Introduction to App Design

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July 11, 2017

Intro to App Design Curriculum

Intro to App Design is an introductory course that delves into the exciting world of developing apps for Android mobile devices. Topics that will be covered include the Android User Interface, Implementing Audio, and Creating Animation. Students will learn the basics of programming through creating apps for an Android device. Best design practices and user accessibility will also be covered. Lastly, students will learn how to publish their apps.

Suggested Course Sequence*:

Unit 1: Voila! Meet and Android: 5 days
Unit 2: Simplify! The Android User Interface: 7 days
Unit 3: Engage! Android User Input, Variables, and Operations: 7 days
Unit 4: Explore! Icons and Decision-Making Controls: 7 days
Unit 5: Investigate! Android Lists, Arrays, and Web Browsers: 7 days
Unit 6: Jam! Implementing Audio in Android Apps: 7 days
Unit 7: Reveal! Displaying Pictures in a GridView: 7 days
Unit 8: Design! Using a DatePicker on a Tablet: 7 days
Unit 9: Customize! Navigating with a Master/Detail Flow Activity on a Tablet: 7 days
Unit 10: Move! Creating Animation: 7 days
Unit 11: Discover! Persistent Data: 7 days
Unit 12: Finale! Publishing YOur Android App: 7 days

Prerequisite: None

*The number of instructional days is an estimate based on the information available at this time. 1 day equals approximately 48 minutes of seat time. Teachers are strongly encouraged to review the entire unit of study carefully and collaboratively to determine whether adjustments to this estimate need to be made.

Content Area: Computer Science

Unit Title: Intro to App Design - Unit 1: Voila! Meet the Android

Grade Level: 9-12

Unit Summary: This unit introduces the Android and describes the current market for Android apps. Students will create their first Android project using Android Studio and become familiar with the Android Studio interface and its tools.

Interdisciplinary Connections: Math: integers, decimals, and other mathematical referenced and connections. English: connections to basic forms of speech (nouns, verbs, adjectives), and vocabulary. Art: graphics

21st Century Themes and Skills: Creativity and Innovation, Communication and Collaboration, Critical Thinking & Problem Solving, Information, Media, and Technology Skills, Life and Career Skills.

> CRP2. Apply appropriate academic and technical skills.
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> CRP6. Demonstrate creativity and innovation.
> CRP7. Employ valid and reliable research strategies.
> CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
> CRP11. Use technology to enhance productivity.

Standards (Content and Technology):

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Unit Essential Question(s):	Unit Enduring Understandings:
- How does the Android Studio work? - How do we use the interface to create an app?	- To learn how the Android Studio works. - To become familiar with and interface of Android Studio.

Unit Learning Targets/Objectives:

Students will...

- Be able to understand the market for Android applications.
- Be able to identify the role of the Android device in the mobile market.
- Be able to describe the features of the Android phone
- Be able to identify which languages are used in Android development
- Be able to describe the role of Google Play in the mobile marketplace
- Be able to create an Android project using Android Studio.
- Be able to explain the role of the Android project view.
- Be able to specify the use of layout and widget controls in the user interface.
- Be able to execute an Android application on an emulator
- Be able to open saved Android project in Android Studio.

Formative Assessments:
- Teacher observations
- Practice programs
- Discussions

Summative/Benchmark Assessment(s):
- Chapter Reviews/Quizzes
- Chapter Assignments
- Labs

Resources/Materials (copy hyperlinks for digital resources):
- TextBook: *Android Boot Camp by Corinne Hoisington*
- https://login.cengage.com/cb/login.htm
- Android SDK with Android Studio: http://developer.android.com/sdk/

Modifications:
- Special Education Students
  - Allow errors
  - Rephrase questions, directions, and explanations
  - Allow extended time to answer questions, and permit drawing, as an explanation
  - Accept participation at any level, even one word
  - Consult with Case Managers and follow IEP accommodations/modifications
- English Language Learners
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- At-Risk Students
  - Provide extended time to complete tasks
  - Consult with Guidance Counselors and follow I&RS procedures/action plans
  - Consult with classroom teacher(s) for specific behavior interventions
  - Provide rewards as necessary
- Gifted and Talented Students
  - Provide extension activities
  - Build on students' intrinsic motivations
  - Consult with parents to accommodate students' interests in completing tasks at their level of engagement

Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
Meet the Android	To become familiar with Android devices	This Chapter will take about 5 days. 1 - 2 days will be used to share and discuss the information in the chapter with students
First Venture into the Android World	To learn the basics of the Android studio interface and to create students first app.	3-4 days will be used for practice programs and end of chapter lab

Teacher Notes: Program time may vary depending on the complexity of the programs given.

