Date	Entry
Nov 9, 2023	Today I thought of doing something about human perception of time and how it changes or something with physics, but then I decided on BCI because I heard of someone who had used a monkey for BCI, so I decided to use it as my project. I worked to solidify the question and figured out it could be a research project too.
Nov 16, 2023	Today I worked on the project proposal, and I also worked on it for several days before and after this date too, and decided to work with Hudson and use the brain waves to control an animatronic device.
Nov 23, 2023	Today I researched more about BCI and found out the 3 types; invasive, semi-invasive, and non-invasive. I will focus on non-invasive because it is not harmful. A few days after that, I brainstormed more with Hudson and decided our plan was to do a robotic arm. Also, buying a BCI model would be too expensive, so we will likely buy electrodes separately and 3D print the frame.
Nov 30, 2023	Today I watched a video on BCI and looked at the types of signals that BCI acquires. I also looked at the price of the different parts of BCI and how to get the software.
Dec 7, 2023	I was absent this week
Dec 14, 2023	Today I completed the CYSF basic project info and the ethics form. I also looked at some winning projects and discovered that most if not all of the ones that did well had innovated something, so maybe my partner and I could try to monitor multiple parts of the brain for increased accuracy. I also looked at some scientific papers to see what was state-of-the-art and if it could be improved. I researched the types of brain signals.
Dec 21, 2023	This week I started to research the specific sections of the brain. I found this very interesting to learn about. I also researched the different types of brain waves: delta, theta, alpha, beta and gamma. I learned that

	alpha waves are most often used in the brain-computer interface. I think that the part of the brain we will monitor will be the motor cortex, or possibly the cerebellum.
Dec 28, 2023	Today I continued researching the types of the brain; I worked on the cerebral cortex, and motor cortex, among others. I found that the workings of the brain are more determined by the communication of different regions of the brain than their independent workings.
January 4, 2024	Today I worked on the stages of BCI and the components. I also bought the components. We are using electrodes, and possibly a heart monitor as an amplifier. We think it is possible to modify it slightly to fit our purpose, and it saves a lot of price. We also decided that we will not have enough time to add signal recognition, so we will only display the signals, with likely no application.
January 11, 2024	Today I researched electrode placement more, and I and Hudson decided that we will be monitoring the prefrontal cortex through Fp1, FpZ, and Fp2. These electrodes are on the forehead, so special electrodes or head shaving are not needed.
January 18, 2024	I was absent this week.
January 25, 2024	This week, I wrote the problem statement on the CYSF platform after researching how to write one, and used that knowledge. Me and Hudson have still not managed to connect our accounts on the platform. On January 29th, I and Hudson finally met and constructed the EEG monitoring system! We still have the following issues: - We are using a heart monitor to substitute for an amplifier, so it only has one channel. - Some of the artifacts are not being filtered out. - The system still has to be connected to a computer by wire; we are thinking of using a Bluetooth module to transmit the signals.

February 1, 2024	Today I put the electrodes on my head again and observed the patterns while playing chess. (the electrodes were monitoring my prefrontal cortex). The prefrontal cortex is responsible for rational decision-making and planning ahead, both of which are used in chess. I made sure to limit external stimuli other than the activity I was testing.
February 8, 2024	Today I learned more about the science fair boards and started planning for mine using Canva. I think that for the research, some of one side will be neuroscience research, some of the other will be computer science research, and the middle & the rest of the sides will be for the results, method, problem, data evidence, etc.
February 15, 2024	There was no science fair today, but between today and the next Thursday I continued planning the science fair board. I started writing the abstract, and method.
February 22, 2024	This week I cut out the subtitles, the title, and printed the research. The wallpaper also arrived today, and I put the blue wallpaper on the board. I didn't do anything for the BCI model this week, because other than the Bluetooth module, it is done.
March 1, 2024	This week, I met with Hudson to attach the Bluetooth module but found that we needed a code that was stored in the instructions that came with it, which we do not have anymore. I also printed out the problem, data, abstract, and some pictures. We printed out pictures of the AD8232 heart monitor and Arduino, with the pins that we used labeled.
March 8, 2024	This week, I printed the rest of the papers for the trifold, and Hudson came over to help glue them onto the board. I am currently making my script. It is guaranteed that we are getting into the CYSF because there are 3 spots and 2 teams, so between the Banded Peak science fair and the CYSF I want to replace the "types of brain waves" research page with a diagram and repeat the one second EEG data snapshot several more times to increase it's accuracy.

The Banded Peak science fair was this week! This was my board: