.6.ET.2.2:	Discuss the benefits associated with Artificial Intelligence (AI).
SC.6.ET.3.2:	Describe how humans and machines interact to accomplish tasks that neither can accomplish alone.
SC.6.HS.1.1:	Identify the connection between strong passwords and Internet safety.
SC.6.HS.1.2:	Discuss the need for downloads to come from trusted sources.

	Clarifications: *Clarification 1:* Instruction focuses on a source's legitimacy.
SC.6.HS.1.4:	Evaluate a given website to determine if it is safe for users. **Clarifications:** *Clarification 1:* Instruction includes discussing the accuracy and security of given websites. *Clarification 2:* Instruction includes types of personal information required for access and whether it is encrypted (https).
SC.6.HS.2.2:	List negative impacts of excessive device usage. **Clarifications:** *Clarification 1:* Instruction includes device addiction, online versus in-person personality traits, digital overload and others.
SC.6.PE.1.1:	Identify the types of operations that can be performed on different data types. **Clarifications:** *Clarification 1:* Operations include arithmetic operations and logical operations.
SC.6.PE.1.2:	Develop a program using a string data type.
SC.6.PE.1.3:	Develop a program using a numeric data type. **Clarifications:** *Clarification 1:* Instruction includes integers and floats.
SC.6.PE.1.4:	Index selected items within a list. **Clarifications:** *Clarification 1:* Instruction includes indexing items from a list in a spreadsheet, array list or programming language.
SC.6.PE.1.7:	Write code segments that use standard mathematical operators. **Clarifications:**

	Clarification 1: Instruction includes the use of addition, subtraction, multiplication and division. *Clarification 2:* Within this benchmark, instruction includes the use of inequalities.
SC.6.PE.1.8:	Use a function for a specified purpose. **Clarifications:** *Clarification 1:* Within this benchmark, the term function and procedure can be used interchangeably. *Clarification 2:* Instruction includes consideration of the intake and output of information.
SC.6.PE.1.9:	Use looping techniques for a specified purpose. **Clarifications:** *Clarification 1:* Within this benchmark, the terms iteration and loop will be used interchangeably.
SC.6.PE.1.10:	Use conditional statements for a specified purpose. **Clarifications:** *Clarification 1:* Within this benchmark, the term selection and conditional statement will be used interchangeably.
SC.6.PE.1.11:	Design solutions that use repetition and two-way selection. **Clarifications:** *Clarification 1:* Within this benchmark two-way selections include while, for and if/else statements.
SC.6.PE.2.1:	Create designated graph types using data. **Clarifications:** *Clarification 1:* Graph types include graphs, charts, tables and Venn diagram.
SC.6.PE.3.1:	Identify what kinds of real-world problems can be solved using modeling and simulation.

SC.6.PE.3.2:	Interact with content-specific models and simulations to support learning, research and problem-solving.
SC.6.PE.3.3:	Design a digital model.
SC.6.PE.3.5:	Create a visual representation of a solution to a problem. **Clarifications:** *Clarification 1:* Instruction includes visually writing out a program plan.
SC.6.PE.3.6:	Evaluate the logical flow of a step-by-step program by acting it out through computer-free activities. **Clarifications:** *Clarification 1:* Instruction includes drafting a flowchart.
SC.6.PE.4.1:	Recognize the phases of the software development life cycle.
SC.6.TI.1.1:	Recognize the data content sources that make your digital footprint. **Clarifications:** *Clarification 1:* Instruction includes permanence of digital footprint. *Clarification 2:* Within this benchmark, digital footprint includes digital profiles and other forms of personally identifiable information (PII).
SC.6.TI.1.2:	Explore the history of computer and other devices. **Clarifications:** *Clarification 1:* Instruction includes legacy devices and antiquated technology.
SC.6.TI.1.4:	Describe various technology-related career paths.
SC.6.TI.2.1:	Recognize the consequences of plagiarism on the development of creative works. **Clarifications:**

	Clarification 1: Creative works include projects, publications and online content. *Clarification 2:* Instruction includes defining intellectual property.
SC.6.TI.2.2:	Demonstrate compliance with the school's Acceptable Use Policy.
SC.6.TI.2.3:	Explain fair use for using copyrighted materials. **Clarifications:** *Clarification 1:* Copyrighted materials include images, music, video and text.
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.

MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency:

	• Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
	Engage in discussions that reflect on the mathematical thinking of self and others. Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence.
MA.K12.MTR.4.1:	**Clarifications:** Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning. • Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.**

Mathematicians who use patterns and structure to help understand and connect mathematical concepts:

- Focus on relevant details within a problem.
- Create plans and procedures to logically order events, steps or ideas to solve problems.
- Decompose a complex problem into manageable parts.
- Relate previously learned concepts to new concepts.
- Look for similarities among problems.
- Connect solutions of problems to more complicated large-scale situations.

Clarifications:
Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts:

- Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts.
- Support students to develop generalizations based on the similarities found among problems.
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Assess the reasonableness of solutions.

MA.K12.MTR.6.1:

Mathematicians who assess the reasonableness of solutions:

- Estimate to discover possible solutions.
- Use benchmark quantities to determine if a solution makes sense.
- Check calculations when solving problems.
- Verify possible solutions by explaining the methods used.
- Evaluate results based on the given context.

Clarifications:
Teachers who encourage students to assess the reasonableness of solutions:

- Have students estimate or predict solutions prior to solving.
- Prompt students to continually ask, "Does this solution make sense? How do you know?"

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ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations.

	4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
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ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work.

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ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

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In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Grade 6 Digital Discoveries introduces students to computer science by focusing on its role in problem-solving, communication, and personal expression. The course highlights the visible aspects of computing, encouraging students to recognize and engage with technology in their surroundings. Students will explore how computer science tools can be applied to various aspects of their lives and gain insight into how technology shapes the world around them.

The course emphasizes active learning experiences that connect with students' personal interests, allowing them to solve relevant problems and express their creativity. Through engaging projects and exploration, students will develop a foundational understanding of computer science principles and learn how to apply them in practical ways. This approach aims to foster curiosity and enable students to see the impact of technology on their daily lives and broader society.

General Information

Course Path: Request ID: 3371 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades 6 to 8 Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Course Year: 2025

Abbreviated Title: GRD 6 DIG DISC

Course Length: Semester (S)

Course Type: Elective Course

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

M/J Grade 7 Digital Discoveries (Request #3376)

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Aligned Standards

Name	Description
SC.K12.CTR.1.1:	**Actively participate in effortful learning both individually and collaboratively.** Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity. • Develop students' ability to justify methods and compare their responses to the responses of their peers.

SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills. • Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow. • Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal:

	• Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking: • Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems.

	• Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.7.CC.1.1:	Apply multimedia tools for local and global group collaboration. **Clarifications:** *Clarification 1:* Tools include collaborative spreadsheets, video conferencing software, collaborative forms, image editing software and other programs.
SC.7.CC.1.2:	Identify productivity tools for collaboration. **Clarifications:** *Clarification 1:* Instruction includes shared calendars, group messaging applications and other project management software.
SC.7.CC.1.3:	Identify individual roles within a collaborative team.
SC.7.CO.1.3:	Describe the relationship between hardware and software. **Clarifications:** *Clarification 1:* Hardware and software including basic input/output systems (BIOS), operating systems and firmware.
SC.7.CO.1.4:	Utilize a set of websites to find information for a given topic.

SC.7.ET.3.1:	Describe ways in which adaptive technologies can assist users in their daily lives.
SC.7.ET.3.2:	Identify ways humans interact with computers. **Clarifications:** *Clarification 1:* Instruction includes software and user interface.
SC.7.ET.3.3:	Identify ways humans interact with hardware components. **Clarifications:** *Clarification 1:* Instruction includes probes, sensors and handheld devices.
SC.7.HS.1.2:	Discuss the impact of online disinhibition on individuals and society.
SC.7.HS.2.1:	Identify the digital practices that may affect your physical and mental well- being.
SC.7.HS.3.3:	Explain the possible consequences of cyberbullying and inappropriate use of digital media and communication on personal life and society.
SC.7.PE.1.2:	Write a code segment that will explore a list using iteration.
SC.7.PE.1.3:	Develop a logical expression using operator precedence. **Clarifications:** *Clarification 1:* Problem types include equations that include parenthesis but not nested parentheses. *Clarification 2:* Instruction focuses on the connection between properties of equality and order of operations.
SC.7.PE.1.4:	Develop an arithmetic expression using operator precedence. **Clarifications:** *Clarification 1:* Problem types include equations that include parenthesis but not nested parentheses. *Clarification 2:* Instruction focuses on the connection between properties of equality and order of operations.
SC.7.PE.1.5:	Identify the types and uses of variables in a program.

	Clarifications: *Clarification 1:* Instruction includes explaining the use of variables in a program. *Clarification 2:* Instruction includes demonstrating how different data types are defined in variables within a given program.
SC.7.PE.1.6:	Develop problem solutions using a block programming language. **Clarifications:** *Clarification 1:* Block programming language includes looping behavior, conditional statements, expressions, variables and functions.
SC.7.PE.1.7:	Create online content using advanced design tools. **Clarifications:** *Clarification 1:* Within this benchmark, online content includes webpages, digital portfolios and multimedia artifacts.
SC.7.PE.1.8:	Identify different types of programming errors. **Clarifications:** *Clarification 1:* Types of programming errors include syntax, logical and runtime.
SC.7.PE.1.11:	Create iterative and non-iterative structures in a code segment. **Clarifications:** *Clarification 1:* Instruction includes the Fibonacci sequence.
SC.7.PE.2.1:	Predict outputs while showing an understanding of inputs.
SC.7.PE.3.1:	Define parameters for individual and collaborative projects using Boolean logic. **Clarifications:** *Clarification 1:* Boolean logic includes “and,” “or” and “not.”
SC.7.PE.3.2:	Modify and create a simulation to analyze and illustrate a concept in depth.

SC.7.PE.3.3:	Use modeling and simulations to test scientific hypotheses.
SC.7.PE.3.4:	Define the concept of a class related to object-oriented programming. **Clarifications:** *Clarification 1:* Instruction includes understanding that in object-oriented programming, a class is the outline for objects or attributes.
SC.7.PE.3.5:	Identify the purpose of indexing the order of elements in a list. **Clarifications:** *Clarification 1:* Instruction includes the potential of different programming languages indexing differently.
SC.7.PE.3.6:	Perform program tracing to predict the behavior of programs. **Clarifications:** *Example:* Students received a program to randomize passwords. The students must read through the program and interpret the logic for each section of the program and write them out in their own words predicting what each section will do.
SC.7.PE.3.7:	Identify the types and uses of variables in a program.
SC.7.PE.4.1:	Define the phases of the software development life cycle.
SC.7.TI.1.2:	Evaluate the responsible and irresponsible use of information on collaborative projects.
SC.7.TI.1.4:	Analyze technology-related career paths.
SC.7.TI.2.1:	Describe legal and ethical behaviors when using information and technology and describe the consequences of misuse.
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task.

	• Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts.

	• Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
	Complete tasks with mathematical fluency. Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations.
MA.K12.MTR.3.1:	**Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency: • Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.** Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes.

- Construct possible arguments based on evidence.

Clarifications:
Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others:

- Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning.
- Create opportunities for students to discuss their thinking with peers.
- Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods.
- Develop students' ability to justify methods and compare their responses to the responses of their peers.

MA.K12.MTR.5.1:

Use patterns and structure to help understand and connect mathematical concepts.

Mathematicians who use patterns and structure to help understand and connect mathematical concepts:

- Focus on relevant details within a problem.
- Create plans and procedures to logically order events, steps or ideas to solve problems.
- Decompose a complex problem into manageable parts.
- Relate previously learned concepts to new concepts.
- Look for similarities among problems.
- Connect solutions of problems to more complicated large-scale situations.

Clarifications:
Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts:

- Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts.
- Support students to develop generalizations based on the similarities found among problems.
- Provide opportunities for students to create plans and procedures to solve problems.

	• Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
MA.K12.MTR.6.1:	**Assess the reasonableness of solutions.** Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
MA.K12.MTR.7.1:	**Apply mathematics to real-world contexts.** Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency. **Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts:

	• Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation. • Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations. 4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently. **Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension.

	Clarifications: Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.
ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully. In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work. **Clarifications:** Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Accommodation changes the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Grade 7 Digital Discoveries introduces students to the fundamentals of computer science by emphasizing how technology serves as a tool for problem-solving, communication, and personal expression. The course encourages students to explore how computing is integrated into various aspects of their daily lives and how it can be used for creative and analytical purposes. By focusing

on the visible and practical applications of computing, students are guided to understand and engage with technology in meaningful ways.

The course covers key areas such as computer systems, programming basics, and the impact of technology on society. Students will engage with interactive content that allows them to see the real-world applications of computer science concepts. Through exploring these areas, students develop a broader understanding of how technology influences and shapes their environment, preparing them to use these skills in diverse contexts.

General Information

Course Path: Request ID: 3376 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades 6 to 8 Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Course Year: 2025

Abbreviated Title: GRD 7 DIG DISC

Course Length: Semester (S)

Course Type: Elective Course

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

M/J Grade 8 Digital Discoveries (Request #3375)

This document was generated on CPALMS - www.cpalms.org

Aligned Standards

Name	Description
SC.K12.CTR.1.1:	**Actively participate in effortful learning both individually and collaboratively.** Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity. • Develop students' ability to justify methods and compare their responses to the responses of their peers.

SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills. • Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow. • Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal:

	• Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking: • Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems.

	• Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.8.CC.1.1:	Design a digital product. **Clarifications:** *Clarification 1:* Instruction includes creating a product pertaining to the real world using a variety of digital tools and resources. *Clarification 2:* Instruction includes the creation of a digital product that provides value to society individually or collaboratively.
SC.8.CO.1.1:	Integrate information from multiple file formats into a single artifact.
SC.8.CO.1.2:	Create a collaborative project utilizing an online digital application. **Clarifications:** *Clarification 1:* Projects include those that inform, persuade and entertain others.
SC.8.CS.2.1:	Evaluate security and privacy issues that relate to computer networks and Internet of Things (IoT) devices. **Clarifications:** *Clarification 1:* Devices include phones, tablets, smartwatches and other emerging technologies.

SC.8.CS.2.2:	Describe security and privacy issues that relate to computer networks.
SC.8.CS.2.3:	Describe the permanency of data on the Internet, online identity and personal privacy. **Clarifications:** *Clarification 1:* Instruction includes discussing the "Right to be Forgotten."
SC.8.ET.1.1:	Identify the emerging features of mobile devices, smart devices and vehicles.
SC.8.ET.1.2:	Identify challenges faced by users when learning to use computer interfaces.
SC.8.ET.1.3:	Identify the impact of natural resources on the manufacturing of computer hardware components.
SC.8.ET.1.4:	Analyze the increasing impact of access to the Internet on daily life.
SC.8.ET.2.2:	Discuss the utilization of intelligent behavior in technology. **Clarifications:** *Clarification 1:* Instruction includes speech and language understanding and computer vision. **Clarifications:** *Example:* Discuss the autonomous robotic vacuum cleaner's ability to map and analyze structures to avoid obstacles. *Example:* Analyze the advantages of implementing drones to spray crops or detect predators in an agricultural environment.
SC.8.ET.3.1:	Investigate the advancement of robotics.
SC.8.HS.1.1:	Describe the impacts of the presence of technology and the lack of technology on everyday life. **Clarifications:** *Clarification 1:* Instruction includes comparing how the presence of

	technology has impacted our daily lives and how the lack of technology has impacted our daily lives.
SC.8.HS.2.3:	Investigate the causes of physical body changes due to device usage. **Clarifications:** *Clarification 1:* Focal points include research on muscle, nervous and bone systems. *Clarification 2:* Instruction is limited to the physical effects of direct digital device usage.
SC.8.HS.3.2:	Analyze how digital media and communication influence behavior. **Clarifications:** *Clarification 1:* Instruction includes the influences on individuals, communities and cultures.
SC.8.PE.1.1:	Use an expression for a specified purpose. **Clarifications:** *Example:* Simon has been asked to develop a rock/paper/scissors game. He assigns rock as the number 1, paper as the number 2 and scissors as the number 3. Develop expressions that will allow the game to output a winner based off the combination of user and computer selections.
SC.8.PE.1.2:	Create a programming process for decomposing a problem. **Clarifications:** *Clarification 1:* Within this benchmark, the term function and procedure can be used interchangeably. *Clarification 2:* Instruction includes consideration of the intake and output of information.
SC.8.PE.1.3:	Create a function with parameters. **Clarifications:** *Clarification 1:* Instruction includes understanding that a parameter is a kind of variable that is defined in the function.

SC.8.PE.1.4:	Explain the use of iterative and non-iterative structures and their uses as a code segment. **Clarifications:** *Clarification 1:* Instruction includes discussing that iteration is a process repeated until a specific end result.
SC.8.PE.1.5:	Create an algorithm to solve one or more parts of a decomposed problem. **Clarifications:** *Clarification 1:* Instruction focuses on creating algorithms that are efficient, reliable and valid. *Clarification 2:* Context for problems include video games, robot obstacle course and making dinner.
SC.8.PE.1.6:	Create an algorithm that can collect data.
SC.8.PE.1.7:	Design an application for a specified purpose. **Clarifications:** *Example:* A marine biologist conducting research at the FSU Coastal and Marine Laboratory is trying to determine why periwinkle snails climb to the top of marsh seagrass. Design a program to determine the time of day that the majority of snails climb the seagrass. Analyze the data to determine what events cause the snails to climb at that certain time.
SC.8.PE.1.8:	Recognize different numerical data types. **Clarifications:** *Clarification 1:* Instruction includes decimal type (floating point) and integers.
SC.8.PE.1.9:	Design a program that will assist a user with equations using standard mathematical operators. **Clarifications:** *Clarification 1:* Instruction includes the use of addition, subtraction, multiplication and division.

	Clarification 2: Within this benchmark, instruction includes the use of inequalities. *Clarification 3:* Instruction includes flowcharting the initial sequence of steps.
SC.8.PE.1.10:	Create a code segment using iteration.
SC.8.PE.1.11:	Identify the limitations that need to be recognized when creating an algorithm. **Clarifications:** *Clarification 1:* Instruction includes the necessity to abide by mathematical rules.
SC.8.PE.1.12:	Select an efficient algorithm for a given task based on certain criteria. **Clarifications:** *Clarification 1:* Within this benchmark, the expectation is that students will not create algorithms, a list will be provided by the teacher. *Clarification 2:* Criteria may include time, resources and accessibility.
SC.8.PE.2.1:	Select and use applicable data-collection technology. **Clarifications:** *Clarification 1:* Instruction includes gathering, viewing, organizing and analyzing data. *Clarification 2:* Data-collection tools include probes, handheld devices, geographic mapping systems and output from multiple runs of a computer program.
SC.8.PE.2.2:	Utilize data-collection technology to report results for content-related problems. **Clarifications:** *Clarification 1:* Instruction includes allowing students to operate individually and collaboratively.

SC.8.PE.2.3:	Utilize data from simulations to test hypotheses. **Clarifications:** *Clarification 1:* Instruction includes the use of digital modeling.
SC.8.PE.2.4:	Perform a variety of operations such as sorting, filtering and searching in a database.
SC.8.PE.2.5:	Utilize organized data within a database to solve a problem. **Clarifications:** *Clarification 1:* Instruction includes the selection and display of the data using an appropriate graph.
SC.8.PE.3.1:	Represent natural phenomena using a model.
SC.8.PE.3.2:	Explore the purpose of a class. **Clarifications:** *Clarification 1:* Instruction includes understanding that classes can be used to create new objects when programming.
SC.8.PE.3.3:	Evaluate the benefits and limitations of the use of models. **Clarifications:** *Clarification 1:* Instruction includes consideration of models. *Clarification 2:* Within this benchmark, instruction includes consideration of safety, cost, time, location and precision. **Clarifications:** *Example:* Mrs. Hooper's class is studying the effects of erosion on the Florida Gulf coastline. Her class is located in Duval County and is not adjacent to the Gulf coast. Evaluate the benefits and limitations of developing a model to simulate the effects of erosion on the Gulf Coast of Florida.
SC.8.PE.4.1:	Explore the purpose of the software development life cycle.
SC.8.PE.4.2:	Explain the phases of a simple software development life cycle.