Additional Resources

Click links below to access additional resources used to design this unit:

Content Area: Computer Science

Unit Title: Intro to App Design - Unit 2: Simplify! The Android User Interface

Grade Level: 9-12

Unit Summary: This unit focuses on the Android user interface. Students learn how to develop a user interface using certain types of controls, select a screen layout, and write code that responds to a button event.

Interdisciplinary Connections: Math: integers, decimals, and other mathematical referenced and connections. English: connections to basic forms of speech (nouns, verbs, adjectives), and vocabulary. Art: graphics

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Unit Essential Question(s):	Unit Enduring Understandings:
• How to create a user interface? • How to use screen layout and button controls?	• To create a user interface for an application.

Unit Learning Targets/Objectives:
Students will...
- Be able to develop a user interface using the TextView, ImageView, and Button controls.
- Be able to add text in strings.xml using the Translations Editor.
- Be able to create an Android project that includes a Button event.
- Be able to describe Relative and Linear layouts for the user interface.
- Be able to create multiple Android Activities.
- Be able to view activities in the Android Manifest file.
- Be able to add a Java class file.
- Be able to add line number to a code window.
- Be able to write code using the onCreate method.
- Be able to Display content using the setContentView command.
- Be able to open a second screen using a Button event handler.
- Be able to us OnClickListener to detect user interaction.
- Be able to launch a second screen using a startActivity method.

- Be able to correct errors in Java code.
- Be able to run the completed app in the emulator.

Formative Assessments:
- Teacher observations
- Practice programs
- Discussions

Summative/Benchmark Assessment(s):
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Designing an Android App	To look at the starting process of creating an app	This Chapter will take about 7 days. 2-3 days will be used to share and discuss the information in the chapter with students 4-5 days will be used for practice programs and end of chapter lab
Using the Android User Interface	To learn how to design the user interface to control the user experience.	
Creating Activities	To learn how to create activities for an Android application.	

The Android Manifest File	To learn what the Android Manifest file is and how it is important to applications.	
Coding the Java Activity	To learn basic java coding for activities.	

Teacher Notes: Program time may vary depending on the complexity of the programs given.

Additional Resources
Click links below to access additional resources used to design this unit:

Content Area: Computer Science

Unit Title: Intro to App Design - Unit 3: Engage! Android User Input, Variables, and Operations

Grade Level: 9-12

Unit Summary: This unit covers user input, variables and operations Students will learn to create a user interface using an Android theme and add controls to the interface, including text fields, buttons, and spinner controls. Students also learn to declare variables and use arithmetic operations to perform calculations, and then convert and format numeric data.

Interdisciplinary Connections: Math: integers, decimals, and other mathematical referenced and connections. English: connections to basic forms of speech (nouns, verbs, adjectives), and vocabulary. Art: graphics

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Unit Essential Question(s):	Unit Enduring Understandings:
- How to use Android themes in applications? - How to create applications that accept user input?	- To make applications unique using themes. - To make applications interactive by accepting user input.

Unit Learning Targets/Objectives:
Students will...
- Be able to use an Android theme.
- Be able to add a theme to the Android Manifest file.
- Be able to add text to the String table.
- Be able to add an XML array string to strings.xml
- Be able to develop a user interface using Text Fields
- Be able to display a hint using the hint property.
- Be able to develop a user interface using a Spinner control.
- Be able to add a prompt to a Spinner control.
- Be able to declare variables to hold data.
- Be able to code the GetText() method.

- Be able to understand arithmetic operations.
- Be able to convert numeric data.
- Be able to format numeric data
- Be able to code the SetText() method
- Be able to run the completed app in an emulator.

