

Computer Science

Students will be able to: Describe a problem that can be addressed by a mobile app; analyze criteria and constraints for solving a problem using a mobile app; synthesize information to design a mobile app that will address a real-world problem.

CONCEPT OVERVIEW

As mobile technology has advanced, the development of software applications, or apps, has exploded. Apps are self-contained, specialized programs that are designed to solve particular, limited problems. During this lesson, students will research and design an app, and present their design at a classroom tech fair.

Fundamental concepts

- Engineering: cost/benefit analysis; criteria and constraints; systems thinking.

ACTIVITY OVERVIEW

Begin the lesson by asking students to write down the names of all the apps that they use on a regular basis. Have each student write the name of one of these apps on the board. As a class, go through some of these apps and discuss what main problem each app was designed to address. Also discuss which apps are student favorites and why. Allow individual time to define key terms and answer pre-activity questions. Then lead a class discussion on the objectives of the activity.

Mobile App Fair: Students research the structure and function of different apps for cellular phones. Working in small groups, students design their own apps and present their designs during a classroom tech fair.

KEY TERMS

- app
- mobile platform
- operating system
- native code
- managed code
- application programming interface (API)
- object-oriented programming
- cost/benefit analysis

Common Core Standards:

CCSS.ELA-Literacy.RST.9-10.7, CCSS.ELA-Literacy.RST.11-12.7, CCSS.ELA-Literacy.RST.11-12.9

National Professional Organization Standards (Next Generation Science Standards):

HS-ETS1-1; HS-ETS1-2; HS-ETS1-3

Curriculum Standards Description:

Translate technical information into visual form; integrate multiple sources of information to solve a problem; synthesize information from a range of sources to understand processes; analyze a global challenge to specify criteria and constraints for solutions; design a solution to a real-world problem by breaking it down into smaller, more manageable problems that can be solved by engineering; evaluate a solution to a real-world problem based on prioritized criteria and constraints.

MATERIALS

Mobile phone with Internet access, computer with word processing or design software, color printer

PRE-ACTIVITY QUESTIONS

1. Why are there different operating systems for different types of phones?
2. When an app is built for one operating system, how can it be adapted to work on another?
3. What are the benefits of using managed code instead of native code?
4. What types of software programs can be used to build apps?
5. What is the benefit of designing an app before starting to build it?

MOBILE APP FAIR

1. Have a class discussion about the types of problems that can be solved by apps. Group these problems into categories.
2. Break into small groups based on shared interest in a particular category of app.
 - a. Perform research on apps that have already been created within your chosen category.
 - List the problem each app solves.
 - Describe the look of each app (its color scheme, graphics, and text), and why this look may have been used.
 - Describe the audience for each app.
 - Describe the structure of each app, such as number of screens and types of buttons or other ways for users to interface with the app.
 - Describe the success or failure of each app in solving the problem it was designed to solve, as reported by users.
 - b. Within each small group, choose three apps to investigate in greater depth.
 - Use all of the features on the app.
 - Write a detailed evaluation of its strengths and weaknesses in engaging the user and addressing its specific problem.
3. After researching apps within a category, identify a problem that your group could address with an app.
 - a. Clearly state the problem.
 - b. Clearly state why a new app would be necessary to address the problem.
 - c. Clearly state how the new app would address the problem.
4. Use the knowledge gained from your research to design the app.
 - a. Thoughtfully choose the types of graphics and text that will be used.
 - b. Design the structure of the app, so it is clear how the user will navigate through the app.
 - c. If the app is a type of game, identify how the user will be rewarded when successful or penalized when unsuccessful.
 - d. Choose any music or audio that will be used with the app.
5. Create printed mockups of the different screens of the app, showing how the user will move through these screens and what will happen when the user makes different choices.
6. Allow all group members to review the mockups and suggest any changes to the app. Approach the entire process of app design as a collaborative back-and-forth process within the group, so that all members are engaged throughout all stages, and feedback can be incorporated up to the point when a final version is agreed upon by the entire group.

Evaluation

Students produce a display about their app for a classroom tech fair. The display should be designed to draw the attention of passersby. It should also simply and creatively explain the structure and function of their app.

Closure: Students vote to present awards for the following at the tech fair: most interesting app, most useful app, most informational display, and most creative display. Students discuss which of the student apps would be realistic to develop, and explore the possibility of obtaining funding for a programmer to work with the class to actually create the app.

RELATED LITERATURE

Staley, Erin. *Career Building through Creating Mobile Apps*. [N.p.]: Rosen, 2013. Digital file.

White, Carla. *Idea to iPhone: The Essential Guide to Creating Your First App for the iPhone and iPad*. Chichester: Wiley, 2013. Print.

Related Database Search - (apps or (applications and software)) and (smartphone or “mobile device” or tablet)

Related Image Search - ((smartphone or mobile or tablet or ipad or iphone or screenshot) and (app or (software and application)))