

# Lesson 8: Loops Make

## Overview

Using Programming Patterns and a step-by-step approach students make their own version of a Lock Screen Maker app. At the beginning of the lesson students are able to explore a working version of the app. They are then given the design elements of the app but begin with minimal starting code. A progression of levels guides students on the high level steps they should use to develop their app but leaves it to them to decide how to write the code. At the end students submit their apps which can be assessed using a provided rubric.

## Purpose

This lesson is an opportunity for students to take on the "blank screen" and build the code that runs an app entirely from scratch. Guidance provided throughout the lesson helps students break down the large task of "building an app" into more incremental steps that they can use on future projects, including this unit's final project and the Create PT.

## Standards

Full Course Alignment

### CSTA K-12 Computer Science Standards (2017)

- **AP** - Algorithms & Programming

## Agenda

### Lesson Modifications

#### Warm Up (2 minutes)

Intro the Project

#### Activity (38 minutes)

Build the Lock Screen Maker App

#### Wrap Up (5 minutes)

Assessment: Make Project

## Objectives

Students will be able to:

- Implement programming patterns with loops to develop a functioning app
- Recognize the need for programming patterns with loops as part of developing a functioning app
- Use debugging skills as part of developing an app
- Write comments to clearly explain both the purpose and function of different segments of code within an app

## Links

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

For the teachers

- **CSP Unit 5 - Lists Loops, and Traversals** - Slides

For the students

- **CSP Loops Make - Lock Screen Maker** - Activity Guide

## Teaching Guide

## Lesson Modifications



**Attention, teachers!** If you are teaching virtually or in a socially-distanced classroom, please read the full lesson plan below, then click **here** to access the modifications.

## Warm Up (2 minutes)

💡 Teaching Tip ▲

**Short Intro:** The Warm Up today is short and light. Students should spend the maximum amount of time working on their projects.

### Intro the Project

#### 🎤 Remarks

For the past few days, we've learned a lot about using lists to help apps keep track of information. In today's Make Project you'll be practicing using lists and programming patterns with loops to create a functioning Lock Screen app.

## Activity (38 minutes)

### Build the Lock Screen Maker App

**Group:** Make a determination as to whether this project will be completed in pairs or individually. You may even choose to let students decide.

**Distribute:** Make sure students have access to scrap paper and pencils / paper for drawing flow charts.

**Level 1 - Explore:** Have students explore the working Lock Screen Maker app in Level 1. If students are not working in pairs they should still discuss with a neighbor.

#### 📋 Discuss:

- *Where (if at all) do you think this app is using a loop?*
- *Where (if at all) do you think this app is using a list?*

#### Discussion Goals:

Where (if at all) do you think this app is using a list?

- It's more important that students justify their answers. However, students may recognize that the different icons are likely being chosen from a list.

Where (if at all) do you think this app is using a loop?

- Students will hopefully recognize that with 20 different icons to be updated by each button there is almost certainly a loop being used by each of those button.

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**Try the Lock Screen Maker**

#### 🎤 Remarks

Now let's build this app. The screen has been set up for you - it's your job to add the code!

**Distribute:** Give students copies of **CSP Loops Make - Lock Screen Maker** if you will be using it during the class.

🔗 Teaching Tip ▲

**Supporting Students:** While students are working on their apps, circulate the room and check in with students who need a little help. Encourage students to collaborate and discuss bugs with each other.

**Debugging:** Review with students steps they can use to debug if they get stuck:

- Build small parts of the program at a time and test them to make sure they work
- Run the code on turtle mode
- Add the variables to the watcher
- Explain the code to a friend and clarify the differences between what they expect to happen and what is actually happening in

**Do This:** Direct students to level two where they complete the Lock Screen Maker app. Based on the needs of your classroom decide whether you will collectively go through the activity guide or have students complete it individually. Afterwards give them time to work on their projects and circulate the room to offer support. Students who finish early can work on the extensions suggested in the activity guide.

**Submit:** Encourage students to check the rubric on the last page of the Activity Guide before submitting.

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Make the Lock Screen Maker

## Wrap Up (5 minutes)

🔗 Teaching Tip ▲

**Maximize Work Time:** The wrap up is short to allow the maximum amount of time for students to complete the activity.

### 🎤 Remarks

📋 Awesome work today! Make sure to submit your project when you're done with it!

## Assessment: Make Project

Use the rubric provided with the project to assess student projects.