

# We Can Make Apps Too!

## Unit Overview

The purpose of this unit is to introduce students to the impacts of computing and have them ideate and design their own app to address a real-world problem.

The unit culminates in students presenting the apps that they designed together in groups to the rest of the class. The unit does **not** require computers, but teachers seeking a computer component can use Lesson 4, which has students design their app of code.org's App Lab. If teachers choose to use this option, they should familiarize themselves with App Lab and its restrictions so that they can communicate these to students as they ideate their apps.

**Lesson 1: Technology in Community and Culture** - Students will understand how technology has changed our lives and solved many problems we face, and think of additional problems either in their personal lives or in the world as a whole that technology could help solve. (IC-01)

**Lesson 2: Ideate and Design App** - Students will brainstorm an idea for an app to address a specific problem and design screens for their apps using provided mobile phone screen templates. (IC-03)

**Lesson 3: Accessibility** - Students will consider and learn about the ways to make apps more accessible, including the one they designed in Lesson 2. (IC-02)

**Lesson 4: Designing App on App Lab** - Students will code their simple app on code.org's App Lab. (IC-03)

*This is an optional addition to the unit. This will require each group to have a laptop, and will take multiple hours. Most likely will have to be spread out over several class days.*

**Lessons 5: Apps Presentation** - Students will present their final apps to the class. (IC-03)

# Technology in Culture

## We Can Make Apps Too: Lesson 1

### Lesson Overview



Introduction

5 minutes



Identify Problems and Solutions

10 minutes



Brainstorming!

10 minutes



Reflection

5 minutes

### Standards

IC-01 Consider technology's influences

### Materials

1 Whiteboard

2 Marker

3 Paper and pencil



## Introduction

Start by asking the class to think of ways computer science has changed the world. If they have trouble, ask them to think about how they would find information if Google did not exist. Use examples like this to prompt the class' thinking about how the world would be different without technology.



## Identify Problems and Solutions

Start by having the students share a couple of ideas for problems they see, whether it is within the school, in their community, or just in the world in general.

If students are struggling, ask questions like “What about everyone who rides the bus? Is it ever frustrating how the bus gets to your home at a different time every morning and you never know exactly when it’ll get there? What if there was an app that tracked where the bus was, would you like that? What would it look like?” Other example problems could be:

- Not knowing what the school lunch is going to be that day
- Struggling to remember all of your homework due dates

Write these issues on a whiteboard for the class to see.

Next, ask students to identify which problems could be best solved by using Computer Science. Of the problems identified, allow students to choose an issue they would like to create a solution for.

Finally, group students based on alike interests, with ideally 3-4 students in each group. Some students may have to agree to work on their second choice in order for there to be balance. These are the groups students should remain in for the rest of the lesson plans in P2!



## Brainstorming!

Students will now brainstorm possible technical solutions for their problem. If you have a preferred method for brainstorming, feel free to use that! If not, here is a method you can use:

Make sure each student has a piece of paper and something to write with. Instruct the students to divide their piece of paper into 2 sections on both sides by drawing a horizontal line across the center, so that they'll have 4 sections in total. You're going to give them 1 minute to write down everything they can about just 1 idea for how to solve the problem using technology. You'll repeat this process 4 times, with the students filling in 1 box each time. It's okay if students don't fill in all the boxes! The goal is for the students to basically get out everything they're thinking very quickly.

Then, students will discuss the ideas they came up with within their groups and start thinking about which ideas they like best as a group.



## Reflection

Ask students to think about things they may have failed to consider in their ideas. In preparation for next class, ask students to imagine ways that ideas are translated into apps to address problems.

# Ideate and Design App

We Can Make Apps Too: Lesson 2

## Lesson Overview



Introduction

5 minutes



Brainstorming!

