Eleven

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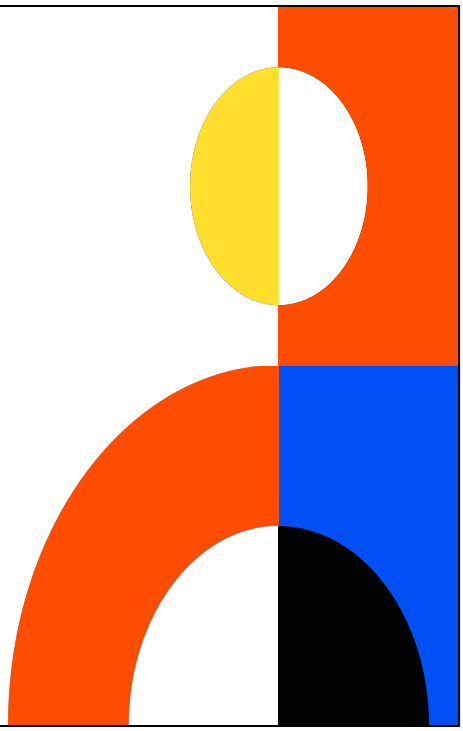
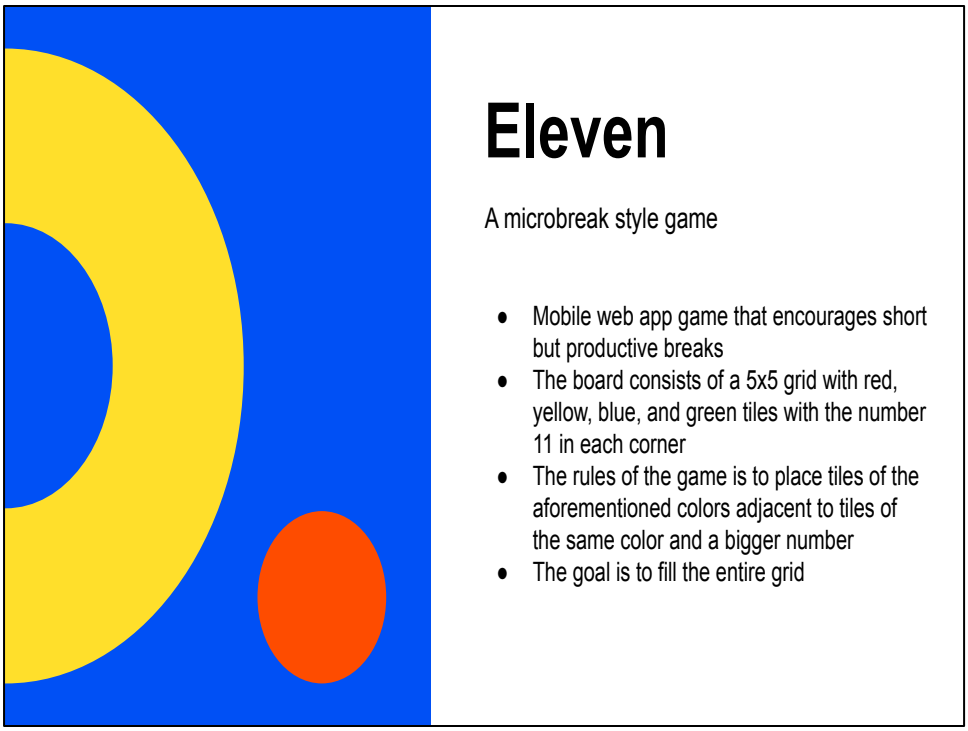
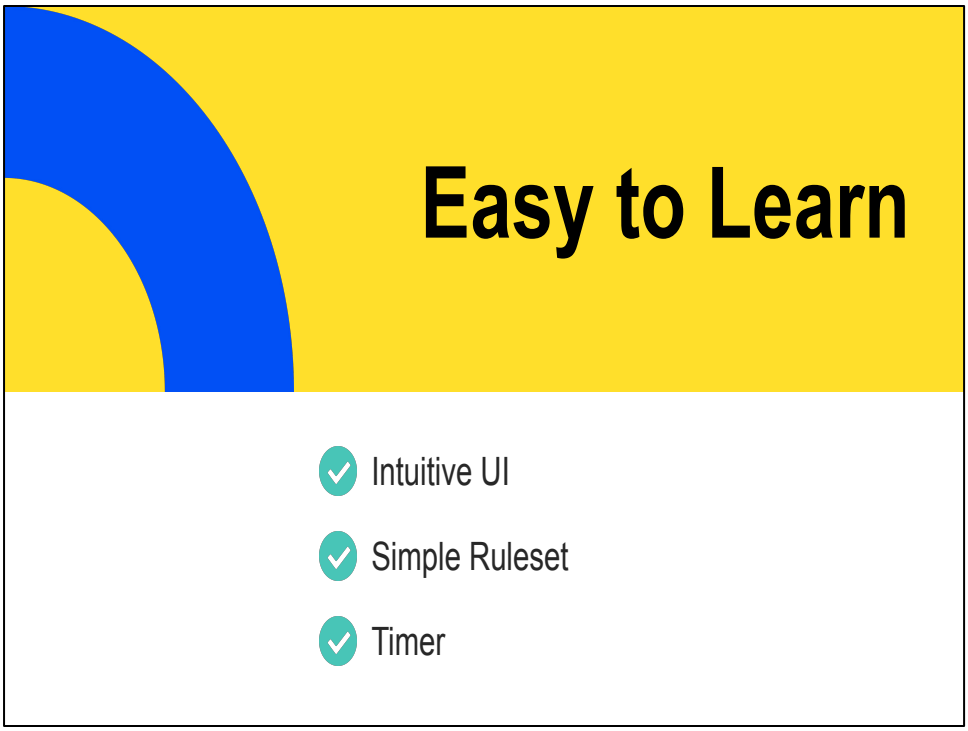
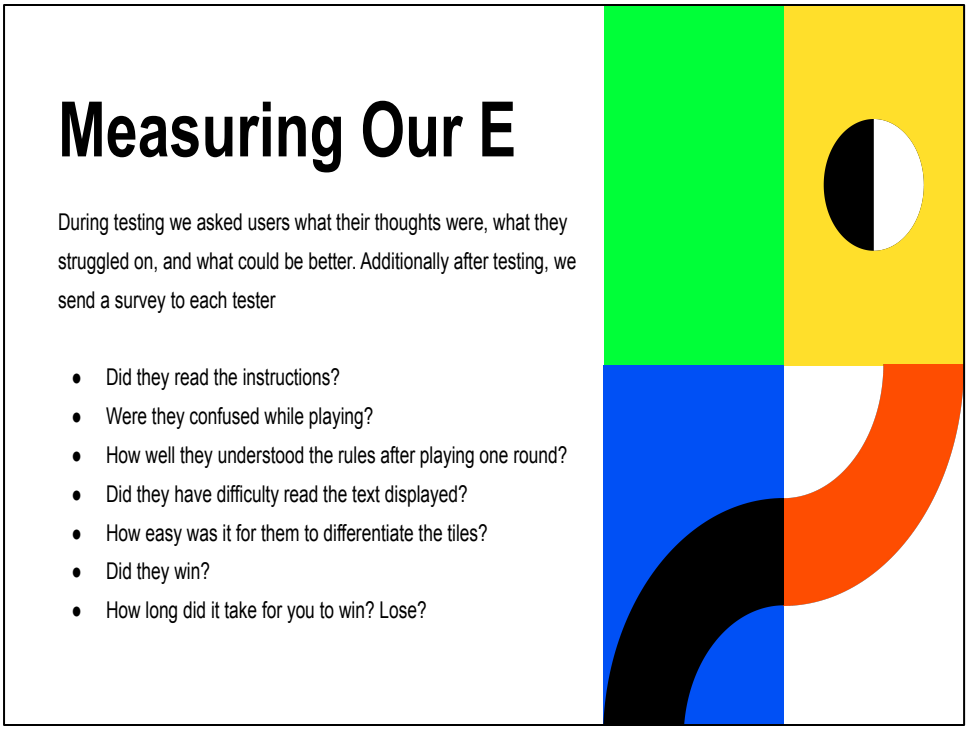




“Our semester project was a game called Eleven. It is a microbreak styled mobile game that encourages short but productive breaks. The game board consists of a 5x5 grid with red, yellow, blue, and green tiles with the number eleven in each corner. The rules of the game is to place tiles of the aforementioned colors adjacent to tiles of the same color but bigger number. For example if the user wants to place a red tile with the number six on it, then they must place it next to any of the red tiles already on the board. Additionally they must make sure that the tile they place, in this case a red tile with the number six, is lower than all the adjacent red tiles’ numbers. So if the adjacent red tile is a five, then they cannot place the red six there. The goal of the game is to fill the entire grid.



