

Adafruit Circuit Playground Project - Rationale

This project was extremely challenging, only for the reason that I didn't budget the proper amount of time to get it finished, let alone complete it in the way that I wanted. That was probably my main challenge: finding time to complete the intricate design required. With a combination of spring break, getting sick, quitting my job, and starting two more jobs, there wasn't a lot I could do in terms of time, energy, and motivation to prioritize this. But here I am! I finished the project, and although it's not entirely what I hoped it would be, it still works, and is still fun! My project was sewing the Adafruit Circuit Playground into a Peppa Pig plushie, and having the circuit board play the Peppa Pig theme song when button A is pressed as well as timed lights that are coordinated to each note of the song, as well as another little tune playing when the user shakes the plushie, activating some more lights.

Some major challenges I faced in the beginning were figuring out how to sew the conductive thread through the plushie. The original plan was to have LED's light up on her cheeks when the circuit board was shaken, having the second tune play while simultaneously lighting up the LED's. That presented another challenge within itself: it was super tough to figure out how to code the lights and music to output at the same time. This is one of the issues I faced, and was unfortunately something I had to give up on in the end. Although there are technically the correct amount of outputs for the project, the lack of variety was disappointing.

I found a lot of success in block coding, especially coding the music. From the beginning of this project, I knew I wanted to code my own song and have it play, and that was by far one of the more fun aspects that I experienced when creating this toy. Being able to see and hear the output on the software through the virtual circuit board was super helpful, and helped me grasp what I was creating as I went along. The most fulfilling thing was transferring the code, and seeing it in action right in front of me. There's something special about making a digital object come to life in the real world, and that in itself was something I listed as a success as well.

In terms of design on the toy, I decided to sew the circuit board and the battery pack into the plushie to give it a more clean look, and to have things out of the way. I sewed it together with the conductive thread, since that was all I had. This yielded some electrical issues every so often, making the songs and lights a lot less prominent. The issue fixes itself after a second, but it's still frustrating. For block coding, like I mentioned before in one of the last sections, I coordinated each of the notes in the Peppa Pig theme song to have a light that complimented it. This took a second to figure out because the lights are numbered in kind of a weird way on the circuit board (0-9, which I thought they were labeled 1-10), so when I tried to code each one as its number, it wasn't outputting the way I wanted it to. Eventually figuring it out, I was able to

code each note to the song and have a fun little jingle within the theme song. I also decided to carefully design the notes to play in their respective half/full beats, so that the song coming from the circuit board has the same timing as the real theme song. This would've really bothered me otherwise, so I'm glad I took the time to figure it out.

To conclude, there were various instances where I was confused between usability and user testing, and finding the difference between the two to further develop my project. After presenting in class, I received some feedback from my classmates to have a different input (shaking the pig instead of pressing another button) to not only include variety, but to also have a more interactive user experience. I counted this as user testing, which from this article: (<https://www.fullsession.io/blog/user-testing-vs-usability-testing/>) explains that it's used to identify the issues within your product that you wouldn't have otherwise noticed. I feel like user testing can be a lot more crucial to the development of a product, not because it's more important, but because you gain different perspectives, and therefore helpful feedback. As for usability testing, which is the action of "identifying and solving specific usability problems and determining whether the product works correctly" I was able to troubleshoot the issues I ran into on my own, like mentioned above, and fix the problems I faced. You can't have usability testing without user testing, so I'm glad I received the feedback I did from both classmates and family throughout this process.

Overall, I am proud of what I came up with, and although it was turned in late, I feel that I did my best given all of the roadblocks I faced. Below are the pictures I took explaining each of the aspects of my project.

- 1) My block code, including on the left: my Peppa Pig theme song code when button A is pressed, and on the right: The song and lights that are outputted when the toy is shaken
- 2) Button A being pressed, and the lights lighting up with the music
- 3) The toy is shaken, and the lights lighting up while the other musical output is playing
 - a) Also shown is the way I sewed the circuit board into the plushie
- 4) Shown here is how I sewed the battery pack into the bottom of the plushie.
- 5) Also shows the sewing job on the front of the toy to keep the circuit board in place.
- 6) Shows the sewing job on the back, where I sewed the wired from the battery pack to be less in the way of the toy when interacting with it.









