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The following list of lessons and projects constitute the creative ***app-building (programming) and*** **computer science principles (*csp*)** components of the Mobile CSP course. The app-building lessons introduce and use programming concepts, but the emphasis is on building apps as a creative and expressive experience. In contrast to traditional introductory programming courses, these lessons do not go deeply into traditional programming concepts such as loops and recursion. The goal of the lessons is to get students excited about creating mobile apps, with the assumption that they will learn what programming and broader computer science concepts they need to know in order to build their apps.

Most lessons have several parts that consist of a ***tutorial*****,** which describes how step-by-step to build an app or how to use certain App Inventor components, followed by ***creative projects***, which provide several challenge problems that the student is encouraged to try on their own.

The course also includes computer science principles (csp) lessons that are non-programming lessons. That is, the csp lessons focus on introducing computer science principles ***Big Ideas*** such as Abstraction and Global Impact without including programming in App Inventor.

#	Lesson Type CSP or App Inventor	Length (mins)	Enduring Understandings, Learning Objectives, and CT Practices	Title, Link and Description	App Inventor Components, Procedures and Events	Programming Concepts	Format
Unit 1 - Getting Started: Preview & Setup					Minutes: 180 | 45 Minute Class Periods: 4		
1.01	CSP			Welcome to Mobile CSP. An overview of the Mobile CSP Course, explains the CS Principles project and why the course uses *mobile computing* for its programming (coding) component.			Lecture Video
1.02	CSP	45	EU 4.1 LO 4.1.1 [P2] LO 4.1.2 [P5] EU 4.2	Mazes, Algorithms and Programming. Uses the Blockly Maze game to introduce the ideas of algorithms and programming and to provide a look at the type of visual, blocks-based programming used in the course.		Blocks programs; Algorithms	Activity

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			LO 4.2.4 [P4] EU 5.1 LO 5.1.2 [P2] LO 5.1.3 [P6] EU 5.2 LO 5.2.1 [P3]				
1.03		45	EU 1.1 LO 1.1.1 [P2] EU 1.2 LO 1.2.1 [P2]	Google Account and Portfolio Set Up. The course requires a Google email (e.g., gmail) account. A Google site is created and used to share student reflections and other course work.			Activity
1.04		45	EU 1.1 LO 1.1.1 [P2]	App Inventor Setup. App Inventor is a visual, blocks-based programming language for creating mobile Android apps. Use Google credentials to create an account on MIT App Inventor site and then use it to create a test app to test the mobile device.			Activity
1.05				BB: Blown to Bits. Takes a look at the free, online version of *Blown to Bits*. Readings from this book will be used throughout the course to focus on important issues that highlight the impact of computing on society.			Activity
1.06		45	P4	Successful Learning in Mobile CSP.			Video
Unit 2 - Introduction to Mobile Apps & Pair Programming					**Minutes: 585 | 45 Minute Class Periods: 13**		
2.02	App	45	EU 1.2 LO 1.2.1 [P2] EU 5.2 LO 5.2.1 [P3] EU 5.4 LO 5.4.1 [P4]	I Have a Dream, I. Plays an MLK speech when a Button is clicked. Introduces event-driven programming.	Button, Sound, Label components. Button.Click event.	Event-driven programming	

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2.03	CSP	45	EU 1.2 LO 1.2.4[P6] EU 6.1 LO 6.1.1[P3] EU 7.1 LO 7.1.1[P4] LO 7.1.2[P4] EU 7.3 LO 7.3.1[P4]	The Internet and the Cloud. Introduces some basic concepts about the Internet and the concept of cloud computing. Students read and discuss the Wikipedia article on *10 Commandments of Computer Ethics.* Includes a POGIL activity to discuss browsers, online applications that students use and the difference between the Internet and WWW.			Reading Discussion POGIL Self Check Reflection
2.04	App	45	EU 1.2 LO 1.2.1 [P2] EU 5.1 LO 5.1.1 [P2] EU 5.4 LO 5.4.1 [P4]	I Have a Dream, II. Extends the app to include two buttons, the second of which plays a Malcolm X speech. Introduces the if/else statement to toggle between playing and pausing the speech when a button is clicked.	Image, Horizontal Arrangement components. Button.Click event.	Descriptive names, Toggle button concept: if/else algorithm.	
2.05	CSP	45	EU 2.2 LO 2.2.3 [P3] EU 5.2 LO 5.2.1 [P3]	Mobile Devices and Apps: Hardware and Software. Introduces computer terminology, such as hardware, software, operating system, programming languages.			Lecture Video Self Check Reflection
2.06	CSP	45	EU 4.1 LO 4.1.1 [P2] LO 4.1.2 [P5] EU 4.2 LO 4.2.4 [P4] RM	Algorithm Basics. Covers basic algorithm concepts, including sequence, selection (if/else), repetition (loops). A POGIL activity asks students to write a simple arithmetic algorithm in pseudocode.			Activity Lecture Video POGIL Self Check Reflection

