Unit 3: Intro to App Design

Unit 3 - Lesson 1
Introduction to Apps

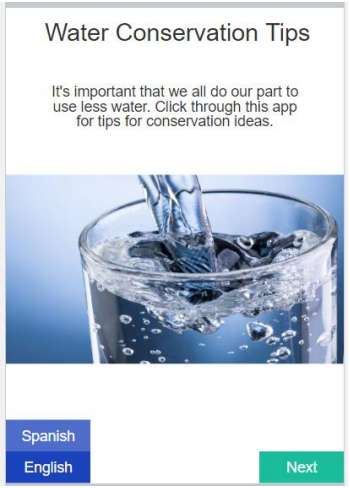
Warm Up

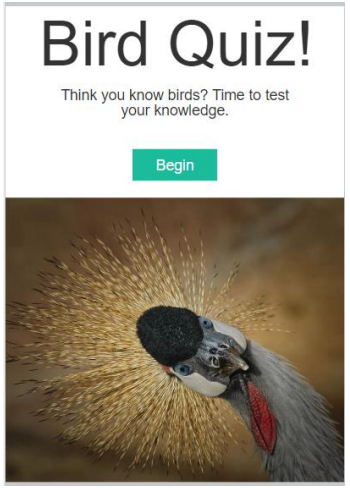
Prompt:

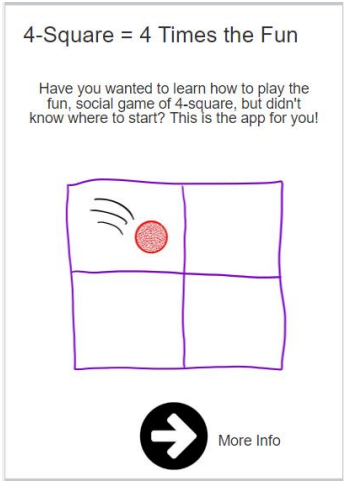
What are apps? How do we interact with them? What kind of things do apps do?

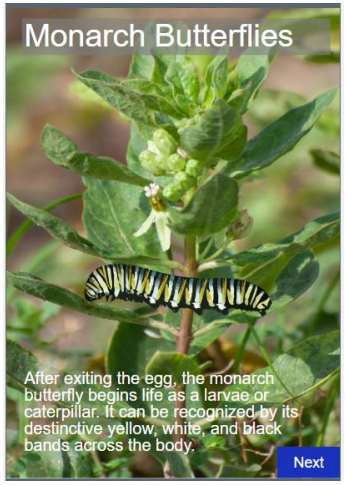
Activity

App Exploration





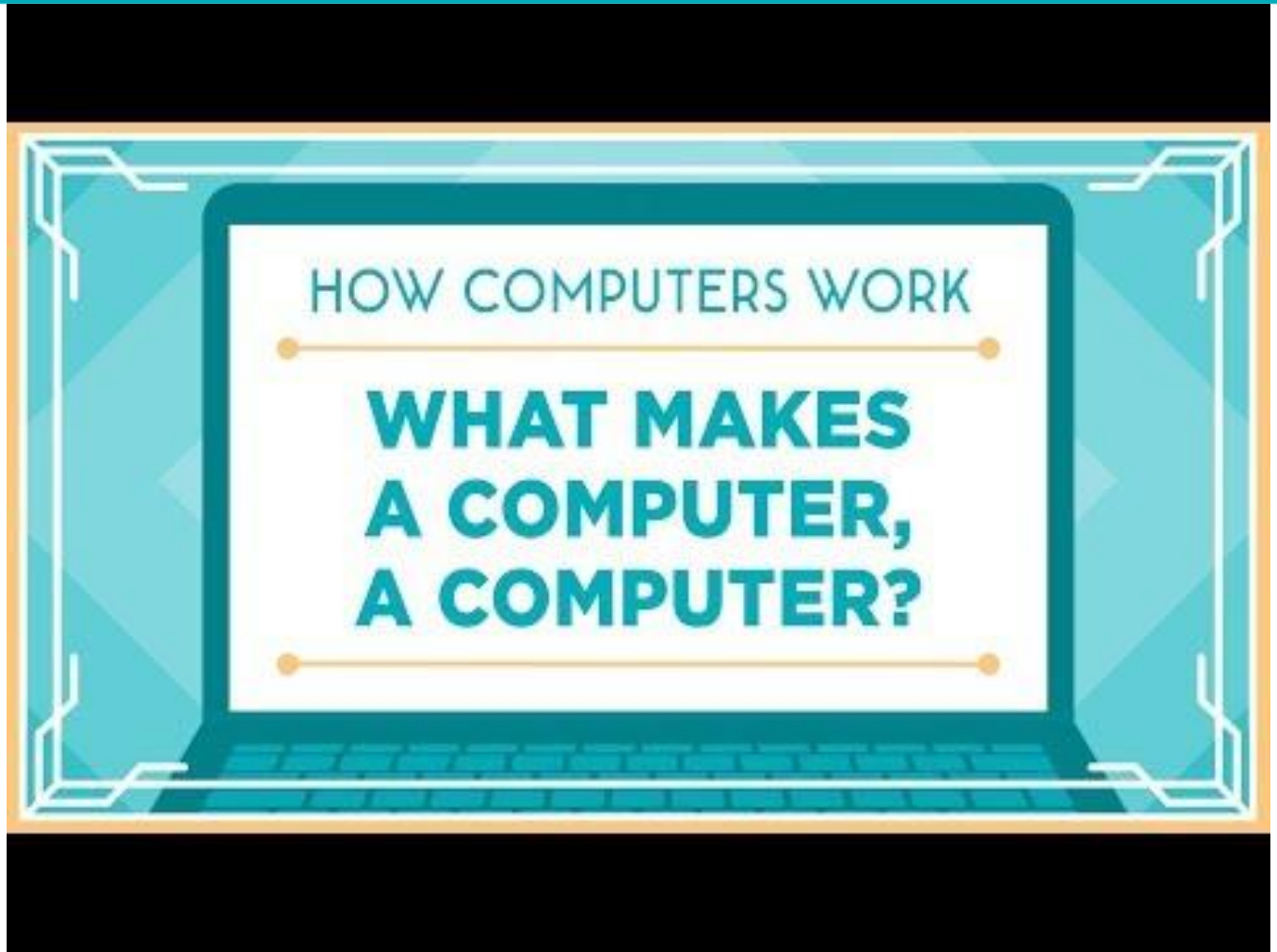




Prompt:

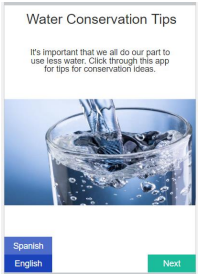
With a partner discuss the following and note down in your journal:

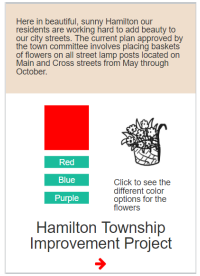
- How does the user interact with the app?
- What is the overall purpose of the app?
- Who is the target audience?