	Clarifications: *Clarification 1:* Instruction includes the following phases: describe the project, list necessary steps, take resources into consideration, create a visual representation, actualize the code then perform maintenance for needed changes.
	Discuss the role of maintenance in the software development cycle.
SC.8.PE.4.3:	**Clarifications:** *Clarification 1:* Instruction includes the outcome of changing, modifying and improving the project to meet the user's needs.
SC.8.TI.2.1:	Describe legal and ethical behaviors when using technology.
	Actively participate in effortful learning both individually and collectively. Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.
MA.K12.MTR.1.1:	**Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.

MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency:

	• Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.** Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence. **Clarifications:** Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning. • Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.**

	Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. **Clarifications:** Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems. • Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
MA.K12.MTR.6.1:	**Assess the reasonableness of solutions.** Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?"

	• Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
	Apply mathematics to real-world contexts. Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency.
MA.K12.MTR.7.1:	**Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts: • Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation. • Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations.

	4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently. **Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension. **Clarifications:** Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.
ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully. In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work.

	Clarifications: Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Accommodation changes the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Grade 8 Digital Discoveries provides students with an in-depth exploration of computer science, focusing on its application as a tool for problem-solving, communication, and personal expression. The course highlights how computing is integrated into various aspects of daily life and encourages students to engage with technology to enhance their understanding and creativity. Through interactive projects and real-world examples, students learn to appreciate the role of computer science in solving problems and expressing ideas.

The curriculum emphasizes areas such as programming fundamentals, digital communication, and the impact of technology on society. Students will explore the functional aspects of computing systems and develop practical skills in creating and managing technology-driven solutions. This course prepares students to use computer science effectively, fostering their ability to understand and influence the technological world around them.

General Information

Course Path: Request ID: 3375 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades 6 to 8 Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Course Year: 2025

Abbreviated Title: GRD 8 DIG DISC

Course Length: Semester (S)

Course Type: Elective Course

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

M/J Introduction to Cybersecurity (Request #3378)

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Aligned Standards

Name	Description
SC.K12.CTR.1.1:	**Actively participate in effortful learning both individually and collaboratively.** Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity. • Develop students' ability to justify methods and compare their responses to the responses of their peers.

SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills. • Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow. • Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal:

	• Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking: • Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems.

	• Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.6.CC.1.1:	Demonstrate an ability to communicate through various online tools.
SC.6.CO.1.1:	Identify multiple file format types. **Clarifications:** *Clarification 1:* Within this benchmark, file types include formats for word processing, images, music and three-dimensional drawings. *Clarification 2:* Instruction includes explaining why different file types exist.
SC.6.CO.1.2:	Identify applications that have different desktop and online versions. **Clarifications:** *Clarification 1:* Instruction includes desktop versions and online subscription services.
SC.6.CO.1.3:	Identify the differences between wired and wireless computer networks.
SC.6.CO.1.4:	Describe how information is translated and communicated between computers and devices over a network.

	Clarifications: *Clarification 1:* Instruction focuses on both text and non-text information.
SC.6.CO.2.1:	Identify and describe the major hardware components and functions of computer systems. **Clarifications:** *Clarification 1:* Major hardware components include motherboards, processors, hard drives, random access memory (RAM) and cooling fans.
SC.6.CO.3.2:	Describe the main functions of an operating system. **Clarifications:** *Clarification 1:* Functions include user interface, input and output (IO), device management and task management.
SC.6.CO.3.3:	Explain how an operating system provides user and system services. **Clarifications:** *Clarification 1:* Instruction includes discussing how an operating system manages the computer hardware and software.
SC.6.CO.3.4:	Describe the major software components and functions of computer systems. **Clarifications:** *Clarification 1:* Major software components include operating system, application programs, graphics, firmware and others.
SC.6.CO.3.5:	Evaluate various forms of input and output (IO) and peripheral devices. **Clarifications:** *Clarification 1:* Input and output and peripheral devices include monitor, mouse, printer, keyboard, headphone, speakers and microphone.
SC.6.CS.1.1:	Define the states of data.

	Clarifications: *Clarification 1:* States of data include data at rest, data in motion and data in use.
SC.6.CS.1.2:	Illustrate the concept of access control and how to limit access to authorized users.
SC.6.CS.1.3:	Discuss the importance of cybersecurity.
SC.6.CS.1.4:	Determine information that should remain confidential.
SC.6.CS.1.5:	Identify the need for encryption.
SC.6.CS.1.6:	Recognize the importance of digital identity.
SC.6.CS.2.1:	Identify the need for security safeguards on personal devices.
SC.6.ET.1.2:	Identify technology skills needed in the workplace.
SC.6.HS.1.1:	Identify the connection between strong passwords and Internet safety.
SC.6.HS.1.3:	Describe safe practices when participating in digital communication. **Clarifications:** *Clarification 1:* Instruction focuses on communications within discussion groups and blogs.
SC.6.HS.1.4:	Evaluate a given website to determine if it is safe for users. **Clarifications:** *Clarification 1:* Instruction includes discussing the accuracy and security of given websites. *Clarification 2:* Instruction includes types of personal information required for access and whether it is encrypted (https).
SC.6.HS.2.1:	Define the online disinhibition effect.
SC.6.HS.2.2:	List negative impacts of excessive device usage. **Clarifications:** *Clarification 1:* Instruction includes device addiction, online versus in-person personality traits, digital overload and others.

	Implement the 20-20-20 rule for technology.
SC.6.HS.2.3:	**Clarifications:** *Clarification 1:* For instruction of this benchmark, the 20-20-20 rule is defined as for every 20 minutes of screen time, look at an object 20 feet away for 20 seconds.
SC.6.HS.3.1:	Explore the impact that digital media and communication has on our behavior. **Clarifications:** *Clarification 1:* Instruction includes identifying impacts of computing, social networking and web technologies on an individual and society.
SC.6.PE.4.1:	Recognize the phases of the software development life cycle.
SC.6.TI.1.1:	Recognize the data content sources that make your digital footprint. **Clarifications:** *Clarification 1:* Instruction includes permanence of digital footprint. *Clarification 2:* Within this benchmark, digital footprint includes digital profiles and other forms of personally identifiable information (PII).
SC.6.TI.2.1:	Recognize the consequences of plagiarism on the development of creative works. **Clarifications:** *Clarification 1:* Creative works include projects, publications and online content. *Clarification 2:* Instruction includes defining intellectual property.
SC.6.TI.2.2:	Demonstrate compliance with the school's Acceptable Use Policy.
SC.6.TI.2.3:	Explain fair use for using copyrighted materials.

	Clarifications: Clarification 1: Copyrighted materials include images, music, video and text.
SC.6.TI.2.4:	Generate citations for text and non-text sources using a digital tool.
SC.7.CO.1.1:	Identify the kinds of content associated with different file types. **Clarifications:** *Clarification 1:* Within this benchmark, file types include .mp3's association with audio, .mp4's association with video and various file types associated with digital documents.
SC.7.CO.1.2:	Differentiate between different file types. **Clarifications:** *Clarification 1:* Instruction includes researching different types of documents such as .docx, .pdf, .stl, .jpg and others. **Clarifications:** *Example:* Lukas is working on a resume to apply for a job at his local grocery store. The grocery store just adopted an all-digital application process. Identify what file type would be best for his virtual resume and why.
SC.7.CO.1.3:	Describe the relationship between hardware and software. **Clarifications:** *Clarification 1:* Hardware and software including basic input/output systems (BIOS), operating systems and firmware.
SC.7.CO.1.6:	Describe strategies for determining the reliability of resources or information on the Internet.
SC.7.CO.2.1:	Explain the difference between wired, local area, wireless and mobile networks.
SC.7.CO.2.2:	Identify and describe the function of the main internal parts of a basic computing device.

	Clarifications: *Clarification 1:* Instruction includes motherboard, hard drive, central processing unit (CPU), random access memory (RAM), graphics processing unit (GPU) and other components.
SC.7.CO.2.3:	Explore devices that contain firmware. **Clarifications:** *Clarification 1:* Instruction includes defining firmware and exploring the importance of it.
SC.7.CO.3.1:	Differentiate between desktop applications and software as a service (SaaS). **Clarifications:** *Clarification 1:* Instruction includes programs that have an online counterpart with varying functionality.
SC.7.CS.1.1:	Describe data in its three states and potential threats to each state. **Clarifications:** *Clarification 1:* The three states of data are data in use, data at rest and data in motion.
SC.7.CS.1.2:	Explain the concept of access control and how to limit access to authorized users. **Clarifications:** *Clarification 1:* Students should examine more advanced authentication and authorization methods, such as two-factor, multifactor and biometric.
SC.7.CS.1.3:	Examine the basics of cybersecurity needs for business, government and organizations.
SC.7.CS.1.4:	List and define the elements of the confidentiality, integrity and availability (CIA) triad.
SC.7.CS.1.5:	Explain components of access control.

	Clarifications: *Clarification 1:* Components of access control include identification, authentication, authorization, accountability and non-repudiation.
SC.7.CS.1.6:	Identify the characteristics of strong versus weak passwords in data and identity security.
SC.7.CS.1.7:	Explain the proper use and operation of security technologies.
SC.7.CS.1.8:	Identify actions that protect electronic devices. **Clarifications:** *Clarification 1:* Actions include protecting devices from viruses, intrusion, vandalism and other malicious activities.
SC.7.CS.2.1:	Define the Internet of Things (IoT). **Clarifications:** *Clarification 1:* Instruction includes understanding that IoT is a network of devices, normally physical objects with sensors, that exchange information and data with one another and to computing systems.
SC.7.CS.3.1:	Identify the types of cyberattacks.
SC.7.CS.3.2:	Explore social engineering attacks.
SC.7.CS.3.3:	Identify data vulnerabilities. **Clarifications:** *Clarification 1:* Instruction includes password strength (alphanumeric passwords), biometric access and two-factor authentication. *Clarification 2:* Within this benchmark, encryptions include cryptography, Ceasar cypher, MD5 hashing and Vigenère cypher.
SC.7.ET.1.1:	Investigate the latest technologies and the potential they have to improve our lives at home, work and in society.
SC.7.HS.1.1:	Explain the possible consequences of cyberbullying.

	Clarifications: *Clarification 1:* Instruction includes the consequences that our society and schools might impose.
SC.7.HS.1.2:	Discuss the impact of online disinhibition on individuals and society.
SC.7.HS.1.3:	Interpret writings and communications using terminology.
SC.7.HS.1.4:	Categorize potential dangers to an individual's safety and security. **Clarifications:** *Clarification 1:* Instruction includes the use of email, chat rooms and other forms of direct electronic communication. *Clarification 2:* Within this benchmark, dangers include predatory behavior and human trafficking on the Internet. **Clarifications:** *Example:* Create a graphic organizer to sort information security, network security and physical security into categories.
SC.7.HS.1.5:	Recognize the importance of reporting suspicious behavior encountered on the Internet.
SC.7.HS.1.6:	Compare the risks and benefits of accessing the Internet. **Clarifications:** *Clarification 1:* Instruction includes access to websites, web applications or software that does not protect against the disclosure, use or dissemination of an individual's personal information.
SC.7.HS.1.7:	Examine safe practices for technology use. **Clarifications:** *Clarification 1:* Instruction includes discussing personal information security. *Clarification 2:* Instruction includes discussing personal safety when utilizing technology.

SC.7.HS.2.1:	Identify the digital practices that may affect your physical and mental well- being.
SC.7.HS.3.1:	Discuss how device usage can affect sleeping patterns.
SC.7.HS.3.2:	Discuss the potential risks of device addiction and how to prevent it.
SC.7.HS.3.3:	Explain the possible consequences of cyberbullying and inappropriate use of digital media and communication on personal life and society.
SC.7.PE.1.6:	Develop problem solutions using a block programming language. **Clarifications:** *Clarification 1:* Block programming language includes looping behavior, conditional statements, expressions, variables and functions.
SC.7.PE.1.7:	Create online content using advanced design tools. **Clarifications:** *Clarification 1:* Within this benchmark, online content includes webpages, digital portfolios and multimedia artifacts.
SC.7.PE.1.8:	Identify different types of programming errors. **Clarifications:** *Clarification 1:* Types of programming errors include syntax, logical and runtime.
SC.7.PE.2.1:	Predict outputs while showing an understanding of inputs.
SC.7.PE.4.1:	Define the phases of the software development life cycle.
SC.7.TI.1.1:	Discuss the ways that technology has increased the capacity for communication within a community.
SC.7.TI.1.2:	Evaluate the responsible and irresponsible use of information on collaborative projects.
SC.7.TI.1.3:	Identify how media is used to influence information.
SC.7.TI.2.1:	Describe legal and ethical behaviors when using information and technology and describe the consequences of misuse.

SC.7.TI.2.2:	Describe and model responsible use of modern communication media and devices. **Clarifications:** *Clarification 1:* Instruction includes discussion of personal information security.
SC.7.TI.2.3:	Recognize the legal use of modern communication media and devices.
SC.7.TI.2.4:	Explore the ethical use of collected data.
SC.7.TI.2.5:	Explain how copyright law and licensing protect the owner of intellectual property.
SC.8.CC.2.1:	Publish a digital product individually and collaboratively. **Clarifications:** *Clarification 1:* Instruction includes creating a product pertaining to the real- world, using a variety of digital tools and resources. *Clarification 2:* Instruction includes publication of a digital product that provides value to society individually or collaboratively. *Clarification 3:* Instruction includes reflecting on the individual and collaborative process.
SC.8.CO.2.1:	Explain how to disassemble or reassemble a desktop computer.
SC.8.CO.2.2:	Explore different hardware specifications and their impact on the performance of the computer. **Clarifications:** *Clarification 1:* Instruction includes multicore processing, refresh rates and their impact on operation.
SC.8.CO.2.3:	Identify the major components of a network. **Clarifications:** *Clarification 1:* Within this benchmark, the components include connection, connecting point and other devices to communicate with.

SC.8.CS.1.1:	Analyze threats and vulnerabilities to information security for individuals and organizations. **Clarifications:** *Clarification 1:* Threats and vulnerabilities such as malware, phishing, smishing and hacks.
SC.8.CS.1.2:	Explain how authentication and authorization methods can protect users. **Clarifications:** *Clarification 1:* Students should examine more advanced authentication and authorization methods, such as two-factor, multifactor and biometric.
SC.8.CS.1.3:	Describe defense in-depth strategies to protect simple networks. **Clarifications:** *Clarification 1:* Instruction includes layered strategies, such as firewalls, allow and block lists, changes to default passwords and access points.
SC.8.CS.1.4:	Explain how malicious actions threaten network security. **Clarifications:** *Clarification 1:* Instruction includes malicious actions, such as social engineering, malware and hacks.
SC.8.CS.1.5:	Explain how malicious actions threaten physical security.
SC.8.CS.1.6:	Describe defense in depth and how physical access controls work together. **Clarifications:** *Clarification 1:* Instruction includes authentic and digital physical access controls, such as door locks, ID cards, PIN codes, bollards, lighting, fencing, cameras and guards.
SC.8.CS.1.7:	Explore the process of protecting computer hardware from exploitation. **Clarifications:**

	Clarification 1: Instruction includes disabled or unused USB ports, windows lock screens and managed access to restricted areas. *Clarification 2:* Instruction includes hardware, tablets, phones and other devices.
SC.8.CS.2.1:	Evaluate security and privacy issues that relate to computer networks and Internet of Things (IoT) devices. **Clarifications:** *Clarification 1:* Devices include phones, tablets, smartwatches and other emerging technologies.
SC.8.CS.2.2:	Describe security and privacy issues that relate to computer networks.
SC.8.CS.2.3:	Describe the permanency of data on the Internet, online identity and personal privacy. **Clarifications:** *Clarification 1:* Instruction includes discussing the "Right to be Forgotten."
SC.8.CS.3.1:	Discuss ransomware attacks.
SC.8.CS.3.2:	Discuss the necessity of immediate security updates of a program.
SC.8.CS.3.3:	Identify the steps of the social engineering attack cycle.
SC.8.ET.1.1:	Identify the emerging features of mobile devices, smart devices and vehicles.
SC.8.ET.1.4:	Analyze the increasing impact of access to the Internet on daily life.
SC.8.HS.1.1:	Describe the impacts of the presence of technology and the lack of technology on everyday life. **Clarifications:** *Clarification 1:* Instruction includes comparing how the presence of technology has impacted our daily lives and how the lack of technology has impacted our daily lives.
SC.8.HS.1.2:	Develop procedures to protect personal information while accessing the Internet.

	Clarifications: *Clarification 1:* Instruction includes access to websites, web applications or software that does not protect against the disclosure, use or dissemination of an individual's personal information. *Clarification 2:* Instruction includes theft of personal data including social security numbers, banking information and identity.
SC.8.HS.2.1:	Determine the association between hand-eye coordination and the use of digital devices.
SC.8.HS.2.2:	Investigate the causes of headaches associated with digital device usage. **Clarifications:** *Clarification 1:* Within this benchmark, causes include but are not limited to poor posture, dehydration, blue light and eye strain.
SC.8.HS.2.3:	Investigate the causes of physical body changes due to device usage. **Clarifications:** *Clarification 1:* Focal points include research on muscle, nervous and bone systems. *Clarification 2:* Instruction is limited to the physical effects of direct digital device usage.
SC.8.HS.2.4:	Identify the effects on cognitive function as a result of technology use.
SC.8.HS.3.1:	Discuss how regulating the use of digital media and communication is important for mental and physical well-being.
SC.8.HS.3.2:	Analyze how digital media and communication influence behavior. **Clarifications:** *Clarification 1:* Instruction includes the influences on individuals, communities and cultures.
SC.8.PE.4.1:	Explore the purpose of the software development life cycle.
SC.8.PE.4.2:	Explain the phases of a simple software development life cycle.

	Clarifications: *Clarification 1:* Instruction includes the following phases: describe the project, list necessary steps, take resources into consideration, create a visual representation, actualize the code then perform maintenance for needed changes.
SC.8.PE.4.3:	Discuss the role of maintenance in the software development cycle. **Clarifications:** *Clarification 1:* Instruction includes the outcome of changing, modifying and improving the project to meet the user's needs.
SC.8.TI.1.2:	Describe the influence of access-to-information technologies over time. **Clarifications:** *Clarification 1:* Instruction includes the effects of information technology on the workplace, education and global society. *Clarification 2:* Instruction includes the historical impact.
SC.8.TI.2.2:	Use a local or federal government website to engage with a public official.
SC.8.TI.2.3:	Compare various technology-related career paths.
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.

	Clarifications: Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency:

	• Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency: • Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.** Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence. **Clarifications:** Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning.

	• Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.** Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. **Clarifications:** Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems. • Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
MA.K12.MTR.6.1:	**Assess the reasonableness of solutions.** Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems.

	• Verify possible solutions by explaining the methods used. • Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
	Apply mathematics to real-world contexts. Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency.
MA.K12.MTR.7.1:	**Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts: • Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation. • Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning.

	Clarifications: K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations. 4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently. **Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension. **Clarifications:** Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.
ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully.

	In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work. **Clarifications:** Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Accommodation changes the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Introduction to Cybersecurity provides students with a foundational understanding of computer science, emphasizing the critical aspects of computing and networking systems. The course covers a range of topics including computer hardware and software, wired and wireless networking, and the principles of internet and online safety. Students will also explore the impact of copyright and digital footprint, as well as career opportunities in the field of cybersecurity.

This course is designed for students in grades 6-8 to introduce them to the essential concepts and practices of cybersecurity. By examining the rules, guidelines, and laws that govern the use of technology in various contexts, students will gain insights into how cybersecurity principles apply to education, business, and everyday life.

General Information

Course Path: Request ID: 3378 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades 6 to 8 Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Course Year: 2025

Abbreviated Title: INTRO CYBERSEC

Course Length: Semester (S)

Course Type: Elective Course

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

M/J Navigating Technology: Digital Literacy and Digital Citizenship (Request #3373)

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Aligned Standards

Name	Description
SC.K12.CTR.1.1:	**Actively participate in effortful learning both individually and collaboratively.** Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity. • Develop students' ability to justify methods and compare their responses to the responses of their peers.

SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills. • Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow. • Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal:

	• Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking: • Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems.

	• Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.6.CC.1.1:	Demonstrate an ability to communicate through various online tools.
SC.6.CC.2.1:	Create a digital product individually and collaboratively. **Clarifications:** *Clarification 1:* When creating a product, students should be able to design and publish the product. *Clarification 2:* Products include those that can inform, persuade or entertain.
SC.6.CO.1.1:	Identify multiple file format types. **Clarifications:** *Clarification 1:* Within this benchmark, file types include formats for word processing, images, music and three-dimensional drawings. *Clarification 2:* Instruction includes explaining why different file types exist.
SC.6.CO.1.2:	Identify applications that have different desktop and online versions.

	Clarifications: *Clarification 1:* Instruction includes desktop versions and online subscription services.
SC.6.CO.1.3:	Identify the differences between wired and wireless computer networks.
SC.6.CO.1.4:	Describe how information is translated and communicated between computers and devices over a network. **Clarifications:** *Clarification 1:* Instruction focuses on both text and non-text information.
SC.6.CO.1.6:	Research questions using digital information resources. **Clarifications:** *Clarification 1:* Research questions should make connections to scientific and statistical questions within this grade level.
SC.6.CO.2.1:	Identify and describe the major hardware components and functions of computer systems. **Clarifications:** *Clarification 1:* Major hardware components include motherboards, processors, hard drives, random access memory (RAM) and cooling fans.
SC.6.CO.3.1:	Describe the essential characteristics of a software artifact. **Clarifications:** *Clarification 1:* Essential characteristics include usability, completeness and accuracy. *Clarification 2:* Instruction includes evaluating the effective use of a given program.
SC.6.CO.3.2:	Describe the main functions of an operating system. **Clarifications:** *Clarification 1:* Functions include user interface, input and output (IO), device management and task management.

SC.6.CO.3.3:	Explain how an operating system provides user and system services. **Clarifications:** *Clarification 1:* Instruction includes discussing how an operating system manages the computer hardware and software.
SC.6.CO.3.4:	Describe the major software components and functions of computer systems. **Clarifications:** *Clarification 1:* Major software components include operating system, application programs, graphics, firmware and others.
SC.6.CO.3.5:	Evaluate various forms of input and output (IO) and peripheral devices. **Clarifications:** *Clarification 1:* Input and output and peripheral devices include monitor, mouse, printer, keyboard, headphone, speakers and microphone.
SC.6.CS.1.1:	Define the states of data. **Clarifications:** *Clarification 1:* States of data include data at rest, data in motion and data in use.
SC.6.CS.1.2:	Illustrate the concept of access control and how to limit access to authorized users.
SC.6.CS.1.3:	Discuss the importance of cybersecurity.
SC.6.CS.1.4:	Determine information that should remain confidential.
SC.6.CS.1.5:	Identify the need for encryption.
SC.6.CS.1.6:	Recognize the importance of digital identity.
SC.6.CS.2.1:	Identify the need for security safeguards on personal devices.
SC.6.ET.1.1:	Identify technology used to support specialized forms of human-computer interaction (HCI).

	Clarifications: *Clarification 1:* Technologies may include augmented reality (AR), virtual reality (VR) and others.
SC.6.ET.2.1:	Identify the characteristics of Artificial Intelligence (AI).
SC.6.ET.2.2:	Discuss the benefits associated with Artificial Intelligence (AI).
SC.6.ET.3.1:	Explain why some tasks can be accomplished faster by computers.
SC.6.ET.3.2:	Describe how humans and machines interact to accomplish tasks that neither can accomplish alone.
SC.6.HS.1.1:	Identify the connection between strong passwords and Internet safety.
SC.6.HS.1.2:	Discuss the need for downloads to come from trusted sources. **Clarifications:** *Clarification 1:* Instruction focuses on a source's legitimacy.
SC.6.HS.1.3:	Describe safe practices when participating in digital communication. **Clarifications:** *Clarification 1:* Instruction focuses on communications within discussion groups and blogs.
SC.6.HS.1.4:	Evaluate a given website to determine if it is safe for users. **Clarifications:** *Clarification 1:* Instruction includes discussing the accuracy and security of given websites. *Clarification 2:* Instruction includes types of personal information required for access and whether it is encrypted (https).
SC.6.HS.2.1:	Define the online disinhibition effect.
SC.6.HS.2.2:	List negative impacts of excessive device usage. **Clarifications:** *Clarification 1:* Instruction includes device addiction, online versus in-person personality traits, digital overload and others.

SC.6.HS.2.3:	Implement the 20-20-20 rule for technology. **Clarifications:** *Clarification 1:* For instruction of this benchmark, the 20-20-20 rule is defined as for every 20 minutes of screen time, look at an object 20 feet away for 20 seconds.
SC.6.HS.3.1:	Explore the impact that digital media and communication has on our behavior. **Clarifications:** *Clarification 1:* Instruction includes identifying impacts of computing, social networking and web technologies on an individual and society.
SC.6.TI.1.1:	Recognize the data content sources that make your digital footprint. **Clarifications:** *Clarification 1:* Instruction includes permanence of digital footprint. *Clarification 2:* Within this benchmark, digital footprint includes digital profiles and other forms of personally identifiable information (PII).
SC.6.TI.1.2:	Explore the history of computer and other devices. **Clarifications:** *Clarification 1:* Instruction includes legacy devices and antiquated technology.
SC.6.TI.1.3:	Create a timeline for the innovation of an electronic device.
SC.6.TI.1.4:	Describe various technology-related career paths.
SC.6.TI.2.1:	Recognize the consequences of plagiarism on the development of creative works. **Clarifications:** *Clarification 1:* Creative works include projects, publications and online content.

	Clarification 2: Instruction includes defining intellectual property.
SC.6.TI.2.2:	Demonstrate compliance with the school's Acceptable Use Policy.
SC.6.TI.2.3:	Explain fair use for using copyrighted materials. **Clarifications:** *Clarification 1:* Copyrighted materials include images, music, video and text.
SC.6.TI.2.4:	Generate citations for text and non-text sources using a digital tool.
SC.7.CC.1.1:	Apply multimedia tools for local and global group collaboration. **Clarifications:** *Clarification 1:* Tools include collaborative spreadsheets, video conferencing software, collaborative forms, image editing software and other programs.
SC.7.CC.1.2:	Identify productivity tools for collaboration. **Clarifications:** *Clarification 1:* Instruction includes shared calendars, group messaging applications and other project management software.
SC.7.CC.1.3:	Identify individual roles within a collaborative team.
SC.7.CC.2.1:	Organize compiled information using a digital tool.
SC.7.CC.2.2:	Analyze one's own ideas with research-based information to create a unique digital artifact.
SC.7.CO.1.1:	Identify the kinds of content associated with different file types. **Clarifications:** *Clarification 1:* Within this benchmark, file types include .mp3's association with audio, .mp4's association with video and various file types associated with digital documents.
SC.7.CO.1.2:	Differentiate between different file types.

	Clarifications: *Clarification 1:* Instruction includes researching different types of documents such as .docx, .pdf, .stl, .jpg and others.
	Clarifications: *Example:* Lukas is working on a resume to apply for a job at his local grocery store. The grocery store just adopted an all-digital application process. Identify what file type would be best for his virtual resume and why.
SC.7.CO.1.3:	Describe the relationship between hardware and software. **Clarifications:** *Clarification 1:* Hardware and software including basic input/output systems (BIOS), operating systems and firmware.
SC.7.CO.1.4:	Utilize a set of websites to find information for a given topic.
SC.7.CO.1.5:	Utilize government websites to facilitate civic engagement. **Clarifications:** *Clarification 1:* Within this benchmark, students will access local, state and federal government websites.
SC.7.CO.1.6:	Describe strategies for determining the reliability of resources or information on the Internet.
SC.7.CO.2.1:	Explain the difference between wired, local area, wireless and mobile networks.
SC.7.CO.2.2:	Identify and describe the function of the main internal parts of a basic computing device. **Clarifications:** *Clarification 1:* Instruction includes motherboard, hard drive, central processing unit (CPU), random access memory (RAM), graphics processing unit (GPU) and other components.
SC.7.CO.2.4:	Explain the connection of natural resources on the manufacturing of computer hardware components.

SC.7.CO.3.1:	Differentiate between desktop applications and software as a service (SaaS). **Clarifications:** *Clarification 1:* Instruction includes programs that have an online counterpart with varying functionality.
SC.7.CS.1.1:	Describe data in its three states and potential threats to each state. **Clarifications:** *Clarification 1:* The three states of data are data in use, data at rest and data in motion.
SC.7.CS.1.2:	Explain the concept of access control and how to limit access to authorized users. **Clarifications:** *Clarification 1:* Students should examine more advanced authentication and authorization methods, such as two-factor, multifactor and biometric.
SC.7.CS.1.3:	Examine the basics of cybersecurity needs for business, government and organizations.
SC.7.CS.1.4:	List and define the elements of the confidentiality, integrity and availability (CIA) triad.
SC.7.CS.1.5:	Explain components of access control. **Clarifications:** *Clarification 1:* Components of access control include identification, authentication, authorization, accountability and non-repudiation.
SC.7.CS.1.6:	Identify the characteristics of strong versus weak passwords in data and identity security.
SC.7.CS.1.7:	Explain the proper use and operation of security technologies.
SC.7.CS.1.8:	Identify actions that protect electronic devices. **Clarifications:** *Clarification 1:* Actions include protecting devices from viruses, intrusion, vandalism and other malicious activities.

SC.7.CS.2.1:	Define the Internet of Things (IoT). **Clarifications:** *Clarification 1:* Instruction includes understanding that IoT is a network of devices, normally physical objects with sensors, that exchange information and data with one another and to computing systems.
SC.7.CS.3.1:	Identify the types of cyberattacks.
SC.7.CS.3.2:	Explore social engineering attacks.
SC.7.CS.3.3:	Identify data vulnerabilities. **Clarifications:** *Clarification 1:* Instruction includes password strength (alphanumeric passwords), biometric access and two-factor authentication. *Clarification 2:* Within this benchmark, encryptions include cryptography, Ceasar cypher, MD5 hashing and Vigenère cypher.
SC.7.ET.1.1:	Investigate the latest technologies and the potential they have to improve our lives at home, work and in society.
SC.7.ET.1.2:	Explore emerging technologies that have the potential to impact education.
SC.7.ET.2.1:	Explore future technologies and the role artificial intelligence (AI) may play.
SC.7.ET.3.1:	Describe ways in which adaptive technologies can assist users in their daily lives.
SC.7.ET.3.2:	Identify ways humans interact with computers. **Clarifications:** *Clarification 1:* Instruction includes software and user interface.
SC.7.ET.3.3:	Identify ways humans interact with hardware components.

	Clarifications: *Clarification 1:* Instruction includes probes, sensors and handheld devices.
SC.7.HS.1.1:	Explain the possible consequences of cyberbullying. **Clarifications:** *Clarification 1:* Instruction includes the consequences that our society and schools might impose.
SC.7.HS.1.2:	Discuss the impact of online disinhibition on individuals and society.
SC.7.HS.1.3:	Interpret writings and communications using terminology.
SC.7.HS.1.4:	Categorize potential dangers to an individual's safety and security. **Clarifications:** *Clarification 1:* Instruction includes the use of email, chat rooms and other forms of direct electronic communication. *Clarification 2:* Within this benchmark, dangers include predatory behavior and human trafficking on the Internet.
	Clarifications: *Example:* Create a graphic organizer to sort information security, network security and physical security into categories.
SC.7.HS.1.5:	Recognize the importance of reporting suspicious behavior encountered on the Internet.
SC.7.HS.1.6:	Compare the risks and benefits of accessing the Internet. **Clarifications:** *Clarification 1:* Instruction includes access to websites, web applications or software that does not protect against the disclosure, use or dissemination of an individual's personal information.
SC.7.HS.1.7:	Examine safe practices for technology use. **Clarifications:**

	Clarification 1: Instruction includes discussing personal information security. *Clarification 2:* Instruction includes discussing personal safety when utilizing technology.
SC.7.HS.2.1:	Identify the digital practices that may affect your physical and mental well- being.
SC.7.HS.3.1:	Discuss how device usage can affect sleeping patterns.
SC.7.HS.3.2:	Discuss the potential risks of device addiction and how to prevent it.
SC.7.HS.3.3:	Explain the possible consequences of cyberbullying and inappropriate use of digital media and communication on personal life and society.
SC.7.TI.1.1:	Discuss the ways that technology has increased the capacity for communication within a community.
SC.7.TI.1.2:	Evaluate the responsible and irresponsible use of information on collaborative projects.
SC.7.TI.1.3:	Identify how media is used to influence information.
SC.7.TI.1.4:	Analyze technology-related career paths.
SC.7.TI.1.5:	Summarize the historical impact of digital media and communication. **Clarifications:** *Clarification 1:* Instruction includes discussing the historical purposes of digital media and communication.
SC.7.TI.1.6:	Explore the innovation of computer components.
SC.7.TI.2.1:	Describe legal and ethical behaviors when using information and technology and describe the consequences of misuse.
SC.7.TI.2.2:	Describe and model responsible use of modern communication media and devices. **Clarifications:** *Clarification 1:* Instruction includes discussion of personal information security.
SC.7.TI.2.3:	Recognize the legal use of modern communication media and devices.

SC.7.TI.2.4:	Explore the ethical use of collected data.
SC.7.TI.2.5:	Explain how copyright law and licensing protect the owner of intellectual property.
SC.8.CC.1.1:	Design a digital product. **Clarifications:** *Clarification 1:* Instruction includes creating a product pertaining to the real world using a variety of digital tools and resources. *Clarification 2:* Instruction includes the creation of a digital product that provides value to society individually or collaboratively.
SC.8.CC.1.2:	Evaluate the benefits of collaboration compared to individual product creation. **Clarifications:** *Clarification 1:* Instruction includes circumstances in which working as a collaborative group would not be optimal or possible.
SC.8.CC.2.1:	Publish a digital product individually and collaboratively. **Clarifications:** *Clarification 1:* Instruction includes creating a product pertaining to the real- world, using a variety of digital tools and resources. *Clarification 2:* Instruction includes publication of a digital product that provides value to society individually or collaboratively. *Clarification 3:* Instruction includes reflecting on the individual and collaborative process.
SC.8.CO.1.1:	Integrate information from multiple file formats into a single artifact.
SC.8.CO.1.2:	Create a collaborative project utilizing an online digital application. **Clarifications:** *Clarification 1:* Projects include those that inform, persuade and entertain others.
SC.8.CO.2.1:	Explain how to disassemble or reassemble a desktop computer.

SC.8.CO.2.2:	Explore different hardware specifications and their impact on the performance of the computer. **Clarifications:** *Clarification 1:* Instruction includes multicore processing, refresh rates and their impact on operation.
SC.8.CO.2.3:	Identify the major components of a network. **Clarifications:** *Clarification 1:* Within this benchmark, the components include connection, connecting point and other devices to communicate with.
SC.8.CO.3.1:	Compare the benefits and limitations of desktop applications and their complimentary online subscription version.
SC.8.CS.1.1:	Analyze threats and vulnerabilities to information security for individuals and organizations. **Clarifications:** *Clarification 1:* Threats and vulnerabilities such as malware, phishing, smishing and hacks.
SC.8.CS.1.2:	Explain how authentication and authorization methods can protect users. **Clarifications:** *Clarification 1:* Students should examine more advanced authentication and authorization methods, such as two-factor, multifactor and biometric.
SC.8.CS.1.3:	Describe defense in-depth strategies to protect simple networks. **Clarifications:** *Clarification 1:* Instruction includes layered strategies, such as firewalls, allow and block lists, changes to default passwords and access points.
SC.8.CS.1.4:	Explain how malicious actions threaten network security.

	Clarifications: *Clarification 1:* Instruction includes malicious actions, such as social engineering, malware and hacks.
SC.8.CS.1.5:	Explain how malicious actions threaten physical security.
SC.8.CS.1.6:	Describe defense in depth and how physical access controls work together. **Clarifications:** *Clarification 1:* Instruction includes authentic and digital physical access controls, such as door locks, ID cards, PIN codes, bollards, lighting, fencing, cameras and guards.
SC.8.CS.1.7:	Explore the process of protecting computer hardware from exploitation. **Clarifications:** *Clarification 1:* Instruction includes disabled or unused USB ports, windows lock screens and managed access to restricted areas. *Clarification 2:* Instruction includes hardware, tablets, phones and other devices.
SC.8.CS.2.1:	Evaluate security and privacy issues that relate to computer networks and Internet of Things (IoT) devices. **Clarifications:** *Clarification 1:* Devices include phones, tablets, smartwatches and other emerging technologies.
SC.8.CS.2.2:	Describe security and privacy issues that relate to computer networks.
SC.8.CS.2.3:	Describe the permanency of data on the Internet, online identity and personal privacy. **Clarifications:** *Clarification 1:* Instruction includes discussing the "Right to be Forgotten."
SC.8.CS.3.1:	Discuss ransomware attacks.
SC.8.CS.3.2:	Discuss the necessity of immediate security updates of a program.

SC.8.CS.3.3:	Identify the steps of the social engineering attack cycle.
SC.8.ET.1.1:	Identify the emerging features of mobile devices, smart devices and vehicles.
SC.8.ET.1.2:	Identify challenges faced by users when learning to use computer interfaces.
SC.8.ET.1.3:	Identify the impact of natural resources on the manufacturing of computer hardware components.
SC.8.ET.2.1:	Explore the use of an artificial intelligence (AI) device to accomplish a task.
SC.8.ET.2.2:	Discuss the utilization of intelligent behavior in technology. **Clarifications:** *Clarification 1:* Instruction includes speech and language understanding and computer vision. **Clarifications:** *Example:* Discuss the autonomous robotic vacuum cleaner's ability to map and analyze structures to avoid obstacles. *Example:* Analyze the advantages of implementing drones to spray crops or detect predators in an agricultural environment.
SC.8.ET.3.1:	Investigate the advancement of robotics.
SC.8.HS.1.1:	Describe the impacts of the presence of technology and the lack of technology on everyday life. **Clarifications:** *Clarification 1:* Instruction includes comparing how the presence of technology has impacted our daily lives and how the lack of technology has impacted our daily lives.
SC.8.HS.1.2:	Develop procedures to protect personal information while accessing the Internet. **Clarifications:**

	Clarification 1: Instruction includes access to websites, web applications or software that does not protect against the disclosure, use or dissemination of an individual's personal information. *Clarification 2:* Instruction includes theft of personal data including social security numbers, banking information and identity.
SC.8.HS.1.3:	Model a procedure to mitigate risks to personal safety while accessing the Internet. **Clarifications:** *Clarification 1:* Instruction focuses on knowledge of location and personal privacy. **Clarifications:** *Example:* Jennifer is playing a game online competing against other players. Her opponent has messaged within the game to ask her where she is from and how old she is. Develop procedures that would mitigate risks for Jennifer's personal safety.
SC.8.HS.2.1:	Determine the association between hand-eye coordination and the use of digital devices.
SC.8.HS.2.2:	Investigate the causes of headaches associated with digital device usage. **Clarifications:** *Clarification 1:* Within this benchmark, causes include but are not limited to poor posture, dehydration, blue light and eye strain.
SC.8.HS.2.3:	Investigate the causes of physical body changes due to device usage. **Clarifications:** *Clarification 1:* Focal points include research on muscle, nervous and bone systems. *Clarification 2:* Instruction is limited to the physical effects of direct digital device usage.
SC.8.HS.2.4:	Identify the effects on cognitive function as a result of technology use.

SC.8.HS.3.1:	Discuss how regulating the use of digital media and communication is important for mental and physical well-being.
SC.8.HS.3.2:	Analyze how digital media and communication influence behavior. **Clarifications:** *Clarification 1:* Instruction includes the influences on individuals, communities and cultures.
SC.8.TI.1.1:	Examine the historical progression and impact of digital media and communication. **Clarifications:** *Clarification 1:* Instruction includes how digital media and communication has changed over time. *Clarification 2:* Instruction includes physical meeting places prior to the popularity of the Internet.
SC.8.TI.1.2:	Describe the influence of access-to-information technologies over time. **Clarifications:** *Clarification 1:* Instruction includes the effects of information technology on the workplace, education and global society. *Clarification 2:* Instruction includes the historical impact.
SC.8.TI.2.1:	Describe legal and ethical behaviors when using technology.
SC.8.TI.2.2:	Use a local or federal government website to engage with a public official.
SC.8.TI.2.3:	Compare various technology-related career paths.
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task.

	• Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts.

	• Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency: • Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.** Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes.

	• Construct possible arguments based on evidence. **Clarifications:** Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning. • Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.** Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. **Clarifications:** Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems.

	• Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
	Assess the reasonableness of solutions. Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context.
MA.K12.MTR.6.1:	**Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
MA.K12.MTR.7.1:	**Apply mathematics to real-world contexts.** Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency.
	Clarifications: Teachers who encourage students to apply mathematics to real-world contexts:

	• Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation. • Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations. 4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently. **Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension.

	Clarifications: Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.
ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully. In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work. **Clarifications:** Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Accommodation changes the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Navigating Technology: Digital Literacy and Citizenship is a comprehensive year-long course for grades 6-8 that equips students with the foundational skills needed to thrive in the digital age. The course focuses on essential aspects of digital literacy, including online safety, information literacy, ethical technology use, and digital communication. Students will explore the societal impact of technology and learn how to engage with digital tools responsibly and effectively.

Throughout the course, students will develop confidence and responsibility in their digital interactions, learning to make informed decisions about their online activities and understanding the broader implications of their digital actions. By the end of the course, students will have gained a deep understanding of digital literacy and citizenship, enhanced their critical thinking and communication skills in digital environments, and fostered safe and responsible online behavior. The course also encourages creativity and collaboration, providing students with the tools to navigate and evaluate online content while understanding the importance of privacy, security, and ethical considerations in the digital world.

General Information

Course Path: Request ID: 3373 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades 6 to 8 Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Course Year: 2025

Abbreviated Title: M/J NAV TECH

Course Length: Year (Y)

Course Type: Elective Course

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

Computer Programming Fundamentals Honors (Request #3363)

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Aligned Standards

Name	Description
	Actively participate in effortful learning both individually and collaboratively. Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.
SC.K12.CTR.1.1:	**Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity.

	• Develop students' ability to justify methods and compare their responses to the responses of their peers.
SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills.

	• Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow.

	• Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal: • Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking:

	• Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems. • Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.912.CC.1.1:	Evaluate digital modes of communication and collaboration. **Clarifications:** *Clarification 1:* Instruction includes examples of appropriate tools including email, instant messaging, word processors and virtual meeting software.
SC.912.CC.1.2:	Utilize tools within a project environment to communicate. **Clarifications:** *Clarification 1:* Instruction includes discussing the productivity of each tool.
SC.912.CC.1.3:	Present information and data using presentation software. **Clarifications:**

	Clarification 1: Instruction includes computing devices such as probes, sensors, software tools, programs and handheld devices. *Clarification 2:* Instruction includes analyzing and presenting interactive data visualizations.
SC.912.CC.1.4:	Create a digital artifact utilizing collaboration, reflection, analysis and iteration.
SC.912.CC.2.1:	Collaborate to publish information and data for a variety of audiences using digital tools and media-rich resources.
SC.912.CC.2.2:	Assess how collaboration influences the design and development of software artifacts. **Clarifications:** *Clarification 1:* Instruction includes comparing an individually designed project to a collaboratively designed project.
SC.912.CC.2.3:	Evaluate program designs and implementations for readability and usability. **Clarifications:** *Clarification 1:* Instruction includes evaluating programs done by third parties, peers and marketable programs.
SC.912.CC.2.4:	Critique the strengths and weaknesses of the collaborative process when creating digital products.
SC.912.CO.1.1:	Describe the efficiency and effectiveness of digital tools or resources used for real-world tasks.
SC.912.CO.1.2:	Identify and select the file format based on trade-offs. **Clarifications:** *Clarification 1:* Trade-offs for the most appropriate file format include analyzing the size, quality and accessibility of the file.
SC.912.CO.1.3:	Select and use the correct file type for specific tasks.
SC.912.CO.1.5:	Describe the organization of a computer and its principal components.

	Clarifications: *Clarification 1:* Instruction includes the identification of components by name, function and the interaction between them.
SC.912.CO.1.8:	Describe how the Internet facilitates global communication. **Clarifications:** *Clarification 1:* Instruction includes the grouping of smaller networks to provide a world wide web that facilitates communication. **Standard Relation to Course: Supporting**
SC.912.CO.1.9:	Evaluate the accuracy, relevance, comprehensiveness and bias of electronic information resources.
SC.912.CO.2.3:	Discuss the central processing unit (CPU). **Clarifications:** *Clarification 1:* Instruction includes similarities and differences between CPUs. *Clarification 2:* Instruction includes multi-core processing, hyper-threading and socket type. **Standard Relation to Course: Supporting**
SC.912.CO.2.7:	Evaluate various forms of input and output (IO). **Clarifications:** *Clarification 1:* Instruction includes data used for or produced by input and output.
SC.912.CO.2.10:	Explore the components of a data packet. **Clarifications:** *Clarification 1:* Instruction includes data breaking down into packets to be routed through networks. **Standard Relation to Course: Supporting**
SC.912.CO.2.11:	Investigate the issues that impact network functionality. **Standard Relation to Course: Supporting**

SC.912.CO.2.16:	Describe how devices are identified on a network. **Clarifications:** *Clarification 1:* Instruction includes differentiation between public and private Internet protocol (IP) addresses. **Standard Relation to Course: Supporting**
SC.912.CO.3.2:	Develop criteria for selecting software when solving a specific real-world problem. **Clarifications:** *Clarification 1:* Instruction includes evaluating cost, features, reliability and usability. **Standard Relation to Course: Supporting**
SC.912.CO.3.3:	Examine the difference between operating system (OS) software and application software. **Clarifications:** *Clarification 1:* Instruction includes the role that operating systems play in relation to application programs. **Standard Relation to Course: Supporting**
SC.912.CO.3.4:	Explain how automated software testing can reduce the cost of the testing effort. **Standard Relation to Course: Supporting**
SC.912.CS.2.2:	Describe security and privacy issues that relate to computer networks including the permanency of data on the Internet, online identity and privacy. **Standard Relation to Course: Supporting**
SC.912.CS.3.3:	Analyze the limitations of a programmer's temporary storage and the security vulnerabilities. **Standard Relation to Course: Supporting**
SC.912.CS.3.4:	Trace the social engineering attack cycle. **Clarifications:**

	Clarification 1: Instruction includes the various ways of collecting information, relationship building and how that information is used for exploitation. *Clarification 2:* Instruction includes discussing and evaluating the social and economic impact of the cycle on computer systems and people.
SC.912.DC.1.2:	Analyze the effects of digital currencies on the current financial market. **Clarifications:** *Clarification 1:* Instruction includes understanding that the value of a digital currency can be very volatile. **Standard Relation to Course: Supporting**
SC.912.DC.2.1:	Differentiate between a digital currency and a security. **Clarifications:** *Clarification 1:* Instruction includes securities serving as a placeholder of ownership or equity in an organization. **Standard Relation to Course: Supporting**
SC.912.DC.2.2:	Discuss the risks associated with digital currencies. **Clarifications:** *Clarification 1:* Instruction includes currencies that show no proof of work (POW) in blockchain. **Standard Relation to Course: Supporting**
SC.912.DC.2.3:	Compare decentralized currencies to centralized currencies. **Standard Relation to Course: Supporting**
SC.912.ET.1.7:	Describe how technology has changed the way people build and manage organizations and how technology impacts personal life. **Standard Relation to Course: Supporting**
SC.912.ET.2.1:	Explore the history of Artificial Intelligence (AI). **Clarifications:**

	Clarification 1: Instruction includes the application of AI tests. *Clarification 2:* Instruction includes how these tests have evolved along with AI. **Standard Relation to Course: Supporting**
SC.912.ET.2.2:	Describe the major branches of Artificial Intelligence (AI). **Clarifications:** *Clarification 1:* Major branches include expert systems, natural language processing, machine perception, machine learning and generative AI. **Standard Relation to Course: Supporting**
SC.912.ET.2.3:	Evaluate the application of algorithms to Artificial Intelligence (AI). **Clarifications:** *Clarification 1:* Instruction includes acknowledging AI measurement tests are algorithms. *Clarification 2:* Instruction includes discussing how algorithms can be used to enhance the effectiveness of AI. **Standard Relation to Course: Supporting**
SC.912.ET.2.4:	Evaluate the Artificial Intelligence (AI) of computers to model human behaviors. **Standard Relation to Course: Supporting**
SC.912.ET.2.5:	Describe major applications of artificial intelligence (AI) and machine learning. **Clarifications:** *Clarification 1:* Instruction includes discussing the applications to the medical, space and automotive fields.
SC.912.ET.2.6:	Describe how predictive Artificial Intelligence (AI) can be used to solve problems. **Clarifications:** *Clarification 1:* Instruction includes using predictive Artificial

	Intelligence (AI) to forecast trends, such as sports, the stock market and weather.
SC.912.ET.3.2:	Examine how robotics are used to address human challenges. **Standard Relation to Course: Supporting**
SC.912.HS.1.1:	Identify potential dangers to an individual's safety and security online. **Clarifications:** *Clarification 1:* Instruction includes the use of email, chat rooms and other forms of direct electronic communication. *Clarification 2:* Instruction includes the dangers of direct electronic communication including predatory behavior and human trafficking.
SC.912.HS.1.5:	Evaluate the risks to personal information while accessing the Internet. **Clarifications:** *Clarification 1:* Instruction includes access to software, websites or web applications that do not protect against the disclosure, use or dissemination of an individual's personal information. *Clarification 2:* Instruction includes theft of personal data including social security numbers, banking information and identity. **Clarifications:** *Example:* John was on a new questionable website the previous night playing video games. When he woke up the following morning, he discovered that his email address had 30 new spam emails advertising various products. John noticed that his checking account also had $20 missing from unauthorized charges. What do you think happened and what should his following steps be?
SC.912.HS.1.6:	Describe the impact of permissible privacy and security. **Clarifications:** *Clarification 1:* Instruction includes, but is not limited to, discussing

	privacy and security as it relates to account settings, cookies and application permissions.
SC.912.HS.1.7:	Construct strategies to combat cyberbullying or online harassment.
SC.912.HS.3.1:	Discuss the permanency of data on the Internet. **Clarifications:** *Clarification 1:* Instruction includes the permanency of sharing materials through digital communication and how it can affect future jobs, scholarship opportunities and potential positions. *Clarification 2:* Instruction focuses on confirmation of legitimacy before interacting with information from others, including liking, sharing and reposting.
SC.912.HS.3.2:	Analyze how social media influences the digital footprint of individuals, communities and cultures. **Standard Relation to Course: Supporting**
SC.912.PE.1.1:	Write code segments. **Clarifications:** *Clarification 1:* Instruction includes writing code segments that accept arguments and other segments such as functions, subroutines and methods.
SC.912.PE.1.2:	Create iterative and non-iterative structures within a program. **Clarifications:** *Clarification 1:* Iterative structures include nested iterative structures.
SC.912.PE.1.3:	Create selection structures within a program. **Clarifications:** *Clarification 1:* Instruction includes explaining selection structures and their uses within a program.
SC.912.PE.1.4:	Write a void function that does not return a value.

	Clarifications: *Clarification 1:* Instruction includes understanding that while void functions perform a function, it does not return a value.
SC.912.PE.1.5:	Write a non-void function that will return a value. **Clarifications:** *Clarification 1:* Methods of function writing include the example of "Hello World" and other value-returning functions.
SC.912.PE.1.6:	Create a nested array to aggregate data. **Clarifications:** *Example:* Beth has written a code segment for her programming class. She has created a list but needs her list to begin with 1 instead of 0. Create a nested array that assigns an alternative value to the numbers in her original list.
SC.912.PE.1.7:	Define multiple variables to the same value while utilizing aliasing. **Clarifications:** *Clarification 1:* Instruction includes discussing why multiple variables will not be aliased for having the same value alone; the variables must refer to the same location as well.
	Standard Relation to Course: Supporting
SC.912.PE.1.8:	Define a class to store data attributes. **Clarifications:** *Clarification 1:* Data attributes include numerical values, categories and descriptions.
SC.912.PE.1.9:	Create methods that a class can inherit.
SC.912.PE.1.10:	Write programs that validate user input.
SC.912.PE.1.11:	Compare the differences in execution of interpreted and compiled languages.

	Clarifications: *Clarification 1:* Instruction includes examining different programming languages and how they are converted to machine language. **Standard Relation to Course: Supporting**
SC.912.PE.1.12:	Classify programming languages. **Clarifications:** *Clarification 1:* Instruction includes the classification of paradigms by object-oriented and procedural. *Clarification 2:* Instruction includes the application of domains by scientific applications and commercial applications. **Standard Relation to Course: Supporting**
SC.912.PE.1.13:	Describe and identify types of programming errors. **Clarifications:** *Clarification 1:* Instruction includes syntax, logic, runtime and computation errors.
SC.912.PE.1.14:	Design and implement variables in a program using global and local scope
SC.912.PE.1.15:	Implement a program using an integrated development environment (IDE) commonly used.
SC.912.PE.1.16:	Explain the distinction between a programming language's standard library and the Application Programming Interface (API). **Clarifications:** *Clarification 1:* Instruction includes facilitating programming solutions using API and libraries. *Clarification 2:* Instruction includes explaining the role of an API in the development of applications.
SC.912.PE.1.17:	Examine the building blocks of algorithms.

	Clarifications: *Clarification 1:* Building blocks include sequence, selection, iteration and recursion.
SC.912.PE.1.18:	Develop a computer program. **Clarifications:** *Clarification 1:* Instruction includes meeting the requirements set by a plan. *Clarification 2:* Instruction includes the use of the software development cycle.
SC.912.PE.1.19:	Review a computer program to verify program functionality, programming styles, program usability and adherence to common programming standards. **Clarifications:** *Clarification 1:* Instruction includes peer review. *Clarification 2:* Instruction includes adherence to a programming language style guide.
SC.912.PE.1.20:	Write programs that use standard logic operators.
SC.912.PE.1.21:	Use Boolean logic to perform logical operations.
SC.912.PE.1.22:	Explain structures and their uses within a program. **Standard Relation to Course: Supporting**
SC.912.PE.1.23:	Compile, run, test and debug a digital artifact.
SC.912.PE.2.1:	Create a matrix from connected lists.
SC.912.PE.2.2:	Evaluate the purpose of sublist indexing. **Clarifications:** *Clarification 1:* Within this benchmark, the terms nesting and sublist can be used interchangeably.
SC.912.PE.2.3:	Compare techniques for analyzing massive data collections. **Standard Relation to Course: Supporting**

SC.912.PE.3.1:	Evaluate arithmetic expressions using operator precedence.
SC.912.PE.3.2:	Decompose a problem by defining new code segments.
SC.912.PE.3.3:	Design and implement a simple simulation that is representative of a natural phenomenon. **Clarifications:** *Clarification 1:* Instruction includes analyzing and understanding the algorithm that is representative of a natural phenomenon.
SC.912.PE.3.4:	Evaluate algorithms by their efficiency, correctness and clarity. **Clarifications:** *Clarification 1:* Instruction includes analyzing and comparing execution times, testing with multiple inputs or data sets and debugging. *Clarification 2:* Instruction includes evaluating a well-known algorithm and implementing a new one. *Clarification 3:* Instruction includes comparing the efficiency between two or more algorithms.
SC.912.PE.3.5:	Differentiate automated testing platforms and their uses. **Standard Relation to Course: Supporting**
SC.912.PE.3.6:	Explain the different types of testing that can be performed in a complex software system. **Standard Relation to Course: Supporting**
SC.912.PE.3.7:	Introduce complex problems and understand that these problems may be computationally unsolvable.
SC.912.PE.3.8:	Describe the concept of parallel processing as a strategy to solve large problems.
SC.912.PE.3.10:	Simplify a complex problem by using abstraction to manage complexity using functions and parameters, classes and methods.
SC.912.PE.3.11:	Perform advanced searches to locate information and design a data-collection approach to gather original data.

SC.912.PE.3.12:	Explain how data analysis is used to enhance the understanding of complex natural and human systems. **Standard Relation to Course: Supporting**
SC.912.PE.3.13:	Create a computational model that utilizes data to analyze and enhance the understanding of complex natural and human systems. **Standard Relation to Course: Supporting**
SC.912.PE.3.14:	Analyze data by identifying patterns through modeling and simulation of real-world data. **Standard Relation to Course: Supporting**
SC.912.PE.3.15:	Test the accuracy of scientific hypotheses using computer models and simulations. **Standard Relation to Course: Supporting**
SC.912.PE.3.16:	Design a representation of a computer program. **Clarifications:** *Clarification 1:* Instruction includes creating a plan that defines requirements, structural design, time estimates and testing elements. *Clarification 2:* Instruction includes the use of the software development cycle.
SC.912.PE.3.17:	Summarize the differences between an array and an array list.
SC.912.PE.3.18:	Explain the principles of cryptography. **Clarifications:** *Clarification 1:* Instruction includes the principles of confidentiality, integrity, authentication, non-repudiation and key management. **Standard Relation to Course: Supporting**
SC.912.PE.3.19:	Determine which encryption method is suitable for an intended task. **Clarifications:** *Clarification 1:* Instruction includes the use of digital signatures and authentication as encryption methods. **Standard Relation to Course: Supporting**

SC.912.PE.4.1:	Explore software development cycles that can be used to solve problems at different software development stages. **Clarifications:** *Clarification 1:* Instruction includes the following stages: analysis, design, coding, testing, verification and maintenance. **Standard Relation to Course: Supporting**
SC.912.PE.4.2:	Develop a software artifact according to a common software development methodology. **Clarifications:** *Clarification 1:* Instruction includes various software development methodologies, including waterfall, spiral model and agile. **Standard Relation to Course: Supporting**
SC.912.PE.4.3:	Identify the tools required to develop a program. **Standard Relation to Course: Supporting**
SC.912.PE.4.4:	Identify the software environment required to create a program within a specific language. **Clarifications:** *Example:* Johnny is given the assignment to create a simple addition program in his computer programming class. He decides to load a popular integrated development environment (IDE) to assist him with coding his program. Identify software environments that will aid Johnny with specific languages.
SC.912.PE.4.5:	Define user prompts for clarity and usability within a program. **Clarifications:** *Example:* Mrs. Jan has given her programming class the task of creating an age verification application. Paolo, a student in the class, initially runs into an issue where when a user enters their birth month out, the program crashes. Define a user prompt that will correct this issue.
SC.912.PE.4.6:	Write a program that utilizes both input and output.

	Clarifications: *Clarification 1:* Instruction includes the end user entering the input and the program delivering the output.
SC.912.PE.4.7:	Use internal documentation to collaboratively design a program according to accepted standards. **Clarifications:** *Clarification 1:* Instruction includes multiple creators communicating within a program utilizing "clean code."
SC.912.PE.4.8:	Create mobile computing applications and/or dynamic web pages using a variety of design and development tools, programming languages and mobile devices/emulators. **Clarifications:** *Clarification 1:* For this benchmark and depending on the task, students can create mobile computing applications, create dynamic web pages or create mobile computing applications and dynamic web pages. **Standard Relation to Course: Supporting**
SC.912.TI.1.2:	Identify ways to use technology to support lifelong learning. **Clarifications:** *Clarification 1:* Instruction includes the use of online tutorials, Artificial Intelligence (AI) and web searches to facilitate personal learning. **Standard Relation to Course: Supporting**
SC.912.TI.1.3:	Analyze the impact of digital media. **Clarifications:** *Clarification 1:* Instruction includes the analysis of digital media for implicit or explicit bias. *Clarification 2:* Instruction includes discerning fact from opinion within digital media. **Standard Relation to Course: Supporting**

SC.912.TI.1.4:	Analyze the impact of digital media on culture and persona. **Clarifications:** *Clarification 1:* Instruction includes the effects of digital media on self- image and societal changes. **Standard Relation to Course: Supporting**
SC.912.TI.1.5:	Describe the impact of computing on business and commerce. **Standard Relation to Course: Supporting**
SC.912.TI.1.6:	Describe how technology impacts personal life. **Clarifications:** *Clarification 1:* Instruction includes evaluating the impact of smartwatches and various Internet of Things (IoT) devices.
SC.912.TI.1.7:	Evaluate ways in which technology may improve accessibility for the varying needs of learners, including students with disabilities (SWD). **Clarifications:** *Clarification 1:* Instruction includes assistive and instructional technologies. **Standard Relation to Course: Supporting**
SC.912.TI.1.8:	Explain how economic and societal factors are affected by access to critical information. **Standard Relation to Course: Supporting**
SC.912.TI.1.9:	Evaluate access and distribution of technology in a global society. **Clarifications:** *Clarification 1:* Instruction includes providing possible solutions to the challenges to equal access and the distribution of technology. **Standard Relation to Course: Supporting**
SC.912.TI.1.11:	Evaluate the benefits of technology regarding environmental concerns. **Clarifications:** *Clarification 1:* Within this benchmark, the expectation is that

	students will recognize occurrences such as a technological drought and its impact on the surrounding area.
	Standard Relation to Course: Supporting
SC.912.TI.1.12:	Examine the history of networking devices. **Clarifications:** *Clarification 1:* Instruction includes hubs, switches, ethernet cabling, wireless technology and fiber optics. **Standard Relation to Course: Supporting**
SC.912.TI.1.13:	Examine the historical impact of social media. **Clarifications:** *Clarification 1:* Instruction includes discussing the purpose of social media. *Clarification 2:* Instruction includes analyzing the impact of current social media platforms.
SC.912.TI.2.2:	Demonstrate knowledge of the Internet safety policy as it applies to state and district guidelines. **Clarifications:** *Clarification 1:* Instruction focuses on the current school district guidelines in which the student is enrolled. *Clarification 2:* Instruction includes local and state level statutory requirements that govern Internet use.
SC.912.TI.2.3:	Recognize the terms and policies associated with the use of public access points. **Clarifications:** *Clarification 1:* Instruction includes understanding that using public access points may pose security risks.

	Clarification 2: Instruction includes discussing the importance of reading the full terms and conditions when using public access points.
	Standard Relation to Course: Supporting
SC.912.TI.2.4:	Explore the legal ramifications of technology use. **Clarifications:** *Clarification 1:* Instruction includes differentiating between legal and ethical responsibility. *Clarification 2:* Instruction includes understanding the importance of staying current with legal changes.
SC.912.TI.2.5:	Describe and model the legal use of modern communication media and devices. **Clarifications:** *Clarification 1:* Instruction includes the responsible use of modern communication media and devices. *Clarification 2:* Instruction includes discussion of personal safety when utilizing technology.
	Standard Relation to Course: Supporting
SC.912.TI.2.6:	Evaluate the impacts of the irresponsible use of information on collaborative projects. **Clarifications:** *Clarification 1:* Instruction includes discussing plagiarism, artificial intelligence (AI) chat usage and falsification of data.
SC.912.TI.2.7:	Describe differences between open source, freeware and proprietary software licenses and how they apply to different types of software.
SC.912.TI.2.8:	Evaluate the consequences of misrepresenting digital work as your own. **Clarifications:** *Clarification 1:* Instruction includes plagiarism, infringement and digital theft.

SC.912.TI.2.9:	Analyze how different categories of software licenses can be used to share and protect intellectual property. **Clarifications:** *Clarification 1:* Types of software licenses include open source and proprietary licenses.
SC.912.TI.2.10:	Analyze how access to information may not include the right to distribute the information. **Clarifications:** *Clarification 1:* Instruction includes comparing licensing in relation to ownership and distribution.
SC.912.TI.2.11:	Utilize citation tools when using digital information.
SC.912.TI.2.12:	Describe legal regulations that govern Internet usage and interaction. **Standard Relation to Course: Supporting**
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners.

	• Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context.

	• Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency: • Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.** Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence. **Clarifications:** Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning. • Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods.

	• Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.** Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. **Clarifications:** Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems. • Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
MA.K12.MTR.6.1:	**Assess the reasonableness of solutions.** Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context.

	Clarifications: Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
	Apply mathematics to real-world contexts. Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency.
MA.K12.MTR.7.1:	**Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts: • Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation. • Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of

	details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations. 4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
	Read and comprehend grade-level complex texts proficiently.
ELA.K12.EE.2.1:	**Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
	Make inferences to support comprehension.
ELA.K12.EE.3.1:	**Clarifications:** Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.
	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations.
ELA.K12.EE.4.1:	**Clarifications:** In kindergarten, students learn to listen to one another respectfully. In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because

	_____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work. **Clarifications:** Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.SI.1:	English language learners communicate for social and instructional purposes within the school setting.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic

success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Accommodation changes the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Computer Programming Fundamentals offers an introduction to the essential concepts of computer science through programming. Students will explore key topics such as problem-solving techniques, data structure organization for managing large datasets and the development and implementation of algorithms for data processing and information discovery.

The course emphasizes evaluating potential solutions and considering the ethical and social impacts of computing systems. It strongly focuses on object-oriented programming and design using an appropriate programming language. This course covers core programming concepts typically found in a first-semester college-level Computer Science course, preparing students for more advanced studies in the field. A solid understanding of mathematical reasoning, including linear functions and the Cartesian (x, y) coordinate system, is recommended for success in this course.

General Information

Course Path: Request ID: 3363 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades 9 to 12 and Adult Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 3

Course Attributes: Honors

Number of Credits: One (1) credit

Course Year: 2025

Abbreviated Title: COMPUTER PRGRM FUND H

Course Length: Year (Y)

Course Type: Elective Course

Graduation Requirements:

- Electives

Submitted By: Whitney Gaddis

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

Conceptual Cybersecurity (Request #3361)

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Aligned Standards

Name	Description
SC.K12.CTR.1.1:	**Actively participate in effortful learning both individually and collaboratively.** Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity. • Develop students' ability to justify methods and compare their responses to the responses of their peers.

SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills. • Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow. • Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal:

	• Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking: • Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems.

	• Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.912.CC.1.1:	Evaluate digital modes of communication and collaboration. **Clarifications:** *Clarification 1:* Instruction includes examples of appropriate tools including email, instant messaging, word processors and virtual meeting software.
SC.912.CC.1.2:	Utilize tools within a project environment to communicate. **Clarifications:** *Clarification 1:* Instruction includes discussing the productivity of each tool.
SC.912.CC.1.3:	Present information and data using presentation software. **Clarifications:** *Clarification 1:* Instruction includes computing devices such as probes, sensors, software tools, programs and handheld devices. *Clarification 2:* Instruction includes analyzing and presenting interactive data visualizations.

SC.912.CC.1.4:	Create a digital artifact utilizing collaboration, reflection, analysis and iteration.
SC.912.CC.2.1:	Collaborate to publish information and data for a variety of audiences using digital tools and media-rich resources.
SC.912.CC.2.2:	Assess how collaboration influences the design and development of software artifacts. **Clarifications:** *Clarification 1:* Instruction includes comparing an individually designed project to a collaboratively designed project.
SC.912.CC.2.3:	Evaluate program designs and implementations for readability and usability. **Clarifications:** *Clarification 1:* Instruction includes evaluating programs done by third parties, peers and marketable programs.
SC.912.CC.2.4:	Critique the strengths and weaknesses of the collaborative process when creating digital products.
SC.912.CO.1.1:	Describe the efficiency and effectiveness of digital tools or resources used for real-world tasks.
SC.912.CO.1.2:	Identify and select the file format based on trade-offs. **Clarifications:** *Clarification 1:* Trade-offs for the most appropriate file format include analyzing the size, quality and accessibility of the file.
SC.912.CO.1.3:	Select and use the correct file type for specific tasks.
SC.912.CO.1.4:	Describe the relationship between drivers, hardware and operating systems. **Clarifications:** *Clarification 1:* Instruction focuses on the driver acting as a communication bridge between hardware and the operating system.
SC.912.CO.1.5:	Describe the organization of a computer and its principal components.

	Clarifications: *Clarification 1:* Instruction includes the identification of components by name, function and the interaction between them.
SC.912.CO.1.7:	Describe the process of protecting computer hardware from exploitation. **Clarifications:** *Clarification 1:* Instruction includes disabled unused USB ports, windows lock screens and managed access to restricted areas. *Clarification 2:* Instruction includes the role of hardware such as tablets, phones and other devices. *Clarification 3:* Instruction includes the role of cyber security software.
SC.912.CO.1.8:	Describe how the Internet facilitates global communication. **Clarifications:** *Clarification 1:* Instruction includes the grouping of smaller networks to provide a world wide web that facilitates communication.
SC.912.CO.1.9:	Evaluate the accuracy, relevance, comprehensiveness and bias of electronic information resources.
SC.912.CO.2.1:	Explore the function of Basic Input/Output System (BIOS) and Unified Extensible Firmware Interface (UEFI) in a computer.
SC.912.CO.2.2:	Explore motherboard variations. **Clarifications:** *Clarification 1:* Instruction includes sizes, input and output, central processing unit (CPU) socket type and expansion slots.
SC.912.CO.2.3:	Discuss the central processing unit (CPU). **Clarifications:** *Clarification 1:* Instruction includes similarities and differences between CPUs.

	Clarification 2: Instruction includes multi-core processing, hyper-threading and socket type.
SC.912.CO.2.4:	Explore the role of a power supply unit (PSU) in relation to a computer system. **Clarifications:** *Clarification 1:* Instruction includes wattage, modulation (semi, non and fully modular) and connector type. *Clarification 2:* Instruction includes the correct wattage for devices to prevent damage.
SC.912.CO.2.5:	Analyze the purpose of various random-access memory (RAM) speeds and storage sizes. **Clarifications:** *Clarification 1:* Instruction includes temporary storage space and speed in relation to communication with the processor. *Clarification 2:* Instruction includes how computers store different data types in random access memory (RAM).
SC.912.CO.2.7:	Evaluate various forms of input and output (IO). **Clarifications:** *Clarification 1:* Instruction includes data used for or produced by input and output.
SC.912.CO.2.8:	Evaluate the basic components of wired computer networks. **Clarifications:** *Clarification 1:* Within this benchmark, components include a network interface card (NIC), an ethernet cable and a network switch. *Clarification 2:* Instruction includes two or more devices to communicate on a network.
SC.912.CO.2.9:	Evaluate the basic components of wireless computer networks.

	Clarifications: *Clarification 1:* Within this benchmark, components include a Wi-Fi adapter and wireless access point. *Clarification 2:* Instruction includes two or more devices to communicate on a network.
SC.912.CO.2.11:	Investigate the issues that impact network functionality.
SC.912.CO.2.12:	Describe common network protocols.
SC.912.CO.2.13:	Discern how common network protocols are applied by client-server and peer-to-peer networks.
SC.912.CO.2.14:	Explore the role of dynamic host control protocol (DHCP) in a networking system. **Clarifications:** *Clarification 1:* Instruction includes discussing how the DHCP client and DHCP server communicate.
SC.912.CO.2.15:	Analyze the importance of subnetting. **Clarifications:** *Clarification 1:* Instruction includes reducing traffic and improved speeds. **Clarifications:** *Example:* Ruby is a network technician at a hospital in Ft. Pierce. Her hospital has over 100 computers active on the internet at one time. Ruby would like to reduce bandwidth lag on the outgoing internet traffic. How can Ruby utilize subnetting to solve the hospital's problem?
SC.912.CO.2.16:	Describe how devices are identified on a network. **Clarifications:** *Clarification 1:* Instruction includes differentiation between public and private Internet protocol (IP) addresses.

SC.912.CO.2.17:	Identify similarities and differences between Internet protocol versions. **Clarifications:** *Clarification 1:* Instruction includes the understanding that Internet protocol version 4 (IPv4) is binary and that Internet protocol version 6 (IPv6) is hexadecimal.
SC.912.CO.2.18:	Examine 2.4 gigahertz (GHz) and 5 gigahertz (GHz) wireless networks.
SC.912.CO.3.1:	Analyze various operating systems. **Clarifications:** *Clarification 1:* Instruction includes similarities and differences in operating systems.
SC.912.CO.3.2:	Develop criteria for selecting software when solving a specific real-world problem. **Clarifications:** *Clarification 1:* Instruction includes evaluating cost, features, reliability and usability.
SC.912.CO.3.3:	Examine the difference between operating system (OS) software and application software. **Clarifications:** *Clarification 1:* Instruction includes the role that operating systems play in relation to application programs.
SC.912.CO.3.4:	Explain how automated software testing can reduce the cost of the testing effort.
SC.912.CS.1.1:	Identify possible risks to maintaining data confidentiality. **Clarifications:** *Clarification 1:* Within this benchmark, risks include shoulder surfing, illicit access to devices and theft of sensitive items.
SC.912.CS.1.2:	Describe computer security vulnerabilities. **Clarifications:** *Clarification 1:* Instruction includes student understanding that a computer worm can replicate itself across the network without

	human interaction while a computer virus requires human interaction to replicate.
SC.912.CS.1.3:	Evaluate computer security vulnerabilities. **Clarifications:** *Clarification 1:* Instruction includes evaluating the effects of attacks on computer systems. *Clarification 2:* Instruction includes evaluating the social and economic impacts on people.
SC.912.CS.2.1:	Analyze security and privacy issues that relate to computer networks and network connected devices.
SC.912.CS.2.2:	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.2.3:	Apply network security concepts and strategies to real-world simulations.
SC.912.CS.3.1:	Investigate ransomware attacks.
SC.912.CS.3.2:	Explore access control rules.
SC.912.CS.3.3:	Analyze the limitations of a program's temporary storage and the security vulnerabilities.
SC.912.CS.3.4:	Trace the social engineering attack cycle. **Clarifications:** *Clarification 1:* Instruction includes the various ways of collecting information, relationship building and how that information is used for exploitation. *Clarification 2:* Instruction includes discussing and evaluating the social and economic impact of the cycle on computer systems and people.
SC.912.ET.1.1:	Describe the emerging features of mobile devices, smart devices and vehicles.

SC.912.ET.1.2:	Describe the physical and cognitive challenges faced by users when learning to use computer interfaces.
SC.912.ET.1.4:	Examine device-to-device interactions that exclude human input. **Clarifications:** *Clarification 1:* Instruction includes making the connection to machine-to-machine (M2M) interaction.
SC.912.ET.1.7:	Describe how technology has changed the way people build and manage organizations and how technology impacts personal life.
SC.912.HS.1.1:	Identify potential dangers to an individual's safety and security online. **Clarifications:** *Clarification 1:* Instruction includes the use of email, chat rooms and other forms of direct electronic communication. *Clarification 2:* Instruction includes the dangers of direct electronic communication including predatory behavior and human trafficking.
SC.912.HS.1.2:	Evaluate the consequences of cyberbullying. **Clarifications:** *Clarification 1:* Instruction includes the consequences for an individual engaged in bullying behavior. *Clarification 2:* Instruction includes the consequences suffered by the victim of cyberbullying. *Clarification 3:* Instruction includes the Jeffrey Johnson Stand Up for All Students Act.
SC.912.HS.1.3:	Determine the consequences of inaction when witnessing unsafe Internet practices. **Clarifications:** *Clarification 1:* Instruction focuses on the possible outcomes when suspicious Internet activity is not reported.

SC.912.HS.1.4:	Examine the positive outcomes when someone reports suspicious behavior on the Internet. **Clarifications:** *Clarification 1:* Instruction focuses on positive outcomes when action is taken relating to Internet reporting. *Clarification 2:* Instruction includes reporting to parents, school staff and peers.
SC.912.HS.1.5:	Evaluate the risks to personal information while accessing the Internet. **Clarifications:** *Clarification 1:* Instruction includes access to software, websites or web applications that do not protect against the disclosure, use or dissemination of an individual's personal information. *Clarification 2:* Instruction includes theft of personal data including social security numbers, banking information and identity. **Clarifications:** *Example:* John was on a new questionable website the previous night playing video games. When he woke up the following morning, he discovered that his email address had 30 new spam emails advertising various products. John noticed that his checking account also had $20 missing from unauthorized charges. What do you think happened and what should his following steps be?
SC.912.HS.1.6:	Describe the impact of permissible privacy and security. **Clarifications:** *Clarification 1:* Instruction includes, but is not limited to, discussing privacy and security as it relates to account settings, cookies and application permissions.
SC.912.HS.1.7:	Construct strategies to combat cyberbullying or online harassment.
SC.912.HS.3.1:	Discuss the permanency of data on the Internet.

	Clarifications: *Clarification 1:* Instruction includes the permanency of sharing materials through digital communication and how it can affect future jobs, scholarship opportunities and potential positions. *Clarification 2:* Instruction focuses on confirmation of legitimacy before interacting with information from others, including liking, sharing and reposting.
SC.912.HS.3.2:	Analyze how social media influences the digital footprint of individuals, communities and cultures.
SC.912.PE.1.1:	Write code segments. **Clarifications:** *Clarification 1:* Instruction includes writing code segments that accept arguments and other segments such as functions, subroutines and methods.
SC.912.PE.1.2:	Create iterative and non-iterative structures within a program. **Clarifications:** *Clarification 1:* Iterative structures include nested iterative structures.
SC.912.PE.1.3:	Create selection structures within a program. **Clarifications:** *Clarification 1:* Instruction includes explaining selection structures and their uses within a program.
SC.912.PE.1.4:	Write a void function that does not return a value. **Clarifications:** *Clarification 1:* Instruction includes understanding that while void functions perform a function, it does not return a value.
SC.912.PE.1.5:	Write a non-void function that will return a value.