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2.07	App	90	EU 1.1 LO 1.1.1 [P2] EU 1.2 LO 1.2.1 [P2] LO 1.2.3 [P2] LO 1.2.4 [P6] EU 1.3 LO 1.3.1 [P2] EU 5.1.1 LO 5.1.1 [P2] EU 5.4 LO 5.4.1 [P4]	I Have a Dream, Projects. Projects add Text-to-speech and Accelerometer components. Solution requires the use of an if/else algorithm.	Custom App Icon. Accelerometer Sensor, Text To Speech components. Accelerometer Shaking event.	Pseudocode, if/else algorithm.	
2.08	CSP	45	EU 2.1 LO 2.1.1 [P3]	What is Abstraction? This lecture provides a first look at the concept of abstraction with examples drawn from everyday experience. Provides examples of data abstraction and procedural abstraction.			Lecture Video Self Check Reflection
2.09	CSP	90	EU 2.1 LO 2.1.1 [P3] LO 2.1.2 [P5]	Binary Numbers. A first look at the binary number system, focusing on how to count, how to convert binary to decimal and decimal to binary. It also introduces *hexadecimal (base 16)* numbers and the general concept of a *positional number system.* Includes several interactive widgets for practicing with binary and hex.			Lecture Videos Activities Reflection
2.10	CSP	45	EU 2.2 LO 2.2.3 [P3] EU 5.5 LO 5.5.1 [P1]	Hardware Abstractions: Logic Gates. A second look at abstraction, this time focusing on low level hardware such as logic gates. A POGIL activity uses the **Logicly** app to study logic gates.			Lecture Video POGIL Activity: Logic.ly Self Check Reflection

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2.11	CSP	90	EU 2.1 LO 2.1.1 [P3] EU 7.1 LO 7.1.1 [P4]	BB: The Digital Explosion. Read and discuss Chapter 1 of *Blown to Bits*, which makes the point that today "everything is digital." Our music, our images and videos, our books are software are all represented as binary data.			Reading Discussion Reflection
Unit 3 - Creating Graphics & Images Bit by Bit					**Minutes: 585 | 45 Minute Class Periods: 13**		
3.02	App	45	EU 1.2 LO 1.2.1 [P2] EU 2.2 LO 2.2.1 [P2] EU 5.2 LO 5.2.1 [P3] EU 5.4 LO 5.4.1 [P4] EU 5.5 LO 5.5.1 [P1]	Paint Pot Tutorial. App Inventor's version of the classic finger painting app. Introduces Canvas touched and dragged events. Introduces global variables for storing and incrementing the radius of the dots drawn.	Button, Canvas, Horizontal Arrangement components. Basic Graphics drawing procedures. Button.Click, Canvas.Touched Canvas.Dragged events.	Abstraction: Variables, Incrementing a variable, Concatenating text.	
3.03	CSP	90	EU 2.1 LO 2.1.1 [P3] LO 2.1.2 [P5] EU 3.3 LO 3.3.1 [P4]	Representing Images. Uses a *CS Unplugged* lesson to show how bits (0s and 1s) are used to represent images. Students practice applying the *image compression* technique known as *run-length encoding (RLE).* Also, provides a brief introduction to ASCII.			Lecture Video CS Unplugged Self Check Reflection
3.04	App	90	EU 1.2 LO 1.2.2 [P2] LO 1.2.4 [P6] EU 3.1 LO 3.1.2 [P6]	Paint Pot Projects. Basic refinements plus the use of Camera component to add a real-time image as the Canvas background. Programming refinements to add decrement button plus using and if/else algorithm to prevent the radius from becoming negative.	Button Canvas Horizontal Arrangement Camera components.	Refinements to existing app Decrementing a variable, use an if/else	