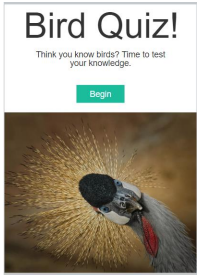

HOW COMPUTERS WORK
WHAT MAKES A COMPUTER, A COMPUTER?

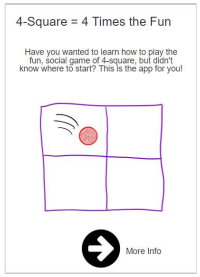
App Investigation

For this part, start at Level 8









Do This:

With your partner, take another look at the sample apps you explored before by navigating to the App Investigation starting at Level 8. Consider what the inputs and outputs are for the apps.

Note these down in your journal.

Wrap Up

Prompt:

Think of your favorite app. Discuss with a partner what the user interface looks like and the inputs and outputs.

User Interface: the inputs and outputs that allow a user to interact with a piece of software. User interfaces can include a variety of forms such as buttons, menus, images, text, and graphics.

Input: data that are sent to a computer for processing by a program. Can come in a variety of forms, such as tactile interaction, audio, visuals, or text.

Output: any data that are sent from a program to a device. Can come in a variety of forms, such as tactile interaction, audio, visuals, or text.

Unit 3 - Lesson 2
Introduction to Design Mode

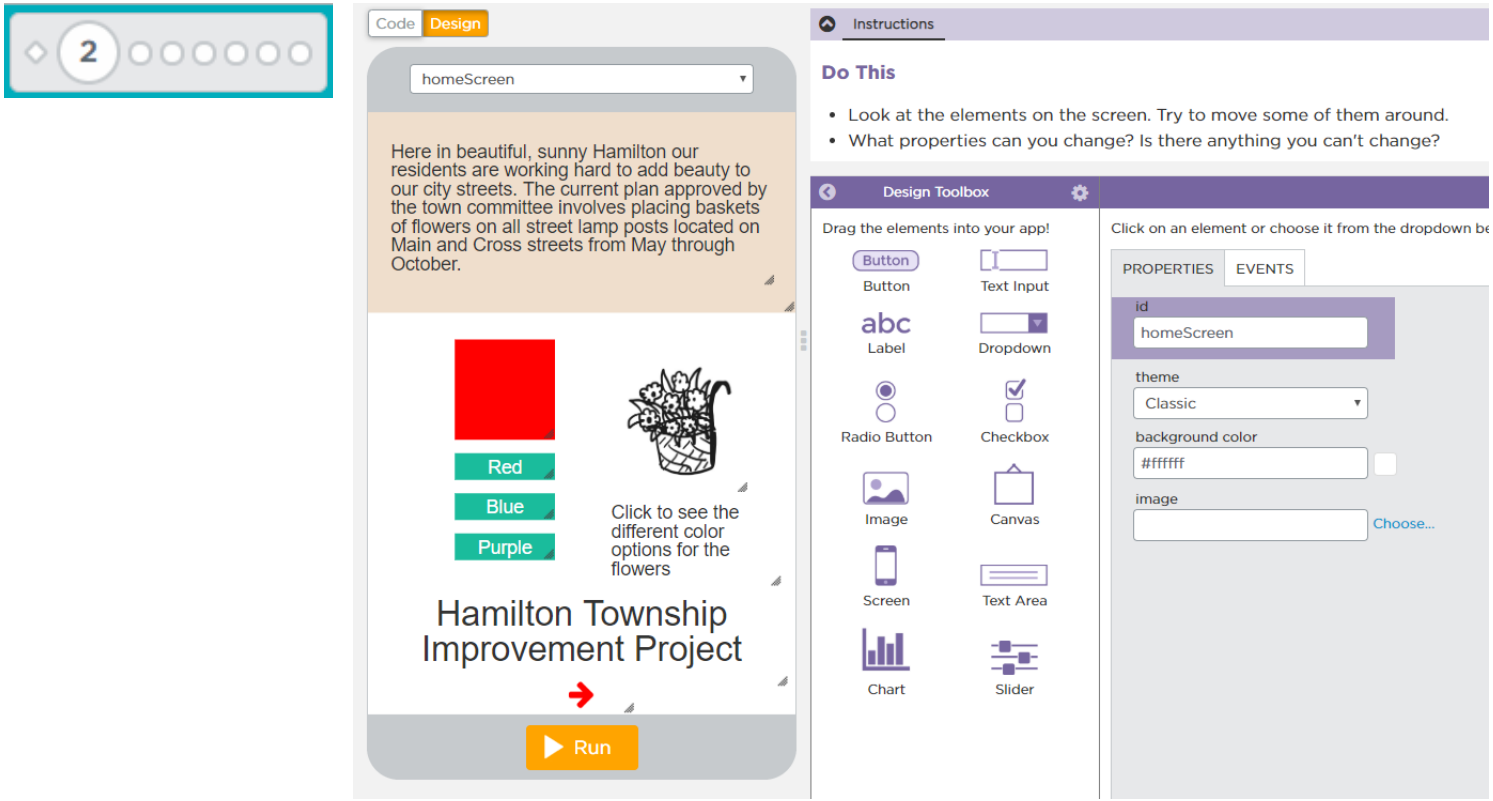
Warm Up

Prompt:

What is a common app that you use? Take a minute to sketch the User Interface of the main screen. Note how the user interacts with the app.

Activity

Introduction to Design Mode



Wrap Up

Prompt:

- What elements collect input?
- What elements display output?
- Do you think there are elements that can do both?

Unit 3 - Lesson 3
Project - Designing an App Part 1

Warm Up

Prompt: People design user interfaces to meet a user's needs, but they don't always get it right.

- Have you ever used an app where the user interface didn't actually meet your needs?
- What was the problem?
- What do you think the designers didn't understand about you or your needs?

Activity

Designing an App Part 1

Name(s) Period Date

App Development Planning Guide

Project Description

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You will submit
- Your final app
- This completed project-planning guide

App Requirements
- Uses at least three screens
- Includes examples of images, audio, and text
- A clear and easy to navigate user interface
- Clearly communicates information about your topic
- Code is clearly written and free of errors

Steps
- Collaborate with your partner to pick a topic you are both interested in
- Interview classmates to identify what they already know about the topic
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- Design and program your app in App Lab
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Step 1. Brainstorm Topic Ideas: Your app can teach your classmates about any topic you and your partner agree on. Your topics could be a hobby, something you've always been interested in, a piece of your personal history, or just something you think your classmates should learn more about.

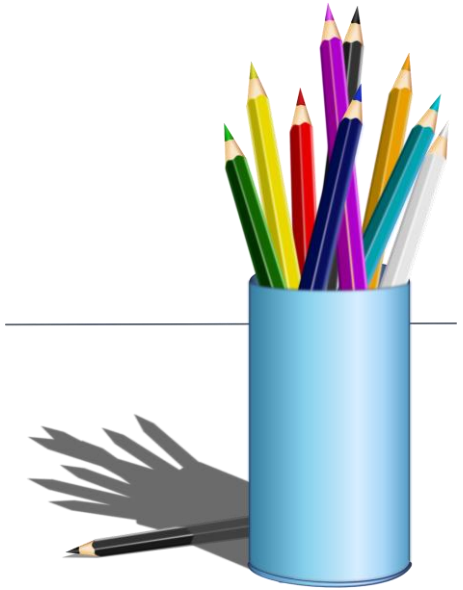
Write down three ideas for a topic that you brainstorm individually.

