

Final Project Write-up

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Part 1:

Moji Match is a classic memory game themed around practicing Japanese language. The twist is that instead of making exact matches like in traditional memory games, the player tries to match the Japanese term / character to the matching definition or sound. The mascot of this game is a cheery squid who helps language learners practice calligraphy by squirting ink! Thus, the game is under the sea-themed with the content centering around practicing Japanese. This combination of practical, well-regarded game mechanics with engaging and novel theming creates a rich learning experience for the user. I was inspired by my own experience learning Japanese. I thought back to long study sessions practicing Kanji, Japanese characters that carry meaning, and how applied practice, like Quizlet flashcards, helped me tremendously. Since then, Quizlet has largely scaled back the features you can use for free, and therefore it seemed like a great opportunity to create something that addresses those limitations. I hope that *Moji Match* is a helpful addition to the learning routine of my target audience: Japanese learners of all ages. I imagine that these users are immersing themselves in other resources to learn Japanese like classes, books, or self-study, and would use this website to practice, which helped guide how much context I provided throughout the game. This is why I focused more on jumping right into practice as opposed to developing explanations for, say, the concept of Kanji characters. For now, the game is limited to English speakers learning Japanese, but I hope to offer more options in the future. I am so excited to share this website with other students like myself, and to use it myself to review my language skills!

Part 2:

Interactions

Menu Page:

- **Squid and Bubble Animation:** View the squid and bubble delightfully animating upon page load by opening the project (or navigating back to the menu page from another page).
- **Music Player:** Enjoy the tunes I wrote for this game by clicking on the music controller button on the bottom left to play and pause the music.
- **Initiate Play:** Press the play button (looks like an ink splotch) to open the character set selection menu

- **Exit the Character Selection:** Try using the “X” button (top left corner of ink splotch character selection menu) to exit the alphabet / character set selection menu and return to the welcome screen / menu. Press the play button again if you need to open the menu again for the next task!
- **Select a Character Set:** Choose an alphabet / character set to practice (Hiragana, Katakana, or Kanji) by clicking on one of the teal buttons on this ink-shaped menu. This should take you to the appropriate game page.

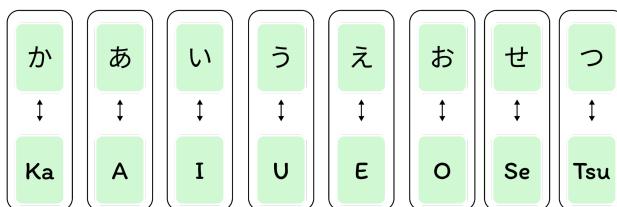
Game Page (Hiragana, Katakana, Kanji)

*Note: the game pages are pretty much the same besides the actual content on the cards, so feel free to try out any of them for the interactions (or try all 3)!

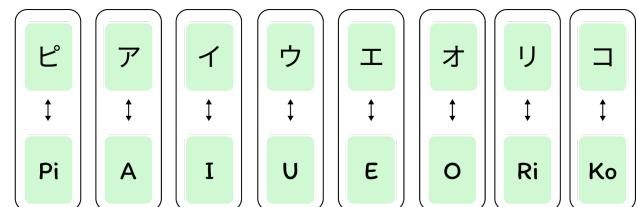
- **Return to Menu (Pre-Win):** You can navigate back to the welcome menu at any time by clicking on the header “Moji Match” in the bubble in the top left corner.
- **Learn How to Play:** Open up the instructions panel by clicking the “How to Play” button on the bottom left. You can close this menu by clicking the “X” button.
- **Music Player:** Enjoy the tunes I wrote for this game by clicking on the music controller button on the bottom left to play and pause the music.
- **Play!:** The cards are randomly shuffled on the game board each time. Click on cards to flip them over and try to make matches.
 - If the two cards you flip match, you should see a banner that says “Match!” and the cards should disappear.
 - If the cards you flip do not match, both cards will flip back over.
 - If you flip a card up and decide you’d rather choose a different one, you can click it again to flip it back over, as long as you haven’t already flipped a second card.