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			EU 5.1 LO 5.1.1 [P2] LO 5.1.2 [P2] LO 5.1.3 [P6] EU 5.4 LO 5.4.1 [P4] EU 5.5 LO 5.5.1 [P1]		Camera TakePicture procedure. Button.Click Canvas.Touched Canvas.Dragged events.	algorithm to prevent a negative radius.	
3.05	App	45	**TBD**	Paint Pot Refactoring and Documentation. Introduces the concepts of refactoring and procedural abstraction. A procedure is used to encapsulate an algorithm that is used 3 times in the app, thereby reducing complexity. Also illustrates how to add comments to App Inventor blocks.		Procedural abstraction to reduce redundant code, Comments to document code.	
3.06	CSP	45	EU 2.1 LO 2.1.1 [P3] LO 2.1.2 [P5]	Error Detection. Uses a *CS Unplugged* lesson (the card trick) to introduce the concept of using redundant bits in data to help detect errors. A POGIL activity asks students to work in teams to figure out how the trick works.			Video demo Discussion POGIL Self Check Reflection
3.07	CSP	45	EU 2.1 LO 2.1.1 [P3] LO 2.1.2 [P5]	Parity Error Detection. A follow-up lesson to 3.8 that introduces the concept of *parity error checking*, with exercises on even- and odd-parity.			Reading Self Check Reflection
3.08	App	45	EU 1.2 LO 1.2.1 [P2] EU 7.1 LO 7.1.1 [P4]	Map Tour Tutorial Uses Activity Starter component to display a location on a Google map.	Image, ListPicker, Activity Starter components. Screen.Initialize, ListPicker after picking events.	Lists, Indexing a list, Starting an external Android Activity	

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3.09	App	45	TBA	Map Tour with GPS and Tiny DB	TBA	TBA	
3.10	CSP	135	EU 2.1 LO 2.1.1 [P3] EU 2.3 LO 2.3.1 [P3] EU 3.2 LO 3.2.1 [P1] EU 3.3 LO 3.3.1 [P4]	BB: Electronic Documents. Read and discuss part of Chapter 3 of *Blown to Bits*, which focuses on *modeling* as it applies to *image representation.* Also introduces the concept of *steganography* -- i.e., hiding information in documents. An imaged editor widget is used to let the student hide their initials in a Bitmap, giving practice with binary sequences and ASCII codes.		ASCII, binary representation of documents, steganography.	Reading Discussion Reflection
Unit 4 - Animation, Simulation, & Modeling					**Minutes: 540 | 45 Minute Class Periods: 12**		
4.02	App	45	EU 2.2 LO 2.2.1 [P2] EU 5.3 LO 5.3.1 [P3]	Turn Off Lights Tutorial A variation of the classic whack-a-mole game. Introduces animation and first use of a procedure definition. A Clock.Timer event is used to move the sprite to random locations on the Canvas.	Canvas, Image Sprite, Button, Label, Clock, Sound components. Clock.Timer to move the sprite, Screen initialize, Sprite touched events.	Procedure definition, Animation	
4.03	App	45	EU 1.2 LO 1.2.2 [P2] LO 1.2.4 [P2] EU 2.2 LO 2.2.1 [P2] EU 4.1 LO 4.1.1 [P2] LO 4.1.2 [P5] EU 5.1	Turn Off Lights Projects. Projects include adding a score keeping feature and increasing the sprite's speed as the score increases.	Text-to-speech component. Same events as in tutorial.	Using if/else for score keeping and controlling the sprite's speed.	

