For our sound sequence we wanted to design something that had a beat to it and a structure that resembled measures of music. We wanted to do this to try and have our users make music out of our diagram rather than just an unorganized sound, this way our alternative notation would have to be good enough for users to get into a beat and easily flow through the sequence rather than a choppy sequence. We viewed this as more of a challenge in regards to user testing, our map design and the iterative design process overall. To achieve these goals we based our project around a drum set setup and a drum set type of beat. Due to the fact that our users will have to easily follow through the sequence without hesitation we wanted to make the notation as recognizable as possible without any additional knowledge. For our setup we have a beer bottle as the symbol, a binder for the snare, 3 pots for the toms and a dog toy under the right foot to imitate a bass pedal. For our sequence notation, diagram A, we have pictures of each of these objects so it is very clear which object we want the user to hit and they are laid out in segments of measures to allow for a music like result. This was our first sequence notation drafted up on notebook paper and it reads vertically top to bottom.

Once we created our sequence it consisted of a simple drum beat that repeated every two measures; however, we didn’t want too much repetition because then the user could pick up on the sound and replicate it without even looking at our notation. To switch things up we inserted 3 unique drum fills, the first two separated by 2 measures of the beat and the third fill only separated by one measure so the user doesn’t get too comfortable. At first we were concerned if this was too complex for an average user but then we decided to take it up as a design challenge for our sequence. Perhaps if we made the notation good enough the user won’t need any kind of musical skill in the first place. After some participatory testing of the sequence we realized that it was hard to identify the difference between the 3 pots, to fix this we color coded all of our objects to match the color and symbol in our notation so the user will have no confusion as to what object to hit when. After this quick first change we decided to create the first computer animated version of our notation and to test it ourselves once again before it undergoes user testing.

Diagram B is the first iteration and the stage theme resembles the rocking out/ music theme we are aiming for with the drum inspired sequence. To fit the whole sequence onto a printable page we had to separate it into 4 separate vertical lines which reads top to bottom and left to right across the columns. Due to this restriction of printable space, reading the
music doesn't quite flow and causes inevitable hesitation between the columns. Also when re-reading through the syllabus we saw that the instructions must clearly communicate all procedures involved in the accurate reproduction of the sequence. From this information we developed diagram C, the next “pre-user test” iteration and made changes to fix the choppy reading of the music and ambiguity of the drum setup. To include all procedures of recreating the sound would also include the setup of our objects. So for our user to “stage” the setup before testing, we decided to place a key on on the “stage” (as seen on diagram C). From this the user should be able to replicate our set up and be ready to replicate the sound sequence. To fix the choppy reading of the music we reorganized the sequence in a snake like formation as illustrated by the arrows also on the right. This change should eliminate that inevitable hesitation I mentioned earlier and the arrows should clear up user confusion on how to read the notation. With this 3rd edition of our map we are ready to user test and will make changes according to what problems we observe.

After conducting the first user tests we came across a few unforeseen problems that now seem quite obvious after the fact. First of all while trying to test out our own sequence with the squeaker toy for the first time, we quickly realized that the toy squeaks twice with each foot note, one squeak for the deflate and another for the inflate. This completely threw off the beat of the intended sound and Daniel even struggled while trying to play with it. Due to this we decided to disregard the toy and rather just stomp with our foot with shoes on. Now we have to consider how to convey to the users that they are suppose to stomp their foot rather than some other action they may infer from seeing a foot shaped note. With Daniel’s first user test, the user had trouble reading the snake notation causing even more hesitation which was what we were trying to fix in the first place with this change. The vertical reading down then up is counter intuitive and tests the persons ability to read the notation in a foreign way rather than just test their ability to recreate the sound. To solve this we are going to either switch the notation to match the natural pattern of reading (left to right proceeding downwards with each row) or simply make it one long strip of notation so the user can easily follow along and be able to just focus on the sound rather than trying to read the unordinary notation. With the second user test, the user never once used his foot and rather just hit the green pot for the foot notes because they were the same color despite being different shapes. This mistake caused the sound sequence to sound completely different and nowhere near our goal. To remedy this we are going to color code the ground by putting a unique
color on the floor, this way the users will know that it is a note and won't confuse it with other notes. Another problem this user had was determining the difference between similar colors such as blue and purple and therefore mixed up a couple notes along the way. So instead of having the background of red we are thinking about changing it to a more basic color such as tan or white so it there is more contrast among all of the notes. Below is an example of our map with these changes in place and we are ready to conduct our second round of user testing with these changes in place.

Diagram D shows the final iteration of the map. It is similar to the previous one, as it still shows the “drum set-up” on the stage and the same icons are portrayed in the sequence, although we changed the layout of it based off of our user tests and the readability issues we were facing with the previous map. Now the user reads it like a book from left to right, The three rows are grouped together with a light grey background to show they are in the same line and are to be hit at the same time. The color of the foot has been changed from the same shade of green as the pot to it's own unique color, orange for our users to easier distinguish between the two. The user will have an orange footprint cutout on the ground representing the foot, so they will know exactly what to do with their foot.

The final user tests with the newest iteration of the map showed interesting results. The first user test that was conducted was easily read, however the user is slightly color blind so they found it difficult to distinguish between the green and blue pot. The second user was successful in conducting the sound sequence and had no hesitation with the layout, although they struggled with the speed at which to play the notes. The users were still slow at performing the piece as it was the first time they had seen it, which was an expected result and consistent with the user testing we conducted with the first map. Although, the layout led to less confusion and hesitation when the user had to skip to the next
row. They seemed to understand this better than the “snake-like” pattern in the first sequence, as it is our natural instinct to read left to right. This was the result we were hoping to achieve with the new layout design.

Upon reflection of the final user tests we concluded that we needed to inquire more information from our users to better understand our results. In all of our user tests we did not ask our subjects any type of personal questions. In the future, we think it would benefit our results to ask our users about any disadvantages, such as being color blind, or advantages, such as a strong musical background, they may possess. These questions would help us better understand the results they produced. We also concluded from our final user tests that we could consider adding measures into the sound sequence to demonstrate the speed of the beats, however this would only pertain to those users who had a strong musical background, which seemed to be a minority among our users. At the beginning of this project, our main goal was to try and have our users perform this piece smoothly and with a beat, however upon realizing our users did not have any musical background, we realized this may be a challenge we wouldn't be able to completely achieve. We did not conduct the test to anyone with a musical background and the last user who was the “average user” (no disadvantages such as color blindness or advantages such as a strong understanding of music) was able to successfully perform the sequence and understand the map. Overall, we feel the last and final iteration of the map was successful. The users were able to accurately play the sequence as smooth as possible, with no musical backgrounds to understand the proper beats and measures of the sequence.