“Our team decided to focused on Easy to Learn as our primary E. We wanted our game to be engaging so that users come back to play again. One way to do this is by making sure that game is easy to pick up. In addition since this is a microbreak game, the game shouldn’t be to complicated otherwise it would be to challenging. To sufficiently achieve this we concentrated on an Intuitive UI and simple ruleset. The UI is minimal so users can stay focused on the task at hand instead of getting distracted or confused. The rules are easy to access, revisit, and straightforward. Additionally, we have a timer at the top of the board, so that users can get a quantitative understanding if they are learning the game. It also pushes users to beat their own record.



“We wanted to measure different aspects of the game, such as how long did it take the user to play their first game, in order to make sure that our team is actually achieving our targeted E. While users tested the application, we took notes on what they struggled with and what they excelled at. In addition, we sent them a survey afterwards to get a more conclusive analysis. Some of the survey questions included did they read the instructions, were they confused during the first playthrough, were they confused on the second playthrough, how confident did they feel about understanding the rules after the first playthrough, did they have difficulty reading the text, did they have difficulty differentiating the tiles, did they win, how long did it take them to win, and how long did it take them to lose.

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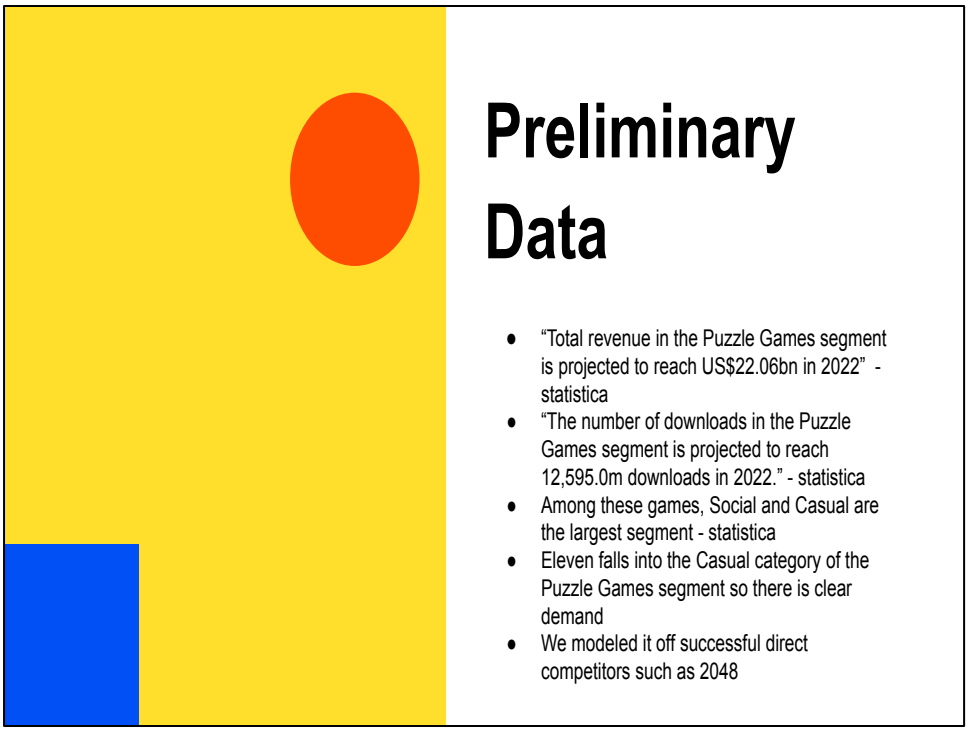


It turns out that the puzzle Games industry is booming. This meant that there would be room for a game such as ours. When we combine this with the benefits to microbreaks we found that we meet all the requirements for gamification and breaks found on playmotive. Specifically, we have motivation through the visible progress made at each step, repetition through the speed of the game allowing many attempts, and the learning is made through each play through. Therefore we meet the three main needs for dopamine stimulation that games like 2048 (our competitors) take advantage of.

- This is what we constructed our persona on based on competitor information.

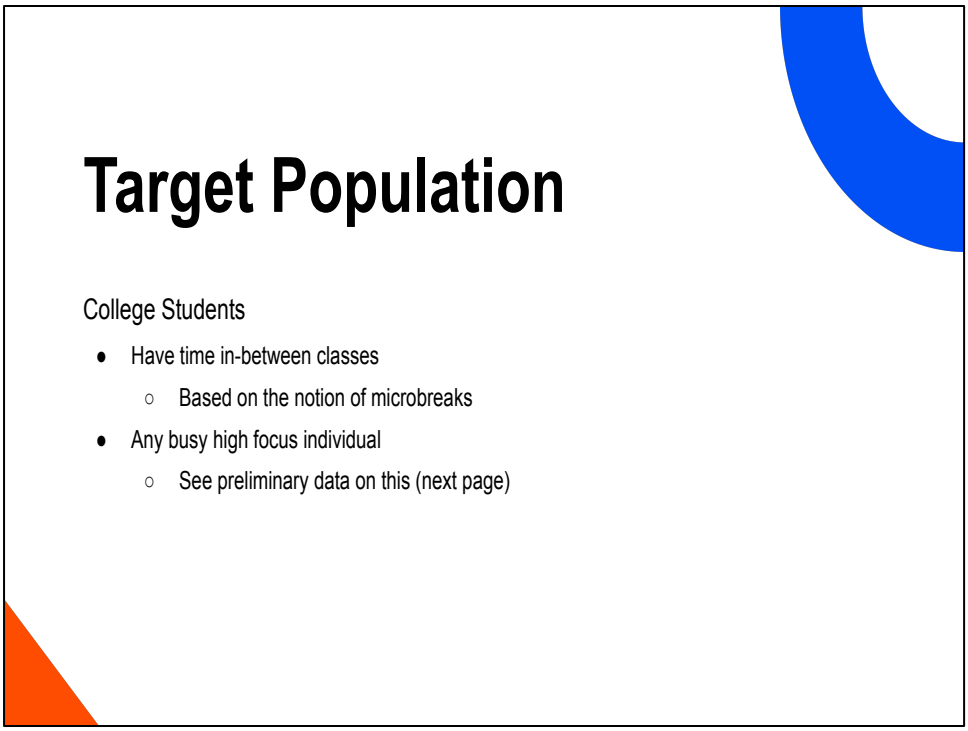
Citations:

Cueto, Emma. "Science Explains Our Addiction for 2048 and All Those Other Game Apps You Waste so Much Time On." *Bustle*, Bustle, 4 Apr. 2014, https://www.bustle.com/articles/20117-science-explains-our-addiction-for-2048-and-all-those-other-game-apps-you-waste-so-much#:~:text=According%20to%20neurologist%20Judy%20Willis,drug%20the%20body%20produces%20naturally.

"Gamification and Dopamine: Why Games Motivate Us." *Playmotiv*, 17 Apr.

2020,
https://playmotiv.com/en/gamification-and-dopamine-why-games-motivate-us/.

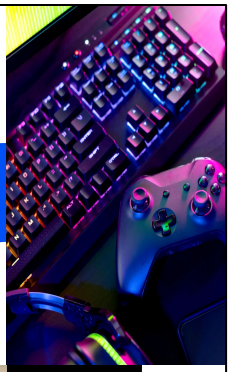
“Puzzle Games - Worldwide: Statista Market Forecast.” *Statista*,
https://www.statista.com/outlook/dmo/app/games/puzzle-games/worldwide.