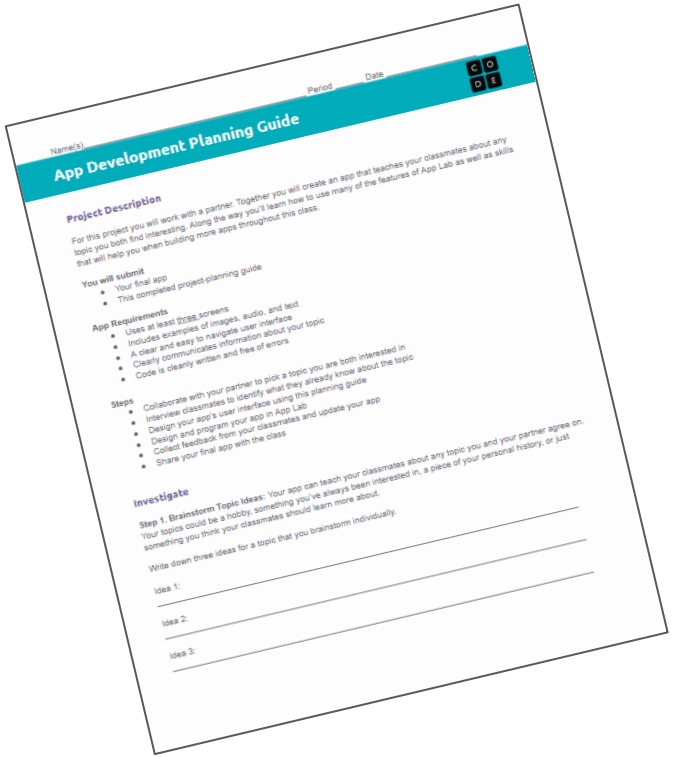
Idea 1:

Idea 2:

Idea 3:

You should have:
App Development Planning Guide





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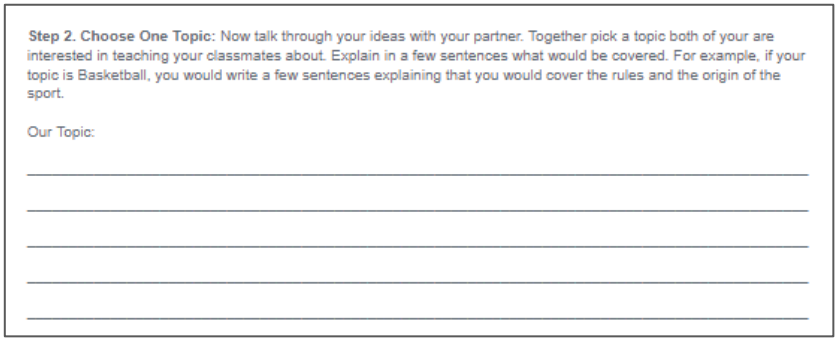
Step 1:
Brainstorm Topic Ideas

Do This:

Choose a partner!

Tip:

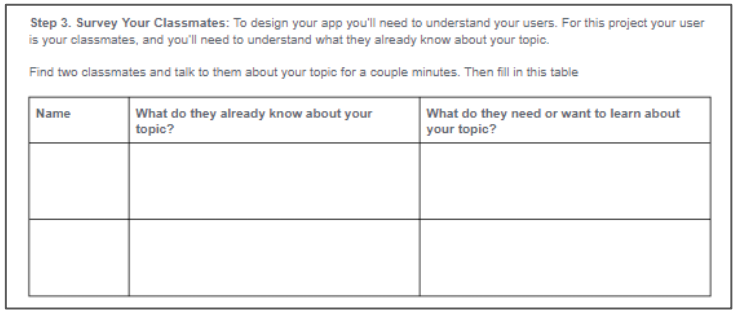
Keep an eye out for bias!
Collaboration with others is key.



Step 2. Choose One Topic: Now talk through your ideas with your partner. Together pick a topic both of your are interested in teaching your classmates about. Explain in a few sentences what would be covered. For example, if your topic is Basketball, you would write a few sentences explaining that you would cover the rules and the origin of the sport.

Our Topic:

Step 2:
Choose One Topic

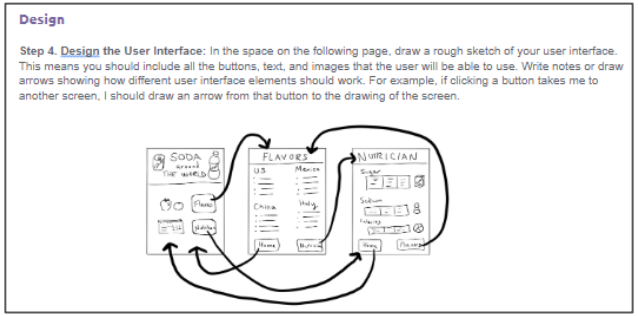


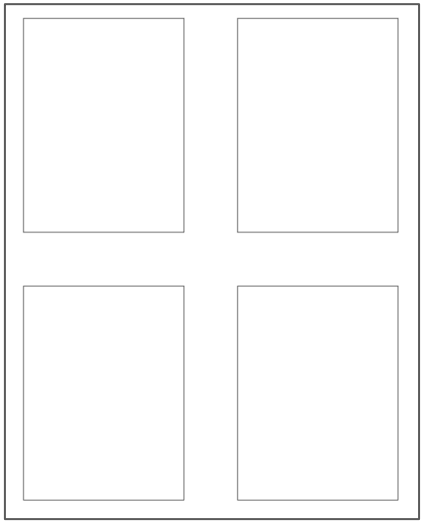
Step 3. Survey Your Classmates: To design your app you'll need to understand your users. For this project your user is your classmates, and you'll need to understand what they already know about your topic.

Find two classmates and talk to them about your topic for a couple minutes. Then fill in this table

Name	What do they already know about your topic?	What do they need or want to learn about your topic?

Step 3:
Survey Your Classmates





Step 4:
Design the User Interface

Wrap Up

Prompt:

How did talking with the users of your app impact your design decisions?

Unit 3 - Lesson 4
Project - Designing an App Part 2

Warm Up

Prompt:

Why is it important to plan out the design of an app?