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			LO 5.1.1 [P2] LO 5.1.2 [P2] LO 5.1.3 [P6]				
4.04	App	45	EU 4.1 LO 4.1.1 [P2] LO 4.1.2 [P5] EU 5.3 LO 5.3.1 [P3]	Logo 1. The template provides a Logo-like drawing platform restricted to very primitive forward() and right turn() commands -- i.e., commands without parameters. (Parameters are introduced in Part II.) Problems include various sized squares and a face. The commands are too weak to draw a triangle, a shortcoming remedied in Part II. Introduces a counting loop to simplify expression of drawing algorithms,.	No new components or events are programmed.	Algorithms, pseudocode, procedures without parameters, loops.	
4.05	App	45	EU 2.3 LO 2.3.1 [P3] EU 4.1 LO 4.1.1 [P2]	Coin Flip Simulation Tutorial. A modeling app to simulate a coin flip. Uses a global variable to represent the coin, App Inventor's random integer function to generate a 1 or 2, and an if/else algorithm to display heads or tails.	Button, Image components. Button.Click event.	Randomness. Variable. If/Else algorithm. Introduces pseudo-randomness (covered in optional lesson).	
4.06	CSP	45	EU 2.3 LO 2.3.2 [P3]	Coin Flip Experiment. This is a lesson about ***modeling.*** In lesson 4.4 we wrote the Coin Flip app, which simulates flipping a coin. In this lesson we do an experiment to test the hypothesis that *App Inventor's random number generator is a* ***good model of random behavior****.* POGIL activity is used to conduct the experiment, where an app is used to simulate 100s of coin flips. Students tabulate results and reflect on whether they support the hypothesis.			POGIL Experiment. Reflection.
4.07	CSP	45	EU 2.3 LO 2.3.1 [P3]	Pseudo Random Numbers. Explains how computers use an algorithm to generate number sequences that *seem* random.			Lecture Video Self Check

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				Introduces the concept of *modular arithmetic* or *clock arithmetic*. Involves some math (long division, modular arithmetic, evaluating an equation.			Reflection
4.08	App	45	EU 1.2 LO 1.2.2 [P2] EU 2.3 LO 2.3.2 [P3] EU 5.1 LO 5.1.2 [P2] EU 5.5 LO 5.5.1 [P1]	Coin Flip Simulation Projects. The projects extend the modeling begun in the coin flip tutorials. New app features (shaking) as well as new models -- 3-sided coin, biased coin.	Accelerometer, Text to Speech components. Accelerometer Shaking event.	Randomness. Model a biased coin. Model a 3-sided coin -- nested if/else.	
4.09	CSP	45	EU 1.3 LO 1.3.1 [P2] EU 2.3 LO 2.3.1[P3] LO 2.3.2 [P3]	Real World Models. Examples of modeling and simulation using real world examples such as climate models, models of the solar system, casino slot machines. Incorporates a POGIL activity to explore an interactive predator/prey model.			Lecture Video POGIL Self Check Reflection
4.10	CSP	45	EU 2.2 LO 2.2.3 [P3] EU 2.3 LO 2.3.1 [P3]	Abstraction: Inside the CPU. Uses a web app to simulate a 4-bit computer, with 16 bytes of RAM, a CPU with ACCumulator and other registers. Illustrates progress through higher levels of abstraction as different generations of the simulation focuson the fetch-execute cycle, machine language programming, assembly language programming.			

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4.11	CSP	135	EU 3.3 LO 3.3.1 [P4] EU 7.1 LO 7.1.1 [P4] EU 7.3 LO 7.3.1 [P4] EU 7.4 LO 7.4.1 [P1]	BB: Privacy. Read and discuss Chapter 2 of *Blown to Bits*, which focuses on the issue of how our privacy is affected by the digital explosion.			Reading Discussion Reflection
Create: Programming Performance Task #1					**Minutes: 360 | 45 Minute Class Periods: 8**		
Crea te 1	CSP App	360	EU 2.2 LO 2.2.1 [P2] EU 4.1 LO 4.1.1 [P2] LO 4.1.2 [P5] EU 5.1 LO 5.1.1 [P2] LO 5.1.2 [P2] EU 5.2 LO 5.2.1 [P3] EU 5.3 LO 5.3.1 [P3] EU 5.4 LO 5.4.1 [P4] EU 5.5 LO 5.5.1 [P1]	**CREATE PT 1** is a practice programming performance task to prepare for the final one submitted to the College Board. The CREATE task is one of two required performance tasks by the College Board - a programming one (CREATE) and a written one (EXPLORE).In this programming performance task, students work in pairs to collaboratively develop a mobile app. This includes going through the entire development process of designing, implementing, and debugging a mobile app. Students then document their work by creating a portfolio write-up and share their work through an oral presentation to the class or a recorded video presentation.			Hands on project
Exam 1 - Midterm					**Minutes: 135 | 45 Minute Class Periods: 3**		
Revie w	CSP App	90		**Exam Review** - while there is no formal Mobile CSP review, teachers should encourage			Self-Check

