

Unit 4: Creating Apps with Devices

7th Grade Video Game Coding

22 class meetings

August 2023

Essential Questions

- What is involved in building an app?
- How do you create app prototypes to solve real-world problems?
- How do we use computing to solve problems in fun and innovative ways?
- How can we design apps with devices based on the needs of a user?
- How do you make computer programs respond to user interaction?
- How do people develop, test, and debug programs?

Enduring Understandings with Unit Goals

EU 1: Students will understand that computer programs (apps) have to respond to user interaction which is called events

- To apply concepts and evaluate the process for developing an app that includes figuring out purpose, audience, navigation structure, design concepts, and content.

EU 2: Students will understand the process to develop, test, and debug programs. Further understand that core programming constructs are necessary to build different components of an app.

- To design an app that will build on programming learned previously as well as to include response to user interaction.

Standards

National Media Arts Standards:

- MA:Cr1.1.6: Formulate variations of goals and solutions for media artworks by practicing chosen creative processes, such as sketching, improvising and brainstorming.
- MA:Cr2.1.6: Organize, propose, and evaluate artistic ideas, plans, prototypes, and production processes for media arts productions, considering purposeful intent.
- MA:Cr3.1.6b: Appraise how elements and components can be altered for intentional effects and audience, and refine media artworks to reflect purpose and intent.
- MA:Pr5.1.6c: Demonstrate adaptability using tools and techniques in standard and experimental ways in constructing media artworks.
- MA:Pr6.1.6c:a. Analyze various presentation formats and fulfill various tasks and defined processes in the presentation and/or distribution of media artworks.
- MA:Pr6.1.6c:b. Analyze results of and improvements for presenting media artworks.
- MA:Re7.1.6:a Identify, describe, and analyze how message and meaning are created by components of media artworks.
- MA:Re7.1.6:b Identify, describe, and analyze how various forms, methods, and styles in media artworks

manage audience experience.

- MA:Re8.1.6: Analyze the intent of a variety of media artworks, using given criteria.
- MA:Re9.1.6: Determine and apply specific criteria to evaluate various media artworks and production processes, considering context and practicing constructive feedback.
- MA:Cn 10.1.6: a. Access, evaluate, and use internal and external resources to create media artworks, such as knowledge, experiences, interests and research.
- MA:Cn11.1.6: a. Research and show media artworks and ideas relate to personal life, and social, community, and cultural situations, such as personal identity, history, and entertainment.

- **ISTE Standards**

- Standard 1: Empowered Learner. Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.
- Standard 2: Digital Citizens. Students recognize the rights, responsibilities and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical.
- Standard 3: Knowledge Constructor. Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.
- Standard 6: Creative Communicator. Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goal.

ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community.

Unit Content Overview

- 1. Getting Started - Intro to Apps**
 - Explore and investigate what makes an app an app.
- 2. Introduction to Design Mode**
 - This builds up skills in designing a user interface but also sets students up to begin designing an app of their own.
- 3. Project - Designing an App Part 1**
 - Brainstorm app ideas and sketch out user interfaces.
- 4. Project - Designing an App Part 2**
 - Students continue to follow the app development process.
- 5. Lesson 5: The Need for Programming Languages**
 - Students are introduced to the concept of a programming language. It helps them understand why programming languages exist.
- 6. Lesson 6: Intro to Programming**
 - Students use and modify a series of simple apps to get familiar with a small set of programming commands.
- 7. Lesson 7: Debugging**
 - Introduce the concept of debugging and are encouraged to use and reflect on this practice throughout the lesson.
- 8. Lesson 8: Project - Designing an App Part 3**
 - Students learn about Pair Programming by watching a video and then practicing it themselves while working on their project apps.
- 9. Lesson 9: Project - Designing an App Part 4**
 - Students continue working on their apps. Students watch other groups test their apps and collect feedback that will be used to make updates.
- 10. Lesson 10: Project - Designing an App Part 5**
 - Students complete their apps, making any final adjustments based on feedback from their peers. Students spend some time reviewing other apps that classmates made and then complete a short set of reflection prompts before submitting their projects.
- 11. Assessment Day**
 - Students complete the Unit Assessment and then spend the rest of class sharing their projects.

Daily Learning Objectives

Students will be able to....

- Brainstorm and choose a topic to develop into an app.
- Use feedback to help guide the design of an app.
- Design the user interface of an app.
- Identify the inputs, outputs, and the purpose of an app.
- Set up the User Interface of an app including buttons, text, and images.
- Brainstorm and choose a topic to develop into an app, Use feedback to help guide the design of an app, Design the user interface of an app.
- Create a user interface based on a prototype.
- Justify the existence of programming languages to precisely communicate instructions, Explain the qualities that differentiate natural languages and programming languages.
- Define a program as a sequence of commands that are executed or run by a computer, explain the differences between how sequential and event-driven programs execute.
- Debug simple sequential and event-driven programs, Use the debugging process and Identify specific best practices for debugging programs, Use the speed slider, break points, and documentation as part of the debugging process.
- Effectively use pair programming while designing the features of an app, Create the code and user interface of an app based on a program specification.
- Test an app's functionality by attempting to use features and behavior described in a program specification, Provide effective feedback on the functionality or usability of an app, Iteratively improve an app based on feedback.
- Reflect on the value of different stages of a development process in creating an app.

Instructional Strategies/Differentiated Instruction

- Whole group instruction
- Small group instructions
- Strategic grouping
- Guided notes
- Instructional videos
- Paragraph frames and sentence starters
- Teacher/student modeling
- Written feedback – teacher and peer
- Think-write-pair-share and small-group discussions
- Graphic organizers
- Accountable talk
- Homework
- Electronic word walls with visuals
- Anchor charts
- Conferencing
- Text and video chunking with guiding questions
- Key vocabulary - translation, reinforcing the contextual definition with visuals
- Provide correct pronunciation by repeating student response
- Word wall
- Do Now's as vocabulary review
- Culturally responsive teaching

- Explicit modeling
- Non verbal assessment
- Assignment modification

EL Differentiation Instruction:

- Verbal: Prompting, questioning, elaborating, higher level thinking skills
- Explicit modeling
- Word walls with visuals
- Pre reading strategies
- Guided and independent practice
- Small group instruction
- Strategic grouping
- Key Vocabulary
- Graphic organizers
- KWL charts

Assessments

FORMATIVE ASSESSMENTS:

- Quick Write responses
- Exit Slips
- Accountable Talk Discussions
- Do Now
- Oral questioning
- Graphic organizers
- Regular Homework
- Thumbs u p/Thumbs down

SUMMATIVE ASSESSMENT(S):

- Unit Task scoring guide
- Teamwork rubric

Unit Task

Unit Task Name: Let's Make it!

Description: Students work with a teammate and create an app that teaches classmates about any topic they find interesting. The app. That is created will be shared and explained utilizing skills and the tools of coding to demonstrate all that has been learned over the course of the last unit of study.

Evaluation: Teamwork Rubric and scoring guide.