	Clarifications: *Clarification 1:* Methods of function writing include the example of "Hello World" and other value-returning functions.
SC.912.PE.1.10:	Write programs that validate user input.
SC.912.PE.1.15:	Implement a program using an integrated development environment (IDE) commonly used.
SC.912.PE.1.16:	Explain the distinction between a programming language's standard library and the Application Programming Interface (API). **Clarifications:** *Clarification 1:* Instruction includes facilitating programming solutions using API and libraries. *Clarification 2:* Instruction includes explaining the role of an API in the development of applications.
SC.912.PE.1.23:	Compile, run, test and debug a digital artifact.
SC.912.PE.2.3:	Compare techniques for analyzing massive data collections.
SC.912.PE.3.5:	Differentiate automated testing platforms and their uses.
SC.912.PE.3.18:	Explain the principles of cryptography. **Clarifications:** *Clarification 1:* Instruction includes the principles of confidentiality, integrity, authentication, non-repudiation and key management.
SC.912.PE.3.19:	Determine which encryption method is suitable for an intended task. **Clarifications:** *Clarification 1:* Instruction includes the use of digital signatures and authentication as encryption methods.
SC.912.TI.1.1:	Analyze historical trends in hardware and software.
SC.912.TI.1.2:	Identify ways to use technology to support lifelong learning. **Clarifications:** *Clarification 1:* Instruction includes the use of online tutorials,

	Artificial Intelligence (AI) and web searches to facilitate personal learning.
SC.912.TI.1.9:	Evaluate access and distribution of technology in a global society. **Clarifications:** *Clarification 1:* Instruction includes providing possible solutions to the challenges to equal access and the distribution of technology.
SC.912.TI.1.10:	Analyze technology-related career paths. **Clarifications:** *Clarification 1:* Technological career paths include programming, medical, health information technology (IT) and various other upcoming industries. *Clarification 2:* Instruction includes predicting future technology-related career trends.
SC.912.TI.1.12:	Examine the history of networking devices. **Clarifications:** *Clarification 1:* Instruction includes hubs, switches, ethernet cabling, wireless technology and fiber optics.
SC.912.TI.2.1:	Research how social media and technology can be used to distort, exaggerate or misrepresent information. **Clarifications:** *Clarification 1:* Instruction includes the consequences associated with posting misinformation, such as slander, libel and defamation. *Clarification 2:* Within this benchmark, emphasis should be placed on the impact of misinformation (clickbait, gaslighting, fake news, propaganda and deepfakes) on individuals, communities and cultures.
SC.912.TI.2.2:	Demonstrate knowledge of the Internet safety policy as it applies to state and district guidelines. **Clarifications:**

	Clarification 1: Instruction focuses on the current school district guidelines in which the student is enrolled. *Clarification 2:* Instruction includes local and state level statutory requirements that govern Internet use.
SC.912.TI.2.3:	Recognize the terms and policies associated with the use of public access points. **Clarifications:** *Clarification 1:* Instruction includes understanding that using public access points may pose security risks. *Clarification 2:* Instruction includes discussing the importance of reading the full terms and conditions when using public access points.
SC.912.TI.2.4:	Explore the legal ramifications of technology use. **Clarifications:** *Clarification 1:* Instruction includes differentiating between legal and ethical responsibility. *Clarification 2:* Instruction includes understanding the importance of staying current with legal changes.
SC.912.TI.2.5:	Describe and model the legal use of modern communication media and devices. **Clarifications:** *Clarification 1:* Instruction includes the responsible use of modern communication media and devices. *Clarification 2:* Instruction includes discussion of personal safety when utilizing technology.
SC.912.TI.2.6:	Evaluate the impacts of the irresponsible use of information on collaborative projects.

	Clarifications: *Clarification 1:* Instruction includes discussing plagiarism, artificial intelligence (AI) chat usage and falsification of data.
SC.912.TI.2.7:	Describe differences between open source, freeware and proprietary software licenses and how they apply to different types of software.
SC.912.TI.2.8:	Evaluate the consequences of misrepresenting digital work as your own. **Clarifications:** *Clarification 1:* Instruction includes plagiarism, infringement and digital theft.
SC.912.TI.2.9:	Analyze how different categories of software licenses can be used to share and protect intellectual property. **Clarifications:** *Clarification 1:* Types of software licenses include open source and proprietary licenses.
SC.912.TI.2.10:	Analyze how access to information may not include the right to distribute the information. **Clarifications:** *Clarification 1:* Instruction includes comparing licensing in relation to ownership and distribution.
SC.912.TI.2.11:	Utilize citation tools when using digital information.
SC.912.TI.2.12:	Describe legal regulations that govern Internet usage and interaction.
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks.

	• Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses.

	• Show students that various representations can have different purposes and can be useful in different situations.
	Complete tasks with mathematical fluency. Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations.
MA.K12.MTR.3.1:	**Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency: • Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
	Engage in discussions that reflect on the mathematical thinking of self and others. Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others:
MA.K12.MTR.4.1:	• Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence.

Clarifications:
Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others:

- Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning.
- Create opportunities for students to discuss their thinking with peers.
- Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods.
- Develop students' ability to justify methods and compare their responses to the responses of their peers.

Use patterns and structure to help understand and connect mathematical concepts.

Mathematicians who use patterns and structure to help understand and connect mathematical concepts:

- Focus on relevant details within a problem.
- Create plans and procedures to logically order events, steps or ideas to solve problems.
- Decompose a complex problem into manageable parts.
- Relate previously learned concepts to new concepts.
- Look for similarities among problems.
- Connect solutions of problems to more complicated large-scale situations.

MA.K12.MTR.5.1:

Clarifications:
Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts:

- Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts.
- Support students to develop generalizations based on the similarities found among problems.
- Provide opportunities for students to create plans and procedures to solve problems.
- Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

MA.K12.MTR.6.1:	**Assess the reasonableness of solutions.** Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
MA.K12.MTR.7.1:	**Apply mathematics to real-world contexts.** Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency. **Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts: • Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation.

	• Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations. 4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently. **Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension. **Clarifications:** Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.

ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully. In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work. **Clarifications:** Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.MA.1:	English language learners communicate information, ideas and concepts necessary for academic success in the content area of Mathematics.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards

(MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Accommodation changes the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Conceptual Cybersecurity offers a comprehensive introduction to the core principles of cybersecurity. Students will delve into topics such as cyber threats, vulnerabilities, and attacks, gaining an understanding of how these elements impact digital security. The course also covers essential areas like encryption, network security and malware, providing a solid foundation in the basics of cybersecurity.

By the end of the course, students will have developed the skills necessary to recognize potential cyber threats, assess security risks, and apply basic cybersecurity practices to protect personal information. This course equips students with the foundational knowledge required to navigate the increasingly complex digital landscape.

General Information

Course Path: Request ID: 3361 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades 9 to 12 and Adult Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Number of Credits: One (1) credit

Course Year: 2025

Abbreviated Title: CYBERSECURITY

Course Length: Year (Y)

Course Type: Elective Course

Graduation Requirements:

- Electives

Submitted By: Whitney Gaddis

Request Justification:

New course due to standards revision process

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

Discovering Computer Science (Request #3359)

This document was generated on CPALMS - www.cpalms.org

Aligned Standards

Name	Description
SC.K12.CTR.1.1:	**Actively participate in effortful learning both individually and collaboratively.** Students who actively participate in effortful learning both individually and with others: • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity. • Develop students' ability to justify methods and compare their responses to the responses of their peers.

SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts. • Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills. • Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.
SC.K12.CTR.5.1:	**Create an algorithm to achieve a given goal.** Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow. • Verify possible solutions by explaining the program or methods used. **Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal:

	• Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task. **Clarifications:** Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation. • Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking: • Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems.

	• Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.912.CC.1.1:	Evaluate digital modes of communication and collaboration. **Clarifications:** *Clarification 1:* Instruction includes examples of appropriate tools including email, instant messaging, word processors and virtual meeting software.
SC.912.CC.1.2:	Utilize tools within a project environment to communicate. **Clarifications:** *Clarification 1:* Instruction includes discussing the productivity of each tool.
SC.912.CC.1.3:	Present information and data using presentation software. **Clarifications:** *Clarification 1:* Instruction includes computing devices such as probes, sensors, software tools, programs and handheld devices. *Clarification 2:* Instruction includes analyzing and presenting interactive data visualizations.

SC.912.CC.1.4:	Create a digital artifact utilizing collaboration, reflection, analysis and iteration.
SC.912.CC.2.1:	Collaborate to publish information and data for a variety of audiences using digital tools and media-rich resources.
SC.912.CC.2.2:	Assess how collaboration influences the design and development of software artifacts. **Clarifications:** *Clarification 1:* Instruction includes comparing an individually designed project to a collaboratively designed project.
SC.912.CC.2.3:	Evaluate program designs and implementations for readability and usability. **Clarifications:** *Clarification 1:* Instruction includes evaluating programs done by third parties, peers and marketable programs.
SC.912.CC.2.4:	Critique the strengths and weaknesses of the collaborative process when creating digital products.
SC.912.CO.1.1:	Describe the efficiency and effectiveness of digital tools or resources used for real-world tasks.
SC.912.CO.1.2:	Identify and select the file format based on trade-offs. **Clarifications:** *Clarification 1:* Trade-offs for the most appropriate file format include analyzing the size, quality and accessibility of the file.
SC.912.CO.1.4:	Describe the relationship between drivers, hardware and operating systems. **Clarifications:** *Clarification 1:* Instruction focuses on the driver acting as a communication bridge between hardware and the operating system.
SC.912.CO.1.5:	Describe the organization of a computer and its principal components.

	Clarifications: *Clarification 1:* Instruction includes the identification of components by name, function and the interaction between them.
SC.912.CO.1.7:	Describe the process of protecting computer hardware from exploitation. **Clarifications:** *Clarification 1:* Instruction includes disabled unused USB ports, windows lock screens and managed access to restricted areas. *Clarification 2:* Instruction includes the role of hardware such as tablets, phones and other devices. *Clarification 3:* Instruction includes the role of cyber security software.
SC.912.CO.1.8:	Describe how the Internet facilitates global communication. **Clarifications:** *Clarification 1:* Instruction includes the grouping of smaller networks to provide a world wide web that facilitates communication.
SC.912.CO.1.9:	Evaluate the accuracy, relevance, comprehensiveness and bias of electronic information resources.
SC.912.CO.2.3:	Discuss the central processing unit (CPU). **Clarifications:** *Clarification 1:* Instruction includes similarities and differences between CPUs. *Clarification 2:* Instruction includes multi-core processing, hyper-threading and socket type.
SC.912.CO.2.4:	Explore the role of a power supply unit (PSU) in relation to a computer system. **Clarifications:**

	Clarification 1: Instruction includes wattage, modulation (semi, non and fully modular) and connector type. *Clarification 2:* Instruction includes the correct wattage for devices to prevent damage.
SC.912.CO.2.7:	Evaluate various forms of input and output (IO). **Clarifications:** *Clarification 1:* Instruction includes data used for or produced by input and output.
SC.912.CO.2.8:	Evaluate the basic components of wired computer networks. **Clarifications:** *Clarification 1:* Within this benchmark, components include a network interface card (NIC), an ethernet cable and a network switch. *Clarification 2:* Instruction includes two or more devices to communicate on a network.
SC.912.CO.2.9:	Evaluate the basic components of wireless computer networks. **Clarifications:** *Clarification 1:* Within this benchmark, components include a Wi-Fi adapter and wireless access point. *Clarification 2:* Instruction includes two or more devices to communicate on a network.
SC.912.CO.2.11:	Investigate the issues that impact network functionality.
SC.912.CO.2.16:	Describe how devices are identified on a network. **Clarifications:** *Clarification 1:* Instruction includes differentiation between public and private Internet protocol (IP) addresses.
SC.912.CO.3.2:	Develop criteria for selecting software when solving a specific real-world problem.

	Clarifications: *Clarification 1:* Instruction includes evaluating cost, features, reliability and usability.
SC.912.CO.3.3:	Examine the difference between operating system (OS) software and application software. **Clarifications:** *Clarification 1:* Instruction includes the role that operating systems play in relation to application programs.
SC.912.CS.1.1:	Identify possible risks to maintaining data confidentiality. **Clarifications:** *Clarification 1:* Within this benchmark, risks include shoulder surfing, illicit access to devices and theft of sensitive items.
SC.912.CS.1.2:	Describe computer security vulnerabilities. **Clarifications:** *Clarification 1:* Instruction includes student understanding that a computer worm can replicate itself across the network without human interaction while a computer virus requires human interaction to replicate.
SC.912.CS.1.3:	Evaluate computer security vulnerabilities. **Clarifications:** *Clarification 1:* Instruction includes evaluating the effects of attacks on computer systems. *Clarification 2:* Instruction includes evaluating the social and economic impacts on people.
SC.912.CS.2.1:	Analyze security and privacy issues that relate to computer networks and network connected devices.
SC.912.CS.2.2:	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.3.4:	Trace the social engineering attack cycle.

	Clarifications: *Clarification 1:* Instruction includes the various ways of collecting information, relationship building and how that information is used for exploitation. *Clarification 2:* Instruction includes discussing and evaluating the social and economic impact of the cycle on computer systems and people.
SC.912.ET.1.1:	Describe the emerging features of mobile devices, smart devices and vehicles.
SC.912.ET.1.2:	Describe the physical and cognitive challenges faced by users when learning to use computer interfaces.
SC.912.ET.1.4:	Examine device-to-device interactions that exclude human input. **Clarifications:** *Clarification 1:* Instruction includes making the connection to machine-to-machine (M2M) interaction.
SC.912.ET.1.5:	Explore the concepts of virtual and augmented reality.
SC.912.ET.1.7:	Describe how technology has changed the way people build and manage organizations and how technology impacts personal life.
SC.912.ET.2.1:	Explore the history of Artificial Intelligence (AI). **Clarifications:** *Clarification 1:* Instruction includes the application of AI tests. *Clarification 2:* Instruction includes how these tests have evolved along with AI.
SC.912.ET.2.5:	Describe major applications of artificial intelligence (AI) and machine learning. **Clarifications:** *Clarification 1:* Instruction includes discussing the applications to the medical, space and automotive fields.

SC.912.ET.2.6:	Describe how predictive Artificial Intelligence (AI) can be used to solve problems. **Clarifications:** *Clarification 1:* Instruction includes using predictive Artificial Intelligence (AI) to forecast trends, such as sports, the stock market and weather.
SC.912.ET.3.2:	Examine how robotics are used to address human challenges.
SC.912.HS.1.1:	Identify potential dangers to an individual's safety and security online. **Clarifications:** *Clarification 1:* Instruction includes the use of email, chat rooms and other forms of direct electronic communication. *Clarification 2:* Instruction includes the dangers of direct electronic communication including predatory behavior and human trafficking.
SC.912.HS.1.2:	Evaluate the consequences of cyberbullying. **Clarifications:** *Clarification 1:* Instruction includes the consequences for an individual engaged in bullying behavior. *Clarification 2:* Instruction includes the consequences suffered by the victim of cyberbullying. *Clarification 3:* Instruction includes the Jeffrey Johnson Stand Up for All Students Act.
SC.912.HS.1.3:	Determine the consequences of inaction when witnessing unsafe Internet practices. **Clarifications:** *Clarification 1:* Instruction focuses on the possible outcomes when suspicious Internet activity is not reported.
SC.912.HS.1.4:	Examine the positive outcomes when someone reports suspicious behavior on the Internet.

	Clarifications: *Clarification 1:* Instruction focuses on positive outcomes when action is taken relating to Internet reporting. *Clarification 2:* Instruction includes reporting to parents, school staff and peers.
SC.912.HS.1.5:	Evaluate the risks to personal information while accessing the Internet. **Clarifications:** *Clarification 1:* Instruction includes access to software, websites or web applications that do not protect against the disclosure, use or dissemination of an individual's personal information. *Clarification 2:* Instruction includes theft of personal data including social security numbers, banking information and identity. **Clarifications:** *Example:* John was on a new questionable website the previous night playing video games. When he woke up the following morning, he discovered that his email address had 30 new spam emails advertising various products. John noticed that his checking account also had $20 missing from unauthorized charges. What do you think happened and what should his following steps be?
SC.912.HS.1.6:	Describe the impact of permissible privacy and security. **Clarifications:** *Clarification 1:* Instruction includes, but is not limited to, discussing privacy and security as it relates to account settings, cookies and application permissions.
SC.912.HS.1.7:	Construct strategies to combat cyberbullying or online harassment.
SC.912.HS.2.1:	Prioritize regulating screen time and the use of electronic devices for mental and physical well-being.

	Clarifications: *Clarification 1:* Instruction includes the role of digital media and communication, gaming devices, cellular devices, television and other digital sources as they relate to mental and physical well-being.
SC.912.HS.2.2:	Investigate the correlation between sedentary behavior and digital device use.
SC.912.HS.2.3:	Assess the role of digital health trackers in promoting healthy behaviors.
SC.912.HS.2.4:	Analyze the relationship between eye strain related to use of technology and exposure to increased blue light. **Clarifications:** *Clarification 1:* Instruction focuses on blurred vision, headaches, sleep deprivation and eye fatigue.
SC.912.HS.3.1:	Discuss the permanency of data on the Internet. **Clarifications:** *Clarification 1:* Instruction includes the permanency of sharing materials through digital communication and how it can affect future jobs, scholarship opportunities and potential positions. *Clarification 2:* Instruction focuses on confirmation of legitimacy before interacting with information from others, including liking, sharing and reposting.
SC.912.HS.3.2:	Analyze how social media influences the digital footprint of individuals, communities and cultures.
SC.912.PE.1.1:	Write code segments. **Clarifications:** *Clarification 1:* Instruction includes writing code segments that accept arguments and other segments such as functions, subroutines and methods.
SC.912.PE.1.2:	Create iterative and non-iterative structures within a program.

	Clarifications: *Clarification 1:* Iterative structures include nested iterative structures.
SC.912.PE.1.3:	Create selection structures within a program. **Clarifications:** *Clarification 1:* Instruction includes explaining selection structures and their uses within a program.
SC.912.PE.1.10:	Write programs that validate user input.
SC.912.PE.1.12:	Classify programming languages. **Clarifications:** *Clarification 1:* Instruction includes the classification of paradigms by object-oriented and procedural. *Clarification 2:* Instruction includes the application of domains by scientific applications and commercial applications.
SC.912.PE.1.13:	Describe and identify types of programming errors. **Clarifications:** *Clarification 1:* Instruction includes syntax, logic, runtime and computation errors.
SC.912.PE.1.15:	Implement a program using an integrated development environment (IDE) commonly used.
SC.912.PE.1.17:	Examine the building blocks of algorithms. **Clarifications:** *Clarification 1:* Building blocks include sequence, selection, iteration and recursion.
SC.912.PE.1.18:	Develop a computer program. **Clarifications:**

	Clarification 1: Instruction includes meeting the requirements set by a plan. *Clarification 2:* Instruction includes the use of the software development cycle.
SC.912.PE.1.19:	Review a computer program to verify program functionality, programming styles, program usability and adherence to common programming standards. **Clarifications:** *Clarification 1:* Instruction includes peer review. *Clarification 2:* Instruction includes adherence to a programming language style guide.
SC.912.PE.1.20:	Write programs that use standard logic operators.
SC.912.PE.1.21:	Use Boolean logic to perform logical operations.
SC.912.PE.1.23:	Compile, run, test and debug a digital artifact.
SC.912.PE.2.3:	Compare techniques for analyzing massive data collections.
SC.912.PE.3.1:	Evaluate arithmetic expressions using operator precedence.
SC.912.PE.3.2:	Decompose a problem by defining new code segments.
SC.912.PE.3.4:	Evaluate algorithms by their efficiency, correctness and clarity. **Clarifications:** *Clarification 1:* Instruction includes analyzing and comparing execution times, testing with multiple inputs or data sets and debugging. *Clarification 2:* Instruction includes evaluating a well-known algorithm and implementing a new one. *Clarification 3:* Instruction includes comparing the efficiency between two or more algorithms.
SC.912.PE.3.11:	Perform advanced searches to locate information and design a data-collection approach to gather original data.