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				students to review their portfolios and retry the self-check and Quizly exercises after each lesson.			
Exam 1	CSP APP	45		**Mobile CSP Exam 1** is the midterm exam for the course. This exam covers Units 1-4.			
Explore: Impact of Computing Innovations Performance Task #1					**Minutes: 360 | 45 Minute Class Periods: 8**		
Explore	CSP APP	225	EU 1.2 LO 1.2.1 [P2] LO 1.2.2 [P2] EU 3.3 LO 3.3.1 [P4] EU 7.1 LO 7.1.1 [P4] EU 7.3 LO 7.3.1 [P4] EU 7.4 LO 7.4.1 [P1] EU 7.5 LO 7.5.2 [P5]	EXPLORE PT 1 is a practice EXPLORE impact of a computing innovation performance task to prepare for the final one submitted to the College Board. The EXPLORE task is one of two required through-course assessments by the College Board - a programming one (CREATE) and a written one (EXPLORE). In this practice written performance task, students work independently to research a computing innovation related to mobile apps that has had significant impact (both positive and negative) on our society. This includes finding credible, reliable, and recent sources, as well as answering a series of prompts about their chosen innovation. Students then create a visual artifact that demonstrates what they learned about one or more of the effects of the innovation. Note that this task should be considered scaffolding for the official task. *You may choose to do this practice task in small groups or as a class.*			Research Written paper
Unit 5 - Algorithms and Procedural Abstraction					**Minutes: 450 | 45 Minute Class Periods: 10**		
5.02	App	45	EU 2.2 LO 2.2.1 [P2] LO 2.2.2 [P3] EU 4.1 LO 4.1.1 [P2] EU 5.3	Logo 2. This version of Logo provides procedures with parameters. Problems include drawing polygons using procedures with one or more parameters. The lesson focuses on how procedures with parameters provide a more powerful abstraction for the forward(N) and turn(A) commands.	No components or events are programmed.	Algorithms, procedures, parameters, loops.	

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			LO 5.3.1 [P3]				
5.03	CSP	45	EU 4.1 LO 4.1.1 [P2] EU 4.2 LO 4.2.4 [P4]	Search Algorithms. An introduction to search algorithms, including sequential (linear) search and binary search. Algorithms are explained through various interactive guessing games. A POGIL activity shows students the binary guessing game and asks them to figure out the algorithm and express it in pseudocode.			Reading POGIL Interactive guessing games Self Check Reflection
5.04	CSP	45	EU 4.1 LO 4.1.1 [P2] LO 4.1.2 [P5]	Sorting Algorithms. An introduction to the problem of sorting with examples of bubble sort, merge sort, and bucket (radix) sort. The algorithms are demonstrated using card shuffling.			Video demonstrations Self Check Reflection
5.05	App	90		Caesar Cipher App.			
5.06	App	45	EU 5.1 LO 5.1.2 [P2] EU 5.4 LO 5.4.1 [P4]	Debugging Caesar Cipher. Find and fix several errors contained in the Caesar Cipher app.	N/A	Debugging, syntax, semantics, testing.	
5.07	CSP	90	EU 4.1 LO 4.1.1 [P2] EU 4.2 LO 4.2.4 [P4]	Analyzing Algorithms. Apps are used to experimentally analyze sorting and searching algorithms. By timing the algorithms on different sized lists and graphing the results, students can identify which algorithm is which just by the shape of its growth curve as *logarithmic (log_2 N), linear,* or *quadratic (N^2).*			Experiment: Use apps to time sorting and searching algorithms Record, graph, and analyze results Reflection
5.08	CSP	45	EU 4.2 LO 4.2.2 [P1]	Limits of Algorithms. A video lecture introduces the concepts of *intractability* and			Lecture Video

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			LO 4.2.3 [P1]	*undecidability* and *heuristics* -- i.e., there are problems for which the best algorithms are incapable of solving the problem in a reasonable amount of time and there are problems which cannot be solved by means of an algorithm. POGIL activities focus on password protection (using intractable problem to protect a password) and Traveling Salesman Problem (using the nearest neighbor heuristic.)			POGIL Self Check Reflection
5.09	CSP	45	EU 4.1 LO 4.1.1 [P2] EU 7.1 LO 7.1.1 [P4] LO 7.1.2 [P4]	BB: Web Searches. Read and discuss Chapter 5 of *Blown to Bits*, which focuses on web searching and how searching is done.			Reading Discussion Reflection
Unit 6 - Using and Analyzing Data & Information					**Minutes: 585 | 45 Minute Class Periods: 13**		
6.02	App	45	EU 3.1 LO 3.1.1 [P4] EU 5.3 LO 5.3.1 [P3] EU 5.5 LO 5.5.1 [P1]	Quiz App. A basic quiz app that uses parallel lists and indexing to keep track of questions and answers.	Button, Image, Textbox, Label, Horizontal Arrangement components. Screen.Initialize, Button.Click events.	Lists, indexing, global index variable.	
6.03	App	90	EU 1.2 LO 1.2.1 [P2] LO 1.2.2 [P2] EU 5.1 LO 5.1.2 [P2] EU 5.5 LO 5.5.1 [P1]	Quiz App Projects. Simple extensions, including keeping a tally.	Text to speech component.	List, indexing, global index. Using variables to control score keeping.	

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6.04	CSP	45	EU 3.1 LO 3.1.2 [P6] LO 3.1.3 [P5] EU 3.2 LO 3.2.1[P1] LO 3.2.2[P3] EU 7.1 LO 7.1.1[P4] EU 7.2 LO 7.2.1[P1]	Big Data. Lectures describing the scope and the challenges involved in managing massive data sets. Includes description of the *Map Reduce* algorithm.			Lecture Videos Self Check Activity: Choose a big data set and use it to explore a hypothesis Reflection
6.05	App	90		Clicker App with TinyWebDB.			
6.06	App	90	EU 3.1 LO 3.1.3 [P5] EU 3.3 LO 3.3.1 [P4]	Clicker App with Firebase. This tutorial uses the FirebaseDB component to store data to the Cloud. The concept of an asynchronous process is introduced to explain how a Web service works. A nested if/else algorithm is used to process requests. The last part of the lesson shows how to store images on the Web, with their URLs stored in FirebaseDb.	FirebaseDb, Notifier components. Firebase.GetValue procedure and GotValue event.	Asynchronous processing. If/else algorithm.	
6.07	CSP	45	EU 3.1 LO 3.1.1 [P4] LO 3.1.3 [P5] EU 3.2 LO 3.2.2 [P3]	Visualizing Data. A sequence of activities that use Google sheets and Google Maps to process and visualize a data set.			Activity: Learn how to use Google sheets as well as Google maps and use them to explore a data set. Reflection

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6.08		90	EU 7.1 LO 7.1.2 [P4] EU 7.2 LO 7.2.1 [P1] EU 7.5 LO 7.5.1 [P1] LO 7.5.2 [P5]	Data Visualization Project Students work in pairs to identify a large data set that interests them, then formulate hypotheses and analyze the data to shed light on the hypotheses.			Activity: Use fusiontables tools to analyze a data set.
6.09	CSP	90	EU 7.2 LO 7.2.1 [P1] EU 7.3 LO 7.3.1 [P4]	BB: Who Owns the Bits. Read and discuss Chapter 6 of *Blown to Bits*, which focuses on the issue of copyright.			Reading Discussion Reflection
Explore: Impact of Computing Innovations Performance Task #2					**Minutes: 480 | 45 Minute Class Periods: 11**		
Explore	CSP APP	480	EU 1.2 LO 1.2.1 [P2] LO 1.2.2 [P2] EU 3.3 LO 3.3.1 [P4] EU 7.1 LO 7.1.1 [P4] EU 7.3 LO 7.3.1 [P4] EU 7.4 LO 7.4.1 [P1] EU 7.5 LO 7.5.2 [P5]	EXPLORE PT 2 is the official EXPLORE impact of a computing innovations performance task that will be submitted to the College Board. The EXPLORE task is one of two required performance tasks by the College Board - a programming one (CREATE) and a written one (EXPLORE). In this written performance task, students work independently to research a computing innovation of their choosing that has had significant impact (both positive and negative) on our society. This includes finding credible, reliable, and recent sources, as well as, answering a series of prompts about their chosen innovation. Students then create a visual artifact that demonstrates what they learned about one or more of the effects of the innovation.			Research Written paper
Unit 7 - Communication Through the Internet					**Minutes: 450 | 45 Minute Class Periods: 10**		

