## **East Penn School District**

**Curriculum and Instruction** 

**Curriculum for: Mobile Apps** 

Course(s): Mobile Apps

Grades: 9-12

**Department: Computers & Business Applications** 

Length of Period (average minutes): 40

Periods per cycle: 6

Type of offering: Elective

Credit(s) awarded: 0.5 credits

Length of Course (yrs): 0.5 year

Developed by: John Dietrick, June Urbassik

ADOPTED: October 28, 2019

Unit 1: Intro to App Inventor					
Enduring Understandings & Essential Questions	Skills and Knowledge	Standards			
<ul> <li>Enduring Understandings:</li> <li>an app can make decisions using a conditional (if) block.</li> <li>a component has a set of properties and that a property is a memory cell that can be changed to modify how a component looks and behaves.</li> <li>Essential Questions:</li> <li>What does an app's behavior consist of?</li> <li>How are apps event-responding machines?</li> <li>In what ways are apps making decisions?</li> </ul>	<ul> <li>Students will be skilled at</li> <li>testing an app</li> <li>deploying the app to a device</li> <li>publish an app</li> <li>designing an app's user interface</li> <li>customizing existing apps</li> </ul> Students will be know <ul> <li>an app's user interface shows the visible components and uses the non-visible components</li> <li>event handlers are blocks that specify how an app responds to an event</li> <li>visible and non-visible components, property, event, event handler, function call, conditional</li> </ul>	<ul> <li>HS-ETSI-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.</li> <li>HS-ETSI-4: Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.</li> <li>ISTE 5.C: Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.</li> <li>ISTE 6.B: Students create original works or responsibly repurpose or remix digital resources into new creations.</li> <li>ISTE 2.B: Students engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.</li> </ul>			

Unit 2: Drawing and Animated Games				
<ul> <li>Enduring Understandings:</li> <li>apps can be programmed to remember information</li> <li>you can define procedures with parameters that control the behavior</li> <li>Essential Questions:</li> <li>How is the internal architecture of an app different than the user interface?</li> <li>What are the different component types in a given app?</li> </ul>	<ul> <li>Students will be skilled at</li> <li>building apps that allow the user to draw on a canvas</li> <li>handling touch and drag events on the device surface</li> <li>controlling screen layout with arrangement components</li> <li>creating and using variables to remember</li> <li>programming an app to do math</li> <li>animate objects</li> </ul> Students will know <ul> <li>Variables remember information</li> <li>Component property is a named memory cell part of a component</li> <li>Each pixel's location is defined by x-y coordinates on a grid system</li> <li>Differences and uses of event parameters and function call parameters</li> </ul>	HS-ETSI-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS-ETSI-4: Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. ISTE 6.D: Students publish or present content that customizes the message and medium for their intended audiences. ISTE 2.B: Students engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.		

Unit 3: Texting and Location-Aware Apps				
Enduring Understandings & Essential Questions	Skills and Knowledge	Standards		
<ul> <li>Enduring Understandings:</li> <li>Data storage can be short-term or persistent</li> <li>Sensors make it possible for users to interact with their environments</li> <li>Essential Questions:</li> <li>What do location-aware apps have to do with GPS?</li> <li>How do I build an app that sends and processes text messages?</li> <li>How is device location information obtained?</li> <li>How are URL's built and show dynamic information?</li> </ul>	<ul> <li>Students will be skilled at</li> <li>Sending and responding to SMS texts</li> <li>Building a one-click texting app</li> <li>Coding text auto-response</li> <li>Using different components, including Texting, TinyDB database, TextToSpeech, LocationSensor</li> <li>Using different events, including Screen.Initialize</li> <li>Students will know</li> <li>Capabilities of TextToSpeech component</li> <li>the 3 blocks involved in sending texts and the block involved to receive texts</li> <li>Basics of Jists and for-each loops</li> <li>Basics of dynamic and persistent data</li> <li>Sensors and properties used to determine location</li> </ul>	HS-ETSI-1: Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. HS-ETSI-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS-ETSI-4: Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. ISTE 4.C: Students develop, test and refine prototypes as part of a cyclical design process. ISTE 2.B: Students engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.		

Unit 4: Quiz and Informational Apps				
Enduring Understandings & Essential Questions	Skills and Knowledge	Standards		
<ul> <li>Enduring Understandings:</li> <li>Data storage can be short-term or persistent</li> <li>Sensors make it possible for users to interact with their environments</li> <li>Essential Questions:</li> <li>How do I build an app that quizzes the user?</li> <li>How can static data (e.g. uploaded pictures) be used in app?</li> <li>Why are lists fundamental to programming?</li> </ul>	<ul> <li>Students will be skilled at</li> <li>Building a slideshow app that require list processing</li> <li>Building a user interface</li> <li>Applying the slideshow app to create a quiz app</li> <li>Iterate through a list with an index variable</li> <li>Fixing the "index out of range" error</li> <li>Use an index variable and if-conditions</li> <li>Iterate backwards to perform different bounds checks</li> <li>Sequencing through a list using an index</li> <li>Designing and adding behaviors to components</li> </ul> Students will know <ul> <li>Definition and function of an index variable</li> <li>Differences of static and dynamic data</li> <li>How apps process lists of data</li> <li>When to use conditional (if) behaviors</li> <li>Purpose of various block types and variables</li> <li>Mechanisms for list manipulation</li> </ul>	HS-ETSI-1: Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. HS-ETSI-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. HS-ETSI-4: Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. ISTE 4.D: Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems. ISTE 2.B: Students engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.		