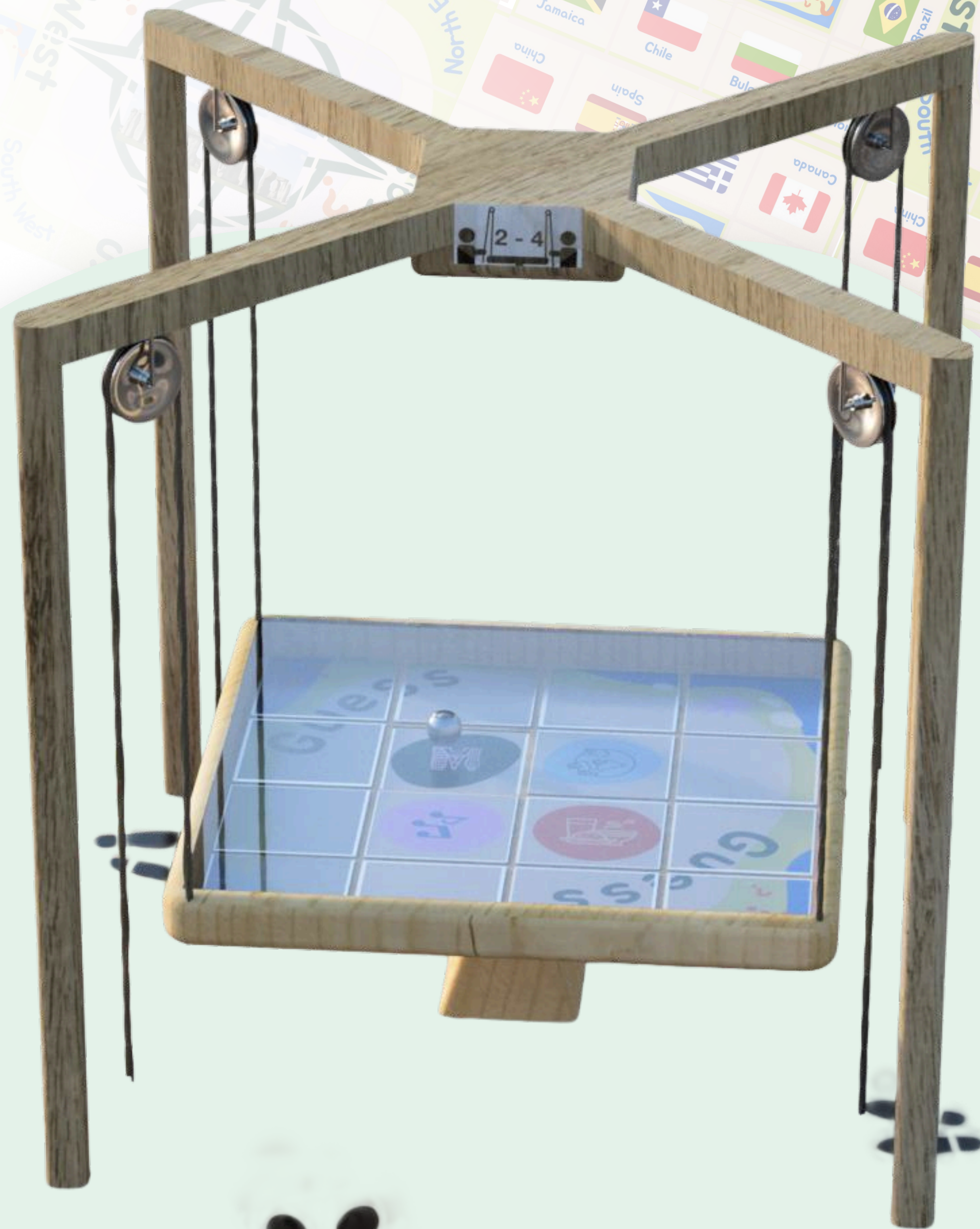




Tilt Quest

Fun Intended: Elena, Leia, Mayli, Veda

Context

The Problem:



Relocating to a new city, especially **internationally**, is widely recognized as one of the **most stressful life transitions**. Beyond adapting to a new environment, individuals must overcome significant social and cultural barriers to feel connected and accepted. **Culture shock, isolation, and language difficulties** are common, often made worse by unfamiliar customs and a lack of local support networks. These challenges make it **difficult for newcomers to form meaningful relationships or feel a true sense of belonging** within their new communities.

Secondary research:



To **build a foundation for our design direction**, we conducted secondary research early in the project by **reviewing existing studies on play theory**, social isolation and belonging, particularly among young adults and **non-native English speakers living in the UK**.

What is Play?

Play is behaviour that combines the following key elements: [1] [2]

- »»»» **Fun** - enjoyable and light-hearted
- »»»» **Voluntary** - chosen freely, not imposed
- »»»» **Intrinsically motivated** - driven by the activity itself, not by external rewards
- »»»» **Imaginative or creative** - open-ended and expressive

Play is not about achieving a specific outcome, the focus is on the experience rather than the result. Because of this, it creates **a space where failure is permitted**, experimentation is encouraged, and social pressure is reduced.



Who?

Individuals integrating into a **residential community** and those welcoming new individuals

Why?

Social integration in new environments can be challenging and not always happen naturally

What?

Increase a sense of community and help people **settle into a neighbourhood**

When?

From the point of someone joining a new community up to them feeling integrated

Where?

Within a residential area or neighbourhood

How?

By creating a **non-verbal, playful experience** that encourages casual connection

Interviews:

We interviewed **8 immigrants** from countries including Poland, Italy and India who had recently moved to London, to **explore challenges** around **cultural adjustment, confidence** and **communication**.



Insight: Navigating New Cultural Norms

To confidently understand and engage with their surroundings independently. A **lack of intuitive visual cues** and **fear of unknowingly breaking social norms** make unfamiliar systems feel risky to explore alone.

Insight: Building Confidence Through Small Interactions

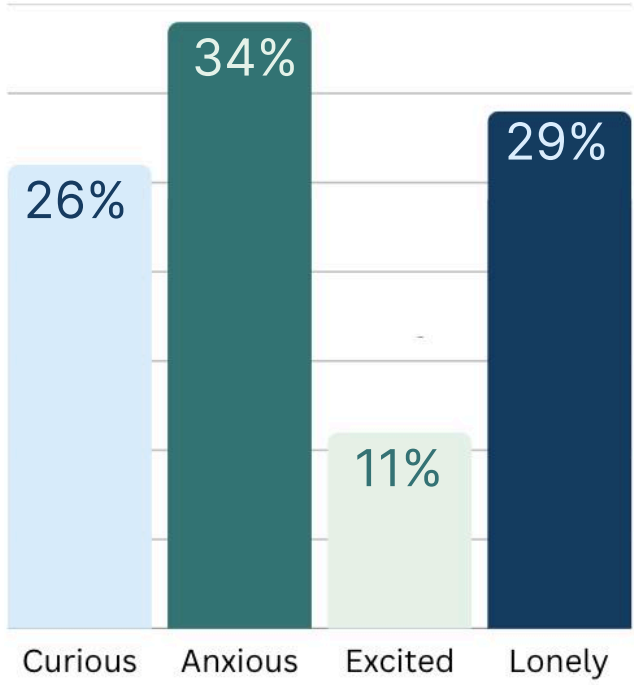
Small, everyday moments, like receiving a smile from a neighbour or being helped at a local shop, gradually helped them **feel more at home**. These micro-interactions helped **build confidence** and a **sense of belonging** over time, even when verbal communication was limited.

Insight: Feeling Seen and Represented

Participants expressed feeling **more connected** when they saw their **culture, language or country** reflected in their surroundings. Familiar visuals, sounds or references helped **validate their identity** and sparked spontaneous conversations..

Survey and Results:

We surveyed **46 people** to understand how they felt when moving somewhere new, helping us **identify common emotional challenges like loneliness and anxiety**.



What emotion best describes how you felt when you first moved somewhere new?

Observations:

We observed interactions in **multicultural public spaces** to see what naturally encourages casual connection, especially in diverse urban settings.

Key Insight: **Visually engaging, interactive elements** naturally attract people and invite casual interaction, creating low-pressure spaces that encourage spontaneous connection, especially valuable in diverse, multicultural settings.