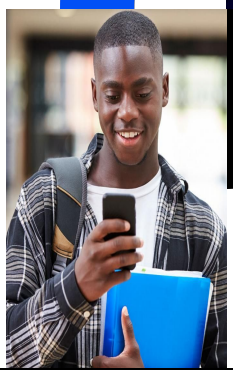


We based our target population on microbreaks data, and the groups that this benefits provided in class. Additionally, the industry data in the previous slide helped guide what kind of microbreak based game we made. Based on the information on microbreaks, we identified college students as a group that has high stress and is busy. This meant that they would benefit greatly from a short, highly interactive game that they could play many quick iterations on. As for the industry data, we found that short puzzle games were a growing segment. This had the added benefit of providing us with come direct competitors. For this reason, we decided to combine these genres to create a competitor to games like 2048.

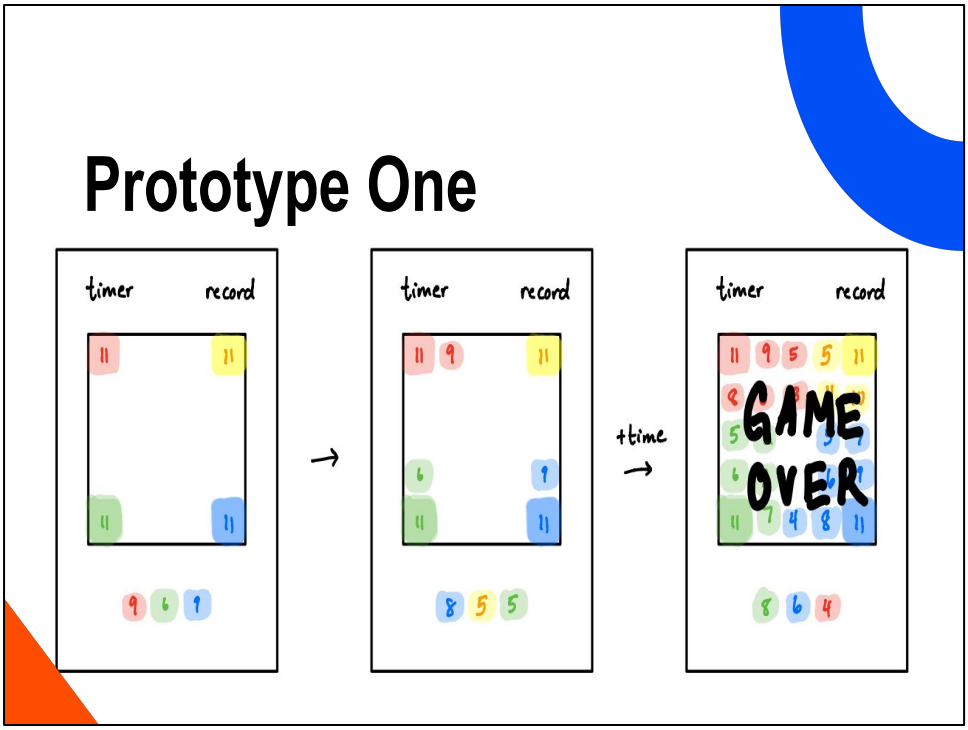
Persona

Name: Sam Smith
Age: 20
Occupation: Student
Bio: This is Sam Smith. He is a 20-year-old sophomore at Stevens Institute of Technology. He enjoys playing guitar in his free time and works a part-time front desk job at the library. He used to play League of Legends, an online battle arena video game, with friends twice a week at night, but he doesn't have the time recently. His current course load is twenty credit hours — three of which are core chemistry major classes. Sam is often seen sitting around campus taking notes and reading textbooks. Recently, his work has been taking him longer than usual, leaving him to feel burnt out.

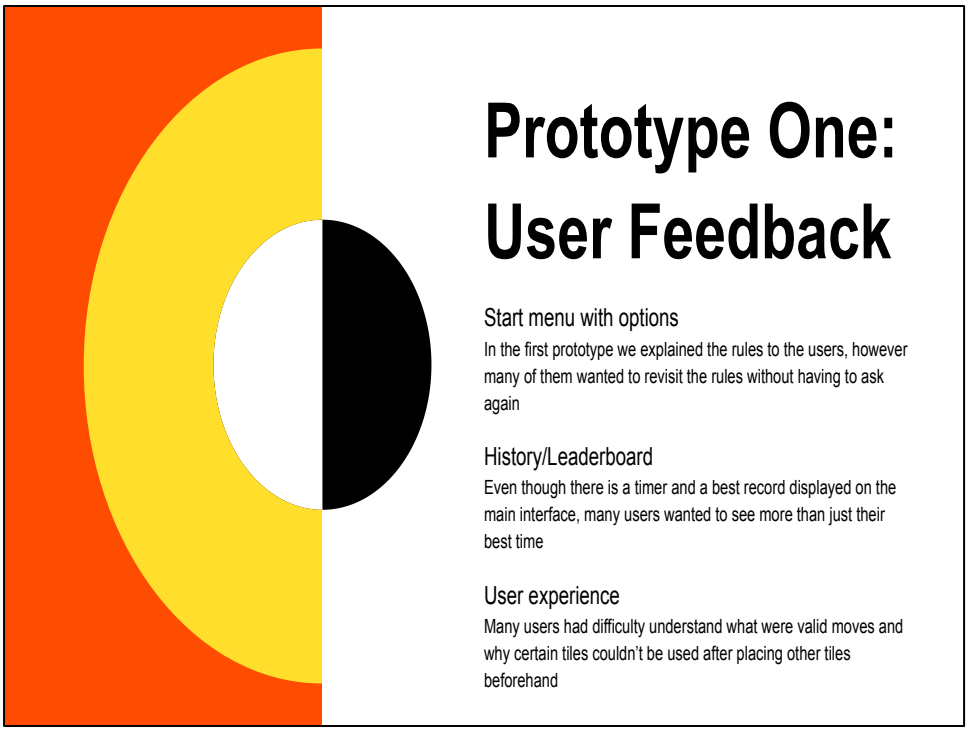




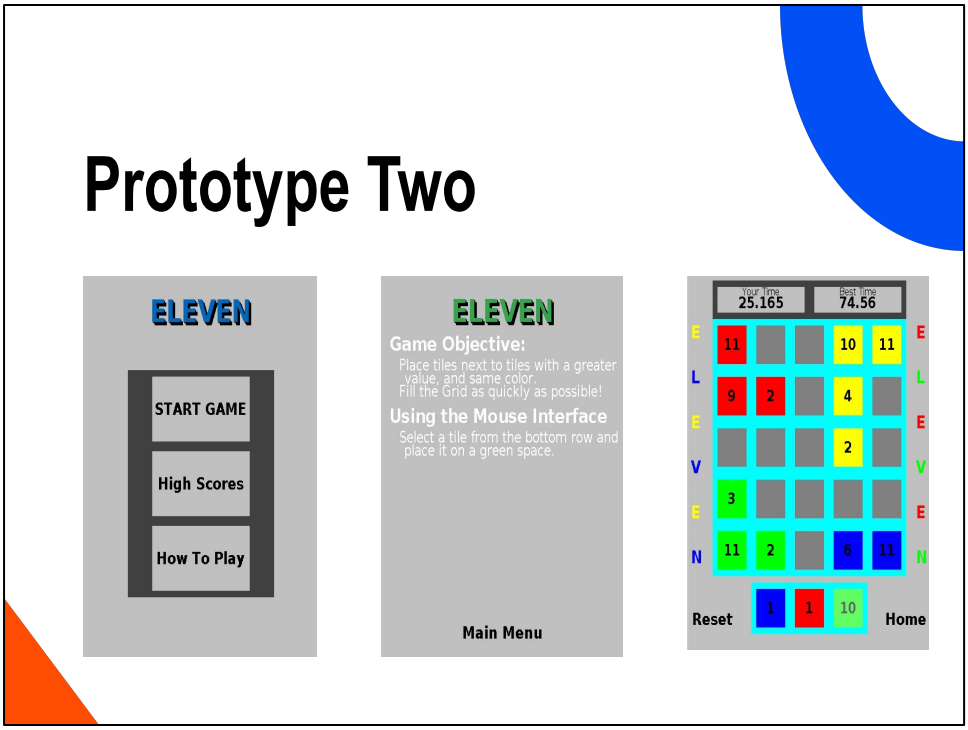
“An example of our persona is a 20 year old college student named Sam Smith. He’s a chemistry major and has a part time job at the library. During his free time he enjoys playing the guitar, video games, and hanging out with friends. However recently he’s been really busy juggling school and work and has been declining his friends’ hangouts to study instead. He’s been feeling really burnt out and could really use a relaxing break.