SC.912.PE.3.14:	Analyze data by identifying patterns through modeling and simulation of real-world data.
SC.912.PE.3.15:	Test the accuracy of scientific hypotheses using computer models and simulations.
SC.912.PE.3.16:	Design a representation of a computer program. **Clarifications:** *Clarification 1:* Instruction includes creating a plan that defines requirements, structural design, time estimates and testing elements. *Clarification 2:* Instruction includes the use of the software development cycle.
SC.912.PE.3.18:	Explain the principles of cryptography. **Clarifications:** *Clarification 1:* Instruction includes the principles of confidentiality, integrity, authentication, non-repudiation and key management.
SC.912.PE.4.5:	Define user prompts for clarity and usability within a program. **Clarifications:** *Example:* Mrs. Jan has given her programming class the task of creating an age verification application. Paolo, a student in the class, initially runs into an issue where when a user enters their birth month out, the program crashes. Define a user prompt that will correct this issue.
SC.912.PE.4.6:	Write a program that utilizes both input and output. **Clarifications:** *Clarification 1:* Instruction includes the end user entering the input and the program delivering the output.
SC.912.PE.4.7:	Use internal documentation to collaboratively design a program according to accepted standards.

	Clarifications: *Clarification 1:* Instruction includes multiple creators communicating within a program utilizing "clean code."
SC.912.TI.1.1:	Analyze historical trends in hardware and software.
SC.912.TI.1.2:	Identify ways to use technology to support lifelong learning. **Clarifications:** *Clarification 1:* Instruction includes the use of online tutorials, Artificial Intelligence (AI) and web searches to facilitate personal learning.
SC.912.TI.1.3:	Analyze the impact of digital media. **Clarifications:** *Clarification 1:* Instruction includes the analysis of digital media for implicit or explicit bias *Clarification 2:* Instruction includes discerning fact from opinion within digital media.
SC.912.TI.1.4:	Analyze the impact of digital media on culture and persona. **Clarifications:** *Clarification 1:* Instruction includes the effects of digital media on self- image and societal changes.
SC.912.TI.1.5:	Describe the impact of computing on business and commerce.
SC.912.TI.1.6:	Describe how technology impacts personal life. **Clarifications:** *Clarification 1:* Instruction includes evaluating the impact of smartwatches and various Internet of Things (IoT) devices.
SC.912.TI.1.7:	Evaluate ways in which technology may improve accessibility for the varying needs of learners, including students with disabilities (SWD).

	Clarifications: *Clarification 1:* Instruction includes assistive and instructional technologies.
SC.912.TI.1.8:	Explain how economic and societal factors are affected by access to critical information.
SC.912.TI.1.9:	Evaluate access and distribution of technology in a global society. **Clarifications:** *Clarification 1:* Instruction includes providing possible solutions to the challenges to equal access and the distribution of technology.
SC.912.TI.1.10:	Analyze technology-related career paths. **Clarifications:** *Clarification 1:* Technological career paths include programming, medical, health information technology (IT) and various other upcoming industries. *Clarification 2:* Instruction includes predicting future technology-related career trends.
SC.912.TI.1.12:	Examine the history of networking devices. **Clarifications:** *Clarification 1:* Instruction includes hubs, switches, ethernet cabling, wireless technology and fiber optics.
SC.912.TI.1.13:	Examine the historical impact of social media. **Clarifications:** *Clarification 1:* Instruction includes discussing the purpose of social media. *Clarification 2:* Instruction includes analyzing the impact of current social media platforms.
SC.912.TI.2.1:	Research how social media and technology can be used to distort, exaggerate or misrepresent information.

	Clarifications: *Clarification 1:* Instruction includes the consequences associated with posting misinformation, such as slander, libel and defamation. *Clarification 2:* Within this benchmark, emphasis should be placed on the impact of misinformation (clickbait, gaslighting, fake news, propaganda and deepfakes) on individuals, communities and cultures.
SC.912.TI.2.2:	Demonstrate knowledge of the Internet safety policy as it applies to state and district guidelines. **Clarifications:** *Clarification 1:* Instruction focuses on the current school district guidelines in which the student is enrolled. *Clarification 2:* Instruction includes local and state level statutory requirements that govern Internet use.
SC.912.TI.2.3:	Recognize the terms and policies associated with the use of public access points. **Clarifications:** *Clarification 1:* Instruction includes understanding that using public access points may pose security risks. *Clarification 2:* Instruction includes discussing the importance of reading the full terms and conditions when using public access points.
SC.912.TI.2.4:	Explore the legal ramifications of technology use. **Clarifications:** *Clarification 1:* Instruction includes differentiating between legal and ethical responsibility. *Clarification 2:* Instruction includes understanding the importance of staying current with legal changes.

SC.912.TI.2.5:	Describe and model the legal use of modern communication media and devices. **Clarifications:** *Clarification 1:* Instruction includes the responsible use of modern communication media and devices. *Clarification 2:* Instruction includes discussion of personal safety when utilizing technology.
SC.912.TI.2.6:	Evaluate the impacts of the irresponsible use of information on collaborative projects. **Clarifications:** *Clarification 1:* Instruction includes discussing plagiarism, artificial intelligence (AI) chat usage and falsification of data.
SC.912.TI.2.7:	Describe differences between open source, freeware and proprietary software licenses and how they apply to different types of software.
SC.912.TI.2.8:	Evaluate the consequences of misrepresenting digital work as your own. **Clarifications:** *Clarification 1:* Instruction includes plagiarism, infringement and digital theft.
SC.912.TI.2.9:	Analyze how different categories of software licenses can be used to share and protect intellectual property. **Clarifications:** *Clarification 1:* Types of software licenses include open source and proprietary licenses.
SC.912.TI.2.10:	Analyze how access to information may not include the right to distribute the information. **Clarifications:** *Clarification 1:* Instruction includes comparing licensing in relation to ownership and distribution.
SC.912.TI.2.11:	Utilize citation tools when using digital information.

MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach. **Clarifications:** Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.** Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose.

	Clarifications: Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency: • Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.**

	Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence. **Clarifications:** Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning. • Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.** Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations.

	Clarifications: Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems. • Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
	Assess the reasonableness of solutions. Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context.
MA.K12.MTR.6.1:	**Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
MA.K12.MTR.7.1:	**Apply mathematics to real-world contexts.** Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems.

	• Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency. **Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts: • Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation. • Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations. 4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently.

	Clarifications: See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension. **Clarifications:** Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.
ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully. In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work. **Clarifications:** Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our

	friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.SI.1:	English language learners communicate for social and instructional purposes within the school setting.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Accommodation changes the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs.

Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Discovering Computer Science introduces high school students to the fundamental principles of computer science, emphasizing its role as a tool for problem-solving, communication, and personal expression. This course highlights the visible and impactful aspects of computing, encouraging students to explore how computer science influences the world around them. Students will engage with the design process, understand how data can solve widespread issues, and learn how physical computing with circuit boards can facilitate various input and output functions.

The course aims to provide students with a comprehensive understanding of computer science as a critical component of modern education. Through hands-on projects and real-world applications, students will develop the skills needed to become active contributors to our increasingly technological society. Whether they pursue careers in technology or not, this course equips students with the knowledge and tools to interpret and influence the digital world, fostering an appreciation for the profound impact of computer science on everyday life.

General Information

Course Path: Request ID: 3359 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades 9 to 12 and Adult Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Number of Credits: One (1) credit

Course Year: 2025

Abbreviated Title: DISCOVERING CS

Course Length: Year (Y)

Graduation Requirements:

- Electives

Submitted By: Whitney Gaddis

Request Justification:

Due to the standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)

Principles of Computer Science (Request #3365)

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Aligned Standards

Name	Description
	Actively participate in effortful learning both individually and collaboratively. Students who actively participate in effortful learning both individually and with others:
SC.K12.CTR.1.1:	• Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.

	Clarifications: Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of learners. • Foster perseverance in students by choosing challenging tasks. • Recognize students' effort when solving challenging problems. • Emphasize project-based learning. • Establish a culture in which students ask questions of the teacher and their peers, and errors as a learning opportunity. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
SC.K12.CTR.2.1:	**Demonstrate understanding by decomposing a problem.** Students who demonstrate understanding by decomposing a problem: • Analyze the problems in a way that makes sense given the task. • Ask questions that will help with solving the task. • Break down complex problems into individual problems. • Decompose a complex problem into manageable parts. **Clarifications:** Teachers who encourage students to demonstrate understanding by decomposing a problem: • Develop students' ability to analyze and problem-solve. • Help students break complex tasks into subtasks. • Show students that the solution to individual parts allows them to solve complex problems more effectively.
SC.K12.CTR.3.1:	**Complete tasks with digital fluency.** Students who complete tasks with digital fluency: Select and use appropriate digital tools by their functions. • Demonstrate proper typing techniques and keyboarding skills. • Understand responsible technology use. • Use feedback to improve efficiency using digital tools. • Relate previously learned concepts to new concepts.

	• Solve problems by developing, testing and refining technological processes. **Clarifications:** Teachers who encourage students to complete tasks with digital fluency: • Provide students with opportunities to increase critical thinking skills. • Provide students with opportunities to use various technology hardware and software, so that technology is an integral part of the learning experience. Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
SC.K12.CTR.4.1:	**Express solutions as computational steps.** Students who express solutions as computational steps: • Solve problems step by step rather than all at once. • Represent solutions to problems in multiple ways, based on context or purpose. • Use patterns and structures to understand and connect computational concepts. • Check computations when solving problems. **Clarifications:** Teachers who encourage students to express solutions as computational steps: • Provide opportunities for students to develop sequentially based understandings of problems. • Guide students to align tasks to a step-by-step solution. • Select sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Prompt students to continually ask, "Does this solution make sense? How do you know?" • Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justification.

	Create an algorithm to achieve a given goal. Students who create algorithms to achieve a given goal: • Create or use a well-defined series of steps to achieve a desired outcome. • Compare the efficiency of an algorithm to those expressed by others. • Design a sequence of steps to follow. • Verify possible solutions by explaining the program or methods used.
SC.K12.CTR.5.1:	**Clarifications:** Teachers who encourage students to create an algorithm to achieve a given goal: • Support students to develop generalizations based on the similarities found among problems. • Have students estimate or predict solutions before solving. • Help students recognize the patterns in the world around them and connect these patterns to other concepts.
SC.K12.CTR.6.1:	**Differentiate between usable data and miscellaneous information.** Students who differentiate between usable data and miscellaneous information: • Express connections between concepts and representations. • Construct possible arguments based on evidence. • Perform decision-making between two actions. • Practice evaluating information and sources. • Perform investigations to gather data or determine if a program or method is appropriate. • Discern relevant, meaningful data from irrelevant or extraneous information. • Understand the characteristics and criteria determining whether data is relevant to a specific problem or task.
	Clarifications: Teachers who encourage students to differentiate between useable data and miscellaneous information: • Support students as they validate conclusions by comparing them to the given situation.

	• Create opportunities for students to discuss their thinking with peers.
SC.K12.CTR.7.1:	**Solve real-life problems in science and engineering using computational thinking.** Students who solve real-life problems in science and engineering using computational thinking: • Adapt procedures to find solutions and apply them to a new context. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. • Connect concepts to everyday experiences. • Use programs, models and methods to understand, represent and solve problems. • Indicate how various concepts can be applied to other disciplines. • Redesign programs, models and methods to improve accuracy or efficiency. Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to solve real-life problems in science and engineering using computational thinking: • Create learning opportunities that require logical reasoning and problem-solving skills. • Provide opportunities for students to create plans and procedures to solve problems. • Provide opportunities for students to create programs or models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their programs, models and methods.
SC.912.CC.1.1:	Evaluate digital modes of communication and collaboration. **Clarifications:** *Clarification 1:* Instruction includes examples of appropriate tools including email, instant messaging, word processors and virtual meeting software.
SC.912.CC.1.2:	Utilize tools within a project environment to communicate.

	Clarifications: *Clarification 1:* Instruction includes discussing the productivity of each tool.
SC.912.CC.1.3:	Present information and data using presentation software. **Clarifications:** *Clarification 1:* Instruction includes computing devices such as probes, sensors, software tools, programs and handheld devices. *Clarification 2:* Instruction includes analyzing and presenting interactive data visualizations.
SC.912.CC.1.4:	Create a digital artifact utilizing collaboration, reflection, analysis and iteration.
SC.912.CC.2.1:	Collaborate to publish information and data for a variety of audiences using digital tools and media-rich resources.
SC.912.CC.2.2:	Assess how collaboration influences the design and development of software artifacts. **Clarifications:** *Clarification 1:* Instruction includes comparing an individually designed project to a collaboratively designed project.
SC.912.CC.2.3:	Evaluate program designs and implementations for readability and usability. **Clarifications:** *Clarification 1:* Instruction includes evaluating programs done by third parties, peers and marketable programs.
SC.912.CC.2.4:	Critique the strengths and weaknesses of the collaborative process when creating digital products.
SC.912.CO.1.1:	Describe the efficiency and effectiveness of digital tools or resources used for real-world tasks.
SC.912.CO.1.2:	Identify and select the file format based on trade-offs.

	Clarifications: *Clarification 1:* Trade-offs for the most appropriate file format include analyzing the size, quality and accessibility of the file.
SC.912.CO.1.3:	Select and use the correct file type for specific tasks.
SC.912.CO.1.4:	Describe the relationship between drivers, hardware and operating systems. **Clarifications:** *Clarification 1:* Instruction focuses on the driver acting as a communication bridge between hardware and the operating system.
SC.912.CO.1.5:	Describe the organization of a computer and its principal components. **Clarifications:** *Clarification 1:* Instruction includes the identification of components by name, function and the interaction between them.
SC.912.CO.1.7:	Describe the process of protecting computer hardware from exploitation. **Clarifications:** *Clarification 1:* Instruction includes disabled unused USB ports, windows lock screens and managed access to restricted areas. *Clarification 2:* Instruction includes the role of hardware such as tablets, phones and other devices. *Clarification 3:* Instruction includes the role of cyber security software.
SC.912.CO.1.8:	Describe how the Internet facilitates global communication. **Clarifications:** *Clarification 1:* Instruction includes the grouping of smaller networks to provide a world wide web that facilitates communication.
SC.912.CO.1.9:	Evaluate the accuracy, relevance, comprehensiveness and bias of electronic information resources.
SC.912.CO.2.3:	Discuss the central processing unit (CPU).

	Clarifications: *Clarification 1:* Instruction includes similarities and differences between CPUs. *Clarification 2:* Instruction includes multi-core processing, hyper-threading and socket type.
SC.912.CO.2.4:	Explore the role of a power supply unit (PSU) in relation to a computer system. **Clarifications:** *Clarification 1:* Instruction includes wattage, modulation (semi, non and fully modular) and connector type. *Clarification 2:* Instruction includes the correct wattage for devices to prevent damage.
SC.912.CO.2.5:	Analyze the purpose of various random-access memory (RAM) speeds and storage sizes. **Clarifications:** *Clarification 1:* Instruction includes temporary storage space and speed in relation to communication with the processor. *Clarification 2:* Instruction includes how computers store different data types in random access memory (RAM).
SC.912.CO.2.7:	Evaluate various forms of input and output (IO). **Clarifications:** *Clarification 1:* Instruction includes data used for or produced by input and output.
SC.912.CO.2.8:	Evaluate the basic components of wired computer networks. **Clarifications:** *Clarification 1:* Within this benchmark, components include a network interface card (NIC), an ethernet cable and a network switch.

	Clarification 2: Instruction includes two or more devices to communicate on a network.
SC.912.CO.2.9:	Evaluate the basic components of wireless computer networks. **Clarifications:** *Clarification 1:* Within this benchmark, components include a Wi-Fi adapter and wireless access point. *Clarification 2:* Instruction includes two or more devices to communicate on a network.
SC.912.CO.2.10:	Explore the components of a data packet. **Clarifications:** *Clarification 1:* Instruction includes data breaking down into packets to be routed through networks.
SC.912.CO.2.11:	Investigate the issues that impact network functionality.
SC.912.CO.2.12:	Describe common network protocols.
SC.912.CO.2.16:	Describe how devices are identified on a network. **Clarifications:** *Clarification 1:* Instruction includes differentiation between public and private Internet protocol (IP) addresses.
SC.912.CO.2.17:	Identify similarities and differences between Internet protocol versions. **Clarifications:** *Clarification 1:* Instruction includes the understanding that Internet protocol version 4 (IPv4) is binary and that Internet protocol version 6 (IPv6) is hexadecimal.
SC.912.CO.2.18:	Examine 2.4 gigahertz (GHz) and 5 gigahertz (GHz) wireless networks.
SC.912.CO.3.2:	Develop criteria for selecting software when solving a specific real-world problem.

	Clarifications: *Clarification 1:* Instruction includes evaluating cost, features, reliability and usability.
SC.912.CO.3.3:	Examine the difference between operating system (OS) software and application software. **Clarifications:** *Clarification 1:* Instruction includes the role that operating systems play in relation to application programs.
SC.912.CS.1.1:	Identify possible risks to maintaining data confidentiality. **Clarifications:** *Clarification 1:* Within this benchmark, risks include shoulder surfing, illicit access to devices and theft of sensitive items.
SC.912.CS.1.2:	Describe computer security vulnerabilities. **Clarifications:** *Clarification 1:* Instruction includes student understanding that a computer worm can replicate itself across the network without human interaction while a computer virus requires human interaction to replicate.
SC.912.CS.1.3:	Evaluate computer security vulnerabilities. **Clarifications:** *Clarification 1:* Instruction includes evaluating the effects of attacks on computer systems. *Clarification 2:* Instruction includes evaluating the social and economic impacts on people.
SC.912.CS.2.1:	Analyze security and privacy issues that relate to computer networks and network connected devices.
SC.912.CS.2.2:	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.3.1:	Investigate ransomware attacks.

SC.912.CS.3.2:	Explore access control rules.
SC.912.CS.3.3:	Analyze the limitations of a programmer's temporary storage and the security vulnerabilities.
SC.912.CS.3.4:	Trace the social engineering attack cycle. **Clarifications:** *Clarification 1:* Instruction includes the various ways of collecting information, relationship building and how that information is used for exploitation. *Clarification 2:* Instruction includes discussing and evaluating the social and economic impact of the cycle on computer systems and people.
SC.912.DC.2.1:	Differentiate between a digital currency and a security. **Clarifications:** *Clarification 1:* Instruction includes securities serving as a placeholder of ownership or equity in an organization.
SC.912.DC.2.2:	Discuss the risks associated with digital currencies. **Clarifications:** *Clarification 1:* Instruction includes currencies that show no proof of work (POW) in blockchain.
SC.912.ET.1.1:	Describe the emerging features of mobile devices, smart devices and vehicles.
SC.912.ET.1.2:	Describe the physical and cognitive challenges faced by users when learning to use computer interfaces.
SC.912.ET.1.4:	Examine device-to-device interactions that exclude human input. **Clarifications:** *Clarification 1:* Instruction includes making the connection to machine-to-machine (M2M) interaction.
SC.912.ET.1.5:	Explore the concepts of virtual and augmented reality.

