

04 Build Your App

Content Area: **Math**
Course(s):
Time Period: **Semester**
Length: **2 - 3 Weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

Introduction to App Development is a semester course that introduces students to fundamental concepts of programming and application design through exercises, labs, and app projects.

Students will become familiar with the process of debugging and troubleshooting their code; develop new ways of thinking that can be applied outside the classroom. They will learn how to articulate their ideas, collaborate on large complicated projects and how to design with a purpose. Students will have the opportunity to foster their ability to develop and apply computational and design thinking to address real-world problems while design creative solutions. Students will engage not only independently but will work collaboratively to navigate the dynamic digital landscape.

In this unit, students will deepen their skill in Xcode and Interface Builder while they build an application from the ground up. Students will design the flow of an application, add elements to scenes, connect elements to code that creates responds to user interactions. Students will experience how to grow an app in phase while testing each phase and using feedback to modify the applications.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Objectives:

- Transform and idea and sketches into a working application
- Communicate audience and objectives for their application

Essential Questions

- What is the relationship between Swift UIKit and Human Interface Guidelines when creating an app?
- How do people develop and test computer programs?
- How do the wants and needs of people influence technology innovation and improvement?
- How do economic, politics, and culture drive the development of new technology?

Enduring Understanding

- Swift allows us to quickly and creatively create minimum viable products for

prototyping.

- Well planned and effective branding is critical for a well-designed user experience.
- The design process is an essential process for creating an effective app.
- Programs can be developed for creative expression, to satisfy personal curiosity, to create new knowledge, or to solve problems.
- Programs are developed, maintained, and used by people for different purposes.

CONTENT AREA STANDARDS

CS.9-12.8.1.12.AP.1	Design algorithms to solve computational problems using a combination of original and existing algorithms.
CS.9-12.8.1.12.AP.2	Create generalized computational solutions using collections instead of repeatedly using simple variables.
CS.9-12.8.1.12.AP.3	Select and combine control structures for a specific application based upon performance and readability, and identify trade-offs to justify the choice.
CS.9-12.8.1.12.AP.4	Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue.
CS.9-12.8.1.12.AP.5	Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.
CS.9-12.8.1.12.AP.6	Create artifacts by using procedures within a program, combinations of data and procedures, or independent but interrelated programs.
CS.9-12.8.1.12.AP.7	Collaboratively design and develop programs and artifacts for broad audiences by incorporating feedback from users.
CS.9-12.8.1.12.AP.8	Evaluate and refine computational artifacts to make them more usable and accessible.
CS.9-12.8.1.12.AP.9	Collaboratively document and present design decisions in the development of complex programs.
CS.9-12.8.2.12.NT.1	Explain how different groups can contribute to the overall design of a product.
CS.9-12.8.2.12.NT.2	Redesign an existing product to improve form or function.
CS.9-12.8.2.12.ITH.1	Analyze a product to determine the impact that economic, political, social, and/or cultural factors have had on its design, including its design constraints.
CS.9-12.NT	<p>Nature of Technology</p> <p>Engineers use science, mathematics, and other disciplines to improve technology. Increased collaboration among engineers, scientists, and mathematicians can improve their work and designs. Technology, product, or system redesign can be more difficult than the original design.</p> <p>Decisions to develop new technology are driven by societal and cultural opinions and demands that differ from culture to culture.</p>

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

MA.K-12.1

Make sense of problems and persevere in solving them.

MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
VA.K-2.1.5.2.Cr1a	Engage in individual and collaborative exploration of materials and ideas through multiple approaches, from imaginative play to brainstorming, to solve art and design problems.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
LA.K-12.NJSLSA.R7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.
LA.K-12.NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
LA.K-12.NJSLSA.SL2	Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
LA.K-12.NJSLSA.L1	Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
LA.K-12.NJSLSA.L6	Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.
WRK.K-12.P.3	Consider the environmental, social and economic impacts of decisions.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.6	Model integrity, ethical leadership and effective management.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.

STUDENT LEARNING TARGETS

Declarative Knowledge

Students will understand that:

- Applications need an audience
- Applications need a purpose
- Testing, debuting and feedback are crucial along the way not just at the end
- When developing an application, you must break functionality and components up into smaller testable parts

- Incorporating artistic design fundamentals are as important and safe uncomplicated code

Procedural Knowledge

Students will be able to

- Convey the purpose and demographics for their application
- Sketch a flow chart design for their application
- Transform paper design to a working prototype
- Create unique data types and structure

EVIDENCE OF LEARNING

Formative Assessments

- Check Lists
- Exit Ticket
- Class Discussion
- Teacher Observation
- Exit/Entrance Tickets
- Classwork

Summative Assessments

- Unit Project

RESOURCES (Instructional, Supplemental, Intervention Materials)

[Project ideas:](#)

- Color Picker
- Chatbot
- Rock Paper Scissors

- Tic Tac Toe
- Meme Maker
- Drawing App
- Financial App
- 2048

[Open Source Repository for iOS Apps](#)

INTERDISCIPLINARY CONNECTIONS

Interdisciplinary connects are made as students pick a purpose and demographic for their application. Students may create an applications that work for a business, a healthier lifestyle, educational purpose or a numerous of other fields. Some example of application are a fitness tracker, nutrition calculator, study aid game, learning application about history, or an application that analyzes data.

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.