Original Lesson

Program: App Lab by Code.org	
Age Range: 13–15	**https://goo.gl/ 2GJZcK**
Duration: About an hour	
Scan the QR Code or type the URL to go to App Lab.	

Overview

The fortune teller is a classic activity, bringing many amazing elements of CS together into one simple and impactful program. In this exercise, students will use arrays (ordered lists) to store possible answers for "yes or no" questions.

Lesson Objectives	Materials and Resources
• Get students programming in a simple interface	• Pens or pencils
• Practice debugging to keep their program in working order	• Paper
• Follow steps to bring their design to life on a computer	• One to two dice
	• Computer with internet

Vocabulary

Array—A list of elements bundled together under one name and organized one after another

Element—A single item in a group

Index—The number given to show the positioning of an element in an array or list

List—In this context, another word for an array

Preparation

As a group, pull students in front of the chalkboard or document camera and tell them that you are going to create your own personal fortune tellers. First, since everyone likes to hear their news in different ways, we will work together to gather a list of possible answers.

Ask for ways to answer a "yes or no" question. You can start the list out for them:

["Yes!", "No."]

(Note: The square brackets, quotes, and commas are vital if you plan to take this to the computer lab following the unplugged portion.)

As students offer additional (appropriate) answers, add them to your list until you have six. If you are using two dice, you can add twelve. Your list might look something like this:

["Yes!", "No.", "Maybe.", "Perhaps!", "Ask again later.", "It is unclear."]

Now, add a number (index) below each possible answer, so that students can choose one at random, based on what the die returns. On the computer, indexing starts at 0, so 0 = "Yes!" and 5 = "It is unclear." How will your students ever get "Yes!" returned when rolling a die that goes from 1 to 6? Pose the question to them and see what they come up with!

Now, ask for volunteers to offer "yes or no" questions. You may have to request that they keep them appropriate and respectful. Pass the die around the room and have students roll to show the answer. Example:

- "Will I be rich?"
- Roll die = 3
- (3 − 1 = 2)
- The element with the index of 2 is "Maybe."
- Have the whole class shout out the answer.

Do this several times until everyone understands how to use a random number to find an element by index in an array.

Finally, have the students grab a piece of paper and write their own (respectful) array for their own fortune teller.

Activity

Get your class to the computers and open up AppLab (studio.code.org/projects/applab). Students can make their own accounts if they would like to return to their projects another day. Accounts are not required, however.

The first thing your students will need to do is make sure that their workspace is on "design" mode.
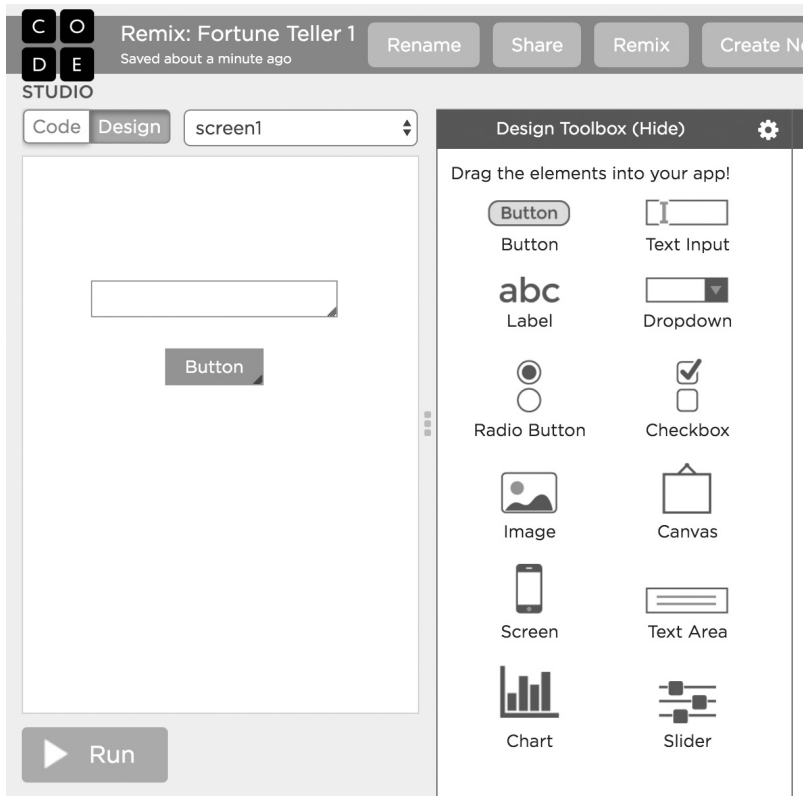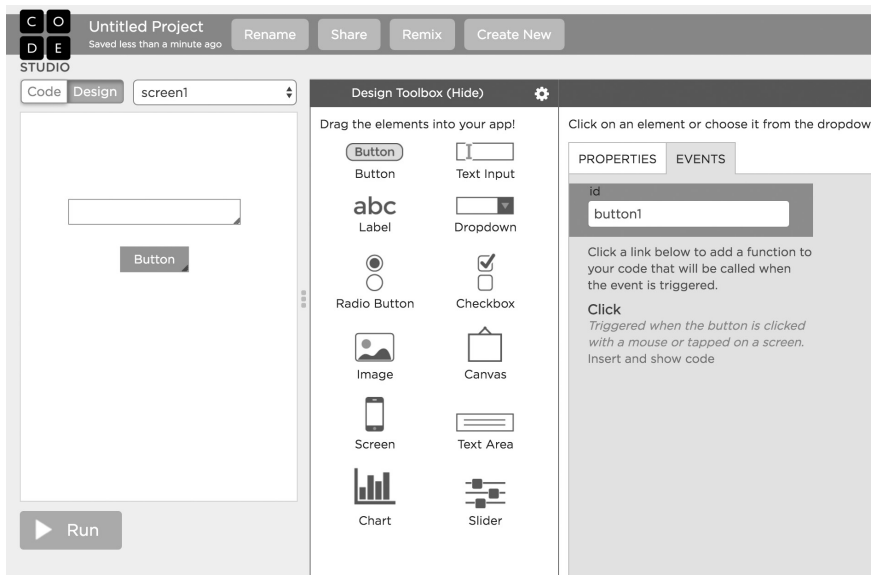

Design Mode in AppLab

Students will need to:

- Drag a "Text Input" area out to the screen and note the name given
- Drag a "Button" out to the screen and note the name given
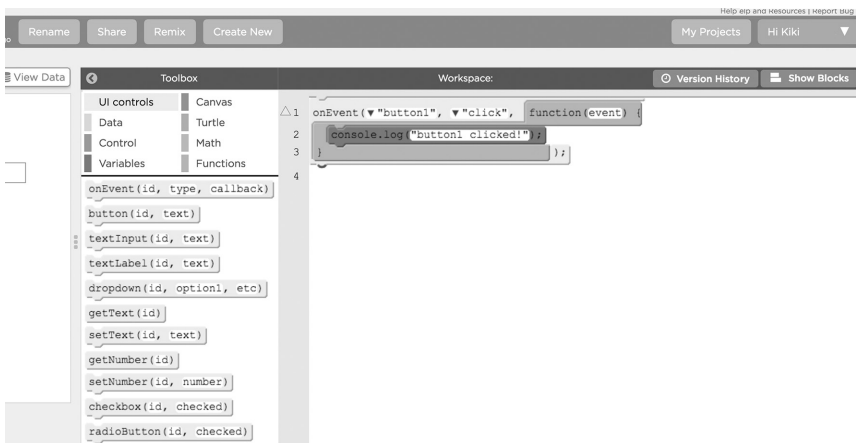- Customize the attributes of each item on the screen as desired

Next, it's time to program. With the button highlighted, click on the "Events" tab, then underneath "Click" click on "Insert and show code."

Edit Properties and Events for Design Elements

Now we see the existing code as blocks!