Formative Assessments:
- Teacher observations
- Practice programs
- Discussions

Summative/Benchmark Assessment(s):
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Android Themes	To learn how to use themes to keep applications from looking the same.	This Chapter will take about 7 days. 2-3 days will be used to share and discuss the information in the chapter with students 4-5 days will be used for practice programs and end of chapter lab

Simplifying User Input	To learn to write applications to accept user input.
Declaring Variables	To learn how to use variables in applications.
Working with Mathematical Operations	To learn how to use mathematical operations in applications.
Displaying Android Output	To learn how to input data on the screen.

Teacher Notes: Program time may vary depending on the complexity of the programs given.

Additional Resources
Click links below to access additional resources used to design this unit:

Content Area: Computer Science
Unit Title: Intro to App Design - Unit 4: Explore! Icons and Decision-Making Controls
Grade Level: 9-12

Unit Summary: This unit discusses icons and decision-making controls. Students will create a project using a custom application icon, learn how to fine-tune the layout of the user interface, and include radio buttons for user selections. Students will also learn how to program decisions using If statement, If Else statements, and logical operators.

Interdisciplinary Connections: Math: integers, decimals, and other mathematical referenced and connections. English: connections to basic forms of speech (nouns, verbs, adjectives), and vocabulary. Art: graphics

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Unit Essential Question(s):	Unit Enduring Understandings:
- How is a custom application icon created? - How do we use decision making statements in our applications?	To learn how to use decision making statements properly.

Unit Learning Targets/Objectives:
Students will...
- Be able to create an android project with a custom icon.
- Be able to change the text color in controls using hexadecimal colors.
- Be able to align controls using the gravity properties.
- Be able to determine layout with the layout:margin properties.
- Be able to place a RadioGroup and RadioButtons in Android applications.
- Be able to write code for a RadioGroup control.
- Be able to make decisions using an If statement.
- Be able to make decisions using an If Else statement.
- Be able to make decisions using logical operators.
- Be able to test the isChecked property.
- Be able to make decisions using nested If statements.

Formative Assessments:
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Using the Launcher Icon	To learn how to create custom launcher icons.	This Chapter will take about 7 days. 2-3 days will be used to share and discuss the information in the chapter with students 4-5 days will be used for practice programs and end of chapter lab
Displaying the Action Bar Icon using Code	To learn how to display an action bar icon.	
String Table	To learn how to create a string table to be used in applications.	

RadioButton and RadioGroup Controls	To learn how to create and use RadioButtons and RadioGroup controls.
Completing the User Interface	To learn how to clean up and complete the user interface for an application.
Making Decisions with Conditional Statements.	To learn how to use conditional statements to make decisions within an application.

Teacher Notes: Program time may vary depending on the complexity of the programs given.

Additional Resources
Click links below to access additional resources used to design this unit:

Content Area: Computer Science
Unit Title: Intro to App Design - Unit 5: Investigate! Android Lists, Arrays, and Web Browsers
Grade Level: 9-12

Unit Summary: This unit describes how to use lists, arrays, and web browsers in an Android app. Students will work with lists, images, and the Switch decision structure. Students also learn how to access a web browser while using an Android app.

Interdisciplinary Connections: Math: integers, decimals, and other mathematical referenced and connections. English: connections to basic forms of speech (nouns, verbs, adjectives), and vocabulary. Art: graphics

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Unit Essential Question(s):	Unit Enduring Understandings:
● How do we use lists and arrays in applications? ● How is the Switch Statement used?	● To learn how the Switch Statement is used in applications.

Unit Learning Targets/Objectives:
Students will...
- Be able to create an Android project using a list.
- Be able to develop a user interface that uses a ListView.
- Be able to extend the ListActivity class.
- Be able to use an array to create a list
- Be able to code a setListAdapter to display an array.
- Be able to design a custom ListView layout with XML code
- Be able to display an image with the ListView control.
- Be able to change the default title bar text.
- Be able to code a custom setListAdapter for a custom layout.
- Be able to call the onListItemClick method when a list item is selected.
- Be able to write code using the Switch decision structure.
- Be able to call an intent to work with an outside app.

