
Freedom and Meaningful Moment Quilt Square Coding Guide





Overview and Description: This guide will help students program the LEDs of their Freedom and Meaningful Moment Quilt Squares using a Circuit Playground Express. Both the Freedom and Meaningful Moment Quilt Squares snap together into columns, which connects the positive (+) and negative (-) lines of each square. This allows each square in the column to use the same code. Students will work in groups to code the LEDs for their column. Students should consider how the pattern and speed of their LEDs affect the message of their quilt squares.



Objectives

Students will:

- Learn how to use and code a sewn computational parallel circuit
- Apply basic programming principles
- Collaborate in small groups to write code
- Explore how coding patterns effect perception

 Preparation	 Supplies per Group
<ul style="list-style-type: none"> ● Allow makecode.com on class computers. ● Prepare supplies for each student as needed. ● Reserve the computer lab if needed. ● Copy student worksheets and guides (1 per student). 	<ul style="list-style-type: none"> ● Circuit Playground Express ● Mini USB cable ● Two Alligator Clips ● Coin Cell Battery

NOTES:

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on its right side, suggesting it's resting on a surface.



Step 1: Attaching your quilt squares

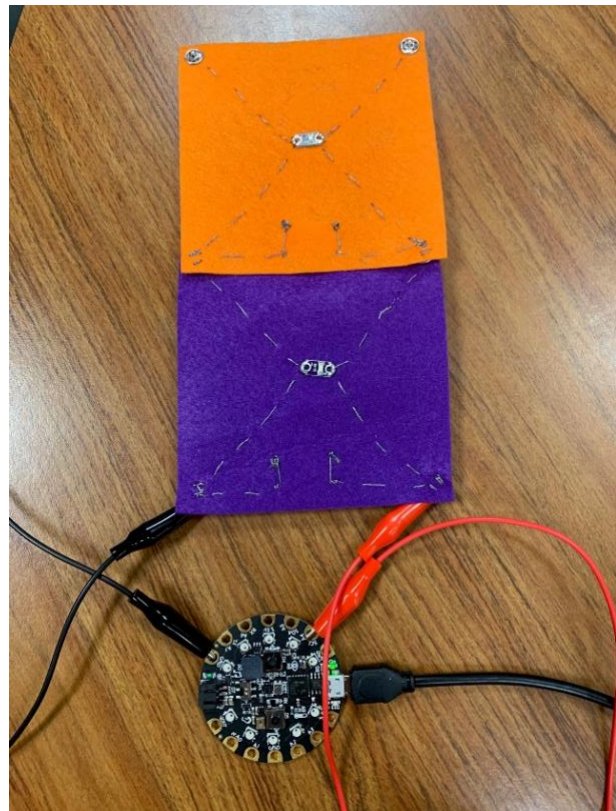
Before you code your quilt squares, you need to attach them to each other. Snap together the bottom snaps of one square to the top snaps of another square and repeat this process until all the squares in your group are snapped together. Do not snap the first and last square together, your squares should all lie flat.



Black alligator clip connecting the (-) snap to GND and red alligator clip connecting the (+) snap to A4.

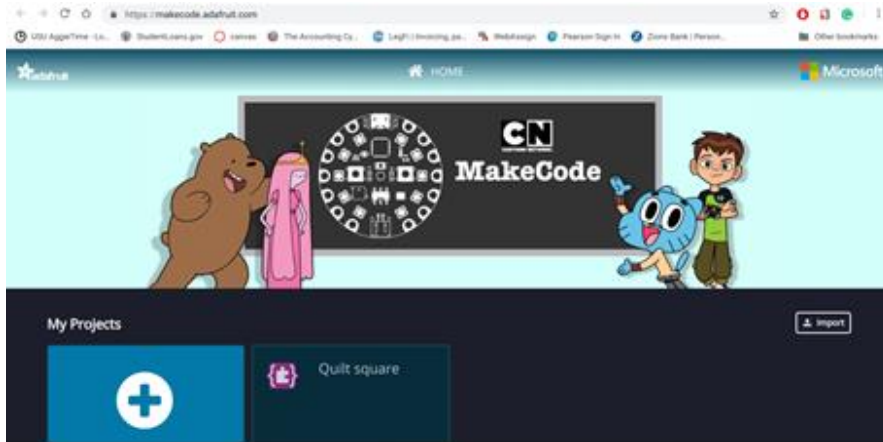
Finally, attach the Circuit Playground Express to the computer using a Micro USB cable. Now you are ready to code!