SC.912.ET.1.7:	Describe how technology has changed the way people build and manage organizations and how technology impacts personal life.
SC.912.ET.2.1:	Explore the history of Artificial Intelligence (AI). **Clarifications:** *Clarification 1:* Instruction includes the application of AI tests. *Clarification 2:* Instruction includes how these tests have evolved along with AI.
SC.912.ET.2.5:	Describe major applications of artificial intelligence (AI) and machine learning. **Clarifications:** *Clarification 1:* Instruction includes discussing the applications to the medical, space and automotive fields.
SC.912.ET.2.6:	Describe how predictive Artificial Intelligence (AI) can be used to solve problems. **Clarifications:** *Clarification 1:* Instruction includes using predictive Artificial Intelligence (AI) to forecast trends, such as sports, the stock market and weather.
SC.912.ET.3.2:	Examine how robotics are used to address human challenges.
SC.912.HS.1.1:	Identify potential dangers to an individual's safety and security online. **Clarifications:** *Clarification 1:* Instruction includes the use of email, chat rooms and other forms of direct electronic communication. *Clarification 2:* Instruction includes the dangers of direct electronic communication including predatory behavior and human trafficking.
SC.912.HS.1.2:	Evaluate the consequences of cyberbullying. **Clarifications:**

	Clarification 1: Instruction includes the consequences for an individual engaged in bullying behavior. *Clarification 2:* Instruction includes the consequences suffered by the victim of cyberbullying. *Clarification 3:* Instruction includes the Jeffrey Johnson Stand Up for All Students Act.
SC.912.HS.1.3:	Determine the consequences of inaction when witnessing unsafe Internet practices. **Clarifications:** *Clarification 1:* Instruction focuses on the possible outcomes when suspicious Internet activity is not reported.
SC.912.HS.1.4:	Examine the positive outcomes when someone reports suspicious behavior on the Internet. **Clarifications:** *Clarification 1:* Instruction focuses on positive outcomes when action is taken relating to Internet reporting. *Clarification 2:* Instruction includes reporting to parents, school staff and peers.
SC.912.HS.1.5:	Evaluate the risks to personal information while accessing the Internet. **Clarifications:** *Clarification 1:* Instruction includes access to software, websites or web applications that do not protect against the disclosure, use or dissemination of an individual's personal information. *Clarification 2:* Instruction includes theft of personal data including social security numbers, banking information and identity. **Clarifications:** *Example:* John was on a new questionable website the previous night

	playing video games. When he woke up the following morning, he discovered that his email address had 30 new spam emails advertising various products. John noticed that his checking account also had $20 missing from unauthorized charges. What do you think happened and what should his following steps be?
SC.912.HS.1.6:	Describe the impact of permissible privacy and security. **Clarifications:** *Clarification 1:* Instruction includes, but is not limited to, discussing privacy and security as it relates to account settings, cookies and application permissions.
SC.912.HS.1.7:	Construct strategies to combat cyberbullying or online harassment.
SC.912.HS.2.1:	Prioritize regulating screen time and the use of electronic devices for mental and physical well-being. **Clarifications:** *Clarification 1:* Instruction includes the role of digital media and communication, gaming devices, cellular devices, television and other digital sources as they relate to mental and physical well-being.
SC.912.HS.2.2:	Investigate the correlation between sedentary behavior and digital device use.
SC.912.HS.2.3:	Assess the role of digital health trackers in promoting healthy behaviors.
SC.912.HS.2.4:	Analyze the relationship between eye strain related to use of technology and exposure to increased blue light. **Clarifications:** *Clarification 1:* Instruction focuses on blurred vision, headaches, sleep deprivation and eye fatigue.
SC.912.HS.3.1:	Discuss the permanency of data on the Internet. **Clarifications:**

	Clarification 1: Instruction includes the permanency of sharing materials through digital communication and how it can affect future jobs, scholarship opportunities and potential positions. *Clarification 2:* Instruction focuses on confirmation of legitimacy before interacting with information from others, including liking, sharing and reposting.
SC.912.HS.3.2:	Analyze how social media influences the digital footprint of individuals, communities and cultures.
SC.912.PE.1.1:	Write code segments. **Clarifications:** *Clarification 1:* Instruction includes writing code segments that accept arguments and other segments such as functions, subroutines and methods.
SC.912.PE.1.2:	Create iterative and non-iterative structures within a program. **Clarifications:** *Clarification 1:* Iterative structures include nested iterative structures.
SC.912.PE.1.3:	Create selection structures within a program. **Clarifications:** *Clarification 1:* Instruction includes explaining selection structures and their uses within a program.
SC.912.PE.1.5:	Write a non-void function that will return a value. **Clarifications:** *Clarification 1:* Methods of function writing include the example of "Hello World" and other value-returning functions.
SC.912.PE.1.6:	Create a nested array to aggregate data. **Clarifications:** *Example:* Beth has written a code segment for her programming class. She has created a list but needs her list to begin with 1 instead

	of 0. Create a nested array that assigns an alternative value to the numbers in her original list.
SC.912.PE.1.10:	Write programs that validate user input.
SC.912.PE.1.11:	Compare the differences in execution of interpreted and compiled languages. **Clarifications:** *Clarification 1:* Instruction includes examining different programming languages and how they are converted to machine language.
SC.912.PE.1.12:	Classify programming languages. **Clarifications:** *Clarification 1:* Instruction includes the classification of paradigms by object-oriented and procedural. *Clarification 2:* Instruction includes the application of domains by scientific applications and commercial applications.
SC.912.PE.1.13:	Describe and identify types of programming errors. **Clarifications:** *Clarification 1:* Instruction includes syntax, logic, runtime and computation errors.
SC.912.PE.1.14:	Design and implement variables in a program using global and local scope
SC.912.PE.1.15:	Implement a program using an integrated development environment (IDE) commonly used.
SC.912.PE.1.17:	Examine the building blocks of algorithms. **Clarifications:** *Clarification 1:* Building blocks include sequence, selection, iteration and recursion.
SC.912.PE.1.18:	Develop a computer program. **Clarifications:**

	Clarification 1: Instruction includes meeting the requirements set by a plan. *Clarification 2:* Instruction includes the use of the software development cycle.
SC.912.PE.1.19:	Review a computer program to verify program functionality, programming styles, program usability and adherence to common programming standards. **Clarifications:** *Clarification 1:* Instruction includes peer review. *Clarification 2:* Instruction includes adherence to a programming language style guide.
SC.912.PE.1.20:	Write programs that use standard logic operators.
SC.912.PE.1.21:	Use Boolean logic to perform logical operations.
SC.912.PE.1.23:	Compile, run, test and debug a digital artifact.
SC.912.PE.2.3:	Compare techniques for analyzing massive data collections.
SC.912.PE.3.1:	Evaluate arithmetic expressions using operator precedence.
SC.912.PE.3.2:	Decompose a problem by defining new code segments.
SC.912.PE.3.4:	Evaluate algorithms by their efficiency, correctness and clarity. **Clarifications:** *Clarification 1:* Instruction includes analyzing and comparing execution times, testing with multiple inputs or data sets and debugging. *Clarification 2:* Instruction includes evaluating a well-known algorithm and implementing a new one. *Clarification 3:* Instruction includes comparing the efficiency between two or more algorithms.
SC.912.PE.3.8:	Describe the concept of parallel processing as a strategy to solve large problems.

SC.912.PE.3.10:	Simplify a complex problem by using abstraction to manage complexity using functions and parameters, classes and methods.
SC.912.PE.3.11:	Perform advanced searches to locate information and design a data-collection approach to gather original data.
SC.912.PE.3.14:	Analyze data by identifying patterns through modeling and simulation of real-world data.
SC.912.PE.3.15:	Test the accuracy of scientific hypotheses using computer models and simulations.
SC.912.PE.3.16:	Design a representation of a computer program. **Clarifications:** *Clarification 1:* Instruction includes creating a plan that defines requirements, structural design, time estimates and testing elements. *Clarification 2:* Instruction includes the use of the software development cycle.
SC.912.PE.3.18:	Explain the principles of cryptography. **Clarifications:** *Clarification 1:* Instruction includes the principles of confidentiality, integrity, authentication, non-repudiation and key management.
SC.912.PE.4.2:	Develop a software artifact according to a common software development methodology. **Clarifications:** *Clarification 1:* Instruction includes various software development methodologies, including waterfall, spiral model and agile.
SC.912.PE.4.3:	Identify the tools required to develop a program.
SC.912.PE.4.5:	Define user prompts for clarity and usability within a program. **Clarifications:** *Example:* Mrs. Jan has given her programming class the task of creating an age verification application. Paolo, a student in the class, initially runs into an issue where when a user enters their birth month

	out, the program crashes. Define a user prompt that will correct this issue.
SC.912.PE.4.6:	Write a program that utilizes both input and output. **Clarifications:** *Clarification 1:* Instruction includes the end user entering the input and the program delivering the output.
SC.912.PE.4.7:	Use internal documentation to collaboratively design a program according to accepted standards. **Clarifications:** *Clarification 1:* Instruction includes multiple creators communicating within a program utilizing "clean code."
SC.912.TI.1.1:	Analyze historical trends in hardware and software.
SC.912.TI.1.2:	Identify ways to use technology to support lifelong learning. **Clarifications:** *Clarification 1:* Instruction includes the use of online tutorials, Artificial Intelligence (AI) and web searches to facilitate personal learning.
SC.912.TI.1.3:	Analyze the impact of digital media. **Clarifications:** *Clarification 1:* Instruction includes the analysis of digital media for implicit or explicit bias *Clarification 2:* Instruction includes discerning fact from opinion within digital media.
SC.912.TI.1.4:	Analyze the impact of digital media on culture and persona. **Clarifications:** *Clarification 1:* Instruction includes the effects of digital media on self- image and societal changes.
SC.912.TI.1.5:	Describe the impact of computing on business and commerce.

SC.912.TI.1.6:	Describe how technology impacts personal life. **Clarifications:** *Clarification 1:* Instruction includes evaluating the impact of smartwatches and various Internet of Things (IoT) devices.
SC.912.TI.1.7:	Evaluate ways in which technology may improve accessibility for the varying needs of learners, including students with disabilities (SWD). **Clarifications:** *Clarification 1:* Instruction includes assistive and instructional technologies.
SC.912.TI.1.8:	Explain how economic and societal factors are affected by access to critical information.
SC.912.TI.1.9:	Evaluate access and distribution of technology in a global society. **Clarifications:** *Clarification 1:* Instruction includes providing possible solutions to the challenges to equal access and the distribution of technology.
SC.912.TI.1.10:	Analyze technology-related career paths. **Clarifications:** *Clarification 1:* Technological career paths include programming, medical, health information technology (IT) and various other upcoming industries. *Clarification 2:* Instruction includes predicting future technology-related career trends.
SC.912.TI.1.12:	Examine the history of networking devices. **Clarifications:** *Clarification 1:* Instruction includes hubs, switches, ethernet cabling, wireless technology and fiber optics.
SC.912.TI.1.13:	Examine the historical impact of social media. **Clarifications:**

	Clarification 1: Instruction includes discussing the purpose of social media. *Clarification 2:* Instruction includes analyzing the impact of current social media platforms.
SC.912.TI.2.1:	Research how social media and technology can be used to distort, exaggerate or misrepresent information. **Clarifications:** *Clarification 1:* Instruction includes the consequences associated with posting misinformation, such as slander, libel and defamation. *Clarification 2:* Within this benchmark, emphasis should be placed on the impact of misinformation (clickbait, gaslighting, fake news, propaganda and deepfakes) on individuals, communities and cultures.
SC.912.TI.2.2:	Demonstrate knowledge of the Internet safety policy as it applies to state and district guidelines. **Clarifications:** *Clarification 1:* Instruction focuses on the current school district guidelines in which the student is enrolled. *Clarification 2:* Instruction includes local and state level statutory requirements that govern Internet use.
SC.912.TI.2.3:	Recognize the terms and policies associated with the use of public access points. **Clarifications:** *Clarification 1:* Instruction includes understanding that using public access points may pose security risks. *Clarification 2:* Instruction includes discussing the importance of reading the full terms and conditions when using public access points.
SC.912.TI.2.4:	Explore the legal ramifications of technology use.

	Clarifications: *Clarification 1:* Instruction includes differentiating between legal and ethical responsibility. *Clarification 2:* Instruction includes understanding the importance of staying current with legal changes.
SC.912.TI.2.5:	Describe and model the legal use of modern communication media and devices. **Clarifications:** *Clarification 1:* Instruction includes the responsible use of modern communication media and devices. *Clarification 2:* Instruction includes discussion of personal safety when utilizing technology.
SC.912.TI.2.6:	Evaluate the impacts of the irresponsible use of information on collaborative projects. **Clarifications:** *Clarification 1:* Instruction includes discussing plagiarism, artificial intelligence (AI) chat usage and falsification of data.
SC.912.TI.2.7:	Describe differences between open source, freeware and proprietary software licenses and how they apply to different types of software.
SC.912.TI.2.8:	Evaluate the consequences of misrepresenting digital work as your own. **Clarifications:** *Clarification 1:* Instruction includes plagiarism, infringement and digital theft.
SC.912.TI.2.9:	Analyze how different categories of software licenses can be used to share and protect intellectual property. **Clarifications:** *Clarification 1:* Types of software licenses include open source and proprietary licenses.

	Analyze how access to information may not include the right to distribute the information.
SC.912.TI.2.10:	**Clarifications:** *Clarification 1:* Instruction includes comparing licensing in relation to ownership and distribution.
SC.912.TI.2.11:	Utilize citation tools when using digital information.
MA.K12.MTR.1.1:	**Actively participate in effortful learning both individually and collectively.** Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.
	Clarifications: Teachers who encourage students to participate actively in effortful learning both individually and with others: • Cultivate a community of growth mindset learners. • Foster perseverance in students by choosing tasks that are challenging. • Develop students' ability to analyze and problem solve. • Recognize students' effort when solving challenging problems.
MA.K12.MTR.2.1:	**Demonstrate understanding by representing problems in multiple ways.**

	Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose. **Clarifications:** Teachers who encourage students to demonstrate understanding by representing problems in multiple ways: • Help students make connections between concepts and representations. • Provide opportunities for students to use manipulatives when investigating concepts. • Guide students from concrete to pictorial to abstract representations as understanding progresses. • Show students that various representations can have different purposes and can be useful in different situations.
MA.K12.MTR.3.1:	**Complete tasks with mathematical fluency.** Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations. **Clarifications:** Teachers who encourage students to complete tasks with mathematical fluency:

	• Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately. • Offer multiple opportunities for students to practice efficient and generalizable methods. • Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.
MA.K12.MTR.4.1:	**Engage in discussions that reflect on the mathematical thinking of self and others.** Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence. **Clarifications:** Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others: • Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning. • Create opportunities for students to discuss their thinking with peers. • Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods. • Develop students' ability to justify methods and compare their responses to the responses of their peers.
MA.K12.MTR.5.1:	**Use patterns and structure to help understand and connect mathematical concepts.**

	Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations. **Clarifications:** Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts: • Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts. • Support students to develop generalizations based on the similarities found among problems. • Provide opportunities for students to create plans and procedures to solve problems. • Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.
MA.K12.MTR.6.1:	**Assess the reasonableness of solutions.** Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context. **Clarifications:** Teachers who encourage students to assess the reasonableness of solutions: • Have students estimate or predict solutions prior to solving. • Prompt students to continually ask, "Does this solution make sense? How do you know?"

	• Reinforce that students check their work as they progress within and after a task. • Strengthen students' ability to verify solutions through justifications.
	Apply mathematics to real-world contexts. Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency.
MA.K12.MTR.7.1:	**Clarifications:** Teachers who encourage students to apply mathematics to real-world contexts: • Provide opportunities for students to create models, both concrete and abstract, and perform investigations. • Challenge students to question the accuracy of their models and methods. • Support students as they validate conclusions by comparing them to the given situation. • Indicate how various concepts can be applied to other disciplines.
ELA.K12.EE.1.1:	Cite evidence to explain and justify reasoning. **Clarifications:** K-1 Students include textual evidence in their oral communication with guidance and support from adults. The evidence can consist of details from the text without naming the text. During 1st grade, students learn how to incorporate the evidence in their writing. 2-3 Students include relevant textual evidence in their written and oral communication. Students should name the text when they refer to it. In 3rd grade, students should use a combination of direct and indirect citations.

	4-5 Students continue with previous skills and reference comments made by speakers and peers. Students cite texts that they've directly quoted, paraphrased, or used for information. When writing, students will use the form of citation dictated by the instructor or the style guide referenced by the instructor. 6-8 Students continue with previous skills and use a style guide to create a proper citation. 9-12 Students continue with previous skills and should be aware of existing style guides and the ways in which they differ.
ELA.K12.EE.2.1:	Read and comprehend grade-level complex texts proficiently. **Clarifications:** See Text Complexity for grade-level complexity bands and a text complexity rubric.
ELA.K12.EE.3.1:	Make inferences to support comprehension. **Clarifications:** Students will make inferences before the words infer or inference are introduced. Kindergarten students will answer questions like "Why is the girl smiling?" or make predictions about what will happen based on the title page. Students will use the terms and apply them in 2nd grade and beyond.
ELA.K12.EE.4.1:	Use appropriate collaborative techniques and active listening skills when engaging in discussions in a variety of situations. **Clarifications:** In kindergarten, students learn to listen to one another respectfully. In grades 1-2, students build upon these skills by justifying what they are thinking. For example: "I think _____ because _____." The collaborative conversations are becoming academic conversations. In grades 3-12, students engage in academic conversations discussing claims and justifying their reasoning, refining and applying skills. Students build on ideas, propel the conversation, and support claims and counterclaims with evidence.
ELA.K12.EE.5.1:	Use the accepted rules governing a specific format to create quality work.

	Clarifications: Students will incorporate skills learned into work products to produce quality work. For students to incorporate these skills appropriately, they must receive instruction. A 3rd grade student creating a poster board display must have instruction in how to effectively present information to do quality work.
ELA.K12.EE.6.1:	Use appropriate voice and tone when speaking or writing. **Clarifications:** In kindergarten and 1st grade, students learn the difference between formal and informal language. For example, the way we talk to our friends differs from the way we speak to adults. In 2nd grade and beyond, students practice appropriate social and academic language to discuss texts.
ELD.K12.ELL.SI.1:	English language learners communicate for social and instructional purposes within the school setting.

General Notes

This course should be taught using Florida's State Academic Standards for Computer Science: Florida's B.E.S.T. ELA Expectations (EE), Mathematical Thinking and Reasoning Standards (MTRs) and Computational Thinking and Reasoning Standards (CTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable.

English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade-level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers which maximizes an ELL's need for communication and social skills. To access an ELL supporting document which delineates performance definitions and descriptors, please click on the following link: https://cpalmsmediaprod.blob.core.windows.net/uploads/docs/standards/eld/si.pdf.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's Individual Educational Plan (IEP) or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Accommodation changes the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an IEP served in Exceptional Student Education (ESE) will need modifications to meet their needs. Modifications change the outcomes and or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course.

Version Description

Principles of Computer Science provides students with a foundational understanding of key computer science concepts and explores how computing and technology influence the world. This course goes beyond basic programming to cover fundamental ideas such as algorithms, data structures, and the impact of technology on society. It aims to show how these concepts are shaping the modern world and preparing students to understand and engage with the technological landscape.

Throughout this course, students gain a critical perspective on how computer science can be applied to solve problems and drive innovation. It emphasizes the importance of computing as a liberal art, equipping students with the knowledge to be informed contributors to our increasingly digital society, whether they pursue careers in technology.

General Information

Course Path: Request ID: 3365 | Type: Course Version | Section: Grades PreK to 12 Education Courses | Grade Group: Grades 9 to 12 and Adult Education Courses | Subject: Computer Science | Sub Subject: General

Course Level Number: 2

Number of Credits: One (1) credit

Course Year: 2025

Abbreviated Title: PRINCIPLS OF CS

Course Length: Year (Y)

Course Type: Elective Course

Graduation Requirements:

- Electives

Submitted By: Whitney Gaddis

Request Justification:

New course due to standards revision process.

Educator Certifications

Any Field When Certification Reflects a Bachelor or Higher Degree
Computer Science (Elementary and Secondary Grades K-12)
Classical Education - Restricted (Elementary and Secondary Grades K-12)