“Our first prototype was a low fidelity paper prototype. This allowed us to draft something quick and get almost instant feedback from users. After explaining the rules to our testers, we asked them to play a few rounds. For example when shown the paper prototype, they would point to one of the three available tiles from the bottom row and point to a place of the board. If it was valid, we would write the tile they selected onto the specified place. If it wasn’t valid, we would have to explain to them why they couldn’t place it there. After a few of these rounds, they would either have no more usable tiles from the bottom row or they would have won the game.

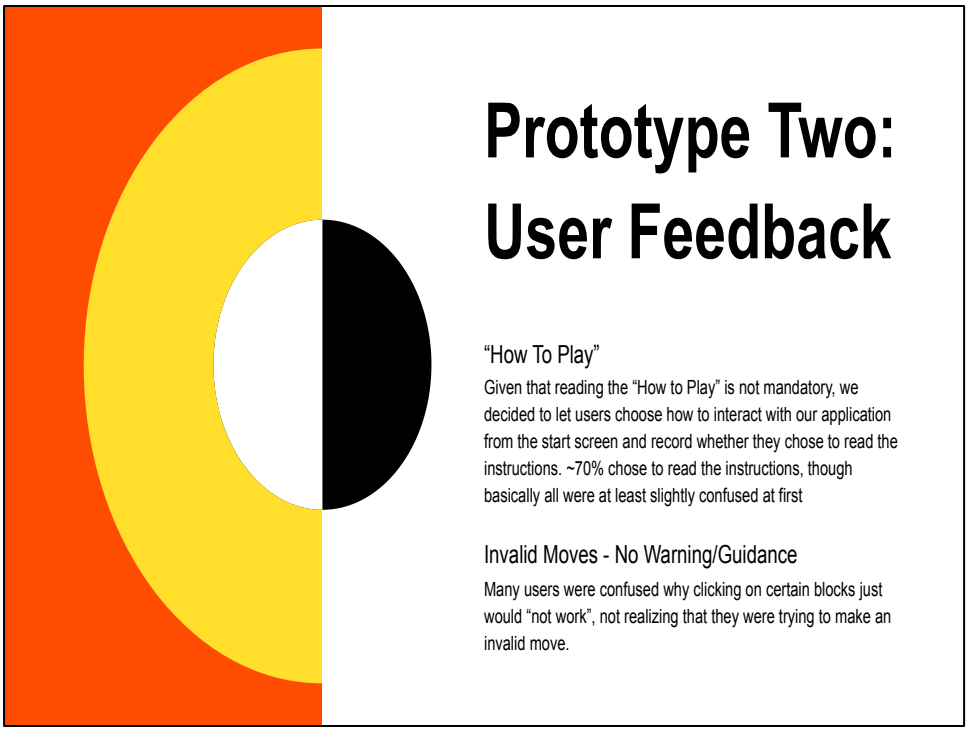


"After our getting user feedback for our first prototype, we learned that having a start menu with options would help users navigation an application instead of a paper prototype. Additional many of our testers wanted to review the rules especially during the game to make sure they had a good and accurate grasp of the game. Another feature we wanted to implement in our next iteration was a leaderboard in addition to the timer and best record on the main interface. This allows users to see more than just their best record as it also allows them to get an idea of if they are getting better at the game. Other things we noticed was a poor user experience. Many users had difficulty understanding what were valid moves and why certain tiles couldn't be used after placing other tiles beforehand



The opening screen; the “How To Play” screen; the game screen mid-session.

A healthy mixture of the primary four colors was used around the game’s design to drive home the distinction and grouping role that the colors play in the core rules. Of note, the application display a current running timer, along with the high score as a means of external motivation for replayability. The “Reset” and “Home” buttons are the only ways to interact with the application outside of the group of 3 tiles in the player’s “hand”; they similarly rest at the bottom of the application for ease of reach. As a way to convey information to the user, the green “10” is clearly disabled with a greyed-out effect to indicate that it is not playable.

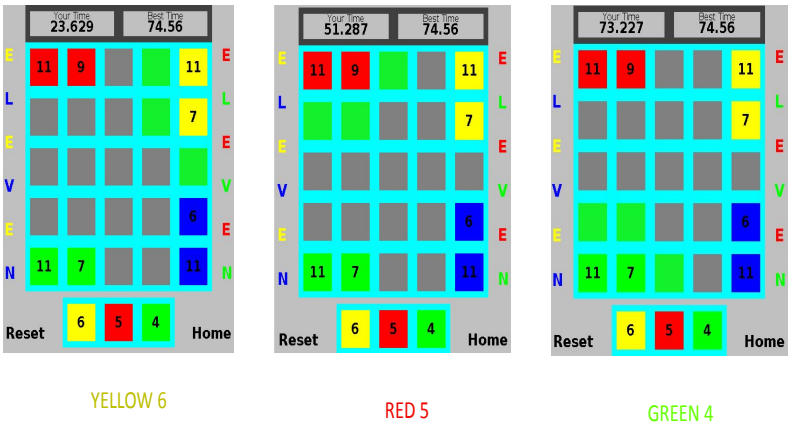


A major component of receiving feedback was to remain hands-off, allowing us to capture how a user would naturally react to the application. This meant that, although the "How to Play" menu was prominently displayed on the main start screen, not every user would initially, or eventually, get to it.

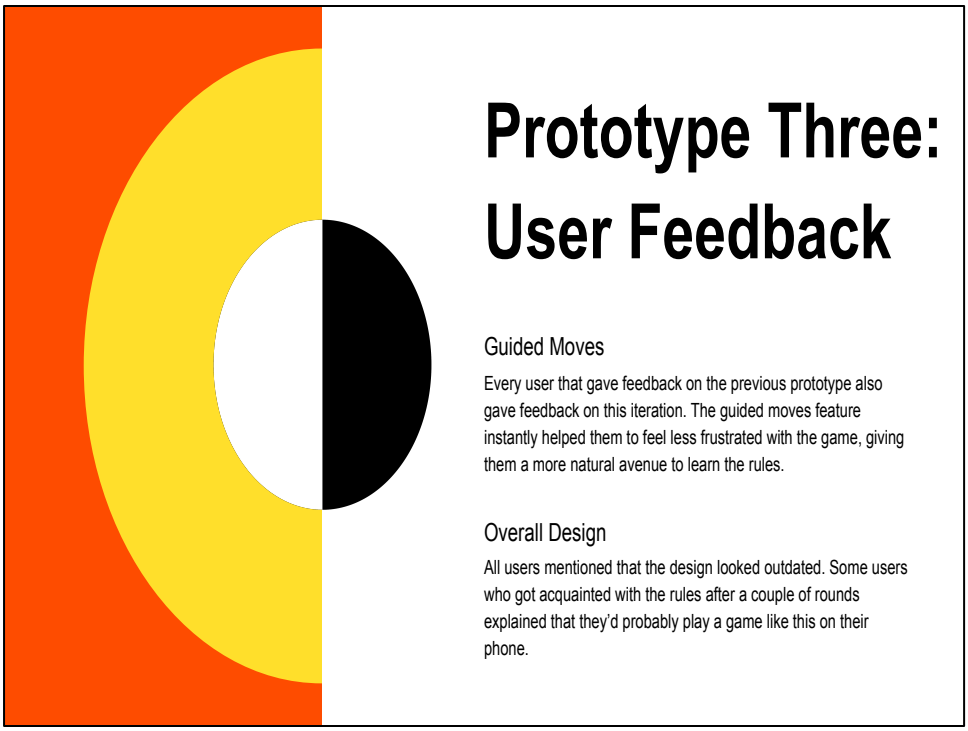
This unintentionally provided additional insights into how intuitive a game we designed, seeing how users interacted with the game board with no upfront instruction. Each player that did not read the rules still reported confidence in the ruleset if they were to play another round, meaning that the "How to Play" screen works well as optional to give player choice.

However, though players reported confidence for future rounds, many experienced confusion within the opening moves of their initial round. Specifically, they were confused why some invalid moves did not work, resulting in a slight frustration with the system, believing there was issues inherent in its design. Without a warning or further guidance, they needed to overcome some frustration to deeper their understanding of the ruleset.

Prototype Three

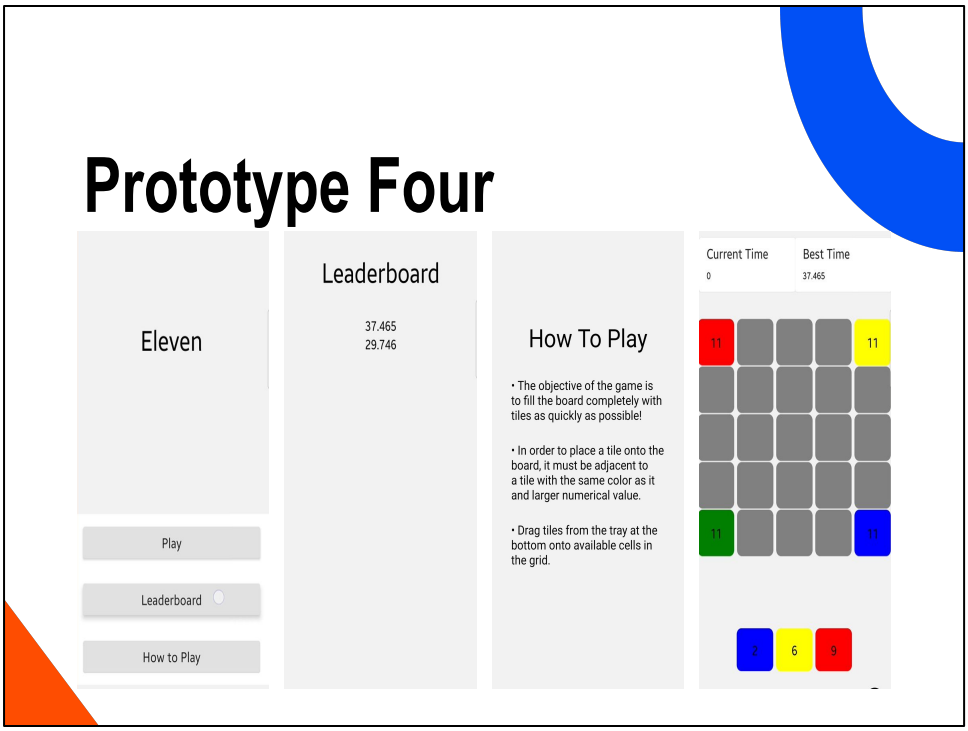


This prototype changes only one major aspect of the design, guidance on acceptable moves for each tile. For instance, when the yellow “6” tile is selected, it’s acceptable moves are highlighted, as shown in the first image.

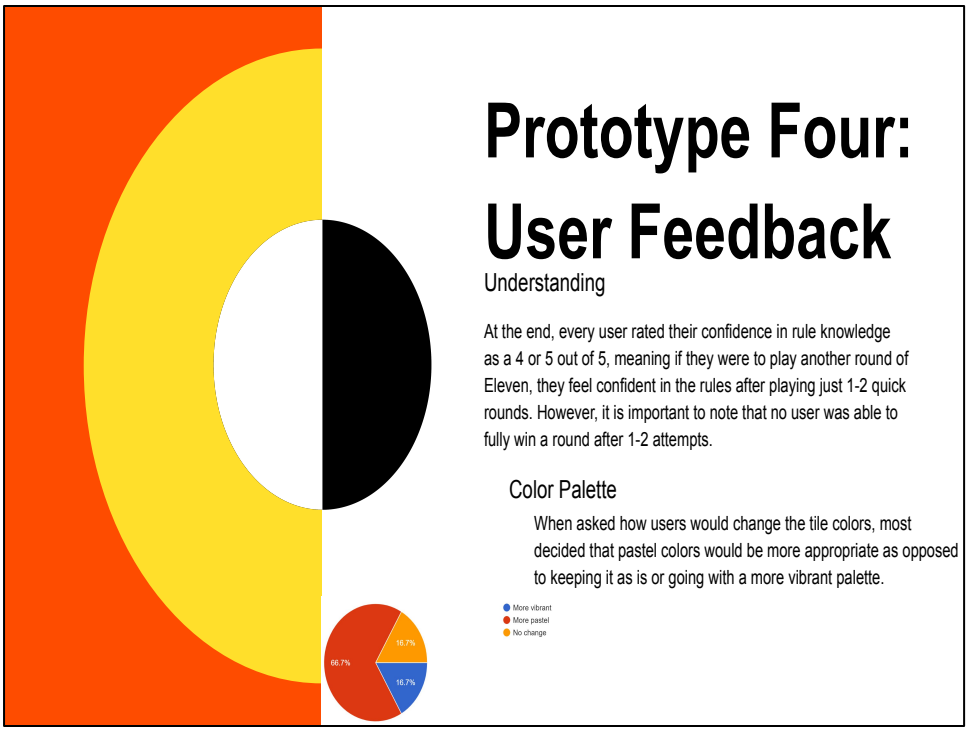


The same users that played the previous prototype also played this prototype, along with some extras. Every user who saw the previous iteration appreciated the slight advancements made here with guided moves. For new users, there was minimal frustration associated with making moves, given the new visible guidance.

However, essentially all users were unhappy with the outdated design, not conforming with modern user interface trends.

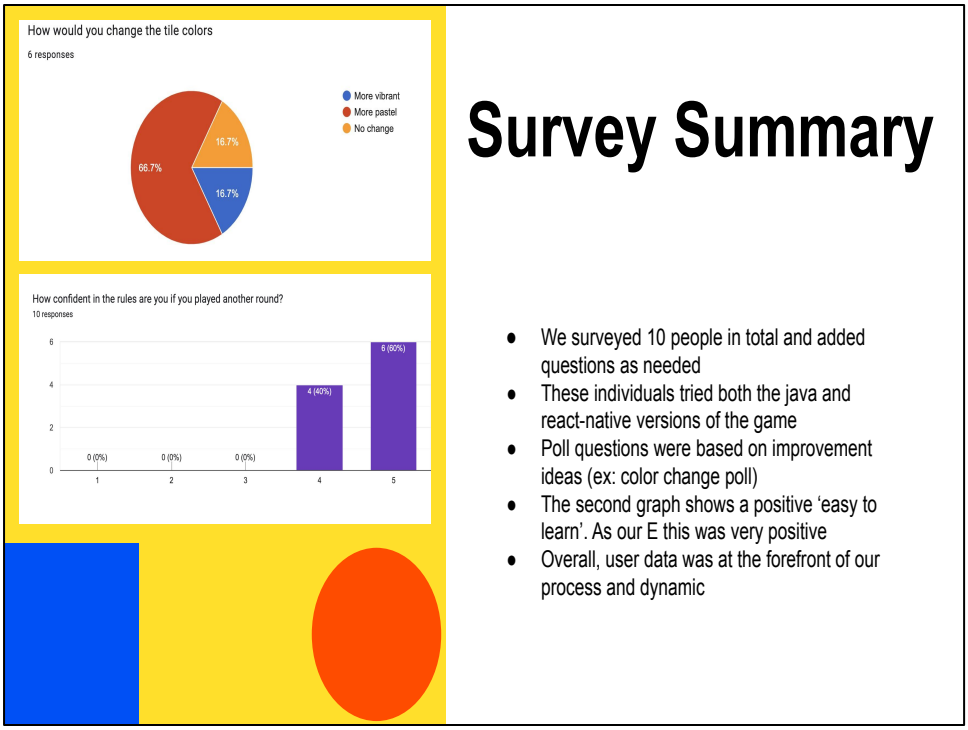


In this final iteration, we switched from Java development to React Native in an effort to capitalize on the application's targeted population.