Design Brief:



- »»»» The aim of this project is to **support young international adults** (20s to late 30s) settling into a new city by helping them **overcome early social and cultural barriers**.
- »»»» Encouraging casual, non-verbal interactions in public spaces to **ease feelings of isolation**, culture shock, and language-related pressure.
- »»»» Designing a **playful, low-pressure experience** that fosters a sense of belonging through shared, inclusive moments.
- »»»» A solution that is **accessible, culturally sensitive**, and seamlessly integrates into diverse urban lifestyles.

Requirements and Selecting a Concept

Context mapping:

To better understand the experience of moving to London, we ran a context mapping session with **6 international students** at a London university. Through creative tasks, we explored their **social needs and emotional responses** to adapting in unfamiliar environments.



Key:



Interviews



Context Mapping



Observations



Personas

Insight: Seeking Safe Entry Points into Social Life

Wish: To participate in social spaces that feel approachable and culturally familiar.
Barrier: Participants were mostly drawn to events specifically designed for international students, suggesting that **general social settings felt too unfamiliar or intimidating** to join.

Insight: Desire Depth in Social Interaction

Wish: To form meaningful relationships that evolve over time.
Barrier: Social settings often led to short, transactional conversations, making it **hard to move beyond initial small talk**.

Personas:

These personas were created by **combining insights from our interviews, surveys, observations and context mapping**. They reflect key behaviours and emotional needs, helping us stay rooted in real user experiences.



Introverted Wei



Extroverted Sofia

Needs:

- Low-pressure spaces for passive or gradual engagement
- Language-light activities
- Familiar, approachable cues
- Meaningful, open-ended interaction
- Shared non-verbal experiences
- Emotionally safe, welcoming environments

Requirements:

High Priority



Design should be **easily interpreted**, without the need for language.



Design must be **naturally interactive between people**, fostering connection.



Design should enable **playful expression** and **cultural sharing** without judgement.



Design must tap into **sensory experiences** to create a positive atmosphere.



Design must be **non verbal** making it more low pressure.



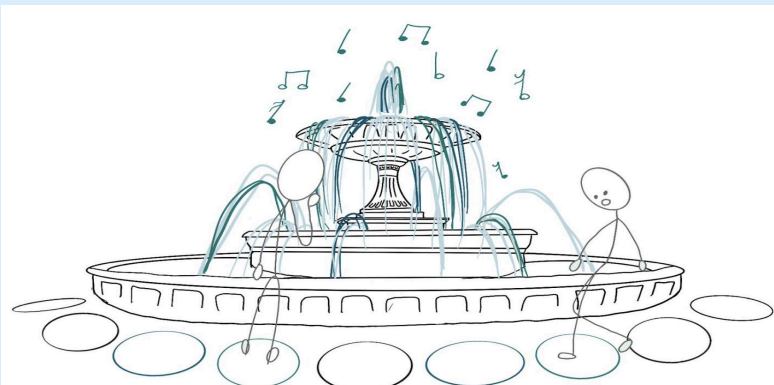
Design must be **visually pleasing** to gather interest.

Low Priority

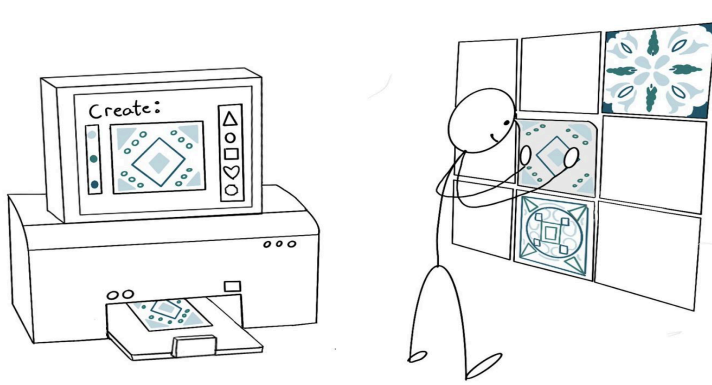
Selecting a Concept

We **compared our three initial concepts against our project's requirements**, using evaluation criteria such as feasibility and desirability to identify the idea that best met the needs of our target users.

Music Steps Fountain



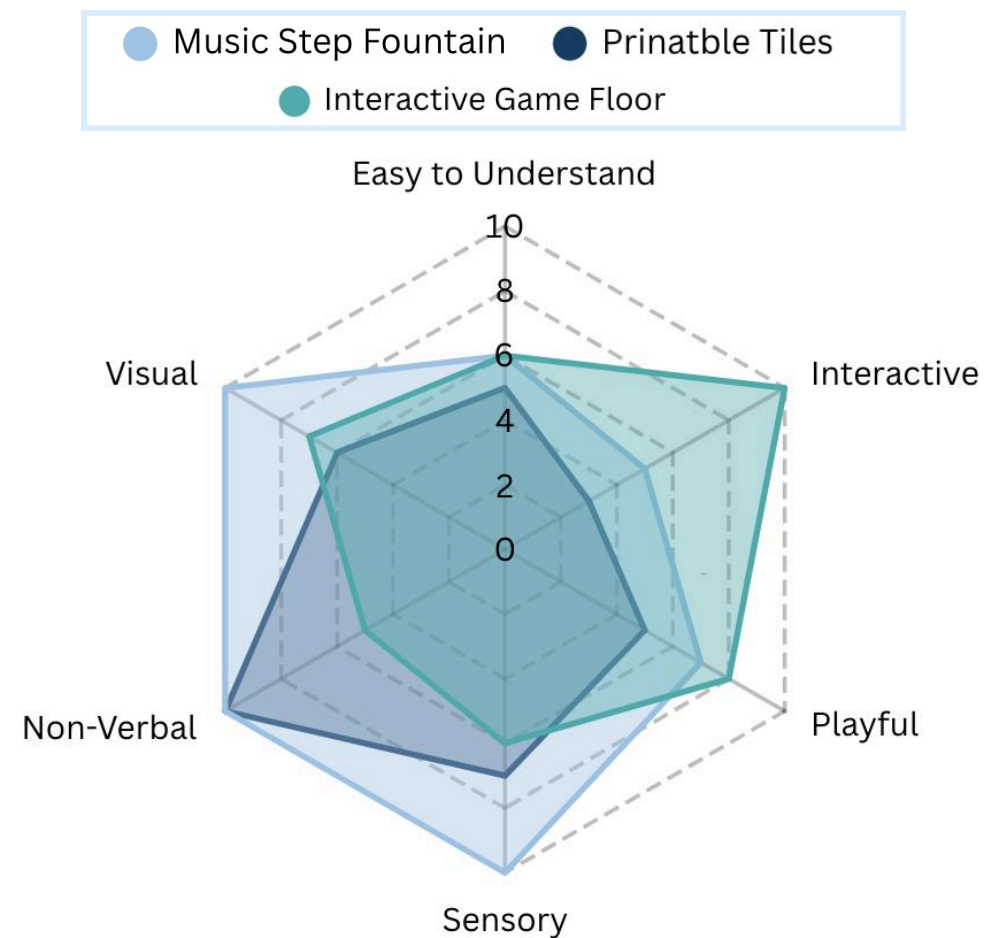
Printable Tiles



Interactive Game Floor



3 Selected Ideas	Feasibility	Viability	Desirability	Low Pressure	Language Level	Interpersonal Interactions
Music Steps Fountain	7	7.5	9	9	9	6
Printable Tiles	8	7	7	8	8	4
Interactive Game Floor	7	7	7	5	4	10



The radar graph helped highlight visually each idea's strengths and weaknesses in relation to our requirements.

Concept evaluation and Justification

The Music Steps Fountain scored **highly in desirability and language accessibility**, indicating it would be both **engaging and inclusive** for a diverse range of users.

Although it performed lower on easy interpretation, it stood out as **the most visually engaging, non-verbal, and sensory-based concept**, qualities that support our aim of creating a playful, low-pressure experience that does not rely on language or prior familiarity.

Key Limitations:

The fountain scored **lower on interpersonal interaction**, which our research showed is **vital** for helping newcomers **build social connections**. Therefore, while moving forwards with the Music Steps Fountain, we **explored ways to integrate elements** from the Interactive Game Floor because it scored strongly in terms of interpersonal interaction, such as its ability to create a multi person 'game'.

