

Course/Subject: Fundamentals of Coding **Grade Level: Kindergarten**

Textbook(s) / Instructional Materials Used: Online resources through code.org

Month(s): August - October **Marking Period 1**

Unit Name

<u>Big Idea</u>	<u>CSTA K-12 Computer Science Standards</u>	<u>Essential Questions & Lesson Essential Question</u>	<u>Concepts/Objectives</u>	<u>Vocabulary</u>	<u>Competencies</u>
Sequencing Loops Events Digital Citizenship	<p>1A-AP-11 - Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.</p> <p>1A-AP-08 - Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.</p> <p>1A-AP-09 - Model the way programs store and manipulate data by using numbers or other symbols to represent information.</p> <p><u>ISTE Standards</u> Computational Thinker</p> <p>Students develop and employ strategies for understanding and</p>	<p>What does it mean to become frustrated?</p> <p>How do I keep working on something when I become frustrated?</p> <p>How can I build a set of directions to complete a task?</p> <p>What is an algorithm?</p> <p>What strategies can I use when coding to find and fix bugs?</p>	<p>Bug Debugging Persistence Algorithms</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> Express that they have noticed when something goes different than what is expected. Identify what the expected result was before an error occurs. Determine and describe the difference between what was expected and what actually happened in the event of an error. 	<p>Bug Debugging Persistence Frustrated Algorithm</p>	<p>Bug Debugging Algorithms</p>

	<p>solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:</p> <ol style="list-style-type: none"> a. formulate problem definitions suited for technology- assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions. b. collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making. c. break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving. d. understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions. 		<ul style="list-style-type: none"> • Identify and point out symptoms of frustration. • Illustrate at least one reason why they will choose to be persistent in the face of frustration, rather than giving up. • Decompose large activities into a series of smaller events. • Arrange sequential events into their logical order. 		
<p>Month(s): November - January</p>			<p>Marking Period 2</p>		

Unit Name

<u>Big Idea</u>	<u>CSTA K-12 Computer Science Standards</u>	<u>Essential Questions & Lesson Essential Question</u>	<u>Concepts/Objectives</u>	<u>Vocabulary</u>	<u>Competencies</u>
<p>Sequencing Loops Events Digital Citizenship</p>	<p>1A-AP-11 - Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.</p> <p>1A-AP-09 - Model the way programs store and manipulate data by using numbers or other symbols to represent information.</p> <p><u>ISTE Standards Computational Thinker</u></p> <p>Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:</p> <p>a. formulate problem definitions suited for technology- assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.</p> <p>b. collect data or identify relevant data sets, use</p>	<p>How should I behave when working on a computer or in a computer lab?</p> <p>What strategies can I use when coding to find and fix bugs?</p> <p>How is an algorithm and a program similar?</p> <p>How can I take a set of movements and organize them into a series of commands?</p>	<p>Click Double-Click Drag Drop Algorithms Sequencing Program Programming</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> • Model proper computer lab behaviors. • Experiment with standard block-based programming actions such as: clicking, drag and drop, etc. • Translate an algorithm into a program. • Decode and run a program created by someone else. • Identify and address bugs or errors in sequenced instructions. • Translate movements 	<p>Click Double-Click Drag Drop Algorithm Debugging Program Programming</p>	<p>Click Double-Click Drag Drop Sequencing Program Programming</p>

	<p>digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.</p> <p>c. break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.</p> <p>d. understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.</p>		into a series of commands.		
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Month(s): January - March	Marking Period 3
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Unit Name

<u>Big Idea</u>	<u>CSTA K-12 Computer Science Standards</u>	<u>Essential Questions & Lesson Essential Question</u>	<u>Concepts/Objectives</u>	<u>Vocabulary</u>	<u>Competencies</u>
Sequencing Loops Events Digital Citizenship	<p>1A-AP-09 - Model the way programs store and manipulate data by using numbers or other symbols to represent information.</p> <p>1A-AP-10 - Develop programs with sequences and simple loops, to</p>	<p>How can I take a set of movements and organize them into a series of commands?</p> <p>What strategies can I use when coding to find and fix bugs?</p>	<p>Algorithms Debugging Program Programming Loops Repeat</p>	<p>Algorithm Bug Debugging Program Programming Loop Repeat</p>	<p>Algorithms Debugging Program Programming Loops</p>

	<p>express ideas or address a problem.</p> <p>1A-AP-11 - Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.</p> <p>1A-AP-14 - Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.</p> <p><u>ISTE Standards</u> Computational Thinker</p> <p>Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:</p> <p>a. formulate problem definitions suited for technology- assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.</p> <p>b. collect data or identify relevant data sets, use digital tools to analyze them, and represent</p>	<p>How do I go places safely on the computer?</p> <p>What is the purpose of a loop command?</p> <p>Why does using a loop make it easier to write code?</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Translate movements into a series of commands. • Identify and locate bugs in a program. • Understand that being safe when they visit websites is similar to staying safe in real life. • Learn to recognize websites that are safe for them to visit. • Recognize the kind of information that is private and understand that it should never be shared online. • Identify repeating code and shorten multiple actions into a single loop. • Interpret a program with loops as a series of multiple actions. • Identify the benefits of using a loop structure instead of manual repetition. • Break down a long sequence of instructions into the 		
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	<p>data in various ways to facilitate problem-solving and decision-making.</p> <p>c. break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.</p> <p>d. understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.</p> <p>Digital Citizen Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical. Students:</p> <p>a. cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.</p>		<p>smallest repeatable sequence possible.</p> <ul style="list-style-type: none"> • Create a program for a given task which loops a sequence of commands. • Employ a combination of sequential and looped commands to reach the end of a maze. 		
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	<p>b. engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.</p> <p>c. demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.</p> <p>d. manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.</p>				
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Month(s): March - June	Marking Period 4
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Unit Name

<u>Big Idea</u>	<u>CSTA K-12 Computer Science Standards</u>	<u>Essential Questions & Lesson Essential Question</u>	<u>Concepts/Objectives</u>	<u>Vocabulary</u>	<u>Competencies</u>
Sequencing Loops Events Digital Citizenship	<p>1A-AP-09 - Model the way programs store and manipulate data by using numbers or other symbols to represent information.</p> <p>1A-AP-10 - Develop programs with sequences and simple loops, to express ideas or address a problem.</p>	<p>What is the purpose of a loop command?</p> <p>Why does using a loop make it easier to write code?</p> <p>What is an event when looking at code?</p> <p>What is the difference</p>	<p>Loop Event</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> Identify the benefits of using a loop structure instead of manual repetition. 	<p>Loop Repeat Event</p>	<p>Loops Events</p>

	<p>1A-AP-11 - Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.</p> <p>1A-AP-14 - Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.</p> <p><u>ISTE Standards</u> Computational Thinker</p> <p>Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions. Students:</p> <p>a. formulate problem definitions suited for technology- assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.</p> <p>b. collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-</p>	<p>between an event and an action?</p> <p>How can events make programs more interactive?</p>	<ul style="list-style-type: none"> • Break down a long sequence of instructions into the smallest repeatable sequence possible. • Count the number of times an action should be repeated and represent it as a loop. • Decompose a shape into its largest repeatable sequence. • Create a program that draws complex shapes by repeating simple sequences. • Recognize actions of the teacher as signals to initiate commands. • Practice differentiating pre-defined actions and event-driven ones. • Identify actions that correlate to input events. • Create an animated, interactive story using sequence and event-handlers. • Share a creative artifact with other students. 		
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	<p>making.</p> <p>c. break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.</p> <p>d. understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.</p>				
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