Lesson 15: Build a Digital Prototype

Overview

Question of the Day: How can I design a digital prototype from a paper prototype?

Having collaboratively developed a paper prototype for their apps, groups now divide and conquer to begin work on an interactive digital version based on the paper prototype. Using the drag-and-drop design mode of App Lab, students individually work through a progression of skill-building levels to learn how to build digital versions of a paper prototype. From there, each group member builds out at least one page of their app in App Lab, to be later combined into a single app.

Purpose

This lesson introduces students to the design mode interface of App Lab, and to the process of translating a paper prototype to digital. They'll use this as a tool to iterate on their paper prototypes, first by building up an exemplar app screen, and eventually building up to an interactive app prototype by the end of the lesson.

Assessment Opportunities

1. **Create a digital prototype of an application screen**

   Code Studio, level 2: See rubric. You may need students to turn in their paper prototypes, or circulate while students are working on the project, to ensure that the digital and paper prototypes are consistent.

Standards

Full Course Alignment

CSTA K-12 Computer Science Standards (2017)

- **AP** - Algorithms & Programming
- **CS** - Computing Systems
- **IC** - Impacts of Computing

Agenda

Warm Up (5 minutes)
- **Getting Prepared**
- **Team Check-In**

Activity (35 minutes)

Objectives

Students will be able to:

- Create a digital prototype of an application screen

Preparation

- Have extra copies of the Screen Design Activity Guide available for students

Links

Heads Up! Please make a copy of any documents you plan to share with students.

For the teachers

- **CSD Unit 4 - The Design Process** - Slides

For the students

- **Screen Design (2021)** - Activity Guide

Screen Design Planning
Building Screens in App Lab
Sharing Designs

Wrap Up (5 minutes)
Journal

Teaching Guide

Warm Up (5 minutes)

Getting Prepared

Distribute: Make sure each team has their materials available, including their paper prototypes and Screen Design Activity Guides from yesterday.

Team Check-In

Prompt: Lay out all of the Screen Design Activity Guide's your team has completed so far. It's okay if not every screen is finished yet. Look over the IDs for each screen and check that:

- Each screen has a name that contains only letters and no spaces
- Each ID starts with the screen name
- All of the IDs are unique across **all** the screens

Discuss: Students don't need to write anything down for this prompt - they can complete it as a group via discussion.

Discussion Goal

Goal: This is a quick task that helps transition students back into completing their Screen Design activity guides, or be prepared to jump into today's activity of designing these screens in App Lab. This is one last check that each team is preparing their IDs for a successful implementation in App Lab.

Remarks

> Preparing our screens is an important step that will make our digital prototypes more organized and save us time when preparing screens in App Lab. Today we will finish planning for any remaining screens in our app, then spend most of our time building these screens in App Lab.

Question of the Day: How can I design a digital prototype from a paper prototype?

Activity (35 minutes)

Screen Design Planning

Do This: Have students complete any remaining Screen Design Activity Guides for their app's screens, focusing on planning the ID names. If some team members finish before others, you can suggest that they help their other teammates finish their remaining screens.

Building Screens in App Lab

Code Studio: When students have finished their Screen Designs, have them log into Code Studio. There is a single level for students to design the screen for their app.

1 **Design a Screen for your App**

2 **App Project: Screen Design**

Teaching Tip

Multiple Screens: At this point, students haven't learned how to add multiple screens to their apps - this happens in the next lesson. However, if a student is in charge of designing multiple screens for their team, you can show them how to add a new screen from Design Mode so they can complete all of their screens on this single level.

Circulate: Monitor students as they build their screens in App Lab, answering questions and providing feedback to students on their design. Encourage students to use their teammates as resources, getting quick feedback or asking questions. Most of the class will be spent with students designing their screens.

Sharing Designs

Share: If there is time, have students share their screens with the class, focusing on the different designs that teams created for their apps.

Wrap Up (5 minutes)

Collect: Collect all the materials from each team in a safe storage location.

Journal

Prompt: How did your initial paper designs change when you recreated them in App Lab? What kinds of adjustments did you have to make?

Discuss: Have students journal individually first, then have students share with a partner before asking a few students to share with the class.

Discussion Goal

Goal: There is no single right answer to this prompt - the goal is to reflect on the process of converting a paper prototype into App Lab. Students may notice that the elements in App Lab make certain types of designs more difficult - for example, it's hard to have curves or wavy lines as part of the design. Students may also realize that their paper prototypes were too "compact" with too much information on one screen - when they tried to recreate in App Lab, the text or icons may have been too small to read.