Here is the key for which cards match for each game page:

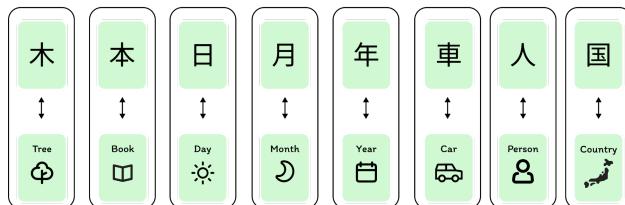
Hiragana



Katakana



Kanji



- **Check Your Score:** The score on the left side under “Matches” should dynamically update as you make matches.
- **Check Your Matches:** Once you’ve made a match or two, expand the matches section by clicking the arrow button on the bottom right corner of the associated box. It should dynamically update as you make more matches. You can minimize this section by again clicking the arrow button on the bottom right of the expanded box.
- **Win!:** Once you’ve made all 8 matches, a congratulatory message and an extra happy squid will appear on the game board.
- **Return to Menu (Post-Win):** Once you’re won and the win message has appeared, click the return to menu button to return to the welcome menu.

Responsiveness:

- **Website is Responsive:** I coded it to be responsive at most sizes, but as far as specific sizes you could try out widths of 500, 800, 1000, and 1200.

Accessibility:

- **Website is Accessible:** All of the above interactions should be accessible based on what we discussed in class.
 - Particularly I would suggest trying out playing a round of the matching game, or perhaps just finding one match, using key input (tab through and enter key to interact).
 - The evidence of accessibility using the Wave Tool is in the Appendix.
 - NOTE: If you are hoping to check the accessibility on your own, please note that you may have to use the [browser extension](#) for the Wave tool as the basic tool may not let you navigate through pages using React Router.

Part 3: Tools

Internal Tools (Programming-Based Tools):

- **React (UI Library)**
 - **Why:** I chose to use React because I had really enjoyed trying it out in our class projects, and wanted to practice applying those skills to my own project, as well as seeing how I could use it in new ways to solve new problems. As I considered my project broken up into small pieces, it became clear to me how well those pieces lent themselves to pages and components, some being reused multiple times with new data or in new contexts, which is an ideal use case for React.
 - **How:** React is the foundation of my project. I used it to structure key elements into components or pages, and store the associated data / properties appropriately.

- **What Does it Add:** I think that using React allowed me to grow the complexity of my project, while maintaining a really clear and highly usable / understandable structure that would allow me to grow my complexity even more if I continued with this project.
- React Router (Routing Library)
 - **Why:** I chose to use React Router because after discussing it in lecture, it seemed like a neat and useful library to learn and practice during this project. I knew I could have several pages to navigate through with my menus and game pages, so it seemed like a great fit and a good opportunity to learn about it.
 - **How:** I used React Router to handle the navigation between different React components as pages of the website in a fast and lightweight way. The menu is its own route, and then users can navigate to the different game screens (depending on what they want to practice), and back to the menu again, all through React Router.
 - **What Does it Add:** From my understanding, React Router allows users to navigate through multiple parts of a web page without refreshing or reloading, making it more efficient for jumping into studying with my game.
- React Awesome Reveal (Animation Library)
 - **Why:** I chose to use React Awesome Reveal because after reading about several animation options (via [this article](#), as well as [this one](#), and others), I was intrigued by the variety of animation options and seemingly simple implementation.
 - **How:** I used React Awesome Reveal to animate the menu squid as well as the accompanying bubble on the menu. They pulse when the menu screen is loaded.
 - **What Does it Add:** This added another element of playfulness to my website helping me to bring my squid to life to have a bigger and more positive impact on the player's mindset.
- Howler (Sound Implementation Library)
 - **Why:** After some research, it seemed like Howler is the preferred javascript sound library, and I liked that the implementation seemed flexible, customizable, and fairly simple.
 - **How:** I used Howler to include the game music in my website, and handle related functions like playing and pausing the music.
 - **What Does it Add:** I was eager to include music to help cultivate an immersive learning experience and Howler helped me implement my vision, while also helping me give users agency over the music in the game (play, pause, etc).