- Be able to pen an Android web browser.
- Be able to launch a website with a URI using an Android browser.
- Be able to test an application with multiple decisions.

Formative Assessments:
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- Practice programs
- Discussions

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Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
Creating a List	To learn how to code a list	This Chapter will take about 7 days. 2-3 days will be used to share and discuss the information in the chapter with students 4-5 days will be used for practice programs and end of chapter lab
Decision Structure-Switch Statement	To learn what a Switch statement is and how to use it.	
Android Intents	To learn what an Android Intent is and what it does.	

Launching the Browser from an Android Device	Learn how to launch a web browser from a device in an application
Adding Multiple Class Files	Learn how to use multiple class files to display images on the screen.

Teacher Notes: Program time may vary depending on the complexity of the programs given.

Additional Resources
Click links below to access additional resources used to design this unit:

Content Area: Computer Science	
Unit Title: Intro to App Design - Unit 6: Jam! Implementing Audio in Android Apps	
Grade Level: 9-12	

Unit Summary: This unit explains how to include audio such as music in Android apps. Students will learn to create and set up a splash screen, learn about the Activity life cycle, pause an Activity, and start, play, stop and resume music playback.

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Unit Essential Question(s):	Unit Enduring Understandings:
• How does a user add music to an app? • How do I create a Splash screen?	• Students will be able to play music through an app.

Unit Learning Targets/Objectives:
Students will...
- Be able to create an Android project using a splash screen.
- Be able to design a TextView control with a background image.
- Be able to pause the execution of an Activity with a timer.
- Be able to understand the Activity lifecycle.
- Be able to pen an Activity with onCreate()
- Be able to end an Activity with finish()
- Be able to assign class variables.
- Be able to create a raw folder for music files
- Be able to play music with a MediaPlayer method
- Be able to start and resume music playback using the start() and pause() method.
- Be able to change the Text property of a control
- Be able to change visibility of a control.

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Creating a Splash Screen	To learn how to create a Splash screen.	This Chapter will take about 7 days. 2-3 days will be used to share and discuss the information in the chapter with students 4-5 days will be used for practice programs and end of chapter lab
Launching the Next Activity	To learn how to launch the next activity from the interface for your applications.	
Designing the activity_main.xml File	To learn how to design the activity_main.xml file.	
Playing Music	To learn how to play music in your applications.	

Creating a Raw Folder for Music Files	To learn how to create a file to hold music files.	
Using the MediaPlayer class	To learn how to make users able to hear music in an application.	

Teacher Notes: Program time may vary depending on the complexity of the programs given.

Additional Resources
Click links below to access additional resources used to design this unit:

Content Area: Computer Science

Unit Title: Intro to App Design - Unit 7: Reveal! Displaying Pictures in A GridView

Grade Level: 9-12

Unit Summary: This unit demonstrates how to use an Android layout tool called a GridView, which shows thumbnail images in a scrolling grid. Students will also learn how to use an array to manage the images.

Interdisciplinary Connections: Math: integers, decimals, and other mathematical referenced and connections. English: connections to basic forms of speech (nouns, verbs, adjectives), and vocabulary. Art: graphics

21st Century Themes and Skills: Creativity and Innovation, Communication and Collaboration, Critical Thinking & Problem Solving, Information, Media, and Technology Skills, Life and Career Skills.

> CRP2. Apply appropriate academic and technical skills.
> CRP4. Communicate clearly and effectively
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> CRP6. Demonstrate creativity and innovation.
> CRP7. Employ valid and reliable research strategies.
> CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
> CRP11. Use technology to enhance productivity.

Standards (Content and Technology):

CPI#:	Statement:
8.1.12.B.2	Apply previous content knowledge by creating and piloting a digital learning game or tutorial.
8.1.12.D.1	Demonstrate appropriate application of copyright, fair use and/or Creative Commons to an original work.
8.2.12.E.1	Demonstrate an understanding of the problem-solving capacity of computers in our world.
8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games
8.2.12.E.4	Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstractions, variables, data types and conditional statements).

Unit Essential Question(s):	**Unit Enduring Understandings:**
• How to use a GridView in an application? • How to use an array to hold images?	• Learn to use a GridView in apps to accommodate viewing a large amount of pictures.