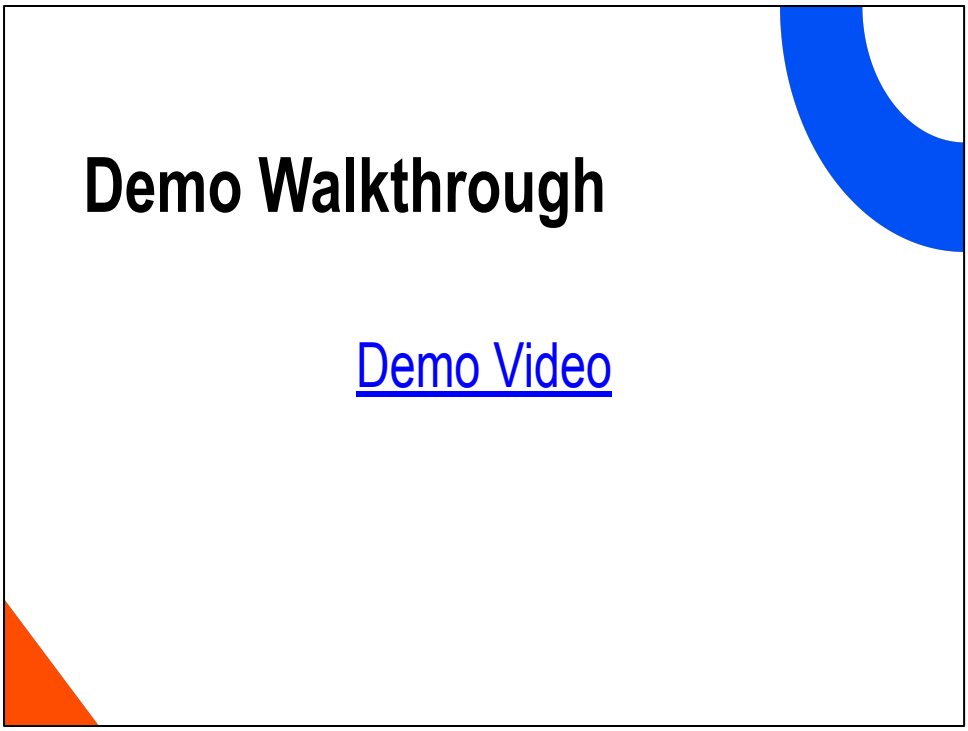


The most important statistic we measured to measure our “E” was level of confidence with the question, “How confident in the rules are you if you played another round?”. On this last iteration, we felt very confident that we delivered a successful product, with regards to our “E”, seeing that every user reported a “4” or “5”, indicating that they were “very confident” or “extremely confident” in the rules after no more than one or two short rounds of play.

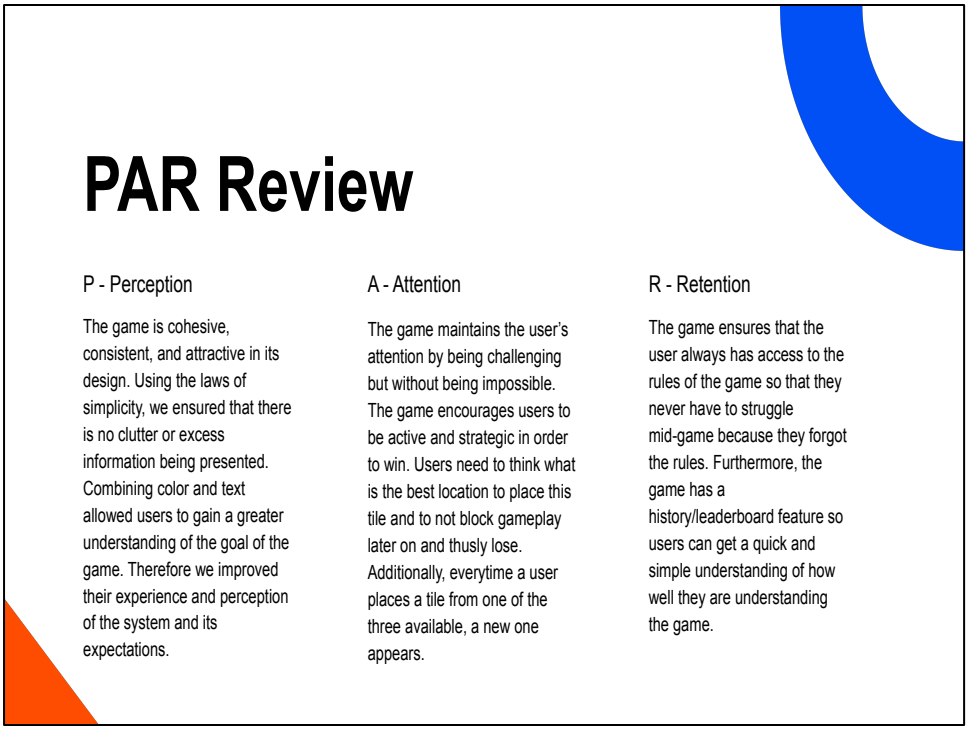
The only minor change we would make, not deserving of its own dedicated iteration was the color palette. We gave user the choice between deciding whether the four primary colors should remain the same, change to a more vibrant palette, or change to a pastel palette. Though most users did not outwardly mind the current color scheme, when prompted with a choice, the majority figured a pastel color palette would fit best, from among the options.



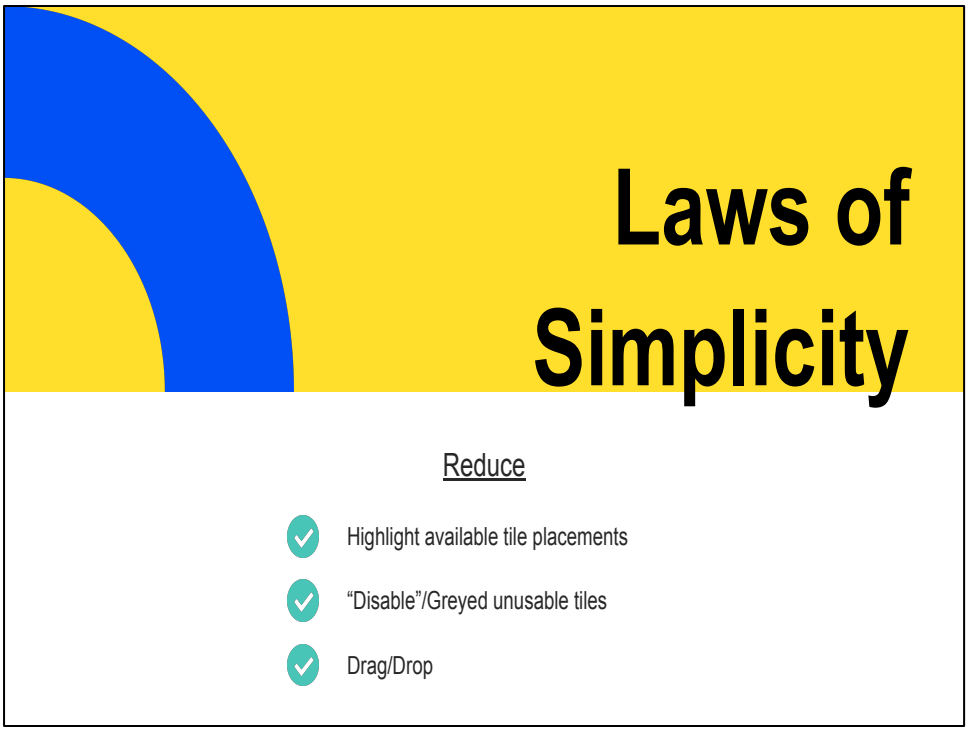
We listened to user feedback and made sure to incorporate it. This meant that when a change was suggested, we added this to the poll to see what users thought. As a result, our poll evolved, and since all participants were the same, we got good consistent feedback. An example of this was that upon a suggestion of using colors with less contrast, we added this to the poll. Since the majority of users agreed that this would be an improvement, we implemented it. Some additional data that came out of the polls was very encouraging, such as the graph on how confident people were with the rules, which shows that our game was easy to learn (our E).



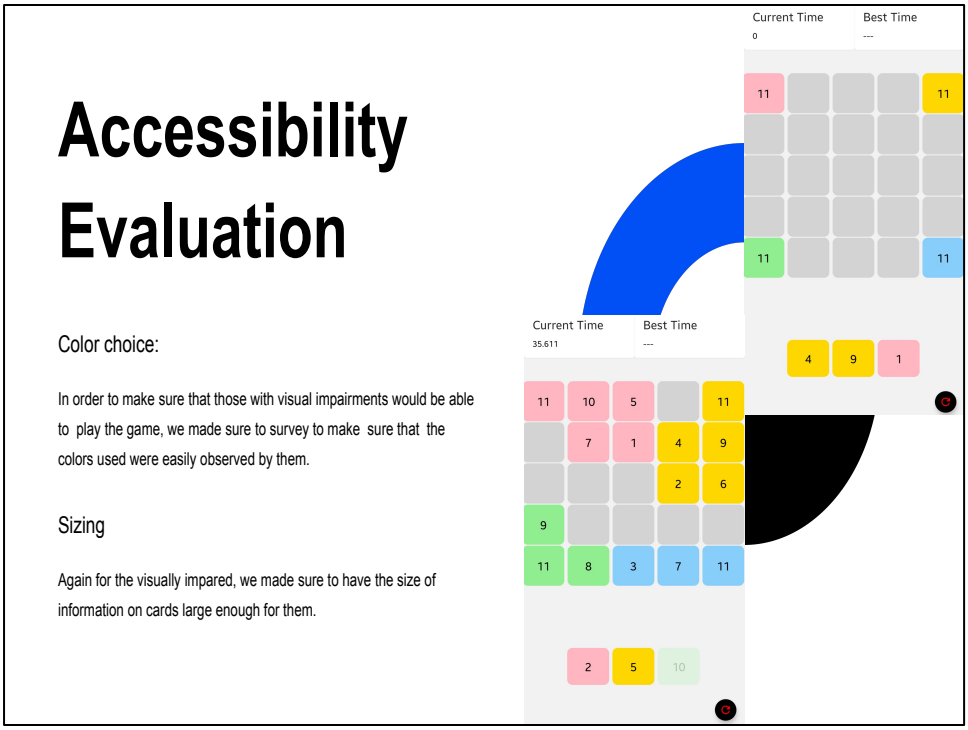
Demo video to get an idea of the game play.



“In our PAR review, we analyzed the perception, attention, and retention of our game. In terms of perception, the game is cohesive, consistent, and attractive in its design. Using the laws of simplicity, we ensured that there is no clutter or excess information being presented. Combining color and text allowed users to gain a greater understanding of the goal of the game. Therefore we improved their experience and perception of the system and its expectations. In terms of attention, the game maintains the user’s attention by being challenging but without being impossible. The game encourages users to be active and strategic in order to win. Users need to think what is the best location to place this tile and to not block gameplay later on and thusly lose. Additionally , everytime a user places a tile from one of the three available, a new one appears and draws the attention of the user. In terms of retention, the game ensures that the user always has access to the rules of the game so that they never have to struggle mid-game because they forgot the rules. Furthermore, the game has a leaderboard feature so users can get a quick and simple understanding of how well they are understanding the game.

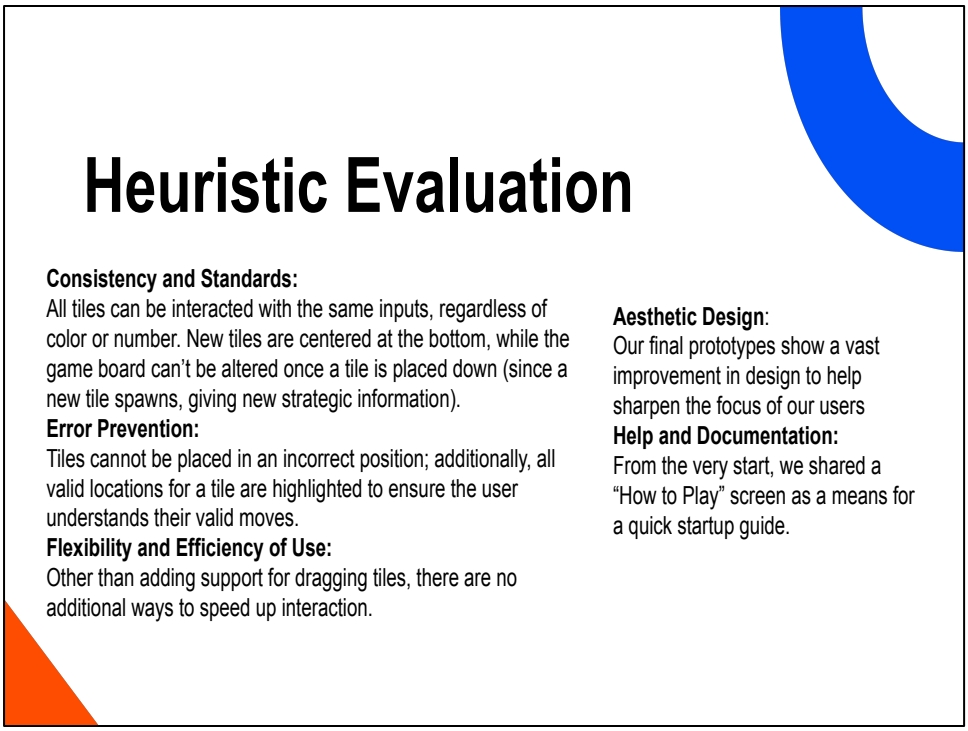


“We made sure to focus on reduction in order to simplify our interface. This prevents users from becoming overwhelmed with too many choices. The first way we did this was by highlighting only available tile placements when a user selects one of the three tiles in the bottom row. This not only guides them and helps them to learn the system better but also visually reduces the possible moves a user can decide. Additionally it helps the user focus on the point of the game without getting overstrained mentally. The second way we achieved this was by disabling or greying out unusable tiles. After a user plays a few rounds, there is the possibility users “blocked” themselves from being able to add more tiles next to existing tiles of the same color. To visually let users know this, we created a visual and universal indicator. This minimizes the available tiles left the user can use and helps narrow down the user’s next decision. The third way we accomplished this was by reducing the amount of clicking the user. Instead of clicking through menus to navigate and clicking/pointing to play the game, we restricted the clicking just for navigating. The game itself now uses an intuitive drag and drop to place tiles.



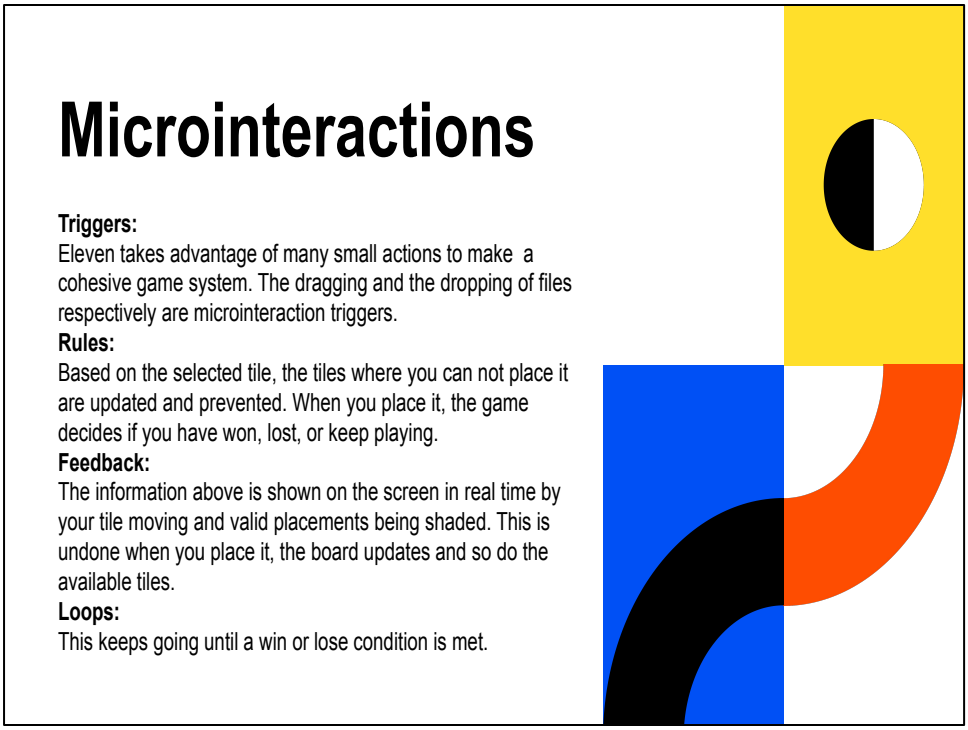
Based on our user feedback, we updated the color palette as seen here with a pastel variant of the initial designs.

An area we also queried users for feedback was on font size. Two-thirds of the users preferred the font size as-is, resulting in no change, yet still verifying that our application accommodates our users well.

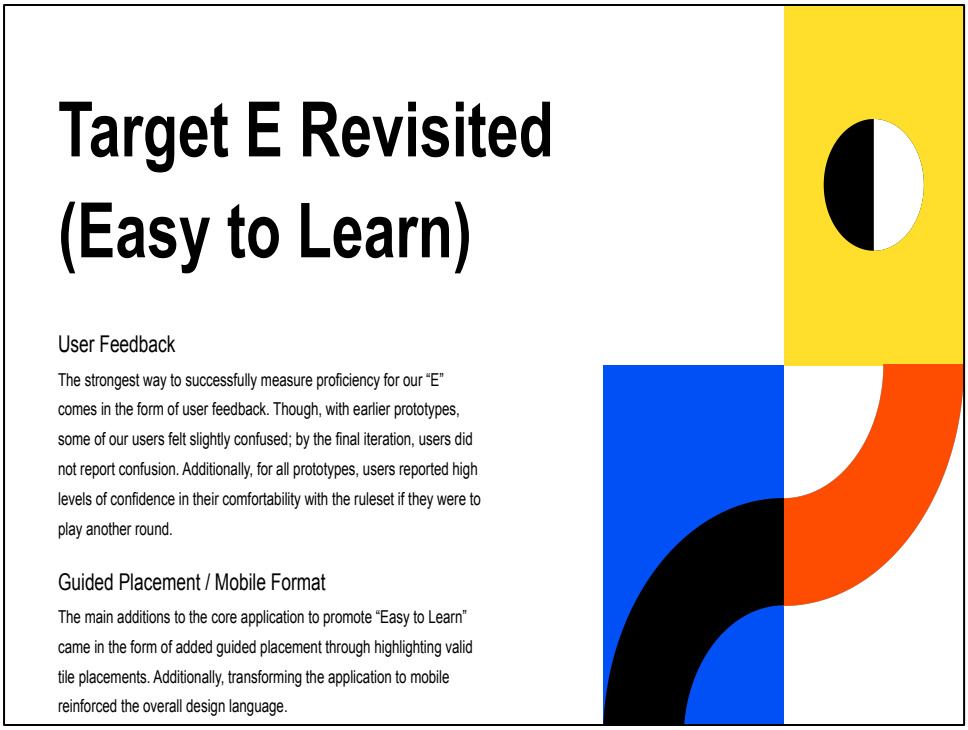


Nielsen's Evaluation list was used. Included on the slide are the key evaluation points that were checked and interesting to discuss.

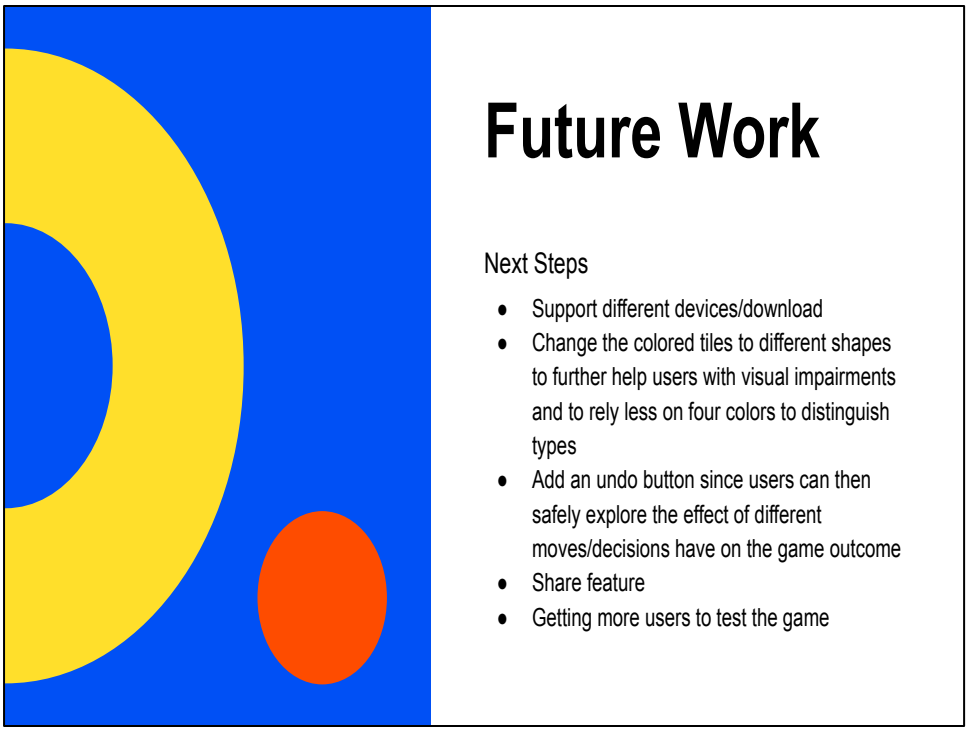
A key standard for gameplay is that a user interacting with the game has all interactable elements available at the bottom of the screen to use, rather than all around the screen. As far as error prevention goes, it's not possible to place a tile in an incorrect location. The dragging interface for mobile phones was added to increase the efficiency of use as much as possible for a mobile application. Over the iterations, the design has greatly improved to meet the desires of our user base. When trying to make a game easy to learn, help and documentation needs to be at the forefront of design, which it has been since the beginning of development.



In order to break the game down into small pieces that make up a whole user experience, we looked into some of the main Microinteractions that make it up. We further subdivided these into the four steps of microinteractions. From this, we were able to see that the interactions themselves were well made. For the triggers, they worked the same repeatedly, are on the screen, show changes in information clearly, and maintain their affordance. The rules all involve making progress to the end of the game (the goal). The feedback isn't overbearing and all relates to the rules and therefore the goal. Finally our loops are conditional on the rules of the game and therefore meet our needs. Overall, we made sure to take into account the standards for good microinteractions.



Upon reflection of our group’s effort to improve making our application “Easy to Learn” we can clearly see the features implemented towards this goal, mainly guided tile placement and mobile oriented design. Through constant user feedback through the entire process, through multiple iterations, we see great results indicating that we successfully made an application that embodies our targeted “E”.



“In terms of future development, we believe we could make a lot more strides in making the game more accessible. Firstly instead of downloading the source code from the github, we believe that being able to download the game from the App store, google store, or play on a browser would increase ease of access and ability for new users to pick up the game. Additionally it would support the development of the game since we would have more users and a better sample size to understand the design flaws there may be. Another step we would take is making the game less dependant on color as a means of differentiating different title types. For example instead of red, blue, yellow, and green tiles, it could be a triangle, circle, square, and diamond shaped tiles. This makes the game more accessible to those with visual impairments. Another step that we would take is adding an undo button. Firstly, this allows users to not feel as though their decision permanently lock them into a winning or losing outcome. In other words, it allows them to explore safely. Furthermore, it encourages users to understand how their decisions affect the outcome game. For example, maybe after five moves they realize how their second move blocked them. Another step that we would take is adding a share feature so that users can show off their score and two so they can spread the word about our game.

While we enjoyed working on the project for the class, we don’t see ourselves continuing this project in the future.


Thank you!