External Tools:

- Ableton (Music Production Software)
 - **Why:** Ableton is a music production software that I've been using for several years, so it made sense to use something I was familiar with when I was considering making game music.
 - **How:** I used Ableton to create the game music for this game from scratch! I used the available electronic instrument kits in Ableton to layer on different beats and rhythms to accompany my game.
 - **What Does it Add:** I feel like the music contributes to making the theme and the game itself immersive. Because I created it myself, I had the opportunity to tailor the music to this game specifically, providing another unique element that draws in the user.
- Autodesk Sketchbook (Visual Art)
 - **Why:** Autodesk Sketchbook is my go-to software for digital art. Because I am familiar with it, it made sense to use it when thinking about creating a mascot and scene for my website.
 - **How:** I used Sketchbook to draw the squid mascot, including a default happy squid (featured on the menu and favicon) and an extra happy squid (featured when the player wins the game), and an accompanying bubble containing a Kanji character. I also created the underwater scene for the game to take place using Sketchbook.
 - **What Does it Add:** I really wanted the look and feel of my website to be completely unique, and to match my vision, and the best way to do that was to do it myself from scratch. The backdrop helps immerse players in the game, and the mascot provides positive reinforcement as well as contributing to a more approachable experience. Learning a new language can be really difficult, but the art and style helps make it feel more light-hearted and playful.
- Figma (Visual Art and Design)
 - **Why:** I chose to use Figma as a tool because it helped me explore designs in the prototyping stage before actually spending the time to build them out. This gave me the opportunity to iterate quickly, and also to use key design elements like vector art (ink, bubble light effect) and menu backgrounds (matches background, game board background) in my future designs. Using figma for design is also a skill I'm currently building, so it felt like a good opportunity to practice, even in a highly technical context.
 - **How:** How I used Figma was closely tied to the reason I chose to use it in the first place as discussed above. I used it to prototype my design and iterate through the visual design, information architecture, and general flow of the project, and when I was happy with those iterations, I used some of the elements I created in Figma in the final design. Figma was also crucial for creating the card designs, as I also printed physical versions of the cards as part of my prototyping process.

- **What Does it Add:** My use of Figma contributed to a clear, clear, and visually-engaging design. I discovered a lot about my designs during user testing, for example that the instructions should be where the game is played, that I was able to perfect before I even started development because I was able to mock up the flow on Figma. Many of my button and pop up designs benefitted from what I was able to create in Figma.

Part 4: Iterations

One big change early in the process was the progression from “Kanji Match” featuring only Kanji Characters, to “Moji Match” which includes a much wider breadth of content based on feedback from the language-learners I spoke to during user testing. Another impactful iteration I made based on feedback from user testing was allowing players to expand out the matching section to see what cards they had already matched. While I got a lot of great feedback from users, those two really resonated with me as insightful findings that translated into highly beneficial improvements. I was also able to make the design much more dynamic during development. While I laid out the visual design in my early prototypes, I couldn’t fully plan or represent the animations or music / sound, which I got to explore and implement while building the project, making my end product a significantly richer and more engaging experience compared to the prototypes.

Part 5: Challenges

While React Router is a super cool tool that I was excited to learn, the generally recommended usage is not supported by GH pages, which caused me severe difficulties during my development and deployment. This required me to do some serious and tedious debugging as I scoured every stack overflow page on the topic that I could find. Although this was tough, ultimately, it was a good lesson in putting my debugging strategies to use, and reminded me of the pains and joys of learning new skills in programming. Unfortunately, because of the many hours these challenges took, I did have to narrow my scope slightly, as I had planned to build out the card content both in breadth (different character sets - Hiragana, Katakana, Kanji) and depth (more cards in each set) after my final project presentation, but ended up prioritizing breadth as I felt like it was more representative of new possibilities, compared to functionality that I did in fact demonstrate, but could be built out more.

Appendix:

Accessibility

Wave Tool: Welcome Menu

The screenshot shows the Wave web accessibility evaluation tool interface. The address bar indicates the report is for <https://erinsa.github.io/esawyer-final-project/>. The main content area displays the Moji Match welcome menu, which features a cartoon squid holding a brush and ink, with a large 'Play!' button. A sidebar on the left provides detailed analysis of the page's accessibility, including sections for Features, Structural Elements, and ARIA labels.

Details

- 3 Features**
 - 2 X Alternative text
 - 1 X Language
- 2 Structural Elements**
 - 1 X Heading level 1
 - 1 X Main content
- 6 ARIA**
 - 6 X ARIA label

If an icon does not appear within the page, turn off Styles above to view it.

Summary

| Errors | Contrast Errors |
|--------|-----------------|
| 0 | 0 |

| Alerts | Features |
|--------|----------|
| 0 | 3 |

| Structural Elements | ARIA |
|---------------------|------|
| 2 | 6 |

This screenshot shows the same Moji Match welcome menu as the previous one, but with the 'Styles' option turned off in the Wave tool's sidebar. As a result, the page's styling is removed, making the content appear more basic. The sidebar now displays a summary of errors, alerts, structural elements, and ARIA labels.