Unit Learning Targets/Objectives:

Students will...

- Be able to create an Android project using GridView control.
- Be able to add a GridView to display a two-dimensional grid of images.
- Be able to reference images through an array.
- Be able to create an ImageAdapter class.
- Be able to code an OnItemClickListener.
- Be able to display a custom toast message.
- Be able to define a Context resource.
- Be able to understand the use of constructors.
- Be able to return a value from a method.
- Be able to determine the length of an array.
- Be able to assign an ImageView control using setImageResource.
- Be able to change the scale and layout size of the GridView.

Formative Assessments:
- Teacher observations
- Practice programs
- Discussions

Summative/Benchmark Assessment(s):
- Chapter Reviews/Quizzes
- Chapter Assignments
- Labs

Resources/Materials (copy hyperlinks for digital resources):
- TextBook: *Android Boot Camp by Corinne Hoisington*
- https://login.cengage.com/cb/login.htm
- Android SDK with Android Studio: http://developer.android.com/sdk/

Modifications:
- Special Education Students
  - Allow errors
  - Rephrase questions, directions, and explanations
  - Allow extended time to answer questions, and permit drawing, as an explanation
  - Accept participation at any level, even one word
  - Consult with Case Managers and follow IEP accommodations/modifications
- English Language Learners
  - Assign a buddy, same language or English speaking
  - Allow errors in speaking
  - Rephrase questions, directions, and explanations
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  - Accept participation at any level, even one word

- At-Risk Students
  - Provide extended time to complete tasks
  - Consult with Guidance Counselors and follow I&RS procedures/action plans
  - Consult with classroom teacher(s) for specific behavior interventions
  - Provide rewards as necessary
- Gifted and Talented Students
  - Provide extension activities
  - Build on students' intrinsic motivations
  - Consult with parents to accommodate students' interests in completing tasks at their level of engagement

Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
Adding a GridView Control	To be able to add a GridView control to an app.	This Chapter will take about 7 days. 2-3 days will be used to share and discuss the information in the chapter with students 4-5 days will be used for practice programs and end of chapter lab
Creating an Array for the Images	To learn how to use an array for images in an app.	
Using a setAdapter with an Image-Adapter	To learn how to use an ImageAdapter with a setAdapter.	

Coding the On-ItemClickListener	To learn what the OnItemClickListener is and how to code it.
Coding a Custom Toast Notification	To learn how to code a custom toast message
Displaying the Selected Image	To learn how to display a selected image when clicked
Customizing the Image-Adapter Class	To learn how to customize the ImageAdapter for an app
Calculating the Length of an Array	To learn how to calculate the length of an array
Coding the getView Method	To learn what the getView method does and how to code it.

Teacher Notes: Program time may vary depending on the complexity of the programs given.

Additional Resources
Click links below to access additional resources used to design this unit:

Content Area: Computer Science

Unit Title: Intro to App Design - Unit 8: Design Using a DatePicker on a Tablet

Grade Level: 9-12

Unit Summary: This unit focuses on learning how to design an app for a tablet device and add an Android Virtual Device specifically designed for tablets.

Interdisciplinary Connections: Math: integers, decimals, and other mathematical referenced and connections. English: connections to basic forms of speech (nouns, verbs, adjectives), and vocabulary. Art: graphics

21st Century Themes and Skills: Creativity and Innovation, Communication and Collaboration, Critical Thinking & Problem Solving, Information, Media, and Technology Skills, Life and Career Skills.

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> CRP6. Demonstrate creativity and innovation.
> CRP7. Employ valid and reliable research strategies.
> CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
> CRP11. Use technology to enhance productivity.

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8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games
8.2.12.E.4	Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstractions, variables, data types and conditional statements).

Unit Essential Question(s):	Unit Enduring Understandings:
- How do you create an application for a tablet? - How do I use date and time in my applications?	- To be able to create applications for tablets. - To be able to use date, time and clocks in applications.

Unit Learning Targets/Objectives:

Students will...