Activity

Designing an App Part 2

Name(s) Period Date

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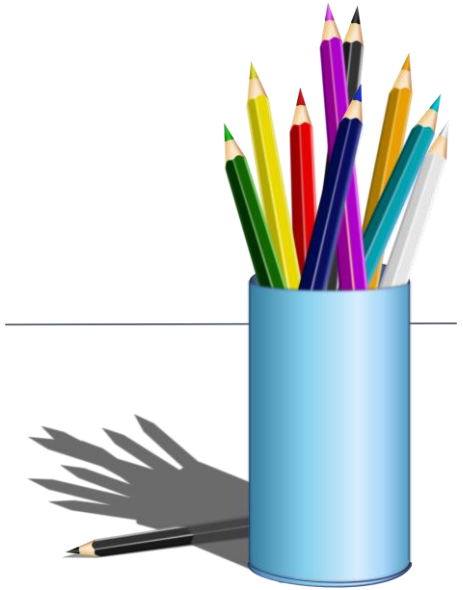
Idea 2:

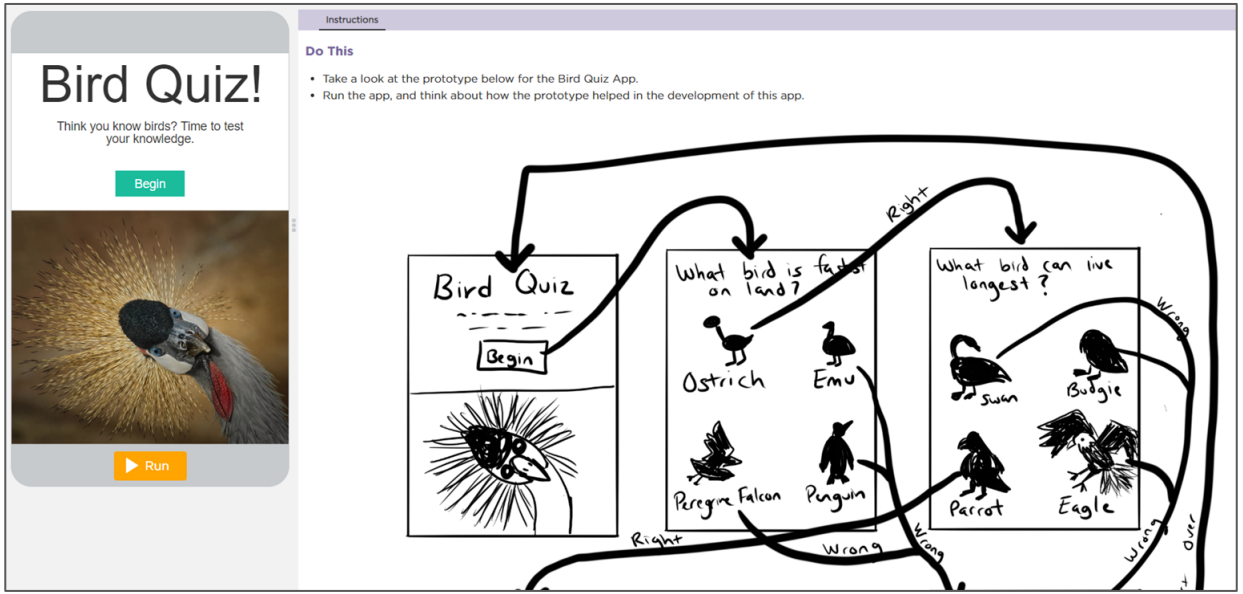
Idea 3:

You and your partner should have:
App Development Planning Guide
Pen/Pencil

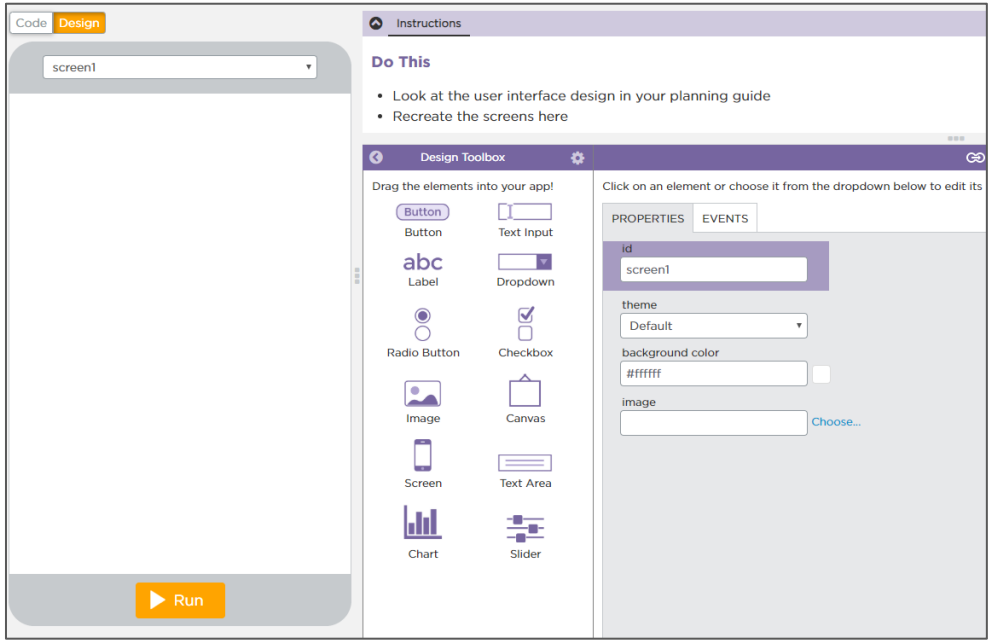


Do This: Navigate to Code Studio, Lesson 4, Level 2. Follow the instructions.

2



Do This: Navigate to Level 3.
Start building your user interfaces!

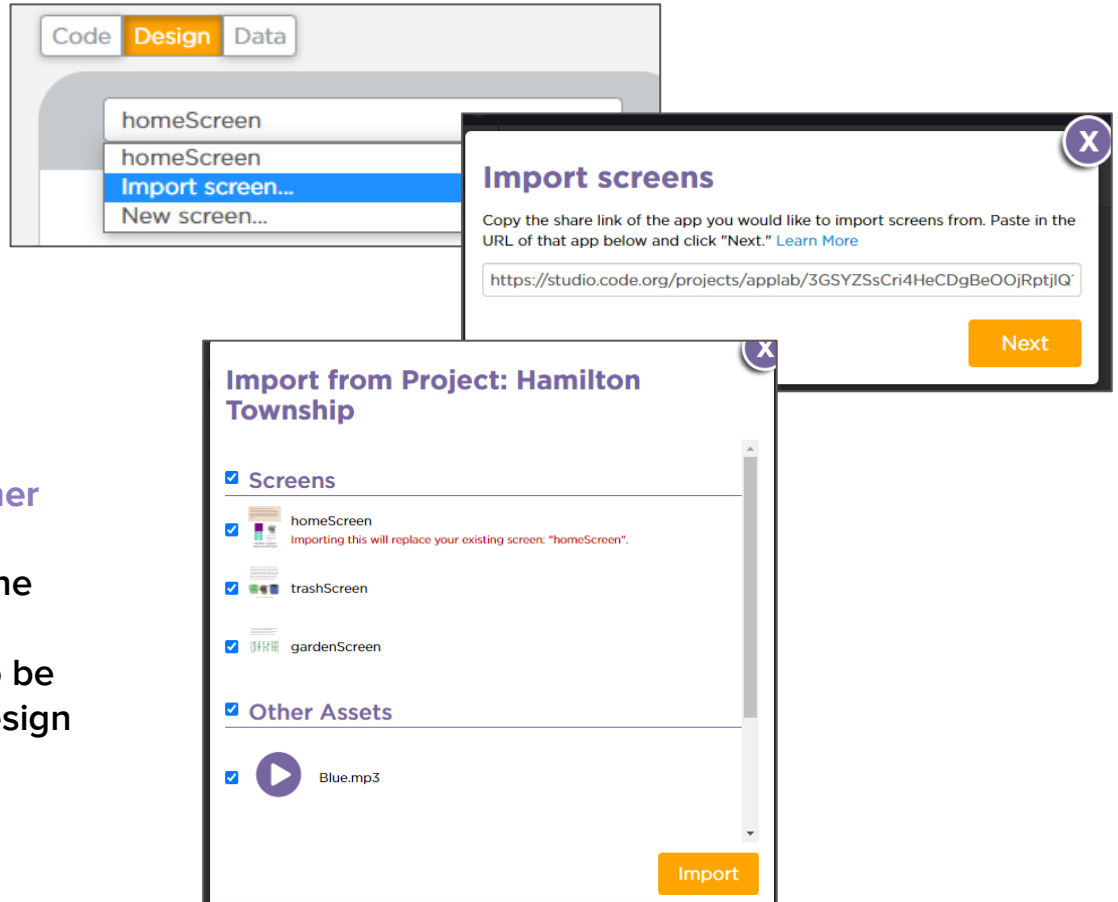


If you divided the screens with a partner, here's how to combine them into one project.

Partner A

Partner B

1. Choose one partner to host the project (Partner A).
2. Partner A clicks the screen dropdown, then clicks "Import screen"
3. Paste in the share link from Partner B.
4. Partner A select to import all of the screens and assets.
5. Partner A set the home screen to be the default screen (Hint: Go to design mode and click on the screen)



Wrap Up

Prompt:

Were there any changes you had to make to your original design once you transferred it to the screen?

Unit 3 - Lesson 5
The Need for Programming Languages

Warm Up

Prompt:

Write down three different reasons you would call a set of instructions "bad".

Be ready to share with a neighbor.

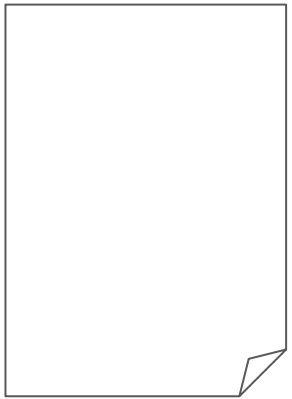
Activity

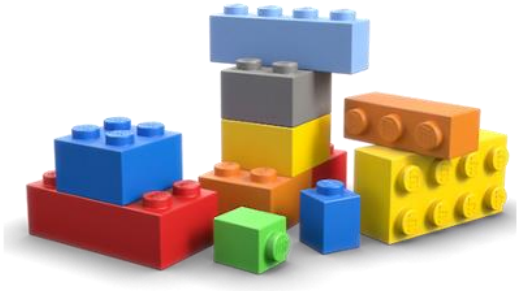
You and your partner should have:

Pen / Pencil

Sheet of paper

A small set of Legos or other blocks





Step 1: Design

- Put 5-6 pieces together
- All pieces must be connected

Step 2: Record

- Take a photo or draw a picture
- Color matters

Step 3: Write instructions

- Write instructions for building your design
- Be as clear and precise as possible
- Just words, no drawings, diagrams, or pictures

Step 4: Trade

- Take apart your design, then trade pieces and instructions with another group

Step 5: Build

- Try to build the design following the instructions

Step 6: Compare

- Compare your design to the picture the other team recorded

Step 7: Repeat

- If you have time try this activity with one or two other groups' instructions.

Wrap Up

Prompt:

When you or your classmates made mistakes following instructions today what "went wrong"? Try to be as specific as possible.

Prompt: Imagine we were going to redesign human language to be really good for giving clear instructions. What types of changes would we need to make?

Unit 3 - Lesson 6
Intro to Programming

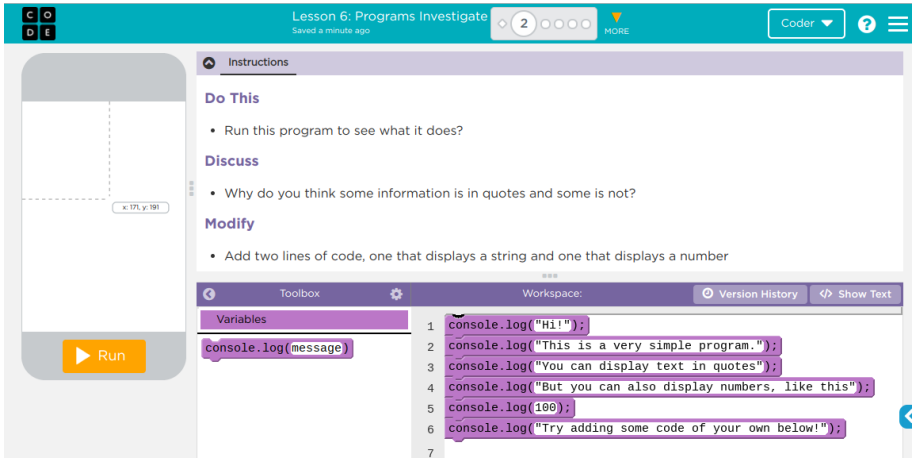
Warm Up

Activity

Intro to Programs

You and your partner should:

- Work together to complete the “Do This”
- Talk through the “Discuss” prompts together
- “Modify” the code to follow the directions given
- Be prepared to share your discussions with the class



Wrap Up

Prompt:

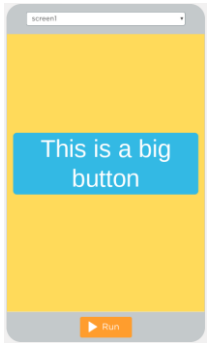
Think about your experiences today and in the previous lesson. How is a programming language different from natural language?

Program Statement: a command or instruction. Sometimes also referred to as a code statement.

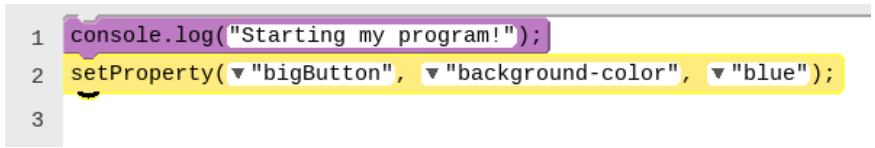
```
setProperty("bigButton", "text", "Click me");
```

```
console.log("Hi!");
```

Program: a collection of program statements. Programs run (or “execute”) one command at a time.



Before



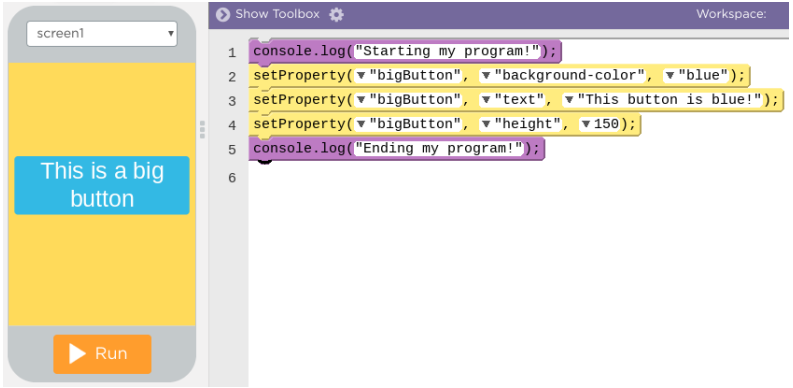
Command Runs
(yellow outline while running)

After

Two different ways for programs to run

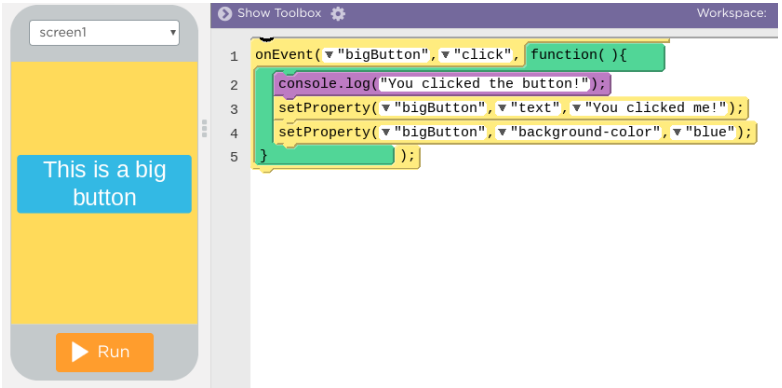
Sequential Programming: program statements run in order, from top to bottom.

- No user interaction
- Code runs the same way every time



Event Driven Programming: some program statements run when triggered by an event, like a mouse click or a key press

- Programs run differently each time depending on user interactions



Unit 3 - Lesson 7
Debugging

Warm Up

Prompt:

Your friend calls and says "I can't get music to come out of my speakers”

Write a quick list of everything you'd ask them or have them check to try to fix the problem.

Activity

Debugging: the process of finding and fixing problems in code

Describe
The Problem

What do you expect it to do?
What does it actually do?
Does it always happen?

Hunt
For Bugs

Are there warnings or errors?
What did you change most recently?
Explain your code to someone else
Look for code related to the problem

Try
Solutions

Make a small change

Document
As You Go

What have you learned?
What strategies did you use?
What questions do you have?

Wrap Up

Prompt:

Share any debugging tips you recorded today with your neighbor.

Be ready to share with the class.

Debugging Strategies

Keep your code clean

- Use clear, meaningful IDs for your elements
- Keep your code organized in chunks that do the same thing
- Use comments to explain your code
- Write code using blocks

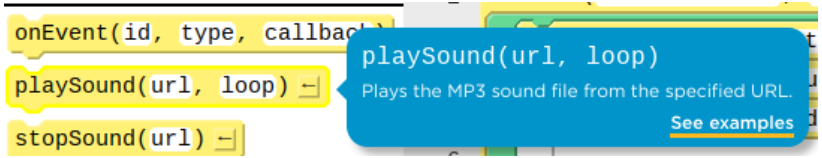
Run your code

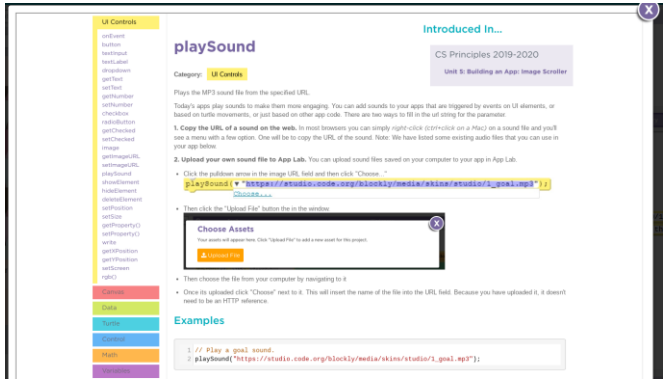
- Run your code a lot, every time you add a command or two
- Slow down your code with the speed slider. Watch how it runs closely
- Use console.log to get output. Add extra output statements throughout your code to get feedback on what parts are running.

Use classmates and resources

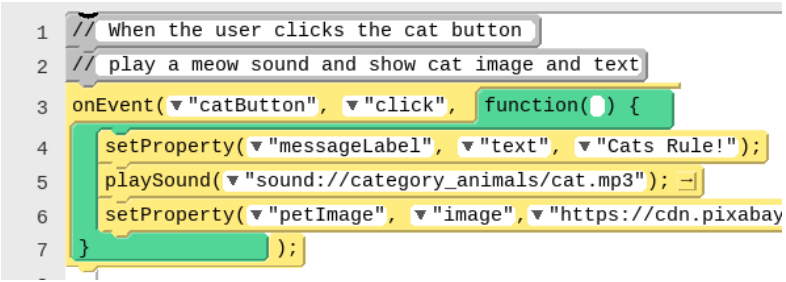
- Talk out the problems with a partner or classmate
- Compare your code to examples that you know work
- Read documentation to know how a block is supposed to work
- Hand trace your code to track what's happening.

Documentation: a written description of how a command or piece of code works or was developed.





Comment: form of program documentation written into the program to be read by people and which do not affect how a program runs.



Unit 3 - Lesson 8
Project - Designing an App Part 3

Warm Up

Prompt:

What makes a good partner?

Activity

Designing an App Part 3

Name(s) Period Date

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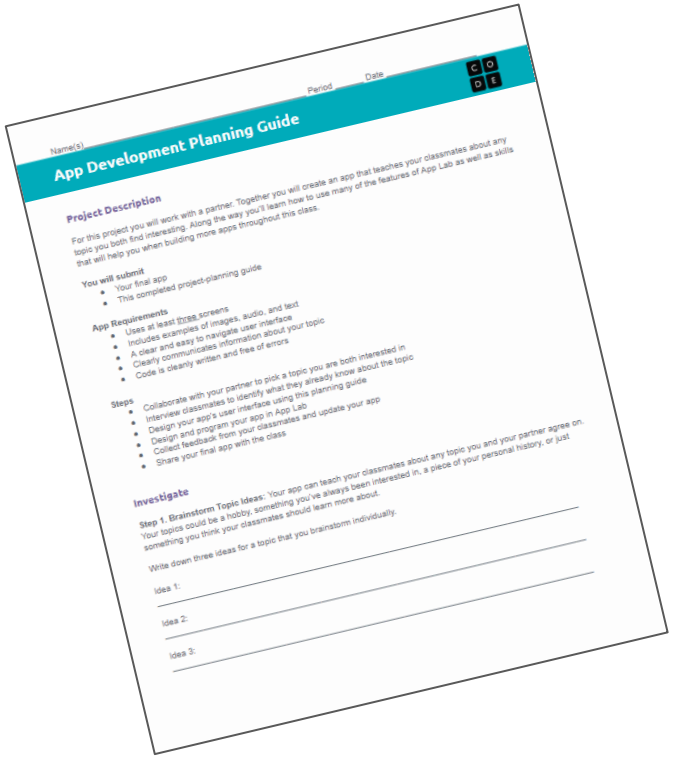

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Idea 1:

Idea 2:

Idea 3:

Step 5:
Start Building Your App

Element ID	Action	What happens?
"dogButton"	*"click"*	*A picture of a dog appears* *The background of the screen changes to green*


OF
COURSE
IT'S
NORMAL

What is Pair Programming?

Driver

Manipulates the keyboard and the mouse

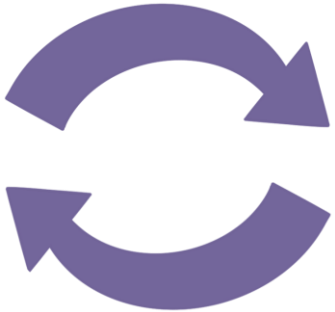
Navigator

Keeps track of the big picture. Guides towards the goal.

You will swap between roles every 3 minutes

Swap every three minutes

Driver



Navigator

Wrap Up

Prompt:

How does Pair Programming help when working on a project?
How does it help with the debugging process in particular?

Pair Programming: a collaborative programming style in which two programmers switch between the roles of writing code and tracking or planning high level progress

Unit 3 - Lesson 9
Project - Designing an App Part 4

Warm Up

Prompt:

Think of times when you've received helpful feedback on school work, a hobby, or a sport.

What makes good feedback?

What makes bad feedback?

Activity

Designing an App Part 4

Name(s) Period Date

App Development Planning Guide

Project Description

For this project you will work with a partner. Together you will create an app that teaches your classmates about any topic you both find interesting. Along the way you'll learn how to use many of the features of App Lab as well as skills that will help you when building more apps throughout this class.

You will submit
- Your final app
- This completed project-planning guide

App Requirements
- Uses at least three screens
- Includes examples of images, audio, and text
- A clear and easy to navigate user interface
- Clearly communicates information about your topic
- Code is cleanly written and free of errors

Steps
- Collaborate with your partner to pick a topic you are both interested in
- Interview classmates to identify what they already know about the topic
- Design your app's user interface using this planning guide
- Design and program your app in App Lab
- Collect feedback from your classmates and update your app
- Share your final app with the class

Investigate

Step 1. Brainstorm Topic Ideas: Your app can teach your classmates about any topic you and your partner agree on. Your topics could be a hobby, something you've always been interested in, a piece of your personal history, or just something you think your classmates should learn more about.

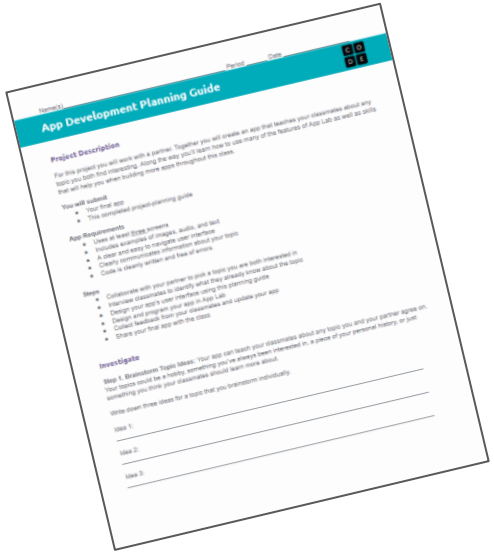
Write down three ideas for a topic that you brainstorm individually.

Idea 1:

Idea 2:

Idea 3:

You should have:
App Development Planning Guide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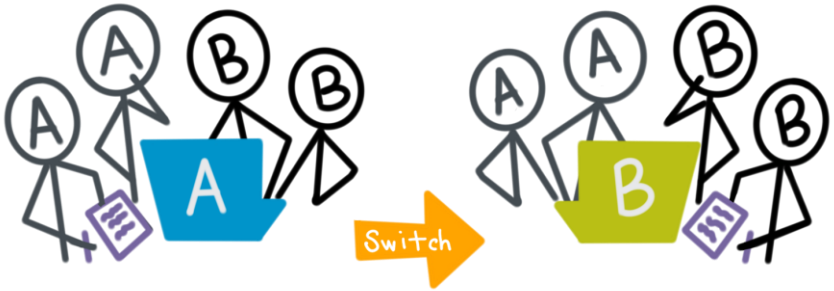
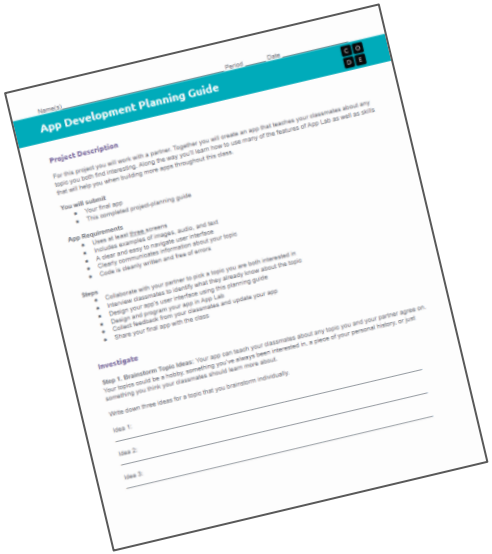


Step 6:
Testing and Feedback

Name	Things that could be improved based on watching them use the app	Improvements this person recommends

Wrap Up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Step 7: Pick Improvements

Step 7. Pick Improvements: Pick at least one improvement you plan to make to your app based on feedback you collected from your classmate.

Improvement 1:

_____

_____

Improvement 2 (Optional):

_____

_____

Prompt:

Why is it important to get feedback from others while building your app?

What is the value of getting this feedback even if you aren't finished with your app?

Unit 3 - Lesson 10
Project - Designing an App Part 5

Warm Up

Activity

Finish Your App

Name(s) Period Date

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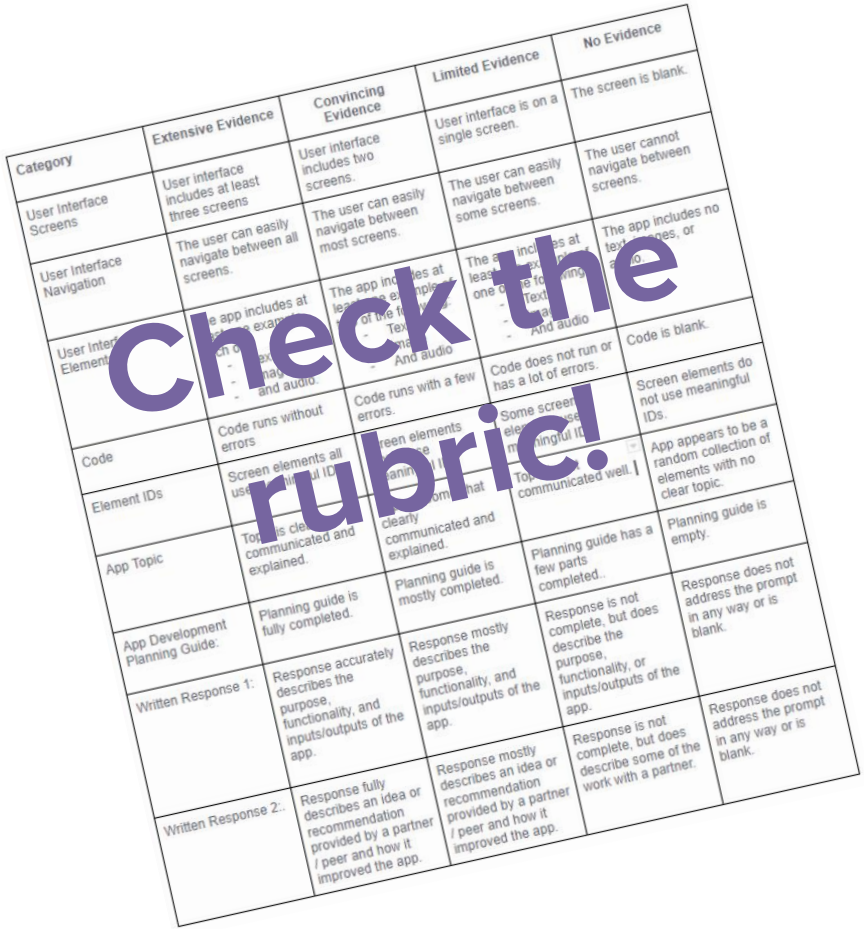


Category	Extensive Evidence	Convincing Evidence	Limited Evidence	No Evidence
User Interface Screens	User interface includes at least three screens	User interface includes two screens.	User interface is on a single screen.	The screen is blank.
User Interface Navigation	The user can easily navigate between all screens.	The user can easily navigate between most screens.	The user can easily navigate between some screens.	The user cannot navigate between screens.
User Interface Elements	The app includes at least one example of Text - Picture - Navigation - And audio.	The app includes at least one example of Text - Picture - Navigation - And audio	The app includes at least one example of Text - Picture - Navigation - And audio	The app includes no text, pictures, or audio.
Code	Code runs without errors	Code runs with a few errors.	Code does not run or has a lot of errors.	Code is blank.
Element IDs	Screen elements all use meaningful IDs.	Screen elements use meaningful IDs.	Some screen elements use meaningful IDs.	Screen elements do not use meaningful IDs.
App Topic	Topic is clearly communicated and explained.	Topic is clearly communicated and explained.	Topic is communicated well.	App appears to be a random collection of elements with no clear topic.
App Development Planning Guide:	Planning guide is fully completed.	Planning guide is mostly completed.	Planning guide has a few parts completed.	Planning guide is empty.
Written Response 1:	Response accurately describes the purpose, functionality, and inputs/outputs of the app.	Response mostly describes the purpose, functionality, and inputs/outputs of the app.	Response is not complete, but does describe the purpose, functionality, or inputs/outputs of the app.	Response does not address the prompt in any way or is blank.
Written Response 2:	Response fully describes an idea or recommendation provided by a partner / peer and how it improved the app.	Response mostly describes an idea or recommendation provided by a partner / peer and how it improved the app.	Response is not complete, but does describe some of the work with a partner.	Response does not address the prompt in any way or is blank.

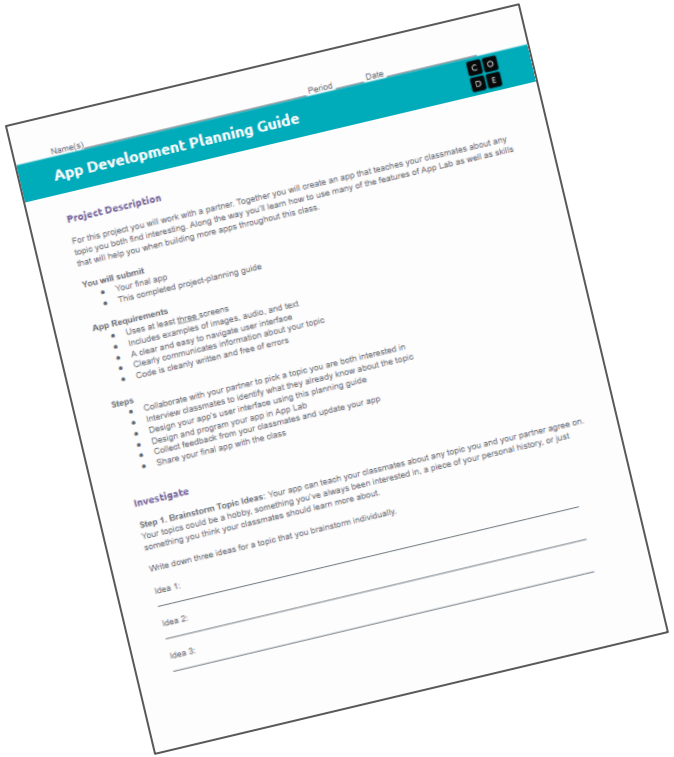
Check the rubric!

Step 8:

Finish your app!

Submit

Wrap Up



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Idea 3:

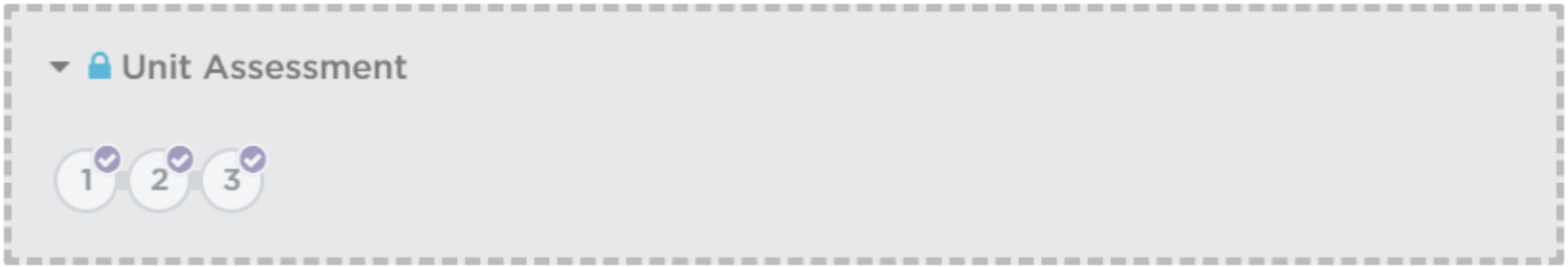
Reflection:

Complete the reflection section of the Planning Guide before turning it in.

Unit 3 - Lesson 11
Assessment Day

Activity

Unit Assessment



Gallery Walk

One student per group displays their app on the computer.

Groups rotate around the room running the different apps.

You can leave comments on sticky notes at each station.