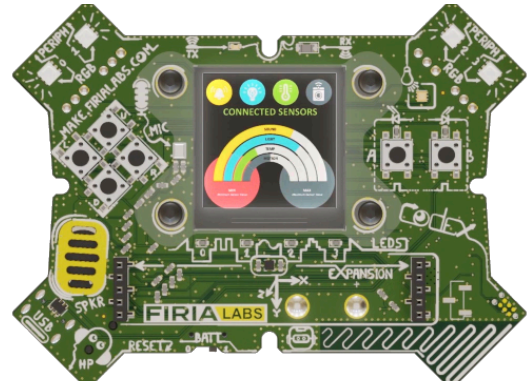


## Unit 2: Putting it all Together

### Mission 7: Personal Billboard



#### Intro and Discussion Points:

Have you ever made a sign to post on a door or wall? How about a name badge to wear? Or a cap or t-shirt with a message or slogan on it? In this project, students will build a device that lets them display images or text, and even use the CodeX's buttons to select what is displayed to suit a particular occasion or mood.

Emphasize that this is a project with *practical* applications. Imagine if everyone at a party or meeting wore CodeX badges like this, to show their name and interests. Or what if you made this into a cap for a sports team, to give out to all the fans before a big game?

## CodeX Lesson Plans

<b>UNIT 2 : Putting it all Together</b>	<b>MISSION 7: Personal Billboard</b>	<b># DAYS: 3</b>
<b>UNIT GOALS:</b> Students will synthesize skills to create more complex programs.	<b>ADDITIONAL MATERIALS:</b> <ul style="list-style-type: none"> <li>• none</li> </ul>	<b>VOCABULARY:</b> <ul style="list-style-type: none"> <li>• List</li> <li>• Data types (image, string)</li> <li>• Conditional statements</li> </ul>
<b>FOCUS CSTA STANDARDS:</b> 1B-AP-09, 1B-AP-10, 2-AP-11, 3A-DA-09, 3A-AP-14		
<b>LEARNING TARGETS:</b> <ul style="list-style-type: none"> <li>• I can create a list to make my code more efficient.</li> <li>• I can distinguish between string and image data types.</li> <li>• I can apply an if/else conditional statement to a new program.</li> </ul>		
<b>SUCCESS CRITERIA:</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Program the buttons to select from a series of images to show.</li> <li><input type="checkbox"/> Change the code to make it easy to add lots more images.</li> <li><input type="checkbox"/> Mix text messages with a selection of images.</li> </ul>		
<b>KEY CONCEPTS:</b> <ul style="list-style-type: none"> <li>• An infinite loop is a good way to continuously check for button presses. Many programs follow this pattern, with a “<b>main loop</b>” that monitors and acts on events as they occur.</li> <li>• You can use a number variable to track the <b>state</b> of the program. In this project the buttons just add +1 or -1 to the state variable, and the remaining code sets the display based on that number.</li> <li>• Comparison operators! In python, the <b>double-equals</b> sign is used to compare for equality. (Single equal is used for <i>assignment</i> to variables.)</li> <li>• Codespace lets you <b>inspect variables in the debugger</b>.</li> <li>• Python’s list is a powerful way to hold a collection of objects.</li> <li>• New data type – <b>strings!</b></li> <li>• Smoothly scroll messages on the CodeX with <code>display.scroll()</code></li> <li>• You can check the <b>type</b> of a variable, and deal with it accordingly.</li> </ul>		
<b>DISCUSS REAL WORLD APPLICATIONS:</b> <p>Have you ever scrolled through a menu system on a website or video game? Software applications of all kinds deal with lists or collections of different types of data. What if you made it so instead of button-presses, the selections just advanced on their own? The list could be animation sequences, or the set-list for a band – you decide! The code you’ve learned to write in this project has thousands of real world applications.</p>		
<b>ASSESSMENT STRATEGIES:</b> <p><b>5.5 Checkpoint</b> - Spend time focusing on the functions of a list..</p> <p><b>Remix suggestions (set aside 0.5-1 period to complete):</b></p> <ul style="list-style-type: none"> <li>• Add music to your selections. You may want to study the <code>music.play()</code> tool information, and use the <code>wait=False</code> parameter. <ul style="list-style-type: none"> <li>○ ex: <code>music.play(music.NYAN, wait=False)</code></li> </ul> </li> <li>• Make the selection advance at a <code>controlLCD</code> speed when you hold a button down.</li> <li>• When both buttons are pressed at the same time, go back to the first selection in list.</li> </ul>		
<b>TEACHER NOTES:</b> <p>Always refer to <a href="#">Appendix A</a>: if you get stuck. It has the “Answer Keys” for you.</p>		