- Be able to create an Android project on a tablet.
- Be able to understand tablet specifications.
- Be able to follow design principles for the Android tablet.
- Be able to add a second Android Virtual Devices.
- Be able to add a custom launcher and tablet theme.
- Be able to understand the Calendar class.
- Be able to use date, time, and clock controls.
- Be able to determine the system date.
- Be able to display a DatePicker control.
- Be able to launch a dialog box containing a DatePicker control.
- Be able to code an onDateSetListener method to await user interaction.
- Determine the date entered on a calendar control.

- Be able to test an application on a tablet emulator.

Formative Assessments:
- Teacher observations
- Practice programs
- Discussions

Summative/Benchmark Assessment(s):
- Chapter Reviews/Quizzes
- Chapter Assignments
- Labs

Resources/Materials (copy hyperlinks for digital resources):
- TextBook: *Android Boot Camp by Corinne Hoisington*
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- Android SDK with Android Studio: http://developer.android.com/sdk/

Modifications:
- Special Education Students
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  - Rephrase questions, directions, and explanations
  - Allow extended time to answer questions, and permit drawing, as an explanation
  - Accept participation at any level, even one word
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- English Language Learners
  - Assign a buddy, same language or English speaking
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  - Rephrase questions, directions, and explanations
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- At-Risk Students
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  - Consult with Guidance Counselors and follow I&RS procedures/action plans
  - Consult with classroom teacher(s) for specific behavior interventions
  - Provide rewards as necessary
- Gifted and Talented Students
  - Provide extension activities
  - Build on students' intrinsic motivations
  - Consult with parents to accommodate students' interests in completing tasks at their level of engagement

Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
Designing a Tablet Application	To learn how to design an application for a tablet.	This Chapter will take about 7 days. 2-3 days will be used to share and discuss the information in the chapter with students 4-5 days will be used for practice programs and end of chapter lab
Creating a Tablet App	To learn how to create an application for a tablet	
Date, Time, and Clocks	To learn how to use date, time and clocks in applications.	
Instantiating the Objects	To learn how to instantiate objects.	

Using the Calendar Class	To learn how to use the calendar class in applications.	

Teacher Notes: Program time may vary depending on the complexity of the programs given.

Additional Resources
Click links below to access additional resources used to design this unit:

Content Area: Computer Science

Unit Title: Intro to App Design - Unit 9: Customize! Navigating with a Master/Detail Flow Activity on a Tablet

Grade Level: 9-12

Unit Summary: This unit continues to explore Android apps designed for tablet devices. Students will create a multipane interface, with a list of options in the left pane, and details about the selected option in the right pane. To do this students will learn about the Master/Detail Flow template.

Interdisciplinary Connections: Math: integers, decimals, and other mathematical referenced and connections. English: connections to basic forms of speech (nouns, verbs, adjectives), and vocabulary. Art: graphics

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Unit Essential Question(s):	Unit Enduring Understandings:
• How do you use responsive design for multiple Android devices? • How can templates be used in design?	• To use responsive design so multiple Android devices can run an app. • To use templates in the design process.

Unit Learning Targets/Objectives:

Students will...

- Be able to understand design for Android apps
- Be able to create an Android tablet project using an application template.
- Be able to understand the Master/Detail Flow template.
- Be able to modify the Master/Detail flow template.
- Be able to add a WebView control.
- Be able to display a Web browser within a tablet app.
- Be able to add an Internet permission to the Android Manifest.
- Be able to customize the content of the sample template file.
- Be able to display a custom layout in the details pane.

Formative Assessments:
- Teacher observations
- Practice programs
- Discussions

Summative/Benchmark Assessment(s):
- Chapter Reviews/Quizzes
- Chapter Assignments
- Labs

Resources/Materials (copy hyperlinks for digital resources):
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- At-Risk Students
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- Gifted and Talented Students
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  - Build on students' intrinsic motivations
  - Consult with parents to accommodate students' interests in completing tasks at their level of engagement

Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
Understand Responsive Design	To learn how to use responsive design in applications.	This Chapter will take about 7 days. 2-3 days will be used to share and discuss the information in the chapter with students 4-5 days will be used for practice programs and end of chapter lab
Using Application Templates	To learn how to use templates in app design	
Designing an XML TableLayout	To learn how to design an XML TableLayout.	
Creating a TextView XML Layout for the	To learn how to create an XML layout that displays two TextView controls.	