Summary

| Errors | Contrast Errors |
|--------|-----------------|
| 0 | 0 |

| Alerts | Features |
|--------|----------|
| 0 | 3 |

| Structural Elements | ARIA |
|---------------------|------|
| 2 | 6 |

Congratulations! No errors were detected! Manual testing is still necessary to ensure compliance and optimal accessibility.

Wave Tool: Character Select Menu

WAVE Report of Moji Match

powered by WebAIM

Address: https://erinsa.github.io/esawyer-final-project/

The following apply to the entire page:

Styles: OFF ON

Summary

| Errors | Contrast Errors |
|--------|-----------------|
| 0 | 0 |

| Alerts | Features |
|--------|----------|
| 0 | 3 |

| Structural Elements | ARIA |
|---------------------|------|
| 2 | 6 |

[View details >](#)

Congratulations! No errors were detected! Manual testing is still necessary to ensure compliance and optimal accessibility.

What would you like to practice?

Hiragana Katakana Kanji

A green cartoonish squid holding a burst of ink, flags, writing utensils, and paper

Code

WAVE Report of Moji Match

powered by WebAIM

Address: https://erinsa.github.io/esawyer-final-project/

The following apply to the entire page:

Styles: OFF ON

Details

| Features |
|--|
| <input checked="" type="checkbox"/> 3 Features |
| <input checked="" type="checkbox"/> 2 X Alternative text |
| <input checked="" type="checkbox"/> 1 X Language |

| Structural Elements |
|---|
| <input checked="" type="checkbox"/> 2 Structural Elements |
| <input checked="" type="checkbox"/> 1 X Heading level 1 |
| <input checked="" type="checkbox"/> 1 X Main content |

| ARIA |
|--|
| <input checked="" type="checkbox"/> 6 ARIA |
| <input checked="" type="checkbox"/> 6 X ARIA label |

If an icon does not appear within the page, turn off Styles above to view it.

What would you like to practice?

Hiragana Katakana Kanji

A green cartoonish squid holding a burst of ink, flags, writing utensils, and paper

Code

Wave Tool (Browser Extension): Game Page

Moji Match

powered by WebAIM

Styles: OFF ON

Details

- Summary
- Details
- Reference
- Order
- Structure
- Contrast

34 Features

- 33 X Alternative text
- 1 X Language

2 Structural Elements

- 1 Heading level 1
- 1 Main content

39 ARIA

- 23 X ARIA label
- 16 X ARIA tabindex

Moji Match

Matches:

0

How to Play

Code

The following apply to the entire page:

4:32 AM 12/10/2023

Moji Match

powered by WebAIM

Styles: OFF ON

Summary

- 0 Errors
- 0 Contrast Errors
- 0 Alerts
- 34 Features
- 2 Structural Elements
- 39 ARIA

Congratulations! No errors were detected! Manual testing is still necessary to ensure compliance and optimal accessibility.

View details

Moji Match

Matches:

0

How to Play

Code

The following apply to the entire page:

4:31 AM 12/10/2023

Wave Tool (Browser Extension): Game Page (Features Expanded and Win Message Shown)

The screenshot shows two instances of the Wave Tool extension running in a browser window. The top instance displays the 'Details' tab, which provides a breakdown of the page's accessibility features. It lists 42 checked features, including 41 X Alternative text and 1 X Language. It also shows 2 structural elements (1 X Heading level 1 and 1 X Main content) and 39 ARIA labels. The bottom instance displays the 'Summary' tab, which provides a high-level overview of the page's accessibility status. It shows 0 Errors, 0 Contrast Errors, 0 Alerts, 42 Features, 2 Structural Elements, and 39 ARIA labels. A message at the bottom of the summary tab says, "Congratulations! No errors were detected! Manual testing is still necessary to ensure compliance and optimal accessibility."

The main content of the page is a 'Moji Match' game. It features a cartoon green squid mascot holding a pencil and a small Japanese flag. The game interface includes a grid of cards with Japanese characters (hiragana and katakana) and their English equivalents. A large, celebratory message on the right side reads:

CONGRATS!
You've won!
Great job
studying!

Return to [button]