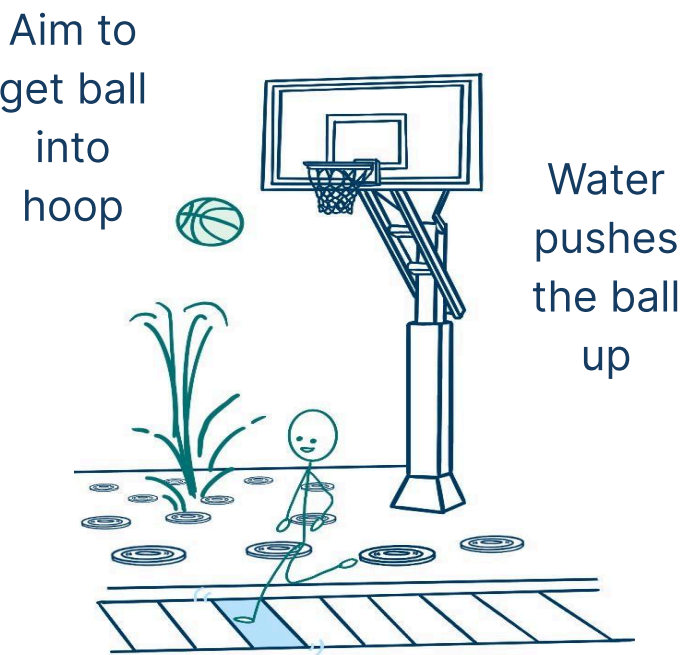
Design Development

Design Iteration Sketches

Our research highlighted the **need for stronger social interaction**, which the fountain lacked. We've chosen to **develop the Music Steps Fountain further**, focusing on integrating **multi-user features** from the Interactive Game Floor to better **support community connection**.

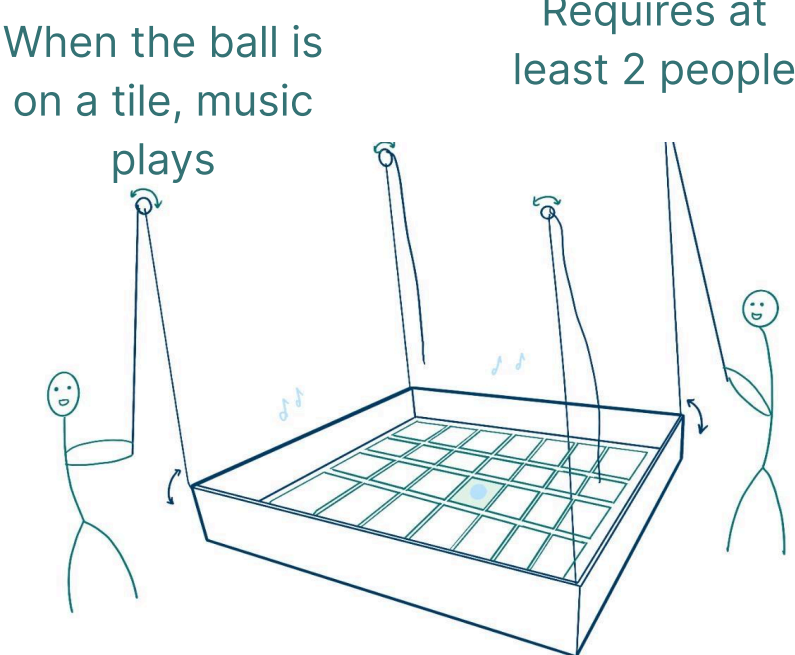
We took the key elements of the musical water fountain, tiles that responded with water, light, and sound, and transformed them into more game-like systems.

1. Water Ball Tiles



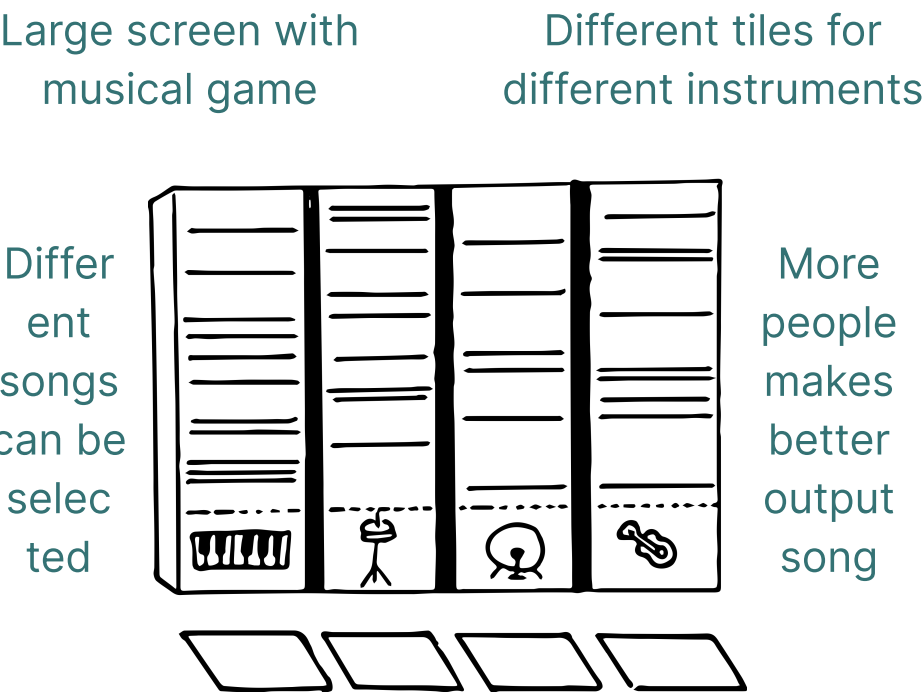
Pressure tiles activate water spurts

2. Tilting Tune Table



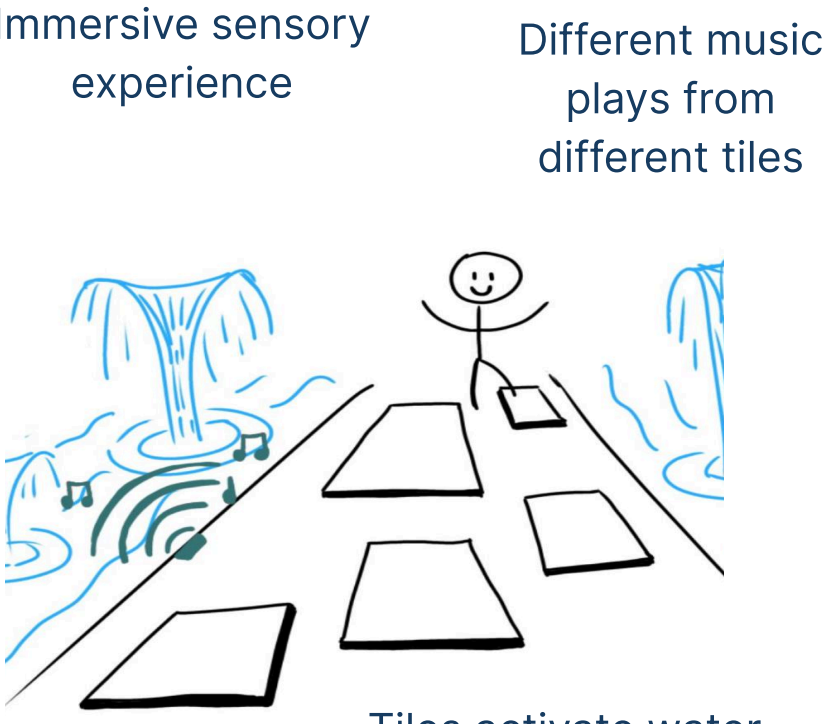
Ball is tilted onto a tile using pulleys
Tiles have screens that light up when the music plays

3. Rhythm Wall



Step on the tiles when the line gets to the instrument

4. Water Tile Walk



User Feedback

We shared our four design concepts with **international university students** to gather feedback on what felt **most engaging and supportive** of social connection. Their input helped us understand which ideas **best aligned** with user needs and goals.

Positives:

- »»» Felt significantly **more team based** and, therefore, encouraged more interaction
- »»» It was seen as a more spontaneous and inviting system for public spaces.
- »»» The use of music and physical inputs was well received.
- »»» Music was seen as a **positive way to express and share different cultures**.

Negatives:

- »»» The water-based features may not appeal to adults, **risk of getting wet and being perceived as childish**.
- »»» In Iteration 4, the "Water Tile Walk" was described as pleasant but **interactive between people**.
- »»» Iteration 1 and 4 lacked elements that actively encourage getting to know neighbours as they were too actively focused.



Based on this feedback, we chose to **further develop Iterations 2 and 3**, as they stood out for their ability to invite teamwork and shared cultural exchange through cultural music. Their positive reception indicated they were **more aligned with our goals and user needs**.

Lo-fi Prototypes

Rhythm Wall

This prototype **simulates the final design** by triggering instrument sounds with keyboard presses.



Questions we had

Does combining multiple instruments feel musical and coherent?

How we tested it

Different instruments were mapped to different tiles in the prototype to simulate a full tune.

Insights and findings

Layering worked well when instrument sounds were spaced out, but overlapping notes caused some confusion.

Tilting Tune Table

This prototype features a tilting surface where a rolling ball triggers music by landing on tiles, each representing a song from a different country to encourage cultural curiosity and shared play



Questions we had

How can the table tilt smoothly?

How we tested it

Springs placed at the corners to enable tilting.

Insights and findings

Springs restricted the range of tilt and reduced overall movement flexibility.

Does the mechanism allow precise selection?

Springs beneath tiles to test bounce and how easily the ball rolls or rests on them.

The ball could trigger tiles, but controlling its path was inconsistent and unpredictable.

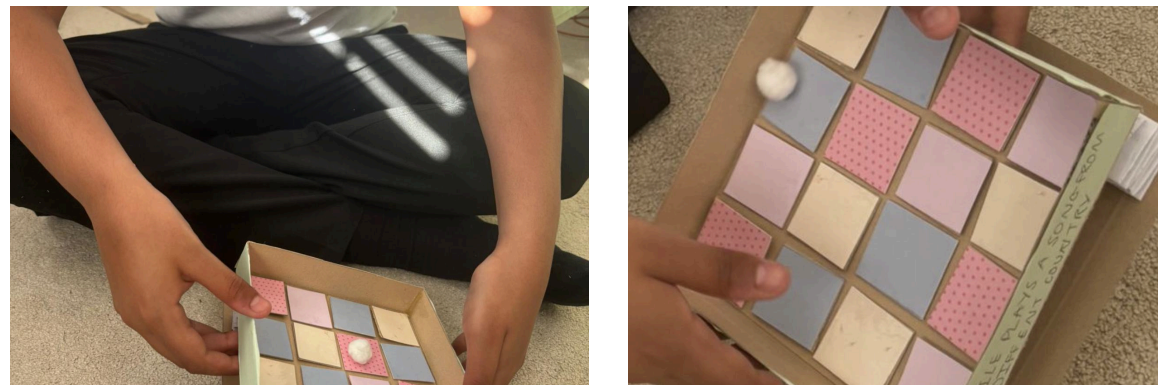
Next steps:

We will experiment with pulley or pivot-based tilt mechanisms for smoother control and test tile materials or layouts to improve ball movement and targeting.

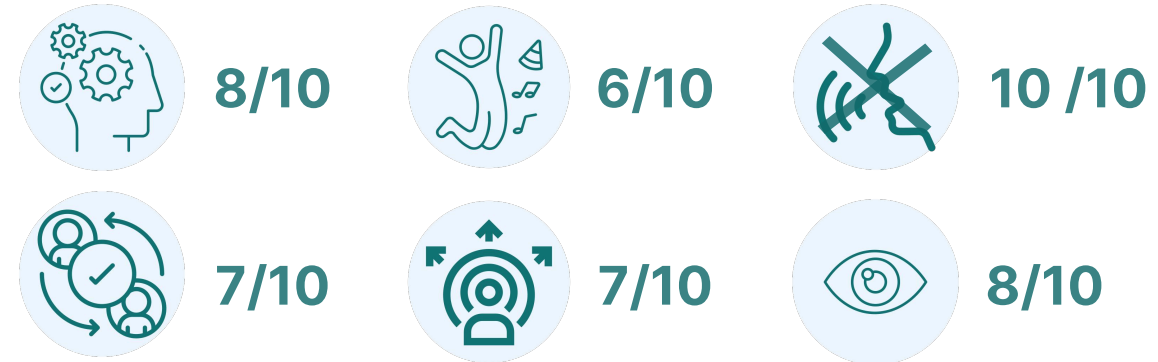
User Feedback

Idea: Tilting Tunes Table

We created a **small-scale cardboard** prototype and asked **international university students** to test it. This helped us observe how users physically interacted with the game and whether it encouraged playful collaboration.



Question: How does the user **interact with the game** and would this **encourage interpersonal interactions**?



46/60

What Worked Well

- Shared control **encouraged teamwork** and non-verbal communication
- Players **enjoyed the musical feedback** and physical interaction
- The game felt different from typical screen-based experiences

What didn't Work

- The moment **after the music played felt awkward** or incomplete
- **Limited replay value** once all tiles had been triggered

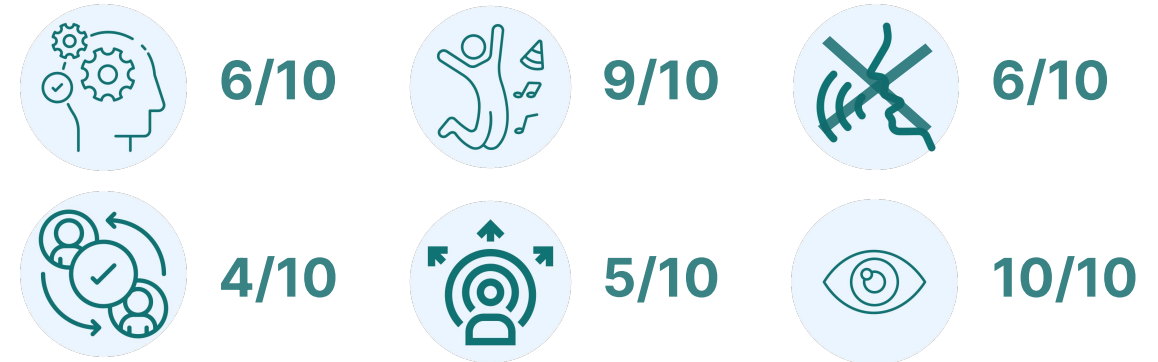
Answer: The shared control encouraged teamwork and interaction, but the experience dropped off after the music played, making it feel unfinished

Idea: Rhythm Game

We developed a **digital prototype** to simulate how the rhythm game might function. We then asked **university students** for feedback on how engaging it felt and whether it encouraged interaction between players.



Question: How **engaging is the game between players** and does it encourage them to interact with one another?



40/60

What Worked Well

- Visually engaging with familiar, **intuitive gameplay**
- Fun to play with satisfying and instant visual and audio feedback
- It encouraged creating music together but could also **work with just one person**

What didn't Work

- Too **screen-focused**, with limited interaction or variation
- Shared controls still **felt like single-player gameplay** side by side and it lacked variation and didn't encourage conversation or cultural exchange

Answer: Users were too focused on timing and the screen to interact with others. It didn't naturally encourage social connection or collaboration.

Input Mechanisms

We tested a **range of input mechanisms** with international university students to explore which felt most **intuitive**, **immersive** and **engaging**. Their feedback helped us identify the inputs best suited for playful, socially interactive experiences.



Question: What are the different kinds of input mechanisms that can be used and which is the **most engaging** for the user?

Pressure Plate



Pressure plates were the **most intuitive and immersive** once paired with sound or visual feedback, making them especially effective for engaging users through gameplay

Button



Buttons were **easy to understand** and offered satisfying tactile feedback. But they **didn't feel as immersive** as other mechanisms when integrated into gameplay.

Pulley System



The pulley system stood out as a **more unusual and exciting** input method. It introduced a fresh way for users to interact that added variety to the experience.

Switch



Switches were **functional and easy** to use but they **felt quite basic** and didn't spark much engagement or curiosity

Answer: Pressure plates were the most engaging, while the pulley system stood out as a playful, novel input worth developing further.

Requirements Key:



Chosen Idea

After testing our low-fidelity prototypes, we chose to **move forward with the Tilting Tunes Table**. It scored higher (46/60) against our requirements and showed the **strongest potential for further development**. Unlike the rhythm game, it supported face-to-face interaction, encouraged teamwork, and created a more playful, non-verbal experience.

Key things we learnt

Music alone isn't engaging enough

Unusual inputs sparked curiosity

Clear feedback boosts engagement



Changes and next steps

Create new game modes to add purpose and replayability

Explore novel mechanisms like the pulley system

Focus on pairing inputs with sound and visuals consistently

Digital Prototype

Design Focus Group

To better understand what kinds of interactive games could support cultural exchange and sustained engagement, we **ran a design focus group with international university students**.



We introduced a range of game concepts and **observed which ones sparked interaction**, curiosity and cultural sharing.

This session helped us **explore** how playful experiences could **naturally lead to connection** between newcomers in a shared space.

Findings:

- Players **enjoyed quiz-style games** for encouraging knowledge sharing and discovery.
- Games that **introduced something new or featured familiar elements** prompted personal storytelling and cultural exchange.
- **Auditory feedback** felt rewarding

Prototype Development

We created a prototype to **demonstrate what each tile would display** and gathered feedback from **international university students** on how the games functioned. We tested two iterations with different colour schemes and gameplay adjustments to explore user preferences in **visual design and interaction style**.

Gameplay

Feedback:

- Users appreciated the cooperative, low-pressure gameplay.
- The games **created a sense of shared experience**.
- Many said they'd be **“curious to try it.”**
- Concern that it's **not obvious the game requires two players**.
- Suggested adding difficulty levels for accessibility and re playability.

Developments:

- Added signage and four sets of footprints to clearly indicate it's a multiplayer game.
- Introduced a **difficulty setting to allow people to play at their own pace**

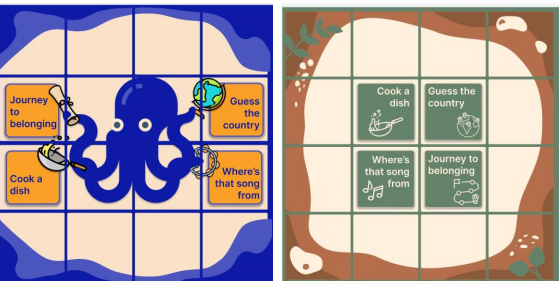
Interface

Feedback:

- The cartoon felt **too childish**, and iteration 2's colours were **too dull**.

Development:

- Adopt a **more vibrant colour palette** and remove the character



Iteration 1

Iteration 2

Game Developments

Question:

How do users respond to the games, and how effective are they at **fostering low-pressure social connections**?

Findings:

Users felt the original games **lacked cohesion**. “Guess” games were preferred for being **more intuitive, adult-appropriate**, and offering light-touch cultural immersion. Other formats involved too much reading. As a result, all **games were restructured** around a unified guessing format.



Physical Prototype

User Testing



We created a **small-scale model** and tested it with **two users at a time**. The game encouraged collaboration and the users engaged well and **naturally began working together**, confirming the design supports co-play.

Key Issue
Orientation: for one player, the interface appeared upside down, disrupting immersion and flow.

This insight led us to reflect on the physical layout and how to **better accommodate multiple perspectives** which we did through a design workshop.

Design Workshop - Tile Orientation

We ran a **focused co-design session** with **6 university students** where users **physically rearranged printed versions** of the tile screens to see what they preferred for a multidirectional layout.

Users were asked:

- What layout feels most comfortable when playing with others?
- Where would they expect certain elements to be?
- How would they move around or interact from different sides?



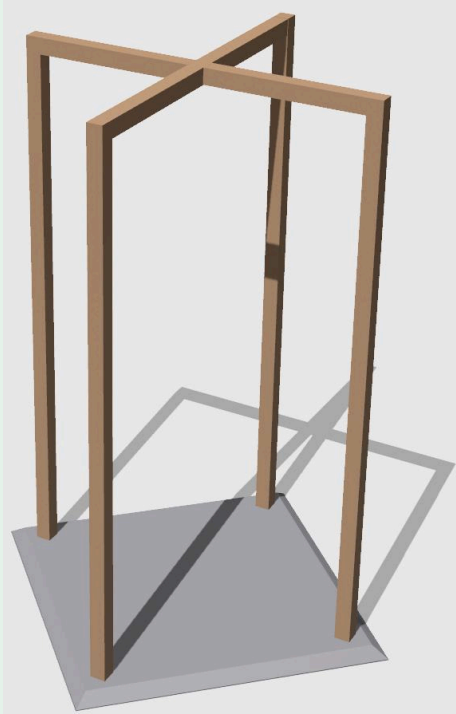
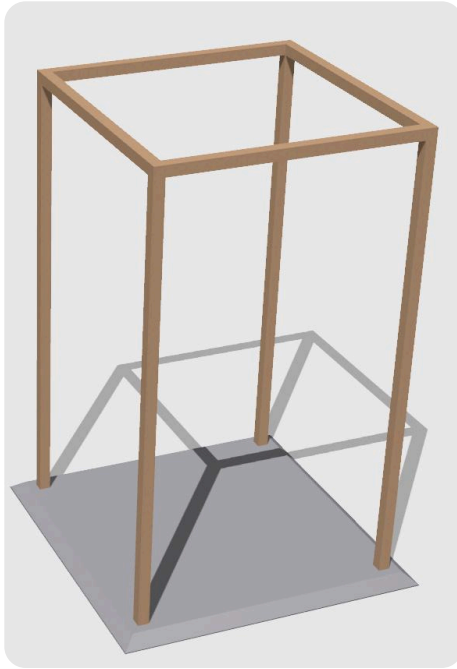
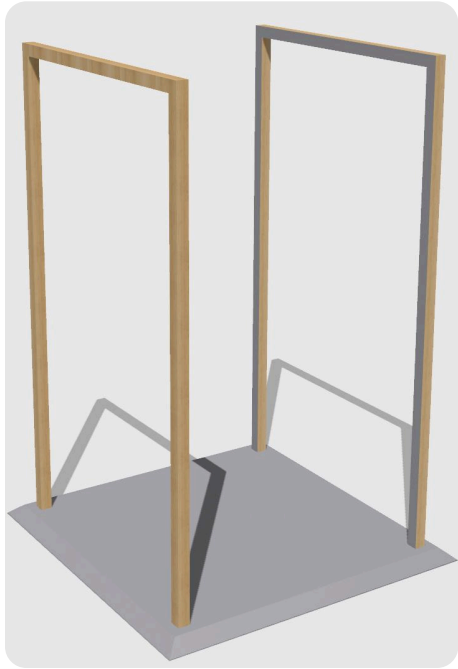
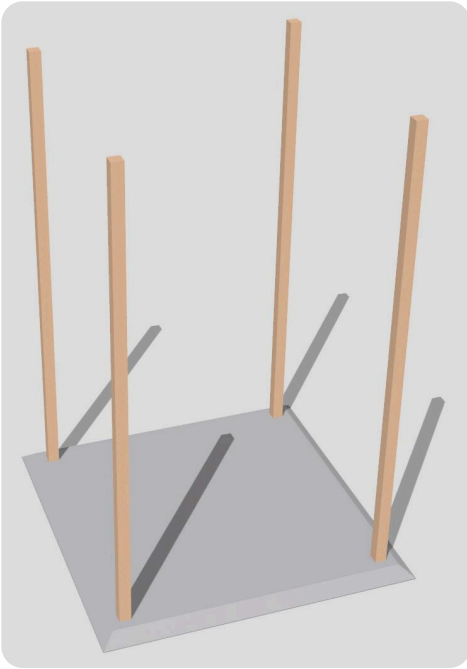
Overall Best Option			
China	Spain	Greece	Canada
Australia	Guess the country	Austria	
Denmark		Brazil	
Jamaica	Chile	Bulgaria	Colombia

Participants consistently **gravitated toward a circular or cylindrical format**. This led to the decision to adopt a radial layout, where users can:

- Walk around the table freely
- View the interface **clearly from all angles**
- Collaborate by physically pointing or moving the ball from different sides

Frame Shape and Structural Iteration

We developed several CAD models to **explore how frame design affects approachability**



This version struck the right balance between **structure and openness**, making the game feel more accessible and playful.

At first, we considered supporting each pulley with its own vertical beam, but users found this setup uninviting and visually harsh. In response, we explored alternative frame designs that felt more open and not too heavy. After testing and discussions with peers, we agreed on a cross-shaped frame. It provides structure without feeling enclosed, allows access from all sides, and subtly defines space for four players while remaining open

Inviting Interactions

A **key priority** in our physical prototype was making the installation **self-explanatory and approachable**; especially for people unfamiliar with the concept. Since the product will be placed in public or semi-public spaces, we aimed to **design cues that invite interaction without needing a facilitator**.

Footprints

- Footprints will be marked on the floor around the table to show where users can stand. These will:
- Indicate **optimal positions** for 2–4 players
 - Reduce hesitation by giving **clear starting points**
 - We're exploring using **different colours or patterns** to show which footprint belongs to which player, or to indicate that anyone can join.
 - Positioning the footprints slightly back from the table encourages users to move around rather than crowd one side.

Signposting

- The sides of the table will feature simple visual cues to:
- Indicate **how many players** are needed or supported
 - Show **how to begin** (e.g. "start here" icon)
- Ideas Include:
- Arrows or icons showing the direction the ball should roll
 - Symbols like **hands, music notes**, or movement lines to imply interaction

Universal Design

- We researched **semiotics** to choose symbols and shapes that feel intuitive across cultures.
- We chose icons and layouts that are **instantly recognisable** without needing words
 - Footprints, arrows, and curved paths are widely understood as movement or directional cues
- This makes the experience **more inclusive**, especially for users with different language abilities.

Final Prototype Validation

Structural Improvements

To make the physical installation feel **more open, intuitive, and group-friendly**, we redesigned the frame and surrounding setup based on earlier feedback and testing.



Cross-Shaped Frame

Earlier versions felt too enclosed or visually unclear. The final cross-shaped frame offers **structure without blocking movement**, staying open on all sides so users can approach from any angle. The rope

Footprint Markers

We added footprint graphics to guide where players stand. These **reduce hesitation**, especially for new users, while still allowing space to move around and interact freely.

Player Number Signage

A top-mounted sign shows the game supports 2–4 players. This **clearly communicates** that it's a **shared activity** and **reassures users** they can join in as a group.

Digital Improvements



We moved away from the **cartoon-style visuals** used in earlier versions, which were seen as **too childish** or patronising.

- »»» The new interface features a **clean, vibrant colour** scheme that feels playful but more grown-up.
- »»» All games now use **symbols instead of text**, improving accessibility across languages and making the **UI more intuitive**.
- »»» Both audio and visual outputs are triggered with the pressure plate to **improve engagement**.



Guess the Song

- »»» The music button is now placed **in the corner** of the screen, making it **easier for users** to hold the ball there for a few seconds while the clip plays.
- »»» This small tweak **improved usability** and encouraged users to focus on listening rather than rushing.



Guess the Location

- »»» The structure remains the same, guessing which country is shown, but the places are now **more obscure**.
- »»» This makes the game **more engaging** for repeat users and **encourages conversation** around lesser-known parts of the world.
- »»» It also **avoids bias** toward only well-known tourist destinations.



Guess the Food

- »»» Previously, this game involved making the dish, which was too complex and inconsistent with the other games. It has now been restructured into a **“guess where this dish is from”** format.
- »»» This keeps gameplay **consistent** while still sparking cultural curiosity and discussion.



Guess the Landmark (Relative to London)

- »»» This game uses a **compass-style interface**, where players guess if the landmark is north, south, east, or west of London.
- »»» This adds a **spatial reasoning** element and encourages users to think geographically and **get to know Britain better**.



Difficulty Settings

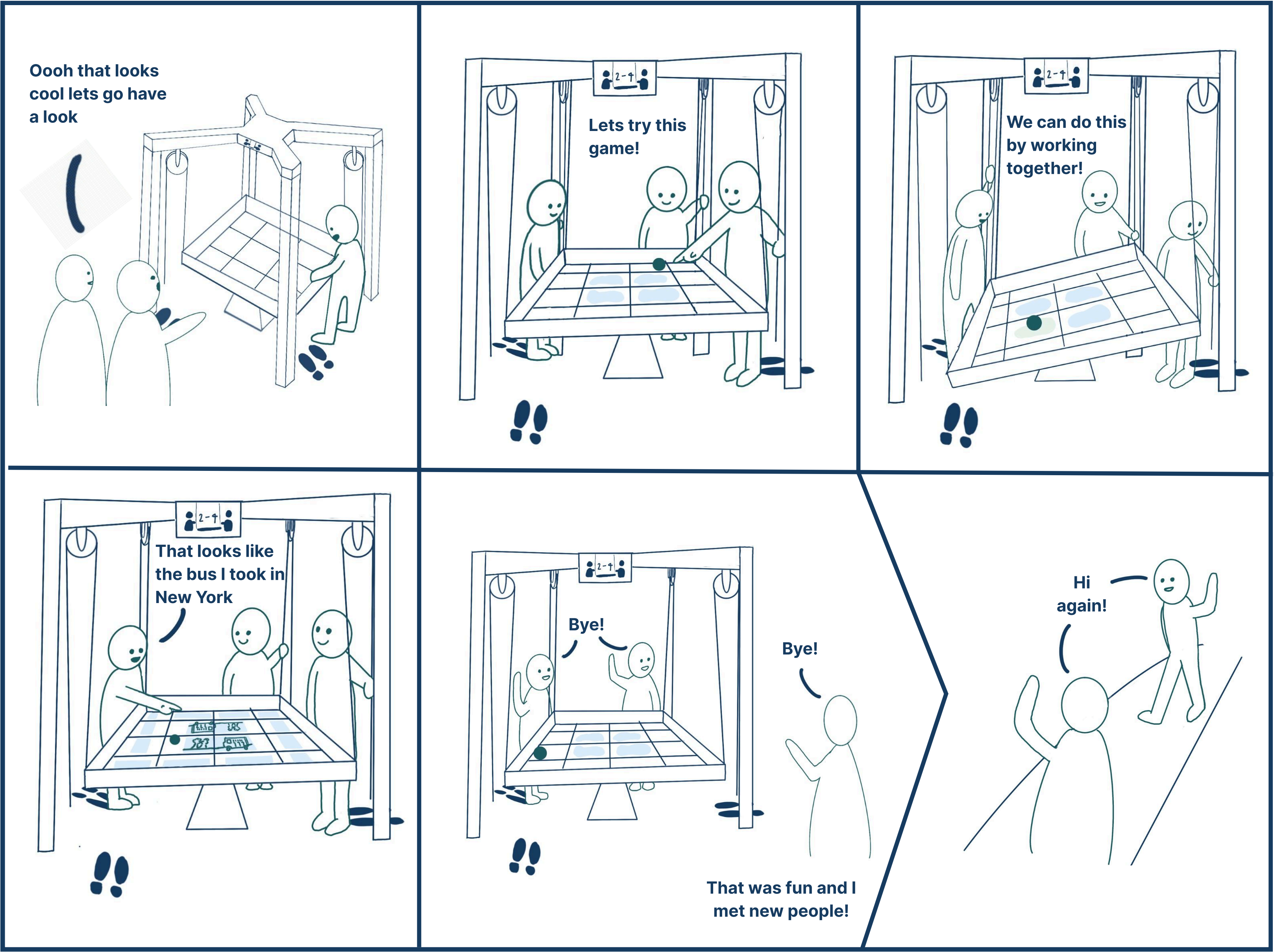
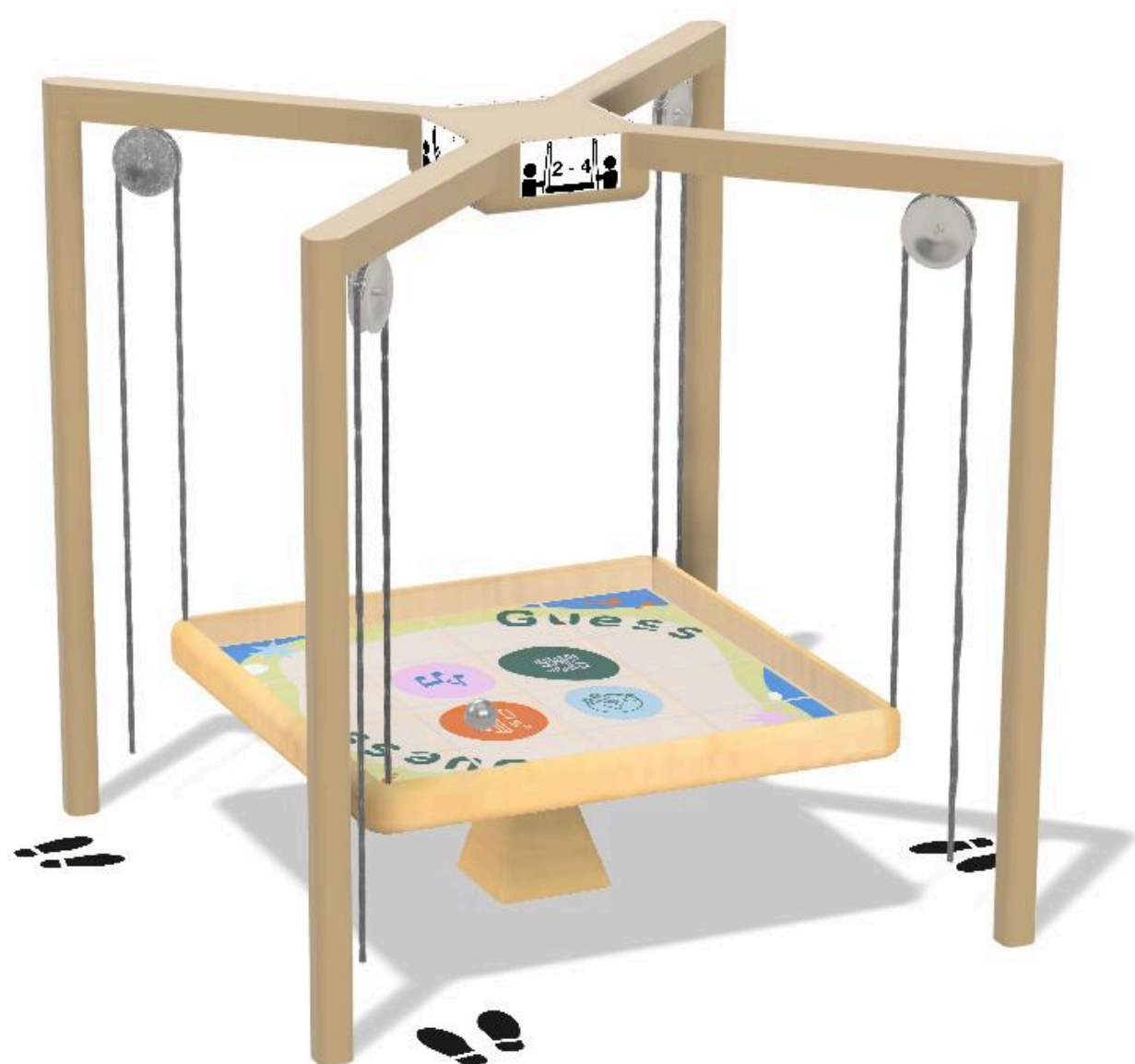
- »»» All games now include a difficulty selector to support **different levels of player confidence**.
- »»» Easier settings are designed to make the game **more approachable** for shy or first-time users.
- »»» Harder settings add **challenge and depth** for adventurous or returning players, **increasing re-playability**.

Overall Feedback

We interviewed **immigrants aged 20–40** to understand how well the final prototype **supported social connection**. Users responded positively to the open frame, footprint markers, and icon-based “Guess” game format, which felt **intuitive** and **accessible across languages**. The new difficulty setting was seen as inclusive while adding a re-playability aspect, and the mix of sound, visuals and movement made the experience fun and engaging in a group.

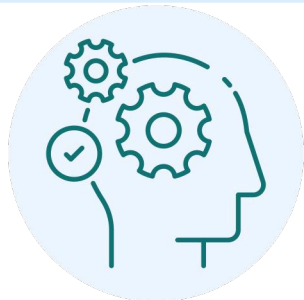


CAD and Storyboard

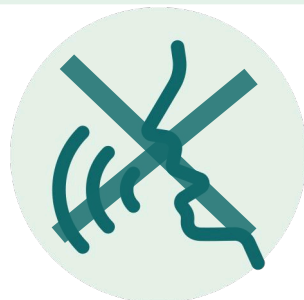


Evaluation

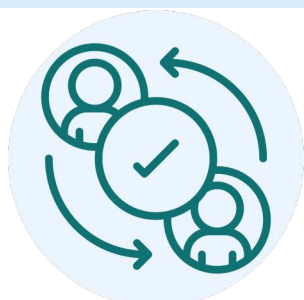
Requirements



Easily Interpreted



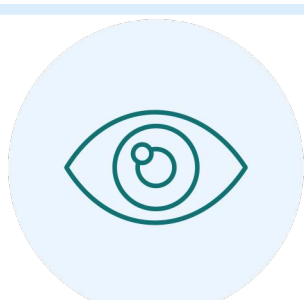
Non-Verbal



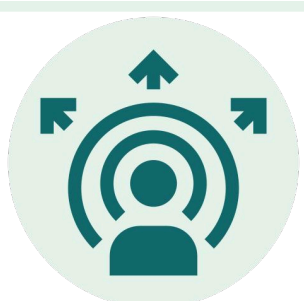
Interactive between people



Playful and Cultural Sharing



Visually Engaging



Multi-sensory experience

Evidence

We conducted **semiotic research** and **tested** our icon designs with **international users**. Most participants from Western and West Asian backgrounds found the symbols clear, though **broader testing is needed** to ensure universal understanding.

Through **user testing with immigrants**, we found that the game could be played **without verbal instructions**. Participants **engaged confidently** using visuals alone, making the **experience feel intuitive** and pressure-free across language differences.

During testing, participants naturally collaborated and shared guesses while playing. The group setup **encouraged interaction**, even for those less confident speaking. Music and clues often led to **spontaneous cultural sharing**.

Immigrant users responded positively to familiar cultural content, with many expressing joy when recognising songs or visuals from their backgrounds. These moments **prompted meaningful exchange** and helped create a playful, low-pressure environment for connection.

Feedback from international users showed that **visual features** like colour, lighting, and open structure made the game feel **welcoming** and easy to approach. These elements successfully attracted attention and **helped guide interaction**.

User testing highlighted that **combining sound, movement, and light** created an engaging, **culturally rich** experience. **Music stood out as especially** effective in sustaining interest and sparking conversation. Users suggested **refining feedback sounds** to keep the tone friendly.

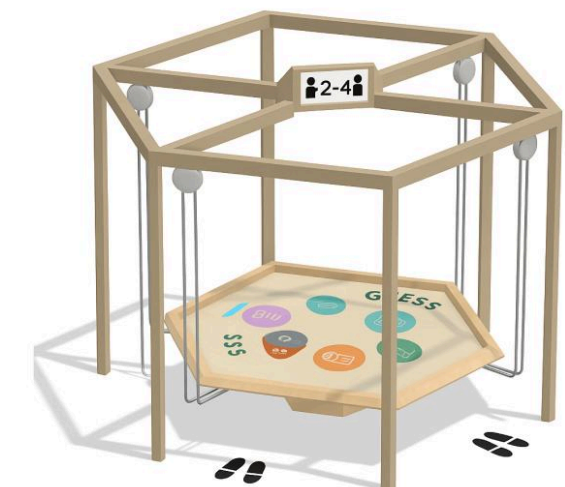
Improvements



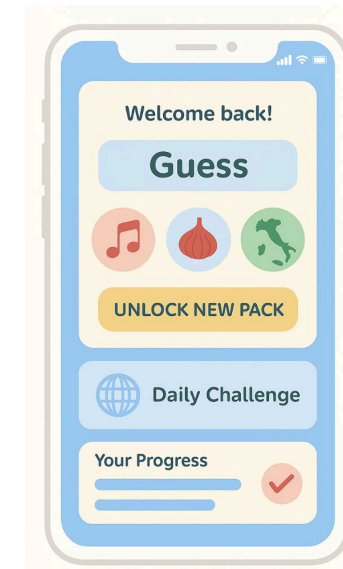
Integrate Solar Panel Roofing: Use a **solar panel** as the **primary energy source** to power lights, sounds, or digital features. This not only **supports sustainability** but also provides a functional **roof, offering shade and shelter** to make the experience more comfortable and accessible in outdoor settings.



Broaden Cultural Testing: Expand testing to include a **wider range of cultural backgrounds** to ensure icons, game content and visual cues are interpreted universally and inclusively. Also **include more countries and cultures** in the games so that everyone feels included.



Support More Players: Prototype with **different group sizes and table sizes** to explore how gameplay can **better support collaboration**, conversation, and shared decision-making in both small and larger groups.



Extend Re-playability with App Integration: Connect the physical game to a mobile app to **unlock new content, track progress, and offer rotating challenges**. This could include themed game packs, user-generated content, or cultural trivia; making the experience **more dynamic, personalised and long-lasting**.

Appendix

References:

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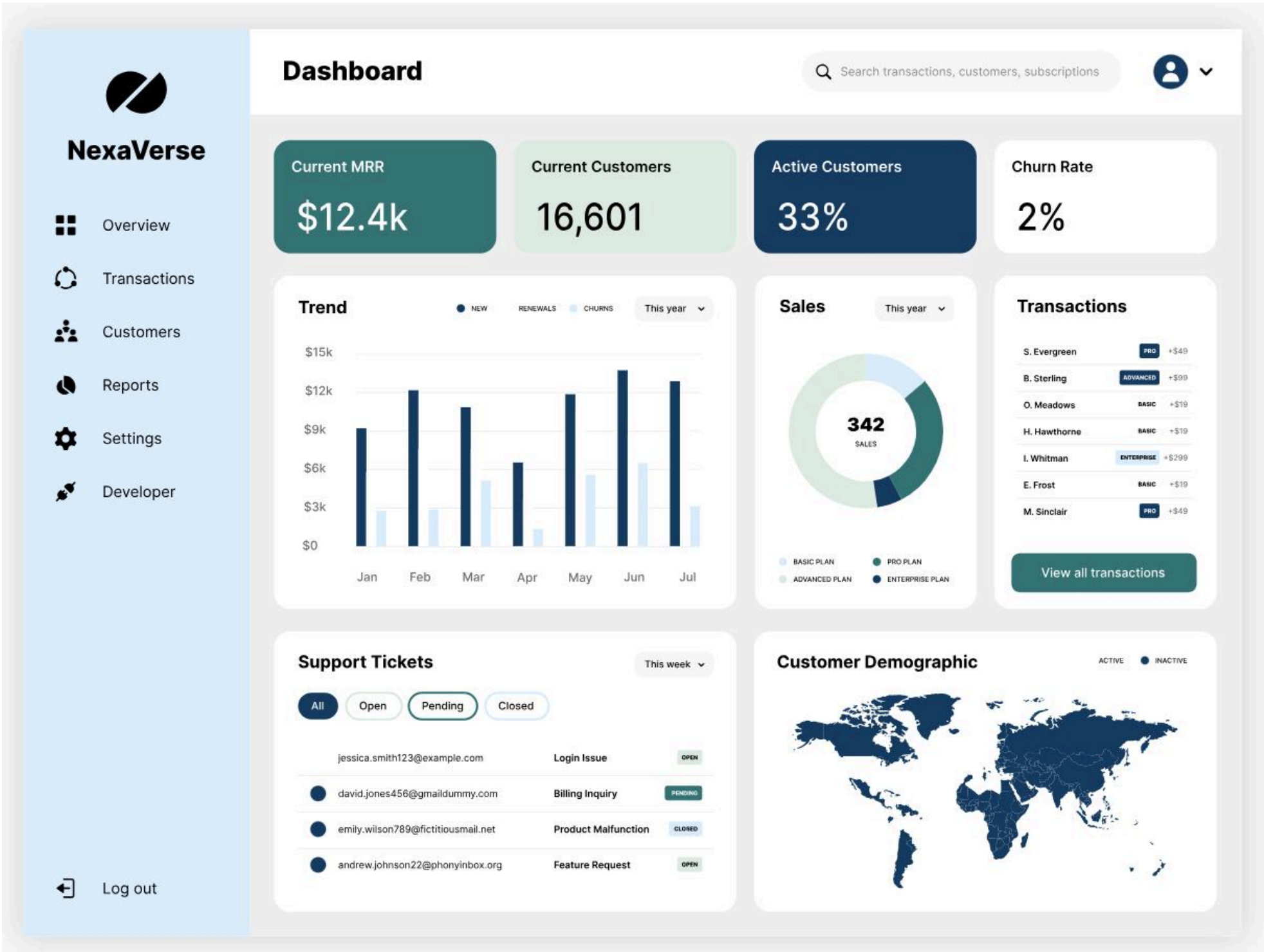
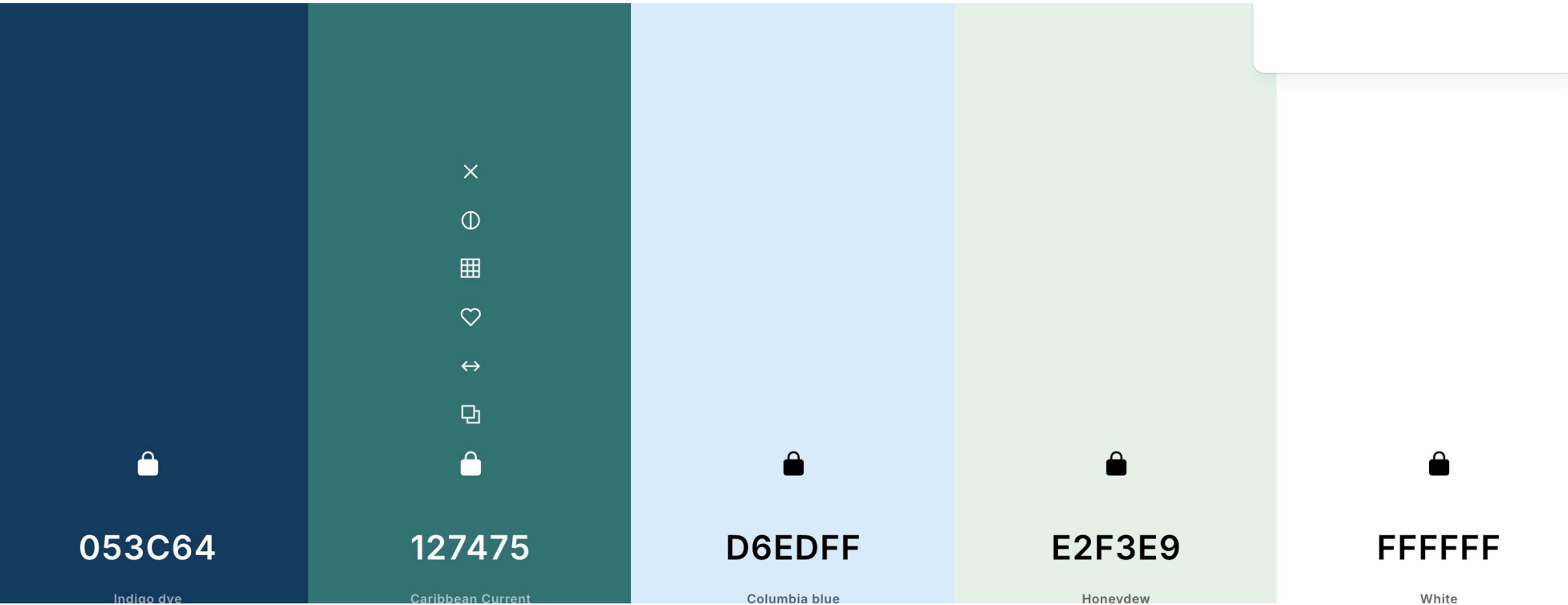
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Colour Scheme:



User Feedback

Compiled:

https://docs.google.com/document/d/14DgzugXSBqWN6UltBaBTZ1Vtnc hBDgsKS_rOW90VzrE/edit?usp=sharing

Meeting Notes

<https://docs.google.com/document/d/1joYAp orPQHcJ5wMCYNvZyGfWm a1ODY2aiPf-PPjpjvE/edit?usp=sharing>