Second List Item		
Creating a WebView XML Layout for the Third List Item	To learn how to create an XML layout that displays three WebView controls.	

Teacher Notes: Program time may vary depending on the complexity of the programs given.

Additional Resources
Click links below to access additional resources used to design this unit:

Content Area: Computer Science

Unit Title: Intro to App Design - Unit 10: Move! Creating Animation

Grade Level: 9-12

Unit Summary: This unit explains how to create two types of animation. Students will learn about both frame-by-frame animation and motion tween animation.

Interdisciplinary Connections: Math: integers, decimals, and other mathematical referenced and connections. English: connections to basic forms of speech (nouns, verbs, adjectives), and vocabulary. Art: graphics

21st Century Themes and Skills: Creativity and Innovation, Communication and Collaboration, Critical Thinking & Problem Solving, Information, Media, and Technology Skills, Life and Career Skills.

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CRP4. Communicate clearly and effectively

CRP5. Consider the environmental, social, and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP11. Use technology to enhance productivity.

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8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games
8.2.12.E.4	Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstractions, variables, data types and conditional statements).

Unit Essential Question(s):	Unit Enduring Understandings:
• How do you use Frame animation in apps? • How do you use Tween animation in apps?	• To understand the two different animation styles and when to use them.

Unit Learning Targets/Objectives:

Students will...

- Be able to create Android application with Frame and Tween animation.
- Be able to understand Frame animation.
- Be able to understand Tween animation.
- Be able to add an animation-list XML file.
- Be able to code the AnimationDrawable resource.
- Be able to set the background Drawable resource
- Be able to launch the start() and stop() methods.
- Be able to add Tween animation to the application.
- Be able to create a Tween XML file that rotates an image.
- Be able to determine the rotation pivot, duration, and repeat count of a Tween animation.
- Be able to load the startActivity Tween animation in a second Activity
- Be able to change the orientation of the emulator.

Formative Assessments:
- Teacher observations
- Practice programs
- Discussions

Summative/Benchmark Assessment(s):
- Chapter Reviews/Quizzes
- Chapter Assignments
- Labs

Resources/Materials (copy hyperlinks for digital resources):
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- At-Risk Students
  - Provide extended time to complete tasks
  - Consult with Guidance Counselors and follow I&RS procedures/action plans
  - Consult with classroom teacher(s) for specific behavior interventions
  - Provide rewards as necessary
- Gifted and Talented Students
  - Provide extension activities
  - Build on students' intrinsic motivations
  - Consult with parents to accommodate students' interests in completing tasks at their level of engagement

Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
Android Animation	To learn about the different types of Android animation.	This Chapter will take about 7 days. 2-3 days will be used to share and discuss the information in the chapter with students 4-5 days will be used for practice programs and end of chapter lab.
Adding the Layout for the Frame Image and Button Controls	To learn how to enhance an application through layout with frame images and button controls.	
Creating Frame-by-Frame Animation	To learn what Frame-by-Frame animation is and how to use it.	

Creating Tween Animation	To learn what Tween animation is and how to use it.
Adding the Layout for the Tween Image	To learn how to use layout with Tween Images.
Changing the Emulator to Landscape Orientation.	To learn how to change the orientation of the emulator.

Teacher Notes: Program time may vary depending on the complexity of the programs given.

Additional Resources
Click links below to access additional resources used to design this unit:

Content Area: Computer Science
Unit Title: Intro to App Design - Unit 11: Discover! Persistent Data
Grade Level: 9-12

Unit Summary: This unit shows students how to create an Android app that requests data, stores it, and then modifies that data to produce a result throughout multiple activities. Students also learn about the ways Android apps can save persistent application data.

Interdisciplinary Connections: Math: integers, decimals, and other mathematical referenced and connections. English: connections to basic forms of speech (nouns, verbs, adjectives), and vocabulary. Art: graphics

21st Century Themes and Skills: Creativity and Innovation, Communication and Collaboration, Critical Thinking & Problem Solving, Information, Media, and Technology Skills, Life and Career Skills.

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8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games
8.2.12.E.4	Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstractions, variables, data types and conditional statements).