15 minutes



Designing the App

20-45 minutes



Reflection

5 minutes

## Standards

IC-03 Explore diverse perspectives

## Materials

1 Paper and Pencil

2 Pens and Markers

3 Template (prvd.)



## Introduction

This is a direct continuation from the previous lesson. Start by having each group say the problem they were trying to think of a technical solution for last class. Today, we're going to continue that brainstorming process and each group will begin actually designing an app that will help solve/address their problem.



## Brainstorming!

Divide students into the same groups as in the previous lesson. Now that students have some ideas for how to solve their problems, we want them to decide which idea they can best implement using a mobile app. Keep in mind, the app doesn't necessarily have to completely solve the problem. For some problems, like world hunger for example, this is infeasible! Instead, the app can raise awareness about the problem or provide a way for other people to contribute to solving the problem.

When deciding which idea to use, students should think of what the app would look like. What could a user do on the app, what kind of information or tools could the app provide. Most importantly, how does the app contribute towards solving our problem?

If groups are struggling to settle on an idea after 10 or so minutes, try to help them think through the various pros and cons of their ideas, and remind them that their idea should be something that they are able to design an app for.



## Designing the App

Now it's time to design the app! It may be helpful to have students think about apps they have used before, or for you to show students a common app on your phone, how you navigate through the app, and what the purpose of the app is.

Have students design a “mock-up” of their app using the provided phone screen templates. They should be focusing on how someone would use the app (where would they click, what would clicking on something do? Take the user to a new screen?) and how the app would accomplish its goal.

It's possible this could take a long time, but if there are time limitations, teachers can keep students focused on designing only 2-4 key screens. It's recommended to allow students the rest of this 30 minute class time as well as the next 30 minute class to work on designing their apps.



## Reflection

Ask the class if they see any limitations or potential problems with their design to lead into the next lesson.

# Accessibility

## We Can Make Apps Too: Lesson 3

### Lesson Overview



Introduction  
5 minutes



Researching!  
20 minutes



Reflection  
5 minutes

### Standards

IC-02 Explore accessibility of technology

### Materials

1 Paper and pencil



## Introduction

The goal of this lesson is to have students think about how accessible apps can be. The reality is that as apps become used by more and more people, developers come across issues that they did not consider before. This is usually true because they have never experienced these certain issues in their own lives.

When it comes to computer science, accessibility is about creating technologies that are suitable for everyone, including people with disabilities. Disabilities usually include physical, auditory, visual, and many others. It is important to have students understand how disabilities are diverse and impact people in different ways.



## Researching!

Start a class discussion about common disabilities and how they affect people. The students should slowly take over the discussion and think about other disabilities.

If you have access to computers, students can do some research on their own about accessibility in apps.

After, students should come up with example apps that might not be accessible to everyone. Students should write down potential solutions to this issue, and then repeat the process with the app built in the previous lesson. They are encouraged to really think of possible accessibility issues with their apps and how they can make the apps more accessible.

If students find themselves stuck in the same ideas such as “don’t make buttons or fonts too small,” help them expand their thoughts to the different disabilities discussed. Consider questions like how does being color blind affect the way you use an app? For some apps, is it important to be able to hear (ie. a game in which the sounds are very important)?



## Reflection

- Why do you think so many apps are not accessible to everyone?
- What are other ways to ensure accessibility throughout the app development process?

# Designing App on Applab

We Can Make Apps Too: Lesson 4

## Lesson Overview



Introduction

20 minutes



Designing an App

2 hours



Reflection

5 minutes

## Standards

IC-03 Explore diverse perspectives

## Materials

1 Computers

2 Projector



## Before You Begin

Applab instructions for teacher:

Here is an [Applab Tutorial Video Series](#) via code.org.

Students will need to only use code from the UI controls section in the “Code tab” and while they can use anything in the “Design” tab if they really want to, they should only need to use buttons, labels, text areas, and images. We recommend that you familiarize yourself with Applab, then build a simple app together with the students, showing them what to do step by step using your computer (which will need to be hooked up to a projector). After students are familiar with Applab, allow them to start designing their app. Since students are in groups, assign each group to one computer and have students work together to create their app. Students should take turns on the computer and stay engaged even when someone else is on the computer.