Using Blocks to Program the Fortune Teller

You can easily switch between blocks and text using the "</> Show Text" button.
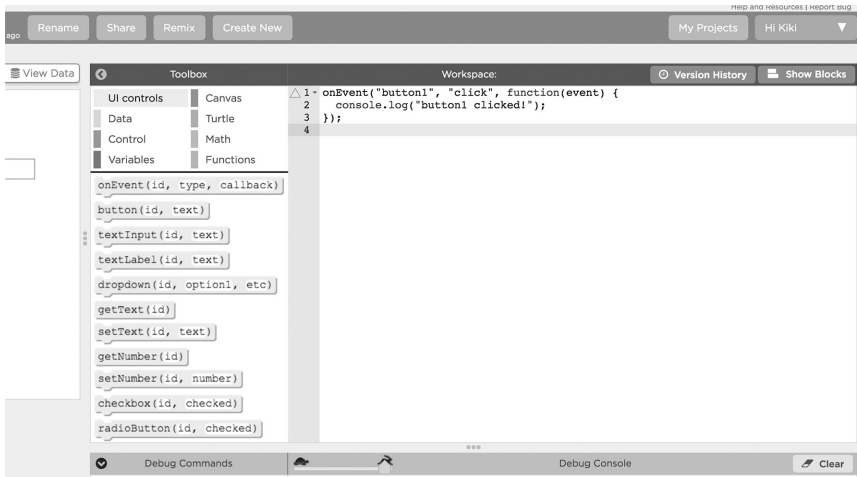

Program in Text View

You can drag blocks from the Toolbox in either mode, and the code will render itself into the whatever format you're currently looking at.

Now, we need to add the code to make our button populate the textbox with an answer. It's worth letting the class browse around to figure out how to do this specifically, but ultimately, they will need to:

- Create a list variable where they enter all of the answers they wrote down earlier
- Set the text of the textbox to an item of that list, noted by **nameOfList[n]** where n is a random number produced by the **randomNumber** function in AppLab

  (The above all needs to be done inside the "event" function already provided.)
- Let students tailor and customize their boxes and buttons (or even add images) if they have extra time.

Here's an example of the finished code. Pretty slick, eh?
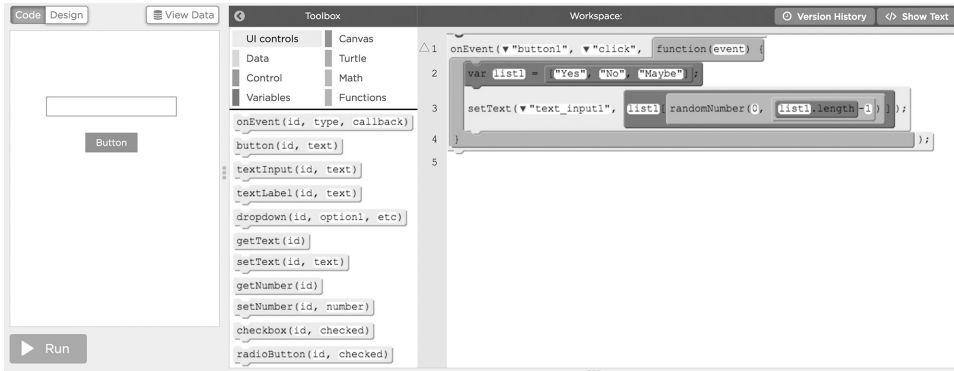
Completed Fortune Teller Program in AppLab

Wrap Up

Let students go around and look at one another's projects.

- Did anyone do something totally out of the ordinary?
- How did your students feel about AppLab?

What It's All About

AppLab is a bridge between block-based coding languages and the text-based language JavaScript. At the time of this writing, JavaScript is the most used programming language around. Head over to githut.info to see where it ranks now!

If your students already know how to create web pages, they can copy the code that they wrote here and paste it directly into their website, where they can guide their own buttons and text boxes!

To see a running version of this app, visit: https://goo.gl/bkTJhA