Unit Essential Question(s):	Unit Enduring Understandings:
• How can SharedPreferences be used to store application data?	• To understand what persistent data is. • To be able to use SharedPreferences to store persistent data.

Unit Learning Targets/Objectives:
Students will...
- Be able to create an Android project using persistent data.
- Be able to understand different types of persistent data.
- Be able to understand SharedPreferences persistent data.
- Be able to understand internal storage.
- Be able to understand external storage.
- Be able to understand saving data using a network connection.
- Be able to understand saving to a database connections.
- Be able to write data using a SharedPreferences object.
- Be able to write data using getString() method
- Be able to retrieve data from a SharedPreferences object.
- Be able to read data using a putString() method.

- Be able to display an ImageView control using code.

Formative Assessments:
- Teacher observations
- Practice programs
- Discussions

Summative/Benchmark Assessment(s):
- Chapter Reviews/Quizzes
- Chapter Assignments
- Labs

Resources/Materials (copy hyperlinks for digital resources):
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- At-Risk Students
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Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
Under-standing Persistent Data	To learn what persistent data is and how to use it.	This Chapter will take about 7 days. 2-3 days will be used to share and discuss the information in the chapter with students 4-5 days will be used for practice programs and end of chapter lab.
Creating XML Layout Files	To learn how to create XML layout files.	
Retrieving Preferences	To learn how to retrieve data and preferences.	
Coding an ImageView Control	To learn how to code and ImageView control.	

Teacher Notes: Program time may vary depending on the complexity of the programs given.

Additional Resources
Click links below to access additional resources used to design this unit:

Content Area: Computer Science
Unit Title: Intro to App Design - Unit 12: Finale! Publishing Your Android App
Grade Level: 9-12

Unit Summary: This unit teaches students how to publish an Android app to the Google Play Store. Before publishing the app, students learn to test it, prepare it for publication, create a package and digitally sign the app.

Interdisciplinary Connections: Math: integers, decimals, and other mathematical referenced and connections. English: connections to basic forms of speech (nouns, verbs, adjectives), and vocabulary. Art: graphics

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8.2.12.E.3	Use a programming language to solve problems or accomplish a task (e.g., robotic functions, website designs, applications, and games
8.2.12.E.4	Use appropriate terms in conversation (e.g., troubleshooting, peripherals, diagnostic software, GUI, abstractions, variables, data types and conditional statements).

Unit Essential Question(s):	Unit Enduring Understandings:
- How do you publish an app to the Google Play store? - How do you make an app accessible to many different users?	To be able to publish an app to the Google Play store.

Unit Learning Targets/Objectives:
Students will...
- Be able to understand Google Play.
- Be able to target various device configurations and languages.
- Be able to prepare your app for publishing.
- Be able to create an APK package by exporting an app.
- Be able to prepare promotional materials
- Be able to publish your app on Google Play

Formative Assessments:
- Teacher observations
- Practice programs
- Discussions

Summative/Benchmark Assessment(s):
- Chapter Reviews/Quizzes
- Chapter Assignments
- Labs

Resources/Materials (copy hyperlinks for digital resources):
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Modifications:
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- **At-Risk Students**
  - Provide extended time to complete tasks
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- **Gifted and Talented Students**
  - Provide extension activities
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Lesson Name/Topic	Lesson Objective(s)	Time frame (day(s) to complete)
Under-standing Google Play	To learn what Google Play is and how it works.	This Chapter will take about 7 days. 2-3 days will be used to share and discuss the information in the chapter with students 4-5 days will be used for practice programs and end of chapter lab.
Targeting Device Con-figurations and Languages	To learn how to target multiple Android devices for an app and program the app in different languages.	
Adding Localization Using the Translations Editor	To learn how to use the localization tool in the translations editor to customize apps for different regions.	

Testing your App on an Android Device	To learn how to test your application before publishing.
Creating an APK Package	To learn how to create a release-ready package for an application.
Preparing Promotional Materials to Upload	To learn how to create promotional materials for the Google Play store.

Teacher Notes: Program time may vary depending on the complexity of the programs given.

Additional Resources
Click links below to access additional resources used to design this unit: