

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT



Computer Science: Creating Apps

Board Approval Date: 6/20/24	Course Length: 1 Semester
Grading: A-F	Credits: N/A
Proposed Grade Level(s): 6, 7, 8	Subject Area: Elective Elective Area (if applicable): Exploratory STEM
Prerequisite(s): None	Corequisite(s): None
CTE Sector/Pathway:	
Intent to Pursue 'A-G' College Prep Status: No	
A-G Course Identifier:	
Graduation Requirement: No	
Course Intent: Program (if applicable):	
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COURSE DESCRIPTION:

The Computer Science: Creating Apps course serves as an introduction to the realm of computer science and the fundamental principles of computational thinking, focusing on the creation of applications, graphics, and web sites. Students are encouraged to unleash their creativity and innovation while collaboratively conceiving and building solutions for real-life challenges. Through this process, students witness the positive impact of implementing computer science in society and across various disciplines.

DETAILED UNITS OF INSTRUCTION:

Unit Number/Title	Unit Essential Questions	Examples of Formative Assessments	Examples of Summative Assessment
1. Getting Started with Apps	How do you use App Inventor to produce an app? What are the main components of App Inventor? What is algorithmic thinking and why is it important to software development?	*Basic counting app using buttons, labels, and text boxes for display/interface and utilizing variables to output collected data	*Flowchart outlining an app planned and created by student *Completed simple app utilizing effective interface, graphic elements, and variables
2. Games R Fun!	How can a developer break a complex task into a sequence of small steps? How can a developer analyze a program to reduce redundant lines of code? How does the concept of abstraction simplify complex processes? How does a developer store and access data in lists?	*Simple app utilizing functions to reduce redundancy *Simple app utilizing lists of stored values	*Culminating game app that pulls phrases from a list and expects the user to identify the author of the quote *App uses functions
3. Who would have Thunk it?	What does each of the Model-view controller layers do? How does a developer update data stored in lists? How do conditional statements control an app's choices?	*Simple apps utilizing conditional statements to control output	*Interactive app that gathers data from user and provides feedback based on input
4. Exploring Code with Karel	What are procedures and why are they used? What are variables and how are they used? What are conditionals and	*Check your understanding quiz *Testing apps for functionality *Review game	*Quiz on variables, conditionals, while loops *Karel Challenges: puzzles utilizing all concepts from this unit

	how are they used?		
5. Exploring Art with Code	What is RGB and how do you use RGB values to define color and opacity in shapes? How do you animate horizontal, vertical, and diagonal motion in sketches? How can you create static and animated shape transformations in p5.js?	*Shape transformations quiz *Project: Create a static sprite *Interactive p5.js sketches using keyboard input.	*Culminating Project: Animate an Emoji *Quiz
6. Exploring the Internet	Why are protocols important? What is cybersecurity and what is its impact? Describe trade-offs of implementing specific security safeguards. Why do we need encryption and how does it work?	*Cryptogram game *Check your understanding quiz *CIA Triad Review challenge	*Culminating Project: Steganography *Quiz
7. Exploring Web Design	What are the various parts of an HTML page? How do you embed and resize an image in HTML? What is CSS and how is it used?	*Check your understanding quiz *Web Design review	*Culminating Project: Complete a homepage using all concepts taught in this unit *Quiz: Exploring Web Design
8. Exploring Game Design	Categorize games based on perspective and/or game genre Describe what a JavaScript library is. How does the X-Y coordinate system work within the p5play canvas?	*Check your understanding quiz *Simple JavaScript program	*Create a p5play sprite in JavaScript *Create a JavaScript program
9. Exploring Vex Code VR	What are sensors and how do robots use them? How can variables be used to control robot behavior?	*VR level 2 activity: Disk Mover *VR level 3 activity: Coral Reef Cleanup *VR Blocks quiz	*VR Blocks quiz

ESSENTIAL STANDARDS:

- 6-8.AP.10 - Use flowcharts and/or pseudocode to design and illustrate algorithms that solve complex problems.
- 6-8.AP.11 - Create clearly named variables that store data, and perform operations on their contents.
- 6-8.AP.12 - Design and iteratively develop programs that combine control structures and use compound conditions.
- 6-8.AP.13 - Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.
- 6-8.AP.14 - Create procedures with parameters to organize code and make it easier to reuse.
- 6-8.AP.16 - Incorporate existing code, media, and libraries into original programs, and give attribution.
- 6-8.AP.17 - Systematically test and refine programs using a range of test cases.
- 6-8.AP.18 - Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.
- 6-8.AP.19 - Document programs in order to make them easier to use, read, test, and debug.
- 6-8.IC.20 - Compare tradeoffs associated with computing technologies that affect people's everyday activities and career options.
- 6-8.IC.21 - Discuss issues of bias and accessibility in the design of existing technologies.
- 6-8.IC.22 - Collaborate with many contributors when creating a computational artifact.
- 6-8.IC.23 - Compare tradeoffs associated with licenses for computational artifacts to balance the protection of the creators' rights and the ability for others to use and modify the artifacts.
- 6-8.NI.4 - Model the role of protocols in transmitting data across networks and the Internet.
- 6-8.NI.6 - Apply multiple methods of information protection to model the secure transmission of information.
- 6-8.CS.1 - Design modifications to computing devices in order to improve the ways users interact with the devices.
- 6-8.DA.8 - Collect data using computational tools and transform the data to make it more useful.
- 6-8.DA.9 - Test and analyze the effects of changing variables while using computational models.

RELEVANT STANDARDS AND FRAMEWORKS, CONTENT/PROGRAM SPECIFIC STANDARDS:

Link to Common Core Standards (if applicable):

Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school.

Middle School NGSS Science Standards Middle School NGSS Engineering Design Standards MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impact on people and the natural environment that may limit possible solutions. MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they met the criteria and constraints of the problem. MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Link to Framework (if applicable):

Curriculum frameworks provide guidance for implementing the content standards adopted by the State Board of Education (SBE). Frameworks are developed by the Instructional Quality Commission, formerly known as the Curriculum Development and Supplemental Materials Commission, which also reviews and recommends textbooks and other instructional materials to be adopted by the SBE.

Standards for Mathematical Practice

Link to Subject Area Content Standards (if applicable):

Content standards were designed to encourage the highest achievement of every student, by defining the knowledge, concepts, and skills that students should acquire at each grade level.

<https://www.cde.ca.gov/be/st/ss/documents/finaelacssstandards.pdf>

<https://www.cde.ca.gov/be/st/ss/documents/ccssmathstandarAug2013.pdf>

Link to Program Content Area Standards (if applicable):

Program Content Area Standards apply to programs such as International Baccalaureate, Advanced Placement, Career and Technical Education, etc.

<https://www.cde.ca.gov/be/st/ss/documents/csstandards.pdf>

TEXTBOOKS AND RESOURCE MATERIALS:

Textbooks

Board Approved	Pilot Completion Date (If applicable)	Textbook Title	Author(s)	Publisher	Edition	Date
		<i>N/A</i>				