Next we need to attach the column to the Circuit Playground Express. We will do this using alligator clips. Clip one end of an alligator clip to the negative snap (-) of the bottom most quilt square and the other end to the ground (GND) pin of the Circuit Playground Express. Using another alligator clip, clip one end of the alligator clip to the positive (+) snap of the bottom most quilt square and the other end to the A4 pin of the Circuit Playground Express.





Step 2: Starting to code

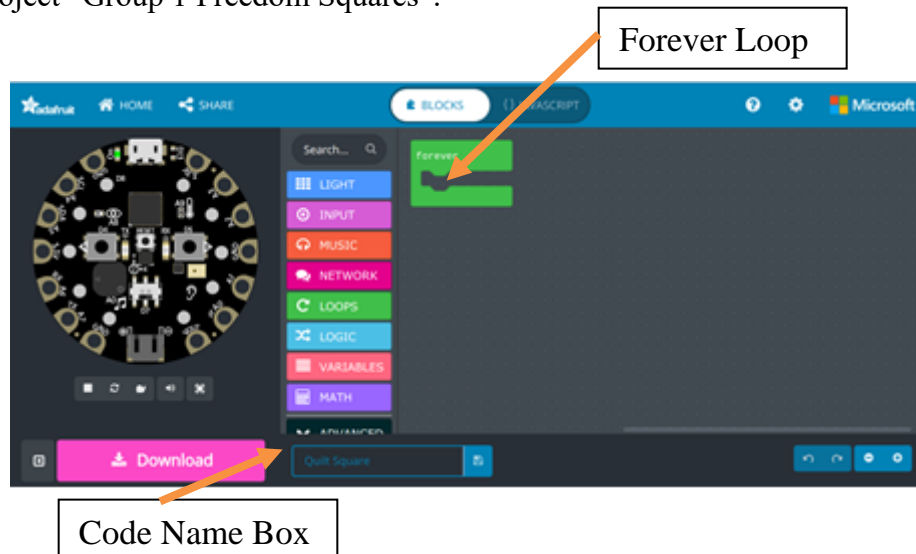


To begin coding you will need access to a computer. Once you are on a computer type this link into your browser:

<https://makecode.adafruit.com>.

Once you are at this website click “New Project”.

Your new project will show up very similar to the picture below. Be sure to label your project in the blue box at the bottom of the window. For example, if you are coding your Freedom Squares name your project “Group 1 Freedom Squares”.



Your project should start with a forever loop; this will make your LEDs turn on and off in a continuous loop. If it does not start with a forever loop already, click on the green tab labeled “Loops” and drag the forever loop onto your starting screen.



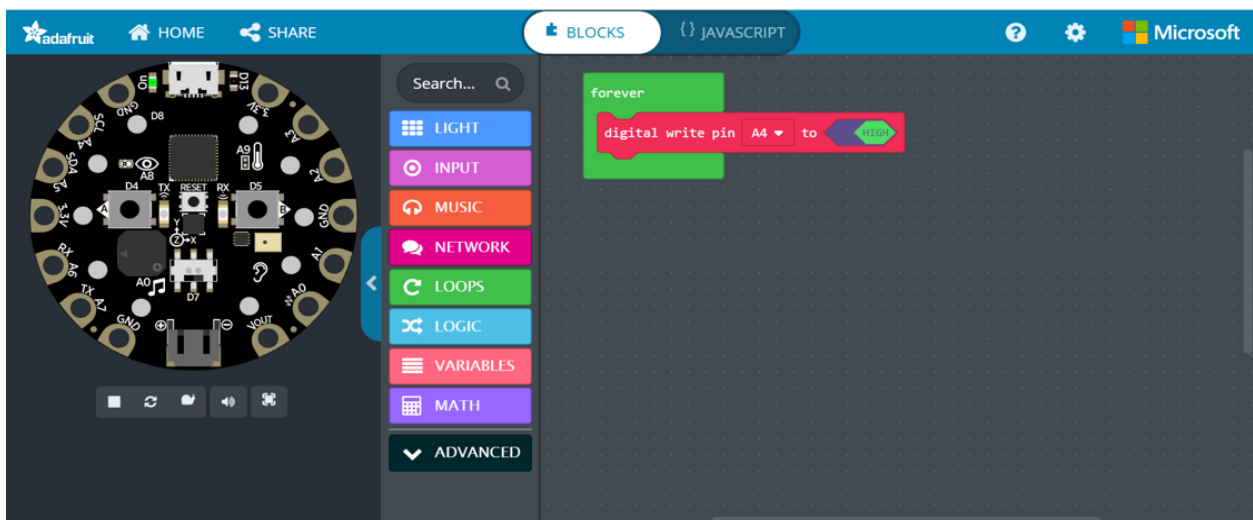
Step 3: Adding the pin and pause to the code

Now that you have your loop, it is time to add the pin. This is what controls your LEDS.

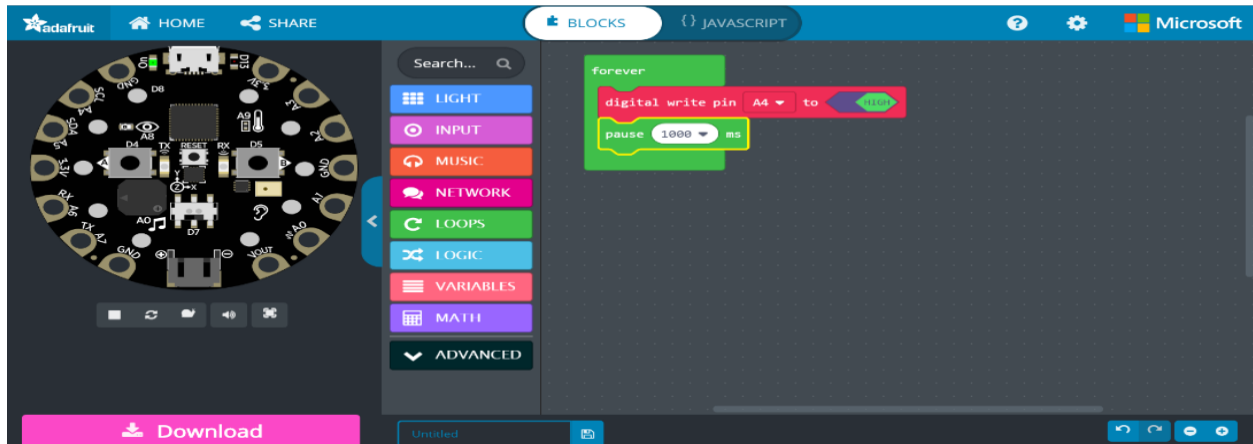
To do this select the “Advanced” option and select “Pins” and select the digital write pin, just like the one highlighted in the image to the left. Drag that piece into your forever loop.



Next, change your pin number from A0 to A4 and change the setting from High to Low. For this project, we use High and Low as On and Off for the Led. High = On and Low = OFF.



After you have changed those correctly you will need a pause so there is time between turning your LED on and turning it off, instead of rapidly flashing on and off. You will find the pause function under the “Loops” tab. Drag the pause under your first pin in your forever loop. Change the time on the pause to 1 second or 1000 milliseconds.



Now that you have your pin turned on and pausing for 1 second you need to turn it off. To do this you will need another digital write pin under the pause and remember to change the pin to A4, so its set to the right pin and the setting to Low (OFF).

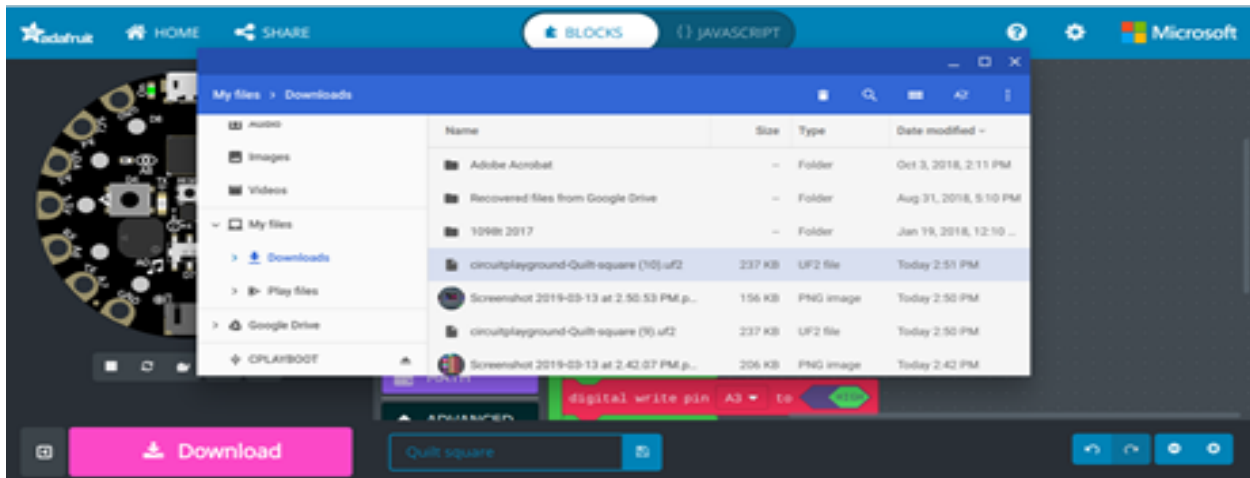


That is all you need for your LED to blink on and off! Try adding in more pin A4 and pause pairs to build different patterns and pauses into your code.



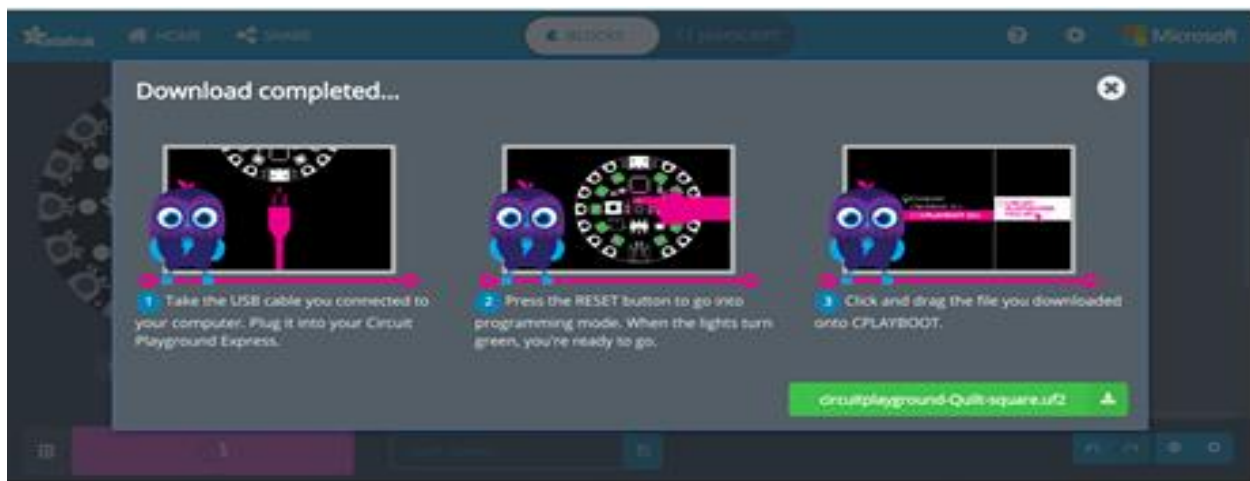
Step 4: Downloading/Uploading the code

After all your coding is correct, click on the pink download button to download your code.



Upload your code to your project:

1. connect your Circuit Playground Express to the computer using a micro-USB cable
2. press the reset button on your Circuit Playground Express and wait for the LEDs to turn green
3. find the file you downloaded and drag it onto the CPLAYBOOT.



Once it's downloaded to the device, all your LEDs should start blinking. Make sure your LED's are blinking correctly, if not adjust your code and follow the same steps for uploading it. If it's blinking correctly you can unplug from the computer and add a battery.