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7.02	CSP	45	EU 6.1 LO 6.1.1 [P3] EU 6.2 LO 6.2.2 [P4]	Internet: Basic Concepts and Terminology. A 3-part lecture that describes what the Internet is, how it differs from the World Wide Web, and how its performance is measured. Uses various online tools to measure *latency* and *bandwidth*.			Lecture Videos Activities Self Check Reflection
7.03	App	90	EU 1.2 LO 1.2.2 [P2] EU 7.1 LO 7.1.1 [P4] EU 7.4 LO 7.4.1 [P1]	Broadcast Hub Tutorial. Users text the word 'join' to the hub device and are included in the members list. When members text the list, their messages are broadcast to all members. A for-each-element-in-list loop is used to send email messages to hub members.	Texting, Notifier components. Texting Message Received event.	List processing, if/else logic, for-each loop to manage hub.	
7.04	CSP	90	EU 6.1 LO 6.1.1 [P3] EU 6.2 LO 6.2.1[P5] LO 6.2.2[P4]	Internet Architecture and Packet Switching. This lesson goes more deeply into the infrastructure and mechanics of the Internet. It explains *packet switching*, *TCP/IP* and the protocol hierarchy.			Lecture Videos Activities Self Check Reflection
7.05	CSP	45	EU 5.2 LO 5.2.1 [P3] EU 6.1 LO 6.1.1 [P3] EU 6.2 LO 6.2.1[P5] LO 6.2.2[P4]	IP Addresses and Domain Names. In this lesson students use a DNS simulator app to send messages to other clients on a router. They learn about DNS, IP addresses, and packets.			Lecture Videos Activities Self Check Reflection
7.06	CSP	90	EU 6.3 LO 6.3.1[P1]	Cryptography Basics. Introduction to cryptography (secret writing). This lesson focuses on classical cryptography, including Caesar cipher, substitution cipher, transposition cipher, Vigenere cipher, and frequency analysis. It ends with the *key*			Lecture Videos Activities Self Check Reflection

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				exchange problem. Activities include using interactive tools to encrypt, decrypt, and analyze secret messages.			
7.07	CSP	45	EU 6.3 LO 6.3.1 [P1]	Cryptography: Securing the Internet. Introduction to the Diffie-Hellman key exchange algorithm and *public key cryptography (PKC).* Demonstrates how PKC is used to implement secure transactions over the Internet. Activities include interactive public key encryption activities.			Lecture Videos Activities Self Check Reflection
7.08	CSP	45	EU 6.3 LO 6.3.1 [P1]	BB: Cryptography and the Government. Read and discuss small sections of Chapter 5 of *Blown to Bits*, which focuses on encryption and how it is used to secure transactions on the Internet. Read a short Wikipedia on recent the Apple vs. FBI controversy.			Reading Discussion Reflection
Create: Programming Performance Task #2					**Minutes: 720 | 45 Minute Class Periods: 16**		
Create 2	CSP App	720	EU 2.2 LO 2.2.1 [P2] EU 4.1 LO 4.1.1 [P2] LO 4.1.2 [P5] EU 5.1 LO 5.1.1 [P2] LO 5.1.2 [P2] EU 5.2 LO 5.2.1 [P3] EU 5.3 LO 5.3.1 [P3] EU 5.4 LO 5.4.1 [P4]	**CREATE PT 2** is the official CREATE programming performance task to be submitted to the College Board. The CREATE task is one of two required performance tasks by the College Board - a programming one (CREATE) and a written one (EXPLORE). In this programming performance task, students work in pairs to collaboratively develop a mobile app. This includes going through the entire development process of designing, implementing, and debugging a mobile app. Students then document their work by creating a portfolio write-up and share their work through an oral presentation to the class or a recorded video presentation.			Hands on project

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			EU 5.5 LO 5.5.1 [P1]				
Unit 8 - AP CS Principles Exam Prep with Exam 2 (Final)					**Minutes: 135 | 45 Minute Class Periods: 3**		
8.02 8.03 8.04	CSP	90	TBD	Discussing the format of the AP CSP exam and reviewing the AP CSP Exam Reference Sheet and AP CSP Pseudocode with Tracing Pseudocode Exercises.			Self-Check
8.05 8.06	CSP	45	TBD	Sample AP CSP Exam Questions and a Mobile CS Principles Quiz app for reviewing and practicing.			
Exam 2 - Final					**Minutes: 45 | 45 Minute Class Periods: 1**		
Exa m 2	CSP	45	TBD	**Mobile CSP Final Exam** is the last exam for the course which follows the same format at the AP CSP exam. This exam is cumulative and covers Unit 1-7 . It can be used as a practice in review for the AP CSP Exam in May.			
Unit 9 - Beyond the AP CSP Exam (optional)					**Minutes: 540 | 45 Minute Class Periods: 13**		
9.02	App	90	EU 1.2 LO 1.2.4 [P6] EU 3.1 LO 3.1.2 [P6] EU 5.1 LO 5.1.3 [P6] EU 5.3 LO 5.3.1 [P3] EU 5.5 LO 5.5.1 [P1]	Magic 8 Ball. App Inventor simulation of the classic Magic-8 Ball game. Introduces the use of a list variable and random selection from the list. A ListPicker is used to implement a simple settings menu that allows the user to select from Speak, Sound, or Silent options for the feedback provided by the app. An if/else algorithm and a global variable are used to implement the setting.	Accelerometer, Text to Speech, ListPicker, Image, Labels, Sound, Speech recognizer components. Accelerometer shaking, ListPicker after picking event. Speech Recognizer. GetText events.	Lists, random select from list, modeling a real-world game, an if/else algorithm to handle a settings menu.	

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9.03	App	90	EU 3.1 LO 3.1.3 [P5] EU 3.3 LO 3.3.1 [P4]	Persisting Photos Tutorial. This tutorial plus projects lesson shows how to save photos to TinyDb, a simple on-device database. An if/else algorithm is needed to properly initialize the app when initially reading from the Db. A second project uses a simple list to store multiple photos in the Db.	TinyDb, Camera components. Screen.Initialize, Camera.TakePhoto events.	Database, tag/value pairs, persistent data, if/else algorithm on initialization.	
9.04	App	45	EU 1.2 LO 1.2.2 [P2] EU 7.1 LO 7.1.1 [P4]	Where is North. Simple compass app that also reports the device's location. Challenging abstraction exercise: Draw direction markers, N, S, E, W, centered along the edges of the Canvas.	Canvas, Image Sprite, Orientation sensor, Location sensor (GPS) components. Orientation changed, Location changed events.	Coordinate system, Abstraction: Canvas.width and Canvas.height properties	
9.05	App	45	EU 5.3 LO 5.3.1 [P3] EU 7.1 LO 7.1.1 [P4]	My Directions. Uses the devices GPS to provide directions from current location to pre-set list of destinations.	List Picker, Web, Location Sensor, Button, Label, TinyDb, Textbox components. Screen initialize, ListPicker after picking, Location Sensor Location changed.	Uses Google Maps API, String concatenation is used to construct the appropriate URL for Google Maps.	
9.06	App	45		The Pong Game			
9.07	App	45		Debugging Pong			
9.08	App	45		Multiple Choice Quiz App: List of Lists			

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9.09	App	90		Hello World Fusion Table App. An optional lesson that uses a Web Viewer to display Fusiontable data.	WebViewer component. Button.Click event.	Uses the concept of a Uniform Resource Identifier (URI) to access the fusiontable.	
9.10	App	90	EU 1.2 LO 1.2.2 [P2] EU 7.1 LO 7.1.1 [P4] EU 7.4 LO 7.4.1 [P1]	No Texting While Busy. The Texting component is used to respond automatically to incoming Text messages. Permits Texting over Wifi (VoIP) by using Google Voice.	Texting, Label components. Texting Message Received event.	Texting VoIP using Google Voice app and Web service.	
9.11	CSP			Learn More About Programming & Careers			