Before class:

Applab requires that you have an account to create anything. You should log into each computer needed with your own code.org account. This is necessary because a group will all be working on one computer, and if the student in that group that made an account and created the project on their account is not there for a day, then the rest of the group will not be able to work on their project. Thus, to resolve this, the teacher should just use their account instead of having students make their own account.



## Introduction

Tell the class that over the next several classes, each group will work together to code the app they designed on paper. This will likely sound both intimidating and exciting to students, so ensure them that it won't be as hard as it might sound and that we're going to start by building a sample app together. Have each group get on a computer together and have students rotate who is on the computer as you go through the demonstration. You will be making the app on your computer with the class following along by watching your attached projector/smart board.

Create a simple app with 2 screens. On the first screen, use a label for your title, a text area for your description, and some sort of image. The actual content does not matter here, we just want to show the students how to use these different elements. Have a button that takes you to a different screen and show how to navigate between different screens of the app. On the next screen, have a button that takes you back to the previous screen. This simple app should show the students enough to get started.



## Designing an App

The paper designs students made should serve as a rough draft for their app.

Some students may have some desired functionality that is not possible to achieve in AppLab (for example, tracking the school busses). In these cases, it is important for students to be focusing on the ideas: How would someone use the app? Where would the bus tracker be? How would you interact with it? They can just use some placeholder image for where the actual tracker would be.

Give students the work time they need to design their app. This will take a while, but try and keep students on track and try to be wary of if a group is stuck on something for too long.



## Reflection

Questions for each work day until done:

- What did you add to your app today?
- Are you currently stuck on anything? If so, what is it?
- What are you going to work on next class?

Questions upon completion:

- Did you think making an app was cool? Why or why not?
- Did you find anything really confusing about Applab?

# Apps Presentation

We Can Make Apps Too: Lesson 5

## Lesson Overview



Introduction

5 minutes



Gallery Walk

20 minutes



Reflection

5 minutes

## Standards

IC-03 Explore diverse perspectives

## Materials

1 Sticky Notes



## Introduction

Note: Please see the “Giving Feedback” lesson in the Miscellaneous folder. If you have not discussed giving constructive feedback with your class before, we strongly recommend teaching the Giving Feedback lesson plan before having students present their apps.

We are ending the unit by having students present their apps to the class!

Remind students that everyone worked hard on these projects, and that we want to show support for each other and be very respectful. Also, it’s good to ask questions about the apps to learn more about them!

Start by telling students how we will be doing the presentations. If you have your own desired presentation method, feel free to use it. Otherwise, here’s a method you can use:

Assign each group as either being Red or Blue. The Red groups will present their app first. Students in the Blue groups will have sticky notes and walk around to learn about the different apps. You can time it so that groups rotate every 5 or so minutes, with each Blue group starting at a Red group’s computer. The Red groups will explain what problem they were tackling, show their app, and explain what it does to address the problem. Students then can write down a piece of positive feedback for the presenters.

After the Blue groups have finished rotating through, switch sides so that the Blue groups are now presenting, and repeat!



## Gallery Walk

Now to do the presentations as described above! (unless you're using your own method)

Before students begin listening to presentations, give them some sticky notes or note cards that they can write short feedback on and give to the groups they listen to. Some examples of what they can write are "My favorite part of your app was...", or "I like how you used ... in your app!" The feedback should not be generic like "this app is cool!" It should include something specific from that app.

As the presentations are happening, circulate the room listening to presentations and also make sure that all feedback is respectful and positive. If students are not following instructions, pause the presentations, review expectations with them, and then resume.



## Reflection

- What is something you saw today that you want to add to your app?
- What do you think you did well on in this assignment?
- What is something you would do differently next time?

# Resources

