



SPRING GROVE AREA SCHOOL DISTRICT



PLANNED COURSE OVERVIEW

Course Title: Introduction to Computer Programming Grade Level(s): 9-12 Units of Credit: .25 Classification: Elective	Length of Course: 15 cycles Periods Per Cycle: 3 Length of Period: 43 minutes Total Instructional Time: 32.25 hours
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Course Description

In this course, students will learn the basics of programming using Apple’s Swift application. As students complete simple tasks, the code they write will control a character in a maze. Through the process of coding, students will participate in tasks that execute digital movement for the code created. Students will learn programming skills such as commands, functions, parameters, loops, conditional statements, variables, operators, types, and initialization. This course can serve as a springboard to other courses in the programming and technology field.

Instructional Strategies, Learning Practices, Activities, and Experiences

Independent Reading Guided Practice	Swift Programming Modules Journal/Reflection	Direct Instruction Debugging
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Assessments

Swift Programming Modules	Journal/Reflection	Short Answer/Essays
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Materials/Resources

iPad	Swift Playground Application for iPad	SeeSaw Application for iPad
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Adopted: 5/21/18

Revised:

CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Introduction to Computer Programming Coding Developer</p>	<p>The students will learn what coding is and why it is important. The students will learn the roles of developers.</p> <p>ISTE-2a - Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.</p>
<p>Commands and Sequences</p>	<p>The students will learn commands and sequences. The students will use commands and sequences to complete a real-life task. The students will code using commands and sequences.</p> <p>ISTE-1c - Use models and simulations to explore complex systems and issues.</p>
<p>Debugging</p>	<p>The students will describe debugging. The students will identify situations in real-life that relate to debugging. The students will debug code.</p> <p>ISTE-3d - Process data and report results. ISTE-4a - Identify and define authentic problems and significant questions for investigation.</p>

CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Functions and Loops For Loop Function</p> <p>Conditional Code Boolean Logical Operator If Then Else</p>	<p>The students will describe functions and loops. The students will demonstrate the use of functions and loops in real-life situations. The students will use functions while coding. The students will use loops while coding. The students will use loops to simplify code. The students will use functions to simplify code.</p> <p>ISTE-4d ~ Use multiple processes and diverse perspectives to explore alternative solutions. ISTE-1a ~ Apply existing knowledge to generate new ideas, products, or processes.</p> <p>The students will utilize Boolean values in conditional code. The students will understand and implement logical operators such as &&, , !, >, >=, <, <=, ==, and !=. The students will code using "if then else" statements using Boolean values and logical operators. The students will utilize conditional code to control the flow of their program and implement decision making.</p> <p>ISTE-3d ~ Process data and report results. ISTE-4c ~ Collect and analyze data to identify solutions and/or make informed decisions. 2.5.11.B ~ Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas, and results. 2.5.11.A ~ Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.</p>

CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>While Loops</p>	<p>The students will understand the usage of while loops. The students will compare and contrast for loops and while loops. The students will demonstrate the use of while loops in real-life situations. The students will code using while loops.</p> <p>ISTE-1c ~ Use models and simulations to explore complex systems and issues. ISTE-1a ~ Apply existing knowledge to generate new ideas, products, or processes. 2.5.11.B ~ Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas, and results. ISTE-4c ~ Collect and analyze data to identify solutions and/or make informed decisions.</p>
<p>Algorithms</p>	<p>The students will describe what an algorithm is and how it is used in real life situations. The students will reflect on algorithms that are used in everyday life. The students will write an algorithm for a real life situation. The students will code using algorithms. The students will break a problem into manageable tasks and create an algorithm to solve complex coding problems.</p> <p>ISTE-3c ~ Evaluate and select information sources and digital tools based on the appropriateness to specific tasks. ISTE-4a ~ Identify and define authentic problems and significant questions for investigation. 2.5.11.A ~ Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.</p>

CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
Parameters	<p>The students will describe a parameter. The students will compare and contrast parameters use in functions and conditional statements. The students will explore how parameters are used in real-life situations. The students will code using parameters.</p> <p>ISTE-3d ~ Process data and report results. ISTE-4b ~ Plan and manage activities to develop a solution or complete a project. ISTE-3c ~ Evaluate and select information sources and digital tools based on the appropriateness to specific tasks. ISTE-1a ~ Apply existing knowledge to generate new ideas, products, or processes. 2.5.11.B ~ Use symbols, mathematical terminology, standard notation, mathematical rules, graphing, and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas, and results. 2.5.11.A ~ Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.</p>
Arrays	<p>The students will define what an array is and how it can be used. The students will describe ways that arrays are used in real life situations. The students will code using arrays.</p> <p>2.5.11.A ~ Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems. 2.5.11.B ~ Use symbols, mathematical terminology, standard notation, mathematical rules, graphing, and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas, and results.</p>

CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Final Project</p>	<p>The students will utilize all concepts learned in this course to create their own world in Swift Playgrounds.</p> <p>2.5.11.A ~ Select and use appropriate mathematical concepts and techniques from different areas of mathematics and apply them to solving non-routine and multi-step problems.</p> <p>2.5.11.B ~ Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas, and results.</p> <p>ISTE-1a ~ Apply existing knowledge to generate new ideas, products, or processes.</p> <p>ISTE-1b ~ Create original works as a means of personal or group expression.</p> <p>ISTE-1c ~ Use models and simulations to explore complex systems and issues.</p> <p>ISTE-2a ~ Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.</p> <p>ISTE-2b ~ Communicate information and ideas effectively to multiple audiences using a variety of media and formats.</p> <p>ISTE-3a ~ Plan strategies to guide inquiry.</p> <p>ISTE-3b ~ Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.</p> <p>ISTE-3c ~ Evaluate and select information sources and digital tools based on the appropriateness to specific tasks.</p> <p>ISTE-3d ~ Process data and report results.</p> <p>ISTE-4a ~ Identify and define authentic problems and significant questions for investigation.</p> <p>ISTE-4b ~ Plan and manage activities to develop a solution or complete a project.</p> <p>ISTE-4c ~ Collect and analyze data to identify solutions and/or make informed decisions.</p> <p>ISTE-4d ~ Use multiple processes and diverse perspectives to explore alternative solutions.</p>